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Teacher Education and Professional Development in Industry 4.0



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TEACHER EDUCATION AND PROFESSIONAL DEVELOPMENT IN INDUSTRY 4.0



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Teacher Education and Professional Development in Industry 4.0

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The fourth International Conference on Teacher Education and Professional Development (INCoTEPD) was held in Yogyakarta, Indonesia on 13–14 November 2019. The event is an annual agenda organized by the Institute of of Educational Development and Quality Assurance of Yogyakarta State University. Responding to the current development in the teaching business, the fourth conference explored “Teacher Education and Professional Development in Industry 4.0”. The conference gained significant responses from students, teachers, lecturers, researchers, and practitioners of different expertise in Indonesia and beyond.

The committee received 154 submissions of papers that were selected by the academic board into 125 eligible papers for presentation at the conference. After two eventful days of conference and further revision by the presenters, the full papers were then reviewed for the second time and the board decided that 63 of the revised papers covering the four sub themes qualified for publication in the conference proceeding that is published by CRC Press. The editors are really pleased with the processes and would like to congratulate all presenters and authors whose papers are published in this volume.

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Plenary speakers' papers



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Teacher education and professional development in Industry 4.0: The case for building a strong assessment literacy

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1 INTRODUCTION

The theme of our conference implies that we need a better revised version of teacher education and professional development (TEd and PD). This makes sense because we humans have a natural tendency to get the best in everything. If we get sick, we want the best doctor and the best medicine to quickly recover. If our car breaks down, we want the best mechanic in our area to fix it. We want the best cellular phone, television and many other things in life. We spend time exploring before making important decisions on what to get. But how about in education? The reason for having a new version of TEd and PD is simple: we want to have the best teachers who can optimise the learning gains of our students. But how do we characterise effective teachers? Are the content and approaches to TEd and PD supporting our teachers to develop and acquire those skills that have the highest impact on improving student learning?

2 WHAT SHOULD BE THE FOCUS OF TED AND PD?

Ten years ago, Popham (2009) made an explicit argument that we need to make sure that the content of TEd and PD should be those that actually improve student learning. Around the world, educational systems are trying to identify and describe the teaching competencies that ensure high quality learning and teaching. This is particularly evident with the movement to develop and apply teacher professional standards in most, if not all educational systems. Such professional standards are believed to enhance teaching performance by providing greater support and specificity for teacher roles and responsibilities. However, critical analysis of currently available teacher professional standards (e.g., the Australian Institute for Teaching and School Leadership (AITSL) Standards, the National Competency-Based Teacher Standards for Philippines, the United Kingdom Teacher Standards, and Teaching Standards in the Asia-Pacific Region) and teacher performance assessment tools are generally broad, covering all learning and teaching functions. Although it is relatively easy to agree upon the importance of a teacher being competent in the classroom (Ferguson & Brown, 2000), the specific attributes of effective teaching are yet to be fully described. This is primarily because teacher competency is such a broad construct (Spanierman et al., 2010) (Vogt & Rogalla, 2009), including a range of dimensions such as classroom management (Emmer & Stough, 2001), pedagogical and content knowledge (Loughran, Mulhall, & Berry, 2004), assessment competence (Hattie, 2003; Stiggins & Duke, 2008), student-teacher rapport (Goddard, Hoy, & Hoy, 2000; Hoy & Miskel, 2001; Tschannen-Moran & Hoy, 2001), and other important dimensions. Hence, some teacher professional standards are too generic and others are too specific to capture the particular knowledge and skills required to teach effectively (Samson & Collins, 2012).

The current emphasis on teacher roles in improving student learning and performance is rooted in the evidence that student achievement is significantly associated with the competence of teacher (Ferguson & Brown, 2000; Sanders & Rivers, 1996). Research shows that high performing teachers create a learning environment where students learn best. The contribution of teachers to student learning explains roughly 30% of the variance observed in student

performance (Hattie, 2003). This means that teacher competence is the next most important determinant of student achievement after the students themselves, who account for 50% of the variance in their learning. However, not everything that teachers do in the classroom brings about the desired learning improvement. Hattie (2008) emphasises that about 95% of what teachers do in the classroom influences student achievement, but not all of these teacher activities positively impact student learning.

In order to optimise student learning and achievement, it is vital to focus efforts on improving the specific components of teaching competencies that positively impact learning. In addition, if schools and the whole system are committed to supporting the key teacher functions that help students to learn effectively, the focus of performance evaluation and professional development for continuous improvement should be on those teacher functions that are known to most positively impact the improvement of student learning and achievement. Amongst these various dimensions of teaching competency, assessment experts and researchers have long argued for the importance of teachers' ability to use assessment and student assessment information to improve student learning (e.g., Black & Wiliam, 1999; Hattie, 2008; Popham, 2009; Stiggins, 2005). This teacher assessment ability is broadly represented by a philosophical framework referred to as assessment for learning (A/L).

The A/L paradigm calls for a shift in teachers' assessment practices from recording and evaluating student achievement to helping and encouraging students' active engagement in learning through assessment (Black & Wiliam, 1999; Hattie, 2008; Hattie & Timperley, 2007; Kluger & DeNisi, 1996). Some of the core A/L strategies include detailed elaboration of learning outcomes, success criteria and performance standards (Gray & Tall, 1994; Nicol & Macfarlane-Dick, 2006); assessment tasks specifically designed for learning (Davison, 2007; Thompson & Wiliam, 2007); effective use of feedback (Hattie & Timperley, 2007; Sadler, 1989); and the use of self and peer assessment in the classroom teaching (Klenowski, 1995; McDonald & Boud, 2003; Price, O'Donovan, & Rust, 2004; Taras, 2003). In a meta-analysis conducted by Black and Wiliam in 1998 using 250 studies, they found that students whose teachers used formative assessment strategies significantly improved their performance. A decade later, a larger scale meta-analysis was conducted by Hattie (2008) exploring the effects of more than 100 educational interventions on learning. From this study, teacher assessment practices emerged as the interventions with the highest potential to enhance student learning.

The work of Black and William (1998) and Hattie (2008), along with other studies (Black, McCormick, James, & Pedder, 2006; Keppel & Carless, 2006; Munns & Woodward, 2006) provides strong empirical support for the claim that teacher assessment practices associated with A/L can be grouped together into one single construct. Combining the effect sizes of all such teacher assessment practices would make teacher A/L literacy the most influential single factor in improving student learning. To ensure that teachers and students take advantage of the positive effects of assessment, Stiggins (1999), Popham (2009), and Davison and Michell (2014) argue that A/L literacy must be a key component of teachers' professional knowledge, skills, and professional development. There is a need to ensure that teachers develop a high level of expertise in the use of A/L because the levels of their A/L literacy affect their confidence in using a range of assessment strategies, both teacher-developed and system-imposed. Similarly, teachers' levels of A/L literacy enable them to effectively use assessment information to make critical decisions related to learning and teaching to further support student learning.

3 WHAT IS TEACHER ASSESSMENT FOR LEARNING LITERACY?

Defining assessment literacy from the point of view of A/L is important in attempting to ensure a consistent interpretation, as the literature presents different views and conceptions of what knowledge and skills constitute teacher assessment literacy. Although the term 'assessment literacy' was originally used to describe the components of assessment practices that teachers need to know in order to carry out their functions in terms of assessing student

Putting together these different views on assessment literacy, I have developed a more comprehensive definition to describe the core content and design of a teacher assessment literacy program consistent with the principles of A/L. I have expanded the definition of assessment literacy by Webb (2002) which emphasises that assessment literacy should focus on the utilisation of assessment information to monitor students' progress in achieving learning outcomes and to improve teaching and effectiveness of the educational programs to help students learn. According to Webb, a clear indicator of an assessment literate individual is his/her capacity to use assessment data to increase the motivation of all stakeholders to carry out their roles in education. What was not emphasised by Webb is the underlying purpose for enhancing teacher assessment literacy. From this point of view and incorporating the principles of A/L, in this study, I define this as:

This version of teacher AfL literacy sees teachers' skills in using assessment as the central unifying process of all learning and teaching activities. The daily decisions made by teachers to improve learning are informed by various assessment information about student learning characteristics, progress and needs, as well as by information from other stakeholders such as parents and school leaders. To fully understand the definition of teacher AfL literacy proposed above, I identify its key characteristics, elaborated in the following section.

Taking into account the critical role of assessment in effective learning and teaching, the definition of teacher A/L literacy for this study needs to embody a number of key characteristics. Firstly, A/L assessment literate teachers translate A/L principles and knowledge into practice to ensure student learning. These principles and knowledge are manifested by teachers' skills in using assessment and analysing assessment information to make important decisions in their learning and teaching context. There are six general clusters of knowledge and skills that comprise assessment literacy. First is the ability of the teachers to develop and use a wide range of assessment strategies to gather robust assessment data (Stiggins, 2005). Second is the ability of the teacher to reflect on the assessment data – both student achievement and student

characteristics – and use this information to develop lesson plans and implement instruction. (Webb, 2002) offers a definition of assessment literacy that encompasses this ability of the teachers. He defines assessment literacy “as the knowledge of means for assessing what students know and can do, how to interpret the results from these assessments, and how to apply these results to improve student learning and program effectiveness” (p. 1). Third are the skills of the teachers to actively engage students in the assessment, learning, and teaching activities. Fourth is the teacher’s use of assessment to enhance and sustain student motivation. As argued by McMillan (2003) teachers need to assess students’ motivation to better understand them and to make contextualised assessment decisions. The teacher needs to know if the assessment task is enhancing students’ engagement in learning and if the students are exerting effort in trying to accomplish the task. Fifth is the ability of the teachers to reflect on their practices and assessment data to identify their professional needs both in assessment knowledge and in curriculum-content knowledge (Timperley, 2011; Timperley, Wilson, Barrar, & Fung, 2008). Sixth is the ability of the teachers to establish strong partnerships with stakeholders by providing them their assessment information needs. Clear understanding of the principles of A/L will help make the implementation of A/L be more effective. For example, policy makers can review assessment policies to ensure that external factors are helping teachers make assessment information more relevant (McMillan, 2003). These six clusters are further described in the theoretical framework in the last section of this chapter.

Secondly, any teacher A/L literacy model must emphasize the responsibility of teachers in working with students, colleagues, parents, and community. As mentioned above, assessment literate teachers provide assessment information to various stakeholder groups (Fullan, 2002; Taylor, 2009). Apart from the ability of teachers to communicate assessment results to students, it is also necessary that they provide assessment information to different stakeholder groups tailored to each groups’ information needs (Davison, 2013). The dialogue between the teacher and stakeholders ensures that stakeholders gain deeper understanding of assessment practices, which consequently draws positive support from them.

Thirdly, the construct of teacher A/L literacy stresses the trustworthiness and social consequences of teachers’ assessment practices. McNamara and Roever (2006) cite some misuse of language testing, which is also relevant to other disciplines, like sorting out and labelling students into various social classes instead of using assessment to improve student learning. Similarly, they cite the controlling effects of centralised standards and testing in teaching. In the definition proposed above, I emphasise enhancing teacher competence in ensuring that their assessment practices are fair and trustworthy from the point of view of all key stakeholders.

Fourthly, a teacher A/L literacy program should not be confined to just formal training but consider the socio-cultural aspects of teacher learning where teachers and school leaders “form a knowledge community by discussing, critiquing and questioning fundamental issues relevant to their context” (Inbar-Lourie, 2008, p. 389). Formal training may build the foundation of teachers’ assessment knowledge but studies have consistently shown that teachers forming a community of learners can better improve their assessment literacy. In the study by Dekker and Feijs (2005), they found that the most significant source of support for teachers in continuing their A/L practices after initial training period was the development of learning groups within the school, where teachers were provided with the environment where they could discuss related assessment issues with peers through professional meetings or through informal contacts.

Finally, the definition of teacher A/L literacy and its characteristics discussed above must address the inconsistencies both in understanding and the actual practices amongst teachers of what constitutes sound assessment practices (Davison & Leung, 2009). Ideally, teachers should have common understanding of their assessment practices. However, in reality teachers have different views and needs as influenced by a range of factors. Davison (2004) has emphasised that in order to resolve conflicts in teachers’ needs in assessment literacy, school systems should prioritise the enhancement of teachers’ assessment skills. This is consistent with the findings of Hayward and Hedge (2005) that in the primary sector in Scotland, staff development related to A/L is one of the most

common areas of concern with teachers arguing that intensive training is needed if they are to implement Af/L reform effectively.

These key characteristics of teacher Af/L literacy capture the elements of the construct and how it should be operationalised in teacher education and professional development.

5 WHERE ARE WE NOW?

Given the timeline (almost three decades since the work of Blank and Wiliam) that the concept of teacher Af/L literacy has been theoretically and empirically supported to be one of most important teaching skills, the question remains whether the huge amount of research evidence is translated into actual teaching practices? This question is relevant due to the fact that teacher Af/L literacy has undergone an advance conceptualisation in the recent years. However, despite its prominence, teacher Af/L literacy remains relatively low (Davison & Michell, 2014; Lam, 2015). Teachers do not feel sufficiently well-prepared to assess students' learning (Mertler & Campbell, 2005) as they have limited knowledge and understanding of Af/L principles and practices (Popham, 2009).

In the context of initial teacher education, pre-service teachers are unprepared to use appropriate Af/L strategies to support student learning (Siegel & Wissehr, 2011; Volante & Fazio, 2007) due to their lack of confidence in applying their Af/L knowledge and building their skills due to insufficient training and opportunities to apply assessment concepts (Ogan-Bekiroglu & Suzuk, 2014). This is due to fact that initial teacher education program lacks focus on assessment courses (Kahl, Hofman, & Brayant, 2013). Another reason is the mismatch between the content taught in their ITE programs and the practical knowledge required in the field (Greenberg, Mckee, & Walsh, 2013).

Given the issue on the low assessment literacy of teachers and the low quality of teacher education and professional development, students are not properly supported to optimise their learning. As a consequence, teachers continue to implement assessment strategies that are negatively impacting student learning (Stiggins, 2002).

6 WHERE TO FROM HERE?

In summary, teacher assessment *for* learning literacy is widely seen as the centrepiece of effective learning and teaching. In principle, the ability of teachers to develop and use a high-quality classroom assessment is considered to be the core of effective learning and teaching. However, at present, we are not there yet. Our teachers need enabling and supporting mechanisms to implement effective assessment principles and practices *through the implementation of strategic policy, systems processes and activities*. Teachers' assessment practice are either enabled or controlled by personal, cultural and structural systems, and thus, there is a need to align their beliefs to effective principles of assessment, build a strong assessment culture across the institution and articulate policies and procedures that will support individual teachers.

So, where to from here? *The answer to this question depends on your answer to the following questions:*

- Does your assessment framework, if you have, have the right balance between high stake and classroom-based assessment?
- Are you willing to shift the focus of assessment from accountability perspective to responsibility and equity perspective to ensure student learning?
- Do you have a common language of effective assessment practices (underpinned by Af/L principles) across different schools?

- How do you view the role of principals and educational leaders in supporting our teachers to develop a high level of AfL literacy?
- Do we trust our teachers to develop and implement a high-quality assessment activities?

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Understanding digital literacy through an examination of trust and ignorance online

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ABSTRACT: This paper examines digital literacy and open learning and explicate how they relate to the study of trust and ignorance online. Using data from a study which explores the knowledge producing work of undergraduate students as they undertake course activities, we argue that a 'social practice' approach to digital literacy can help examine epistemologies of trust and ignorance when learning is 'opened up'. We argue that the learning activities of students in open and online environments is supported and shaped by powerful historical, social, and economic forces, or 'sponsors' of digital technologies who, through their digital platforms and applications, offer users both opportunities to learn and the potential to constrain and suppress. A challenge for open education is to understand how, when education is 'opened up', particular forms of online practice pave the way for the construction of ignorance and that this is not predictable from person to person and location to location. Developing approaches to counter ignorance and foster critical thinking, therefore, is far from straightforward in the current age of informational abundance and ubiquitous connectivity.

1 INTRODUCTION

1.1 *The 'opening up' of learning*

According to Kaggle, as reported by Rayome (2017), 59% of employed data scientists in 2017 acquired all their desired learning through their own practices of self-directed learning online or via MOOCs (Massive Open Online Courses), rather than through a formal university programme of study. While it is interesting that university faculty staff were providing the content for those MOOCs and online materials, this is part of a trend which points to a decline in a traditional model of university education to a more 'opened up' form of non-traditional learning. This is a model which primarily consists of non-traditional and non-campus learners whose needs are not being met by most current university infrastructures. As Open Education looks ahead to a future where open and distance learning will move into a realm of immersed online learning, with internet connectivity and flexibility being the greatest enablers, how universities meet the needs of this growing and largely self-directed student body is a pressing concern and brings a number of challenges to the fore.

One such concern is how learners, such as those reported about in the Kaggle report, in different subject disciplines, attempt to make sense of the plethora of information they encounter online. This includes how they search for information in an opened up online environment, how they engage with it critically (or not), and make evaluative judgements about its credibility and relevance to their learning and knowledge development as novices in a new subject discipline. This forms the basis of a research project discussed below.

The focus of the research reported on in this paper is on Higher Education, and our data is drawn from a study of digital literacy in university campus sites. Using ethnographic interviews alongside a detailed videography of the writing process, the study examines how students in different disciplines (STEM, Arts & Humanities and Business courses) attempt to make sense of the plethora of information they encounter online. This includes how they

search for information, engage with it critically (or not), and make evaluative judgements about its credibility and relevance to curricular work. We explore how students appear to engage in digital literacy practices which demonstrate forms of strategic ignorance, and how they accord epistemic trust when they are online. But first, we orient the general reader to our twin theoretical bases: first, a 'social practice' approach to digital literacy, and second, epistemologies of ignorance, particularly in relation to the power of algorithms in online activity.

1.2 *Literacy and knowledge production*

As an inter-disciplinary field of research, Literacy Studies begins with the local and everyday experience of literacy in particular communities. It is rooted in people's intimate experience with text and this is not always predictable from one person to another. There are different literacy practices in different domains of people's lives, whether through, for example, formal learning, religious activity, or family life. Literacy is, therefore, to be understood in a pluralistic sense: 'literacies' to which, in addition, digital media also adds plurality; and how students use digital technology will vary across different social, age, and subject groups. Learners in an open online environment are faced with an increasing range of digital platforms with which to work, and an often unpredictable set of social and material resources which shape their writing and knowledge production.

Literacy, therefore, cannot be seen outside of the powerful interests and agencies which seek to define it in particular ways (Tett et al., 2012): literacy is a profitable and fertile resource which can be sponsored, bought and sold, and regulated, suppressed or withheld (Brandt, 1998). As Brandt defines it, the 'sponsors' of literacy are 'any agents, local or distant, concrete or abstract, who enable, support, teach, model, as well as recruit, regulate, suppress, or withhold literacy—and gain advantage by it in some way' (1998:166). Whether they are community leaders, academic institutions, or technology companies, they ultimately control 'the ideological freight that must be borne for access to what they have' (p.168).

Sponsors also shift over time, and where the chief sponsors of literacy were once religious institutions who controlled how and where literacy was taught (and still do in many parts of the world), they have since been eclipsed by new sets of sponsors in the guise of businesses and the digital technology industries. These new actors have shaped current literacy demands in ways which are relevant to this research, as we will discuss below.

Brandt's ideas are relevant in today's world of open and online education where information is organised and made accessible to those who seek it online through search engines such as Google. Companies such as Google, through their computer code and artificial intelligence systems, are among today's highly influential 'sponsors of literacy'. Their digital platforms are conduits of economic and political forces which regulate and establish the value and agentic potential of people's digital literacies as they use those platforms (Noble, 2018).

Further, ignorance of how digital technologies work, how users' online activities can be used to the advantage of the platform owners or sponsors without the users' knowledge, and, indeed, how the internet appears to be structured so as to encourage people who enter it to confine their browsing to opinions they already accept, is not always well understood. Given that internet platforms are designed by corporations, they will be influenced by motivations, values, and intentions that are embedded in their architecture (Origgi, 2012). However, it is difficult to know whom to query when these features become manifest or troublesome: there is little accountability or transparency, and it is difficult to exercise agency. As Eubanks (2018) observes 'we have remarkably limited access to the equations, algorithms, and models that shape our life chances'.

1.3 *The study of ignorance and trust*

Epistemology is, very simply, the study of knowledge and justified belief. *Ignorance*, by contrast, is generally taken to mean the absence or lack of knowledge or awareness, and so it seems counterintuitive to talk about the *epistemology of ignorance*. How is it intelligibly

possible to bring these two seemingly antonymic states together? However, ignorance is not mere lack of knowledge, a benign gap in knowledge or some epistemic oversight that needs only to be filled or rectified. Epistemologies of ignorance is, rather, an ‘examination of the complex phenomena of ignorance’ (Sullivan & Tuana, 2007: 1): how it is actively constructed and sustained for the purposes of domination or exploitation, or for epistemic advantage; how it is sponsored and regulated (Brandt, 1998); used wittingly or unwittingly to distort, suppress or withhold knowledge (O’Neil, 2016); and as a substantive epistemic practice in itself in which ignorance is wilful and socially acceptable (Alcoff, 2007). Ignorance is, therefore, something which is performed as a *social practice*, is often ritualised and, as we will show, it has a complex role to play in an online learning environment.

Yet, epistemic ignorance also has value. For example, it is good epistemic practice to be strategically ignorant and highly selective in the things we know or seek to know in order to remain epistemically functional, particularly now that most of us are almost exclusively immersed in information-dense digital environments. It often makes sense to grant epistemic authority and trust to those with expertise and reputation, and who are known to be epistemically responsible. We often judge what to believe on *whom* to believe, and to make these judgments we rely on criteria of plausibility, consensus, relevance, and credibility, among other things. In digital informational environments these criteria may also include online rankings, ratings, and the order of search results, such as those provided by Google. Google, the search engine that seems to be synonymous with the internet, is judged by many users to be reliable and trustworthy, though we argue below that this is not always the case. The Pew Internet and American Life Project (Purcell et al., 2012) reported that 73% of search engine users say that most or all the information they find through search engines is ‘accurate and trustworthy’ and 66% of users regarded search engines as a ‘fair and unbiased source of information’ (p.3).

Reputation also helps when we are ignorant or uncertain. In information-dense online environments, information is useful, according to Origgi (2012), only in conjunction with reputation. Understandably, given our pervasive epistemic interdependence, and finite time, ‘good epistemic conduct needs to be understood as the maintenance of appropriate balances of knowledge and ignorance, in oneself and also in relation to others’ (Fricker, 2016: 160). Reputation, therefore, is an ‘essential epistemological notion’ (Origgi, 2012) and directly shapes whose claims we are ready to accept, and ought to accept, as credible – be they writers of journal articles, newspaper reports or a course lecturer.

Today, online searches are where most information is sought. They are conducted through a series of steps, algorithmically mediated, which are implemented by programme code (Noble, 2018: 37). Regarded as neutral because they are algorithmic and scientific, these mathematical formulations are evaluated through procedural and mechanistic practices which include tracing hyperlinks among pages. Noble (2018), among others (e.g. O’Neil, 2016; Eubanks, 2018), has pointed out that, contrary to the belief that online platforms like Google are objective and neutral, or even infallible, discrimination is embedded within their very computer code and artificial intelligence systems, and that these can mask and deepen inequality, as well as render the user less agential than she thought. The mathematical formulations that drive automated decisions are not ‘benign, neutral or objective’ (Noble, 2018:1). The designers themselves have values which may promote prejudice as Noble (2018) documents with respect to persistent and widespread racial profiling, sexism and misogyny online.

Why should this be a matter of concern? One reason is that algorithms are creating ‘new asymmetries of power’, and are perceived as being better knowers of ourselves than we are (Origgi & Ciranna, 2017: 303). Data mining, is a useful example. Since data mining and algorithmic procedures are determined by the owners of the platforms according to their interests, a profile of a user can be created using personalisation algorithms, by collecting and storing tracks based on browsing history, IP addresses, social network activity, email content, and key words in search engines. As we are increasingly coming to understand, such ignorance is not a benign gap in knowledge. We should question how corporate ‘sponsors’ (Brandt, 1998) of digital literacy, companies who dominate the internet such as Google and Facebook, are benefitting (economically and in other ways) through users’ ignorance of their platforms.

Learners who are novices within a particular knowledge-based community or academic discipline will understandably rely on the directions and guidance of other actors, such as lecturers or online actors, leading to an inevitable and somewhat necessary asymmetry of power. Academics often warn their students about the quality and veracity of information they obtain from the internet. Students are often told to undertake rigorous searches in subject-specific repositories and rely on refereed literature, rather than trust more accessible treatments of a topic available in Wikipedia or in alluring YouTube videos, both of which will likely appear at the top of students' search results.

Yet how university students and learners in open educational environments actually go about seeking out and discerning information as part of their study practices has remained remarkably under-explored. As we have all increasingly come to realise, and have argued above, the internet is not the infallible and neutral repository of information we recently believed it to be; so how do students learn whom or what to trust to help them navigate through the epistemic gaps in their curricular work? This is one of the key areas of investigation in a current study of digital literacy in Higher Education, as we will now discuss.

2 METHODS

The research was situated across disciplinary sites (STEM, Arts and Humanities, and Business subjects) in two universities in the UK. To capture the diversity and richness of digital literacy and writing practices of the students, a combination of the following methods was used i) Initial focussed interviews were conducted with each student participant. ii) After the initial interview, each participant conducted a screen recording of a course assignment task. iii) This was followed by a post-assignment discussion of the writing task and the students' history of use with digital media over the course of their life. iv) Additionally, software which captures quantitative patterns of digital behaviour (e.g. time spent on tasks and sub-tasks like web searching) was also obtained.

The gathered data were then analysed to examine these participants' conceptions of trust and ignorance. Further, the analysed data were rewritten to form a line of individual narratives from the participants.

3 FINDINGS

3.1 *Kim (Cinematic Arts)*

Kim, a first year student of Cinematic Arts, very rarely goes beyond the resources uploaded by her lecturer in the Virtual Learning Environment (VLE). We can view this practice of the lecturer as a form of 'curation' (Bhatt, 2017), which is 'when certain actors guide the assignment writing along a certain path and place boundaries around the task to regulate its outcome' (p. 144). These curated resources are the basis of the course content in the form of slides from lectures, pdf files and links to online readings. This curation is important for Kim, as it helps standardise, and in some ways ritualise, the writing practices necessary for assignment completion.

Throughout the interviews, and substantiated in the screen-recording of her assignment, Kim emphasised how reliant she was on the curation work of the lecturer, arguing that '*If a teacher sends a reading to us, I'll trust it. I don't know why, but you just do*'. She would even email the lecturer to request resources when she was not satisfied with what she was given. This is because, as she states, '*If I am the one who found it myself, I would be sceptical about it*'. Kim lacks epistemic trust and confidence in her own skills and knowledge, and so accords epistemic credibility to her lecturer.

But in the rare instance where she felt the need to go outside the framework of her lecturer's carefully curated resources, she attaches value to the results only if the searched item (a key word, concept, story, for example) appears at the top of search engine results. In terms of any epistemic

judgements she makes, the greater the congruity between websites in what they report and rank, the more likely she is to accept that information and incorporate it into her assignment.

A kind of discernment did, however, emerge in her pre-assignment group task. The assignment that was screen recorded was on the subject of visual storytelling. A pre-assignment task involved a group discussion online where Kim was able to garner information from a group of fellow students about the topic. Much of the recording is spent with Kim writing and flicking back and forth from ideas she had collected in the group chat prior to the actual writing of the assignment. This was a recording of an online group chat by which she could access a record of the group's collective ideas. She had curated this information from the group members, her epistemic community, and was able to draw from it as she wrote the assignment rather than search for content online.

3.2 *Rahat (Economics)*

Rahat's approach to writing for assignments does not differ considerably from Kim's. The lecturer gives him links to websites for each individual assignment, and sometimes this will be a single link with all the important readings on it. His lecturer would usually explain the readings in class and then double up by sending them via email to the students to make sure: 'It's all in the email'. Rahat also explained that he would rely on it a lot, arguing that 'it's the best guidance because the lecturer has read through it'. Understandably, and unsurprisingly, Rahat places epistemic trust in his lecturer to guide him to the best reading. Rahat also applied the same level of trust to his lecturer's tweets, considering them to be on a par with thought leaders and public commentators in the field of Economics. He benefitted from his lecturers' social media updates, and therefore reputation, because they provided a broader view of the subject than the lectures.

If further and more extensive reading is required for an assignment, Rahat will search via his preferred search engine, Google, by typing in the title of the assignment task and clicking on the results that immediately relate to this. This he explained as follows: 'I would type in the main title of what the essay is about, and scroll down, and whatever I think that I can relate to and understand easily, I would go with that'. On the surface, Rahat uses few complex thought process and concepts in the search since he uses his essay title, and readily accepts results that closely match it.

Rahat was unable to describe other filtering processes. What seemed to matter was that the filtering of search results was related to the extent to which the information he received was relevant to his assignment rather than its academic credibility. As with Kim, he also favoured top search results and judged the credibility of these based on their popularity, and, hence, assumed reputation.

3.3 *Nusrat (Medicine)*

Nusrat is a second-year student of Medicine. The assignments he has to complete for his course are varied in nature, and include write-ups of scientific practicals and short essays which require prior reading and research. When he has to write an essay, he steadfastly limits himself to academic sources only. He told us that:

I wouldn't be using Wikipedia. I'd be looking at papers from PubMed. Often I'll just type in the subject matter on Google and it will give me links to different websites, which I know have academic papers on.

He is fairly confident when it comes to independent study practices, including his ability to search for, and select information for his course. He explained that:

I know what I'm searching for. Even if the lecture might not be that detailed, I would still use that lecture as a guide of what I need to know. For instance, I was learning about female reproductive physiology and the PowerPoint for that wasn't that detailed. But I found the relevant chapter in a physiology textbook and I was able to fill in the missing pieces and make sense of it.

Here, Nusrat emphasises his confidence in making sense of information that he feels is lacking in his lecturer's course content. His strategy is to target academic databases for information, like PubMed, a database of academic reports on life sciences and biomedical topics, for sources that may be lacking in his lecture notes. Most of Nusrat's web searching is channelled through these databases and they are his primary source of information.

We see an example of this during the screen recording of his assignment which was on the portrayal of mental illness in film. As he began the task, Nusrat accessed the recommended readings from his lecturer's notes. He then searched online for 'movies and mental illness pubmed' highlighting the desire to channel his results through 'pubmed' to merely skim to see which films had been analysed for their portrayal of mental health issues. It is only after viewing multiple results of films in academic articles that Nusrat decided to target these films for analysis in his own assignment. The question here is about trusting what has been analysed before in previous research. Nusrat outlines his trust in selected online materials as follows: 'if you go onto a website and the article looks poorly produced, or informally written, or only one author has written it, that would make me turn away from it.'

3.4 *Phil (Politics & Philosophy)*

Due to the nature of his course, Politics & Philosophy, Phil, a first year student, recently joined Twitter in order to keep up to date with news and current events, as they inform his ongoing written work. Having used Twitter in the past, he stopped using it because of the amount of time it was taking up. He then began re-using it more strategically to keep up to date with political events and news for his course. After experiencing an overwhelming amount of variety of news through Twitter, Phil decided to subscribe to Guardian Online for the news relevant to his course. In this way, he felt able to manage the multiple sources of news he receives by relying on Guardian Online for, as he assesses it, journalistic quality, integrity and news that is consistent with his political inclinations.

This management of his news information sources is essential for two reasons: it is information which will contribute to his development on his Politics & Philosophy course, and Phil currently has little interest in consuming information which is in direct conflict with his political views. Phil's practices mean that he is engaged in a form of strategic ignorance: to be epistemically functional, there are things or views of the world that he does not want to, or cannot know. However, though Phil's decision was strategic, relying only on one source of news information is not, perhaps, best practice. By deciding to channel all his news through Guardian Online, however reputable, he ritualises his practices and ensures non-exposure to views different to his own.

4 DISCUSSION

Kim, Nusrat, Rahat, and Phil all offer interesting insights into their varied practices of digital literacy. Kim and Rahat typically follow the detailed guidance specified by their lecturers and both are careful to produce work which only draws from the resources provided as part of course materials. When each of them felt the need to search for information beyond what was provided, Kim and Rahat tended to rely on search results that appeared in multiple locations as a criterion of authority. Nusrat, in contrast, casts a much smaller net in his searches for information. His self-reports and assignment recording revealed a much more focussed practice of information searching, and a certain amount of confidence in his ability to use other sources to 'fill in the missing pieces' from lecture notes. Nusrat attempts to understand the curricular task he is set. Clearly, most of what he produced in the course of writing his assignment was through this kind of self-discovery, with information filtered through his own assessment of its importance and credibility. For Kim and Rahat, the lecturers seemed to be the ultimate epistemic authority.

Phil, on the other hand, knowingly channelled his news through the Guardian Online website, entering into a particular set of debates which delineate his belief formations in order to manage his finite time and resources. Yet, while Phil's decision is strategic, even necessary, it entails a particular kind of epistemic dependence on a particular set of views – perhaps we could even think of this as *invested*, and not just strategic, ignorance of alternative world views.

These and numerous similar observations led us to the conclusion that all the students' writing and information seeking practices were ritualised—that is, motivated mainly by a need to adhere to the rules of the game. Ritualisation directs teaching and, rather than encouraging students to cultivate skills of discernment and trust in their own judgement, has the potential to restrict research practices on account of high levels of epistemic trust in certain actors, be they lecturers, search engines, or news websites. This can constrain and restrict students' practices of information gathering, and thereby sustain ignorance of alternatives. But can and should we expect anything more from undergraduate students? Would doing otherwise result in cognitive overload? Ritualisation can be an essential part of inducting a student into the forms of knowledge creation necessary within a given discipline. It is itself a form of non-culpable strategic ignorance, and can help situate a student's literacy practices as a novice within their discipline. But such habits could, conversely, create a tendency to be unreflective and habituated in research practices, and leave students over-reliant on, and passive users of, the decisions of popular search engines, with all the dangers that entails, as we discussed earlier.

The findings presented within this research collectively present a number of challenges for the field of Open Education. Open Education currently looks ahead to a future where open and distance learning will move into a realm of immersed online learning, with internet connectivity and flexibility being the greatest enablers. Therefore, how learners, such as those cited in the Kaggle survey at the start of the paper, search for information in an opened up online environment, how they engage with it critically (or not), and make evaluative judgements about its credibility and relevance to their learning and knowledge development is a pressing concern for open educators and digital literacy theorists.

5 CONCLUSION

This research addresses these concerns through an examination of the epistemologies of trust and ignorance online. As learning is 'opened up' and open learners globally are more self-directed in their goals for learning, and as open learning proliferates globally and crosses national boundaries then this issue becomes more prevalent: More and more people are using and sharing exponentially increasing amounts of information for learning and their experience is not at all equal. As we have seen, individuals differ in how they seek information, discern its quality and trust its veracity. Ultimately, this is a question of what can civil society do to prepare the citizens to adopt the challenges of the 21st Century in a world where open learning is becoming more popular and necessary. How epistemic trust is accorded online, community allegiances, collective action, and ideological biases all manifest in online practice and present enormous challenges for open educators to make sense. In the context of these current changes, open educators have an unprecedented opportunity to provide leadership and direction.

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Desired skills and competencies of the future workforce and what they mean for teacher education today

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ABSTRACT: The paper addresses why integrating the 21st century competencies in English teaching and English teacher education today is of vital importance. The paper begins by highlighting the key 21st century learning, literacy, and life competencies and showing how they map out to daily schooling of children in some of the most innovative schools in the United States. For educators whose contexts may not allow for immediate implementation of large-scale curricular changes, I describe smaller-scale daily routines that can also cultivate 21st century skills in ways that are more manageable for educators where curriculum or state standards may be externally imposed. This article concludes with a call to consideration of English teacher and teacher educator identity shifts that predicate the pedagogical practices grounded in 21st century skills and competencies. Specifically, educators are challenged to expand their identities from those of knowledgeable facilitators of English language learning and sole possessors of power over instructional decisions to those of youth capacity builders, fellow learners, and co-decision makers.

1 INTRODUCTION

Never before has the schooling experience of most mid-career English language teachers and their students been more authentic than it is today. To illustrate, a teacher schooled in the 1980s and 1990s in a non-English immersed context (but also many novice English teachers around the world) could hardly dream of access to authentic English beyond songs on the radio or an occasional encounter with an English-speaking tourist. These teachers' students had to rely solely on the skillset of their language teachers to progress in their English proficiency or on limited printed resources they could study from at home. In contrast, most English language learners today enjoy an unprecedented access to authentic English through their use of the Internet. They no longer have to rely on a teacher alone—if they do not understand the teacher's explanation, they can find a tutorial online. If they want to communicate, they join social media groups that use English. If they want to improve English listening skills, they access English podcasts or watch English movies. Many students also engage in interactive video games that allow them to use a wide range of English language skills and strategies, even engaging in peer feedback as they work with other players to perfect their avatar descriptions!

Different also are the professional prospects of the students today. The increasingly globalized production of goods and services has led to many jobs being outsourced to algorithms or relocated to other countries. The jobs that now remain have changed significantly in terms of management structures, decision making, information sharing, and flexibility in employment, production, or service delivery (Partnership for 21st century skills, 2008). These profound changes in the economy have left today's teachers with an uneasy task of having to prepare students for navigating an ever-evolving "new age" workplace and for jobs that may not yet even exist! English teachers are increasingly expected to think about what these new employment directions mean in the preparation of their students beyond their development of English as an international language. Such two-fold preparation of the productive future workforce requires background in not just effective English language pedagogy, but also a broader

awareness of key 21st century skills that better reflect the recent economic and social changes that stand in contrast to the economy of the previous century. After all, it is the mastery of both English as an international language and the 21st skills and competencies that will likely determine the new learners' professional advancement and employment opportunities as well as the larger success of their societies.

In what follows, I briefly describe what is meant by 21st century skills and competencies. I then briefly describe several effective, 21st century skills-focused English education and English teacher education practices that can be adapted to a large range of instructional contexts. An elaboration of thinking shifts needed to best benefit from these directions will conclude the article, along with specific additional considerations for the Indonesian context.

2 21ST CENTURY SKILLS AND COMPETENCIES

There has been an explosion in the amount of scholarly work around 21st century skills and competencies—the simple search for “21st century skills” led to almost 2 million entries on Google Scholar alone. Many frameworks and models have been proposed. In a meta-analysis of 75 articles (of the initial 1592 works), van Laar, van Deursen, van Dijk, and de Haan (2017), highlighted the importance of the following seven core skills that have been the most mentioned across the examined professional literature: information management, communication, technical (or ICT skills), collaboration, creativity, critical thinking and problem solving, as well as five contextual skills: ethical awareness, cultural awareness, flexibility, self-direction and lifelong learning.

The scope and purpose of this article does not allow for a detailed examination of multiple 21st century learning frameworks. Instead, in what follows, I will demonstrate how many of the 12 core 21st century skills identified through the meta-analysis by van Laar et al. (2017) got reflected in the EFL, ESL, and TESOL curriculum that attempted to improve students English (and teaching effectiveness for preservice teachers) through various effective experiential approaches.

3 ENGLISH EDUCATION AND ENGLISH TEACHER EDUCATION PRACTICES FOCUSED ON 21ST CENTURY SKILLS AND COMPETENCIES: MACRO-LEVEL IDEAS

Teachers and teacher educators can consider several experiential approaches to delivering English teaching and English teacher education curriculum in ways that reflect the competencies highlighted in the various 21st century frameworks, including that by van Laar et al. (2017). These may include:

- Multi-modal Learning: This approach challenges learners to expand their basic learning modalities (e.g. writing) to include multiple modes. These additional modes often involve learner creativity, as well as ICT skills.
- Problem-based Learning: This approach starts with a relevant, real-life problem that students or preservice teachers are guided to identify, learn about, analyze, and explore solutions for. The emphasis throughout is on process—how can students effectively develop new knowledge about an issue and how might they go about critically thinking about workable solutions?
- Project-based Learning: This approach starts with a product that the teacher or teacher educator presents or negotiates with the students. As students work toward developing the product, they are guided to take initiative and solve various problems they encounter along the way.
- Place-based Learning: This approach draws upon the inquiry-, problem-, and project-based learning, but its main premise is that learning be grounded in its social, historical, cultural, and geographical locality. While some may view this as being in conflict with the globalization-focused 21st century skills, other educators posit that a deeper understanding of issues

surrounding one's roots, identity, community, and locality are a prerequisite to becoming a global citizen.

- Service Learning: This reciprocal educational approach, also referred to as community-engaged learning, brings together two or more partners who stand to expand their capacity and knowledge through actively participating in a mutual activity or collaboration.
- Design for Change Movement: This international movement places an emphasis on the emancipatory pedagogy, meaning a belief that children can not only learn, but also gain a sense of self-efficacy and empowerment through projects or tasks that engage them in actively solving a problem for a particular community or group of citizens.
- Online Intercultural Learning: This learning centers on online exchanges of information or mutual development of projects between two or more online partners.
- Gaming: Increasingly, especially in institutions that enjoy access to new technologies, educators explore how learning can be furthered through online or video gaming.

The distinctions among the outlined pedagogical approaches are useful in that they serve as a starting point for further inquiry to educators who wish to learn more about the various forms of experiential learning that can deepen their students' subject matter learning and put into practice the 21st century skills. However, in the classroom context, these approaches hardly ever fall into neat categories. For instance, it is impossible for a project-based approach to not include attention to problem-solving. Similarly, one would be hard-pressed to find a high-quality service-learning program that does not deepen students' understanding of the place in which it occurs. Consequently, a conceptual overlap is to be expected, even celebrated, rather than feared or viewed as a source of frustration. As such, rather than providing an example per approach, I'll briefly describe four case studies which illustrate ways in which EFL teachers and teacher educators can draw upon some of these experiential learning approaches to improve English instruction or English methodology (for preservice teachers), all while furthering the participating learners' 21st century competencies.

3.1 *Online intercultural exchange between two international elementary schools*

This project was implemented in 2019 and is currently being planned for 2020. Two partners—students from one 5th grade English as a Second Language (ESL) classroom in Michigan and one 6th grade EFL classroom worked together to learn about writing English informational texts and revising and editing skills through a project that engaged them in taking pictures and writing descriptions of their school communities. Students helped revise and edit each other's writing. The Slovak EFL learners were surprised to learn that even children who pursue their education in English in the United States still make many grammatical and spelling mistakes as they grapple with developing their English language proficiency. This, according to their EFL teacher, empowered the Slovak learners to feel less anxious about making mistakes in their own work—an issue that is common for EFL learners in many contexts. Students were challenged to make their writing multimodal and shared their projects with families at their respective schools.

In addition to practicing the targeted English language skills (writing informational texts and practicing revising and editing skills), the collaboration challenged both the ESL and EFL learners to practice many of the key 21st century skills identified by van Laar et al. (2017). Specifically, they engaged ICT skills in using technology to document community-life and present information online, all while collaboratively solving problems specific to effectively sharing information with students from another culture (hence also developing their cultural awareness). Students were also given opportunities to self-direct and be creative through the multi-modal component of the final project.

3.2 *Project photo essays on community trash in an EFL middle school*

This project took place in 2018 in a 7th grade EFL classroom in Montenegro. The EFL teacher invited students to help collect trash around their school while guiding them to critically reflect on the extent of and reasons for trash in their community. For the target English language skills, the

EFL teacher selected language for practicing contrasting ideas. Students were challenged to take a photo of an area prior to the clean-up and after the clean-up and write a short essay about the two photographs. Students showcased their projects during a school event, raising peers' and community members' awareness about the negative consequences of excessive trash in their school community. Students also reflected on the insights they gained during the project in an article they collaboratively published in their school newsletter.

This community-centered, multimodal, project-based learning opportunity accomplished more than providing an authentic avenue for practicing expressions for contrasting ideas in English. Like with the previous project, these EFL learners had to think critically and work collaboratively to address a real-world problem in their community. They considered the ethical issues surrounding individual versus communal responsibility and engaged ICT skills in their final presentations.

3.3 *Kindness rock project in an EFL high school*

This service-learning project was developed and implemented by American in-service and pre-service TESOL teachers from Eastern Michigan University working in a two-week intensive EFL program in Montenegro while completing graduate level coursework in TESOL. The program was free of charge to some 100 participating school children. The high school EFL learners in the class that revolved around the kindness rock gardens were guided to identify tasks needed to accomplish the project. This involved learners from other classes in painting affirmation messages on rocks and creating two rock gardens—one by their school and one in the town center. The high school EFL learners worked in teams: some were in charge of the creative and logistical decisions, others worked on promotion and social media awareness, yet others collaborated on a video about the project. Throughout the two weeks, students used primarily English to accomplish the many tasks associated with the project. They also had to actively problem-solve as they addressed unexpected challenges and reflected on the experience to improve their work. The final presentation of the project to the community showcased some of the students' communication and leadership skills. Three of the learners impressed us in acting on their own sense of self-direction by creating their own kindness project and bringing the project to another school the following academic year! One team challenged themselves in developing ICT skills through creating a video about the project and making it available through a private YouTube channel to all of the program participants. This kind of self-driven initiative is not an expectation for youth in Montenegro.

3.4 *Service learning program for preservice teachers*

Similar to the service-learning Study Abroad Program in Montenegro described above, the Eastern Michigan University's TESOL program also offers a service-learning program for preservice teachers in the US. During this program, preservice teachers take a Methods course as part of which they teach English learners enrolled in an 8-session after-school program. Preservice teachers work together to design an English teaching course/after school program, deliver, assess, and reflect on it, in a real-life context, working with actual English learners.

Like with the other EFL learner projects, this teacher education example demonstrates how learners, in this case preservice teachers, can, through a meaningful instruction that involves engaging in a real-life context, engage in developing important 21st century skills along with improving their understanding of effective instructional approaches. Rather than lesson planning in a vacuum or microteaching peers pretending to be English learners, teacher candidates utilize problem-solving, creative thinking, and a variety of ICT skills to identify strengths and needs of their learners, develop, delivery, and evaluate specific lesson plans, and reflect on the connections between their practical experiences and theoretical discussions and readings. In accordance to the 21st core skillset highlighted by van Laar et al. (2017), preservice teachers develop cultural awareness as evidenced through deepened reflection on their interactions with English learners throughout the program. They are encouraged to self-direct as they brainstorm topics, lesson plans, and activities in the program.

The four case studies described above were a result of teachers and teacher educators adopting less traditional, more experiential approaches to teaching English and TESOL, in part because they find these approaches to be better positioned to cultivate the 21st century skills while also furthering students' learning of English language or English teaching. The effectiveness of furthering EFL learners' English while engaging them with 21st century skills has been documented elsewhere also (e.g., Motallebzahed & Kafi, 2015; Devkota, Giri, & Bagale, 2017).

And while for many practitioners, such a decision may lead to a complete departure from the traditional curriculum, others may choose to employ these experiential approaches in alternative ways that may be more compatible with administrators' expectations, state standards, or sociocultural realities. As an example, instead of devoting a few intensive weeks to an experiential project, teachers may motivate learners to get the mandated work done more efficiently so that the last 10-15 minutes of each class period could be devoted to a project. Alternatively, every third or fourth class or the last month of the school year could engage learners in more experiential, 21st century-focused English language learning.

4 ENGLISH EDUCATION AND ENGLISH TEACHER EDUCATION PRACTICES FOCUSED ON 21ST CENTURY SKILLS AND COMPETENCIES: MICRO-LEVEL IDEAS

For educators whose contexts do not allow for incorporation of any larger-scale experiential approaches, teachers can develop micro-level classroom routines that can, in smaller ways, still cultivate EFL learners' 21st century skills in addition to developing English proficiency. At the very basic level, teachers can find a way to spend the first 5 minutes of each class allowing students to discuss their own interests in English. For younger learners, this could involve bringing a special object from home and explaining to their classmates what makes it special. Alternatively, students can produce a short English booklet about themselves and present it to peers. Older students can take turns bringing in excerpts from a thought-provoking article, lyrics to their favorite song, phone app for learning English, or an inspiring motto and use these as a springboard for a brief class "warm-up" activity. Older learners could also be challenged to research a particular topic on the internet and present the findings to the class. Finding ways to adapt curriculum to students' own interests and passions can not only motivate them to try harder in their English classes, but get them in the habit of taking initiative and leadership, as well as practicing public speaking—all important 21st century competencies.

Another micro-level strategy that aims to increase relevance while also encouraging more independence, initiative, and creativity is to offer more choice in assignments. Students could be invited to choose from two possible homework assignments or even English language assessments! If students produce a paragraph or a short essay, they can be asked to then turn it into a children's book that EFL learners in younger grades could read. Other modalities that could be explored may include an infographic, poster, blog, or school newsletter—all of which could allow learners with access to the internet and computers to further develop their ICT skills.

Other simple ways of getting students into the habit of taking initiative and communicating their preferences would be to offer them control over some basic timing and space decisions. For instance, a teacher could allow students to choose which of the main classroom tasks they'd like to do first or ask if they prefer to work on a lengthier task at their tables, circle, or even outside!

Finally, EFL teachers can share ways of studying English autonomously. As the Internet access expands, more and more learners will be able to take advantage of the many resources that can foster their English language development. Teachers must be willing to guide learners toward effective and appropriate resources and help them develop autonomous strategies for learning on their own, outside the walls of a classroom.

5 DISCUSSION AND CONCLUSION

Some of the ideas presented in this pedagogically-oriented article may, despite some appeal, simply sound too complex or unorthodox and an already overwhelmed teacher may ultimately prefer to stick with the more comfortable, tried-and-tested, textbook-based teaching approaches. And while it is true that innovating our pedagogy may result in some initial dissonance, even disruption, if we, as English teachers and teacher educators want to have positive impact on our learners through and beyond English, we must be willing to experiment with approaches that allow us to do both—facilitate English language and the 21st century skills. After all, the world for which we are preparing our learners is full of complexity, ambiguity, and uncertainty and the current generation of young people faces unprecedented challenges such as climate change, political polarizations in many countries, and social inequity. If this generation of young people is to remain hopeful in the face of these challenges, we, as their educators, must instill in them the value of key 21st century skills such as problem-solving, adaptability, etc. Doing so may require our willingness to transform ourselves as we expand our view of EFL learners from that of pupils who have relatively little to contribute to their English development to that of learners as capable problem-solvers who are the future custodians of our communities.

And this concluding aspiration, as well as all described approaches in this article, are well-aligned with at least three of the four professional religiosity principles that reflect the socio-cultural reality of Muslim learners in Indonesia (Suherdi, 2012)—*amanah* (responsibility, accountability, and trustworthiness), *rahmah* (compassion), and *sillah* (networking/collaboration). If EFL learners are to develop and execute a successful self-initiated project as part of their English curriculum, they have to take responsibility for their action and be accountable to their teammates with whom they collaborate. Likewise, they have to demonstrate compassion in projects that include a service-component (e.g. when working with less proficient learners, elders, or people with disabilities).

The fourth principle—*taaddubah* (discipline and rule-governed behavior establishment) — is something that EFL teachers and teacher educators might grapple with reconciling as they explore the kinds of experiential, equity-focused approaches described in this article. Teachers might feel that solely imposing discipline rules in a top-down manner may undermine their striving toward less hierarchical instructional models that undergird the 21st century educational movements. One viable integration of the *taaddubah* principle and the 21st century movement may be in allowing older learners to have some input in the negotiation of rules or working agreements for efficient and effective classroom-based learning. Other ideas such as letting students make small-scale choices in assignments, seating arrangements etc. mentioned earlier in this article may, if scaffolded carefully, also encourage 21st century skills while honoring established Indonesian values.

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*Education and teacher skills in Industry 4.0 & education for
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5Cs: Stages for fostering students' critical thinking skills in Industry 4.0 education

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ABSTRACT: The field of education field is inevitably influenced by the Industrial Revolution 4.0. Education 4.0 brings new paradigms in the teaching–learning process. Generation Z students' attachment to technology creates new trends in learning. Teachers are challenged to keep improving students' critical thinking abilities to do what technology cannot do, and to not be overpowered by technology. This literature study focused on the significance of teaching critical thinking in Industry 4.0 education. Literature resources, both books and journal articles, mainly on Education 4.0, critical thinking, and classroom application, were studied. This article highlights how critical thinking is crucial and can be learned and taught. Finally, it concludes with ideas on classroom activities to teach and enhance critical thinking skills for Indonesian EFL students at the higher level based on 5C stages, namely comprehend, compare, comment, construct, and create to make students good thinkers. An example of classroom application is also provided.

1 INTRODUCTION

The Industrial Revolution 4.0 (IR 4.0) marks the massive use of technology to promote computerization of manufacturing, with an emphasis on the digital revolution (Afrianto 2018). It blurs the lines between the physical, digital, and biological worlds (Hussin 2018). It also affects many fields including education. Therefore, the term Education 4.0 came into existence to describe education in IR 4.0 (Hussin 2018).

Education 4.0 is marked with the presence of technology in the teaching and learning process. Technology is no longer considered as only a tool. Instead, technology is an instrument to enhance new ways of instruction (Razak et al. 2018). Along with technological advancement, teachers, students, and learning processes are challenged to integrate technology in classrooms without being overpowered by technology. Therefore, critical thinking is promoted to address the challenges.

The discussion in this article is based on a literature review of critical thinking as one of the 21st century skills. It is, however, not possible to exhibit all reviews on approaches or methods of teaching critical thinking in EFL classrooms. The discussion was therefore narrowed to the idea of fostering critical thinking skills of Indonesian EFL learners by providing a classroom activity following 5C stages. The works of literature being reviewed were selected from both online and offline resources, mainly reviewed journal articles, in relatively recent years and not limited to resources related to the Indonesian context. The resources were mostly in three major categories: Education 4.0, critical thinking, and classroom application.

2 SHIFTING PARADIGM IN EDUCATION 4.0

The presence of the digital revolution in IR 4.0 leads to shifting paradigms in teaching and learning processes. Teachers have to face generation Z, those who were born after 1995, who nowadays fill up classrooms. They are often referred to as digital natives, as they were the first

generation born into the Internet era and were strongly attached to technology (Cilliers 2017). They are very skillful in using technology and demand instant information. In short, they “live and breathe” technology (Cilliers 2017). On the other hand, most practicing teachers nowadays are generation X, born between 1965 and 1979, and generation Y, born between 1980 and 1995, and are not digital natives.

As a result, using technology for teaching brings enormous challenges for teachers, as they are not digital natives and yet have to interact with students who are much more aware of the technology. First, teachers are continuously challenged to think about how they can maximize their students’ exposure to technology in learning processes. Second, teachers also need to rethink their roles. They may no longer merely perform a one-man show in classrooms but are now required to undertake co-teaching or collaborative teaching (Razak et al. 2018). As their students can get information almost instantly, teachers may not function as knowledge transferers any longer. For teachers to perform well in Education 4.0, they need to have a 21st century learning mindset, catch up with digital advancement, and firmly see the opportunities for better teaching by using technology (Afrianto 2018).

The students, especially generation Z, have been strongly attached to smart devices and gadgets since they were very young, and thus they are called digital natives. Students’ attachment to technology in Education 4.0 allows students to access as much information as they want, when they want, wherever they are. Students can get instant information with a click on their screens. As a result, many of them may underestimate instructional processes because they can get much more information and answers quickly, easily, and in a more convenient way from their smart devices.

These experiences result in changes of studying values and trigger the new trends in learning. According to Fisk (2017), there are nine trends in Education 4.0 (Hussin 2018). First, learning can take place anytime and anywhere. Second, learning will be personalized to individual students. They can be given harder tasks if they have achieved a certain level of mastery. Third, students have a choice in determining how they want to learn. This is very possible with the BYOD (Bring Your Own Device) approach and students are free to choose the tools or techniques. Fourth, students will be exposed to more project-based learning. Students no longer have in-class final tests as the only measurement tool of success. They are expected to be able to apply their knowledge and skills to complete projects collaboratively. Working in a team helps students to appreciate the strengths of each member and they will be able to take roles and adapt appropriately (Afrianto 2018). Fifth, students are exposed to more hands-on learning through field experiences. Moreover, technology makes it possible for them to learn beyond boundaries of time and place. Sixth, students will be exposed to data interpretation. Instead of asking students to find data, they are given opportunities to use their reasoning skills to make inferences. Seventh, students will be assessed differently for their factual knowledge and the application of the knowledge. Eighth, students’ opinions will be considered in designing the curriculum in order to maintain the relevance and contemporariness of the curriculum. Last, students become more independent in their own learning. As a result, in this case, teachers may perform different roles as facilitators who guide their students throughout the learning process.

3 THINKING SKILLS IN EDUCATION 4.0

3.1 *The thinking process*

Thinking is the basis of everything we do. Every argument we have and every decision we make are the results of our thinking process. There are misconceptions about thinking that result in a debate about whether thinking skills can or cannot be taught. The misconceptions are based on a statement that we cannot teach our students to think and that our students can think anyway (Matthews & Lally 2010). Students were born with thinking capabilities, so they need not be taught how to think; instead they can think already and all processes in their lives are results of their thinking.

Second, critical thinking is purposeful. When we start learning something, we are very attentive and thinking carefully about the information we receive. In this situation, we are aware of what we are thinking and we do it purposefully. Third, critical thinking is a process of understanding a situation, assessing, drawing conclusions, and performing actions. Fourth, critical thinking is conducted within a framework that is built upon some processes.

Critical thinking as a cognitive activity is closely associated with the use of mind and reasoning or the use of human capacity for rational thought (Halpern 1999). Rationale here also means “using reason” to solve problems. These are reasons for what we believe and do, an ability to evaluate our beliefs and actions, and also the ability to present the reasons for our beliefs and actions (Cottrell 2005). Thus, the actions are not merely based on “because somebody said so.”

Critical thinking is also related to the use of cognitive skills or strategies to increase the probability of a desirable outcome (Halpern 1999). It is done with purposes, reasons, and goals that are set and expected to direct the process. It includes the ability to think about your own thinking, to reconsider your point of view, and also to “reconstruct your thinking in an improved form” (Judge et al. 2009). This ability includes understanding the strengths and weaknesses of your own thinking and being open-minded to others’ points of view.

Critical thinking has been defined in several ways, such as an “active and systematic cognitive strategy to examine, evaluate, understand events, solve problems, and make decisions based on sound reasoning and valid evidence” (Hosseini et al. 2012). Different points of view define critical thinking as learning how to ask and answer questions of analysis, synthesis, and evaluation. Thinking skills that require ones to analyze, synthesize, and evaluate are in fact part of Bloom’s Taxonomy, which is often referred to as currently aspired educational objectives across disciplines or majors. Therefore, critical thinking is basically a questioning, challenging approach to knowledge and perceived wisdom that helps learners to become objective and to accommodate their own values, attitudes, and personal philosophy to position and question the information (Judge et al. 2009). In other words, critical thinking means challenging our own thinking by questioning, evaluating, and examining in order to perceive objective information.

5 APPLYING CRITICAL THINKING IN EDUCATION 4.0

There have been many studies on critical thinking. Vaseghi and Barjesteh (2012), for example, found that critical thinking skills significantly positively affected EFL learners’ reading comprehension performance and students’ learning. Regardless of many definitions of critical thinking, there is a common understanding that critical thinking skills can be taught and learned, and when students learn these skills, they become better thinkers (Halpern 1999). Especially in Education 4.0, teachers must be aware of the new paradigms in teaching and learning processes, including not only what roles should they perform, but also how to benefit from having students’ close proximity to technology. That way, it does not mean that should rely fully on technology. Instead, teachers should think harder about how to accommodate technology in classrooms. Teachers will need to explore ideas on how to develop students’ critical thinking skills by accommodating technology in teaching and learning processes.

In this article, the writer would argue that five stages of critical thinking application in classroom activities, called 5C stages, namely comprehend, compare, comment, construct, and create, can assist teachers in providing instructional processes that foster the development of critical thinking abilities. This model of 5C stages helps students challenge the existing information and their own thinking, which can be done collaboratively in a group to maintain students’ social senses and appreciate one another. This 5C activity is suitable for higher level students and necessitates students to have access to their smart devices.

With regard to English language teaching in the Indonesian context where the culture of accepting differences and being moderate to contradiction (Sfera 2015) are the common norm,

it is expected that this activity can gradually help Indonesian students challenge their own thinking, differences, evaluate ideas, and ultimately exercise critical thinking skills. This activity requires an input that can be in the form of a reading text or video recording with a suitable level of difficulty and familiar EFL/ESL context that allows students to understand the content without significant problems. The correct level of reading is essential because the emphasis of this activity is not on reading comprehension, but on fostering critical thinking skills. In addition, a familiar text may trigger students' interest to deepen their understanding of the topic.

5.1 *The 5C stages*

5.1.1 *Comprehend*

This is a stage in which students are expected to comprehend the information correctly. In this stage, teachers need to make sure the students get the same meaning as what the writer wants to convey. This stage can be accomplished with reading comprehension questions, retelling, doing short presentations, etc. Thus, at the end of this stage, both teachers and students will have the same understanding about what the text is about. As suggested earlier, because the input is something familiar to students, this comprehension process will not take much time. In addition, the input is aimed to trigger students' interest and curiosity, so they will be willing to browse more information on the related topic.

5.1.2 *Compare*

The second stage, comparing, asks students to compare information that they get with other resources. This is aimed to maintain the objectivity of students' points of view. Students can access information from their smart devices to browse similar information.

5.1.3 *Comment*

Based on the information they have gathered, or even added with their experiences, students may be able to provide comments related to the topic. Students may even choose what their preference is among other choices. In this case, students can also present rationales for their position and arguments. In this stage, students exercise their critical thinking abilities by evaluating and analyzing arguments. Their comments can also be recorded and uploaded, and it will be interesting for the class to watch these together.

5.1.4 *Construct*

After listening to some comments and analyses from other groups, students are faced with many ideas and points of interest. They can adopt these pieces of information and construct them into an idea. In this stage, students are able to manage, make better, and plan before they create a new idea. Students, according to their capacities, will construct their knowledge and skills.

5.1.5 *Create*

The ultimate stage is to create, during which students cultivate their creativity to create something based on what they have understood. This process can result in innovative classroom practices that challenge students to be more creative and come up with something original and brilliant. Students then present their creations in interesting and attractive ways.

5.2 *Classroom application*

These 5C stages will be illustrated in the text that follows to exemplify how the stages are implemented to exercise critical thinking in reading classroom activities. A short article on "Online Transportation, Series of Advantages" by Dhiandra Rahmadani Yurmal, dated April 23, 2018 taken from www.kompasiana.com is used (Yurmal 2018). This article discusses the presence of GO-JEK, an Indonesian business startup that provides online transportation. It brings many advantages, not only wider ranges of services for citizens (GO-BIKE, GO-FOOD, GO-MART, etc.), but also a number of working opportunities

for Indonesians. This is a topic with which students are very familiar, and even most of them may have used its service. Teachers then ask students to work in groups and read and comprehend this article. Then, teachers lead the following 5C stages as follows.

5.2.1 *First stage: Comprehend*

First, teachers have to make sure that students understand the information correctly, and students get the same message as the writer intends. Teachers can have a question-and-answer activity to check students' comprehension. Retelling can also be done for the same purpose. This stage should not use much time, as the chosen text is relatively not too difficult for higher level students. This is aimed to provide an opportunity for students to freely disclose their opinions on something they are familiar with and trigger their thinking skills.

5.2.2 *Second stage: Compare*

In this second stage, students are given opportunities to find more information related to the text using their smart devices. Generation Z students enjoy browsing information from smart devices, so this activity will not be considered as tiring literature research they have to do. They search more information on GO-JEK and compare other online transportation services. After gathering more information on the topic, students are asked to present a comparison between GO-JEK and other online transportation services in Indonesia or abroad. It may cover its features, strengths, weaknesses, etc.

5.2.3 *Third stage: Comment*

Students are asked to comment on the article on GO-JEK based on their renewed comprehension after comparing the information they have gathered. They can do it orally, so the results are recorded as a short video. This video can later be played in classrooms, or the teachers can ask them to upload their videos. This can be very interesting and challenging.

5.2.4 *Fourth stage: Construct*

Students are asked to map the ideas on GO-JEK based on the article and the information they browse from the Internet. They may also be enriched from other groups' ideas and comments. This mapping activity is an initial stage, like creating a blueprint for their innovation. They may think about its weaknesses, strengths, possible innovations along with what features will be added, how these will be done, which parties it involves, and many more.

5.2.5 *Fifth stage: Create*

After students go through stages 1 to 4, the last stage is the summit of their thinking processes. Teachers ask them to think of an innovation. They can think of creating other online transportation services with better features than GO-JEK, or they can also try to add new features of GO-JEK as if they are the founder of GO-JEK who brings innovation to the company. Maybe this can also be a result of their comparison with other services or their own ideas from constructing existing information to create new things. Teachers encourage students to be able to present reasons and evaluation on what they will do and why they do so. This innovation can be presented argumentatively, either by oral presentation or another video presentation. Teachers may be surprised to witness how their students can be very good thinkers and come up with brilliant ideas.

These 5C stages are merely one of many other ideas on fostering critical thinking in classrooms with the use of technology. It is expected that this can trigger and foster students' critical thinking abilities by giving them space to explore much information and to come up with an innovation. Teachers can also create a more challenging learning process using certain technology applications.

6 CONCLUSION

Facing the reality of unstoppable technological growth that results in a shifting paradigm in Education 4.0, both teachers and students have to be able to see this opportunity wisely to create better teaching–learning processes. Teachers must adapt to these changes and grow the 21st-century learning mindset to assist their students to develop thinking skills. Critical thinking, as one of most required skills in IR 4.0, must be taught in a manner that scaffolds the thinking processes following a set of educational activities. This article has argued that classroom activities adopting 5Cs stages can challenge Indonesian students to freely express their opinions, challenge their own or others' ideas, analyze choices, and even present a brilliant idea as a result of their thinking and creativity. Making use of both teachers' and students' adeptness with technology, teachers can apply 5C stages in developing the critical thinking of their students to create good thinkers who can compete in the 4.0 Education age.

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Can Indonesian educational leaders respond to rapid contextual changes in a digital age? A narrative of issues and challenges

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ABSTRACT: This study aimed to examine the complexities that Indonesian educational leaders (ELs) experience in the course of steering their institutions to respond to rapid contextual changes, in this case, the impact of advancing technology. Thirty-five Indonesian ELs were interviewed for two months to document their experiences in role performance as academic leaders. Four complexities hindering them from addressing rapid contextual changes were identified, i.e.: (1) a need for a less bureaucratic resource allocation system, (2) a need for sufficient financial resources and better facilities, (3) a need for better role preparation and human capital development, and (4) a need for better work-life balance for educational leaders. Addressing these needs will enable ELs to perform their educational roles effectively in responding to advancing technologies. Implications to policy and practice are discussed.

1 INTRODUCTION

The purpose of this study is to focus a critical lens on the complexities that Indonesian educational leaders (ELs) experience in the course of steering their institutions to respond to rapid contextual changes, in this case, the impact of advancing technology. In April 2018, President Joko Widodo launched *Making Indonesia 4.0*, the country's national roadmap for tackling and addressing the demand for skilled workforce in this new era of technological advancement and innovation known as Industry 4.0 (IN4.0). This period refers to the current trend of automation and data exchange in manufacturing technologies (Usman 2018). It is deemed a technological revolution because of its scale and impact, and the way it transforms human activities using automated methods. According to Liffler and Tschienner (2013), the basic principles of IN4.0 are the incorporation of machines, workflows, and systems, by applying intelligent networks along the chain and production processes to control each other independently. Sung (2017) identified the following challenges of IN4.0: a) information technology security issues, b) reliability and stability of production machines, c) lack of adequate skills, d) reluctance to change by stakeholders, and e) the gradual phasing out of human labour due to automation.

Furthermore, then Vice President Jusuf Kalla stated that in the development of IN4.0, the support of competent and talented workforce is necessary, since according to him, IN4.0 and human resources competency are closely related (Hartomo 2018). Hence, one of the challenges that Indonesia faces is the readiness of its workforce for automation and advanced technology. Indonesia is the 4th largest workforce in the world, and unfortunately very lacking in talent (Insiderstories.com 2018). The advent of rapid technology and IN4.0, therefore, needs greater attention from all stakeholders in the educational, business, and professional spheres. The role of education leaders in this current landscape calls for it to be more strategic. Significant technological changes related to artificial intelligence and machine learning, for example, will require better change management interventions so the workforce can transition gradually to automation. Therefore, high-quality education plays a significant role in preparing the country's skilled workforce. More importantly, educational leaders will be at the forefront of this challenge as they are responsible for steering the country towards this goal.

Role theory guides this study of educational leaders' roles in changing contextual landscapes. Role theory has found prominence in the study of managing universities and the higher education system (e.g. Brennan 2010); in the development of educational leaders (Gronn 2003), and in how academic leaders utilise their multiple roles in times of change and complexities (Jones 2011, Jones et al. 2012). Undertaking a study that documents how educational leaders navigate the constraints of their roles in this period of significant change is timely, and provides an important contribution to the expansion of the study of educational leadership in an Indonesian context. A study by Ngo (2013) suggests Indonesian ELs experience tough choices in the process of leading, and tensions often occur in aligning teaching, learning, and managing stakeholders' demands (Bolden et al. 2008, Degn 2014), resulting in unbalanced workloads and stress (Devlin 2013). Indonesian ELs suffer the same paradoxes of "freedom and constraint", and "creativity and conformity" (Stryker 1994) in the performance of their roles. This dimension to Indonesian ELs' roles has not been examined previously, therefore extending our knowledge on educational leadership in Indonesia. The study therefore aims to answer the research question: What issues and challenges do Indonesian ELs perceive that would hinder them from addressing rapid contextual changes in the sector?

2 LITERATURE REVIEW

ELs are men and women who participate in a process of leading universities through which educational values and identities are constructed, communicated, and enacted (Bolden et al. 2012, p. 15). Bolden, et al. (2008) presented four different contexts that shape or hinder ELs' experiences in performing their roles. The first is *personal context*, which refers to the personal qualities, experience, and preferences, and barriers to role performance. Barriers include frustration, burnout, or recalcitrance to face the challenges of advancing technology. The second is *structural context*, which refers to situations that may hinder or enable role performance, e.g. governance, processes and structures, responsive top management, the support of colleagues and, significantly, opportunities to develop educational leaders' capability, confidence, skills, and competence as leaders. More importantly, educational leaders have access to resources so they would experience elevated and favourable sense of identity, and also salience and heightened self-belief in their capability to lead (Motta & Molan 2008, Stets & Burke 2000).

ELs need material and non-material resources to sustain leadership and their interactions, for example, fiscal resources, facilities, and institutional policies. With limited financial capacity, ELs are encumbered, among other accountabilities, with the responsibility for staff development. They face consistent pressure from staff who clamour for opportunities to undertake skills development training, undertake research, attend conferences, and engage in socio-civic projects that require funding. Being required to do a lot with limited resources is a daunting challenge for many educational leaders because their department's performance is dependent on the support of performing and energized employees. The serious under-funding does not bode well relative to the heightened expectations for leaders and educational units to deliver quality research and better education services.

The third is *social context* which refers to the presence or absence of personal support systems, positive working relationships with chairpersons and other administrators, and encouragement and support by family and friends. Barriers include passive support or opposition, infighting, or spoken or unspoken disapproval from colleagues and subordinates. The fourth is *developmental context*, which refers to opportunities to develop human capital, is important to help someone with a pure academic transition to a leader role, and then gain or build forms of influence in the organization. Included in this condition are holistic approaches to enhance educational leaders' capabilities where they are given sufficient preparation prior to role assumption (Bush 2010, Bush & Jackson 2002), and, in the process of leading, also receive developmental interventions that enhance their skills and capabilities (Bolden et.al. 2012, Bolden et al. 2008, Cafarella & Zinn 1999, Smith 2002). Without adequate understanding, clarity, and preparation for their roles, it is argued that educational leaders will not be able to

develop a philosophy of their role leaders, and could enter their appointments with a flawed vision of the role. Lack of preparation can leave new educational leaders feeling misunderstood, unappreciated, inadequate, frustrated, and discouraged (Raines & Alberg 2003, p. 34).

3 METHODOLOGY

Criterion sampling strategy (Creswell 2013) identified the universities using three criteria: university's long history, national ranking, and growth in student population. The universities selected were all located in Indonesia's three major cities where top universities are located (Hill & Thee 2012). For participants, the criteria were age, gender, number of years prior to leadership experience, and number of years of experience in current ELs' role.

Thirty-five (35) educational leaders from six universities across Indonesia participated in the study; 14 of them were females, and 21 males. All except one were married. They were aged between 35 and 56 years old, with Islam being the dominant religion. The participants were mostly from majority ethnic groups, the Javanese and Sundanese. In terms of position, 25 out of 35 participants were Heads of Departments (HODs), while the rest were Deans, Vice Deans, and a Department Secretary.

Data were collected through semi-structured interviews conducted in the national language, *Bahasa Indonesia*. The interviews, which were conducted over a period of two months, were conducted on-site, allowing researchers to fully engage with participants in their context (Brinkman & Kvale 2005, p. 177). The study used the constant comparison method to identify the common themes arising from the coded data. The coding process used NVivo 11 software. The coded data were categorised into nodes, providing descriptive information about the context or setting from which the data were derived (Lincoln & Guba 1985, p. 203). Based on these categorised nodes, a coding protocol was established. To ensure abstractions and metaphors in the interview data were properly categorised, the help of senior Indonesian educational colleagues who were well-versed with the local ethnic language was sought (e.g. Javanese or Sundanese).

Member-checking activities were performed on site after data were analysed, which involved the participants checking and analysing back the coded data. The purpose was to allow them to check the data accuracy and credibility (Creswell 2013, p. 252, Kempster & Parry 2011). Specifically, the activities included a) two focus group discussions; b) six face-to-face meetings; c) two phone interviews; and d) three interviews via email. With member-checking, the researchers found that the interpretations made were an adequate representation of the members' own realities. Through this method, misinterpretations were avoided, further enhancing validity of findings (Kempster & Parry 2011).

4 FINDINGS

4.1 *Response to change is hampered by bureaucratic resource allocation system*

ELs will be able to respond actively to rapid contextual changes if reforms occur in reducing the prevailing bureaucratic procedures for funding approval and disbursement. ELs perceive that it is the long, bureaucratic, and circuitous approval processes (*'there are interconnected, rigid regulations for how the funds are to be used'*—quote from Educational Leader (EL) #17) that cause delays in the disbursement of funds. An EL explained:

It is the bureaucracy that is our biggest obstacle, from the university down to the faculty. Our program implementation is therefore very lengthy, often delayed. Our external parties do not know about this but our bureaucracy here is very, very rigid (EL #12).

An EL commented that the bureaucratic internal procedures *'force me to be slow in my response'* (EL #12), affecting responsiveness levels, resulting in *'minimum levels of service'* (EL #12) to stakeholders. She further adds that if they know how to circumvent the circuitous system, *'then it makes it very fast...but you see, I do not like to make a noise, like an animal*

looking for food' (EL #12). This latter statement depicts how an EL facing this situation feels derogated by the system, yet at the same time, does not want to be humiliated by the system's failure to support her role as an educational leader.

ELs believe that Indonesia's rigid bureaucracy has resulted in the unequivocally slow implementation of plans and programs, and feelings of decreased salience and power by ELs. While ELs believe that their *'institutions have a good vision, and top management understand this vision and what needs to be achieved'* (EL#32), they also believe that top management similarly feels incapacitated by not being able to achieve the vision for the institution (*'they cannot sufficiently do their jobs because the system is considered burdensome'* - EL#32) because the internal machinery blocks the actualisation of the vision. Therefore, as front-liners, ELs must carry the burden of implementation for top management, putting more strain on them and their teams: *'so eventually it is us, the lower staff, the teaching staff, and the research staff, who carry the brunt of this problem'* (EL #32).

Delays in program implementation often stretch for months, and sometimes programs must be put on hold because of the *'lengthy bureaucratic process as we have to ask the approval of this and that person'* (EL #24). One EL says that while his department is one of the biggest income-earners in the Faculty given its ability to attract many students, they never get to enjoy the fruits of their labour. However, while the rigid bureaucratic process is burdensome, many ELs understand that it is part of the government's effort to improve governance in higher education. Better accountabilities in the allocation and use of funds are deemed necessary to minimise corruption in the education sector (Wicaksono & Friawan, 2011), as commented by an EL: *'Our management is just too careful. I understand. We are being watched'* - (EL #24).

4.2 Response to change needs sufficient financial resources and better facilities

Tied to the problem of bureaucracy is the lack of fiscal resources allocated to public and private universities. ELs feel that the problem in the financial system *'presents us all with big hurdles'* (EL #35). ELs in this study who belonged to privatised and autonomous state universities report a decline in financial support from the government. They are affected by this regulation and have to do more with less. Specifically, it means ELs are expected to help their cash-strapped universities improve education quality despite the obvious lack of funding (*'My pressure? I can think of only two words: lack of funding. It is extremely difficult to achieve anything at the moment. We have lack of commitment from the top to fund our external activities'* - (EL#3). Moreover, the need for additional infrastructure is one issue that ELs in this study are struggling to make heard by management. ELs reported that they have been advocating for better office facilities for their lecturers and staff. One EL in Central Java said, *'I have been screaming for these facilities, especially laboratory for my students'* (EL #10).

ELs report that the lack of funding affects them (*'How can we manoeuvre freely if these funding problems are controlling us?'* -EL #10). The situation causes ELs to sometimes feel desperate. ELs report that their university sometimes suggests for the educational staff to take the initiative to source funds for their department. A female EL, feeling quite angry at this problem, once confronted her Dean and told him that *'my lecturers are already over-loaded. Don't give them this responsibility of looking for money. Don't burden them!'* (EL#34). ELs in this study contend that they would like top management to be more responsive in their attitudes in dealing with these problems. Part of responsiveness is continuing dialogue with ELs, to enable ELs to give feedback on operational issues plaguing their departments, and for top management to give their response, and address these issues. Top leader responsiveness will also aid *'lower-level leaders like us to unite the resources'* (EL #1). In conclusion, they need top management to listen to them.

4.3 Response to change needs better role preparation as part of human capital development

Interviews with ELs show that selection is generally side-tracked in favour of a speedier process, using a *'personal approach'* where anyone who is deemed qualified is requested to consider

the assignation. An EL commented that *'if one has achieved a certain educational rank, experience, then, ergo, it is assumed that the person is ready to be a leader'* (EL#8). Therefore, it has been the experience of some ELs in this study that accepting the job of an educational leader is like *'inheriting a field, you can plant any seeds you like, grow any vegetables you like'* (EL#14).

This statement connotes leaders' roles that are unstructured, unclear, and ambiguous. This issue further highlights the problem of lack of preparation for educational leadership roles that can result in job stress, and feelings of inadequacy for the role. An EL recommends that the appointment process for leadership needs to be improved, and he is speaking generally, for Indonesian higher education: *'that is one of the key problems of Indonesian higher education leaders: appointment is without integrity'* (EL#35). This perception was corroborated by another EL who said *'When we got promoted, we did not know what to do, so I just flow with the role'* (EL #9). ELs relied on the support of their program secretaries for routine administrative activities; others relied on the advice and guidance of their previous mentors, and the support of their peers. Nevertheless, data show that ELs would like to see definite, formal plans for succession (*'I think there should be a clearer structure to develop educational leaders'* – EL#1). ELs in this study would like to see a blueprint for educational leadership roles, and leadership succession, designed and implemented. As a male EL commented:

There should also be a kind of map, a blueprint for hierarchy development but also for people of the same level. There should be a blueprint of the duties, assignments, obligations, and so forth. These blueprints are currently not very clear. We have to put everything on the map very clearly (EL #1).

4.4 Response to change needs ELs to have better work-life balance

With massive contextual changes in education, ELs' job demands have increased tremendously since they must coordinate productively with lecturers, colleagues, staff, and students to maintain an over-all functioning structure. ELs in this study complained about the heavy administrative workloads, judging the administrative work to be *'repetitive, doing the same thing continuously'* (EL#33), yet needing their constant attention. To ELs, work overload is at the top of the least satisfying aspects of their job, regarding it as *'really burdensome'* (EL#15). Therefore, ELs feel that they have lost a lot of productive time, *'so much of our work is consumed by non-educational matters'* (EL#9); it is *'unpleasant'* (EL #15), and the workload *'eats up a lot of my precious time'* (EL #17) compared to his major job which is to teach. Yet, despite the help that is extended to them, many of these lecturers *'don't care about this function'* (EL #33); they continue to submit *'mediocre reports'* (EL #31), much to the dismay of educational ELs in this study. They believe that the solution is *'having competent human resources who can operate new and efficient systems, although we don't have these new systems in place'* (EL #15), comparing Indonesia to Malaysia, its nearest more advanced neighbour. Another EL said that the conflicts between managing and teaching have been made all the more complicated, because the administrative burden of having too many students is a challenge and yet frustrating, commenting that *'it impedes our productivity and creativity to do other things because most of our time is spent on teaching'* (EL #34).

It appears from this statement that ELs feel that the lack of skilled human resources is a fundamental issue that should be addressed by their institutions. If a comprehensive human resource development program could address staff capability deficiencies, then ELs could focus their energy on doing other productive activities like research, searching for external funding, or improving the teaching delivery/curriculum materials. Despite this obstacle, however, ELs feel that as educational leaders, it is important to look at the problems positively by aiming to *'continuously improve the management control system so we can adapt to the challenges and the changes'* (EL #15).

5 DISCUSSION

The experiences of ELs in this study confirm the views of Degn (2014) who argued that ELs suffer from the conflicts of establishing educational legitimacy to maintain educational status, yet, at the same time, must perform expected leadership roles. Stryker (1994) called this the paradox between 'freedom' (educational legitimacy) and 'constraint' (leadership restrictions). Findings show that it is the *structural context* (Bolden et al. 2012) that is most problematic for ELs. It has been emphasised that the 'current mechanism for the allocation and channelling of education funds is very complex and needs to be simplified in order to achieve greater efficiency and accountability' (Hill & Thee 2012, p. 239). Therefore, due to the inter-connected nature of leading and managing, findings in this study suggest that Indonesian HEIs need to evaluate, in a fair and objective manner, the gains of their departments through the performance of their ELs. The rapid changes in national education policies, the continuing struggles and debates related to the new curriculum, and the lack of fiscal resources have made the life of ELs more challenging and complicated (Arquisola 2016). On top of that, ELs feel there is consistent pressure from national education regulatory bodies for higher education institutions to abide by quality control mechanisms, accreditation requirements, and research and publications, putting more administrative pressure on Indonesian ELs. These workloads sit on top of the teaching workloads but are included in a leader's duties.

Findings suggest that there appear to be differences in core values between what the institution expects from ELs (to manage and lead), and what the ELs value as their core passion: teaching, because they believe that first and foremost, they are academics. Consistent with the findings of Turnbull and Edwards (2005), role conflicts can lead to confusion, uncertainty, and discomfort, and as ELs showed, feelings of desperation. ELs feel the brunt of pressures due to the resource deficiencies identified in this study. Consistent with Spendlove's (2007) argument, resource deficiencies have resulted in a high cost to scholarship and leadership for ELs, as evidenced in this study.

Responsiveness, as argued by Mantere (2008), relates to top management providing their educational leaders timely feedback on their performance, mentoring (where necessary), and sorting through issues affecting their performance. Through this mechanism, personal issues and grievances of ELs and their subordinates can be identified, or top management could provide resources, and adjust workloads, to stimulate scholarship and research (Benoit & Graham 2005). Findings in this study enhance the extant literature on the role that resource deficiencies play on educational leadership, by identifying the different barriers causing role conflicts for educational leaders in non-Western settings.

From the findings, the study found that another barrier is caused by *developmental context* (Bolden et al. 2012). There is no institution-wide, planned, and systematic development program for heads of departments. There is no preparation before assuming the role, and ELs report there is no clear job description, or job accountabilities. Some ELs expressed a sense of grievance that they did not receive sufficient support from their institutions in the development of their careers as educational leaders. While it is true that the majority of ELs in this study had previous experience of between 5-10 years as Department Secretary, this experience helped them understand only the administrative requirements of the job, which was about managing administrative paperwork, scheduling classes, and coordinating course delivery. Gallant (2014) calls this a micro-focus experience rather than the big picture experience that leadership requires. There is no preparation before assuming the role, for example, in management and leadership, or financial management, and there is no job contract or clear job description. Some of them relied on the support of their program secretaries for routine administrative activities; others relied on the advice and guidance of their previous mentors, and the support of their peers.

Without preparation, research has shown that even those who are deemed competent and qualified and well-suited for a leading role may still find the transition from an educational to management and leadership roles to be difficult. Leaders must fill different roles and encounter different aspects of the environment. The lack of preparation for educational roles can leave new educational leaders feeling misunderstood, unappreciated, inadequate, frustrated,

and discouraged (Raines & Alberg 2003). These arguments underline how crucial sufficient preparation is before leadership roles are taken on, as shown in studies by Bush and Jackson (2002) and Bush (2010). Preparation of educational leaders is important to succeed in the role as shown in other studies by Bush and Jackson (2002) and Bush (2010). Aziz et al. (2005) suggest that training in preparation for an educational leader's role and responsibilities would be helpful in minimising role ambiguity and conflict, and enable leaders to contribute meaningfully to the functioning of their departments. One avenue that scholars suggest for preparation is having a mentor to the leader protégé'. It is seen as a transformative relationship in which the mentor is actively invested in shaping the protégé's worldview, acting as role model in the sharing of experiences, ideas and insights, and his/her potential contribution to the institution (Murphy 2003).

6 IMPLICATIONS TO POLICY AND PRACTICE

Studies have proposed improvements in the financial management system to enable HEIs to respond quickly to the changing demands in higher education (Hill & Thee 2012, Welch 2007, Nizam 2006), by assessing the efficiency of the resource allocation system in higher education, which is considered to be bureaucratic and circuitous. This reform will ease up the burden currently facing Indonesian ELs as they need to plan and implement programs to improve student and academic competencies needed to address rapid technological changes, in this case, the challenges of IN4.0. They need to purchase better laboratories and work stations. They need to send their academics to training on the latest automated technology. This conundrum is not helpful at all to Indonesian ELs in this study as they appear to be tossed between a rock and a hard place in terms of wanting to achieve their goals with limited resources, and limited authority to dispose of these resources. Nevertheless, agencies like the World Bank have asked the national government to consider carefully giving Indonesian HEIs more money via block grants, similar to the one implemented by the New Zealand Tertiary Education Commission that Indonesian HEIs can use at their discretion. Another scheme proposed is to provide incentives to universities to seek other sources by matching any funds raised privately, fostering a greater sense of self-ownership and independence (World Bank 2014, p.47).

7 CONCLUSIONS

The barriers, in terms of structural resource limitations, and developmental skills gaps to Indonesian ELs competencies to lead their institutions in this rapidly changing context have been identified and their implications to leadership practice have been examined. The study concludes that the absence of organisational resources or apparatus to engage in wilful determination to perform their roles has been a big stumbling block for Indonesian ELs in the discharge of their duties as leaders. The study identified these stumbling blocks as absence of a responsive bureaucracy, lack of fiscal resources, lack of facilities, lack of role preparation and development, and lack of management engagement through active communication with ELs. ELs are required to do more with much less support. If these barriers are systematically reduced, Indonesian ELs will have feelings of increased salience as leaders and therefore will be able to perform their roles effectively in response to rapid contextual changes.

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What does it take to be 4.0 EFL learners?

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ABSTRACT: In Industry 4.0, the use of technology in second and foreign language learning and acquisition is predominant. This study closely examined how successful EFL learners use the technologies available in Industry 4.0 to enhance their English proficiency, whether through conscious or subconscious efforts. One-to-one, semistructured interviews were employed to collect data from four non-native English speakers (all Indonesian) aged 15 to 18 years old with upper intermediate level of English. It was found out that the respondents make the most of digital devices and internet technologies to improve their English proficiency by (1) using digital devices and accessing Internet content that is mostly in the English language, and (2) developing personal interests such as playing online games involving multiple players from various countries, watching foreign movies with English subtitles, and participating in international fandom communities. This finding suggests that technologies available in Industry 4.0 provide numerous opportunities for respondents to use English in authentic environments.

1 INTRODUCTION

Industry 4.0, a term first introduced by the German government to define the ongoing industrial revolution (Kagermann et al. 2013), is bringing about changes in industry. The changes eventually touch almost every aspect in society with advancements in artificial intelligence (AI), big data, the Internet of Things (IoT), and other modern technological developments. Of many technological advancements, access to the Internet and its benefits for societal development are most noticeable. Currently, almost half of the world is regularly connected to the Internet (Schwab 2017). The proliferation of wireless networking technology and the transformation of digital media, which is a core component of Industry 4.0, has changed how people live and communicate with each other (Schwab 2017). Technological advancements along with changes in society offer ample opportunities for second and foreign language learning and acquisition.

The use of technology to teach and learn second and foreign languages goes back to the 1960s when CALL (computer-assisted language learning) was first introduced. In its early days, CALL emphasized computer programs providing instructions on language learning that leaned heavily toward the behavioristic approach. The field has progressed and evolved since then (Levy & Stockwell 2006; Garrett 2009). In terms of pedagogical theories of language, CALL has moved from using a behavioristic to a communicative approach in the late 1970s, and when the Internet first became available to the public, CALL based itself on the principles of an integrative approach (Warschauer & Kern 2000).

With the emerging Internet technologies and digital device advancement, the computer is not the only device that can be used as a medium for language learning. Learners could use smartphones, tablets, and e-book readers to enhance their second and foreign language skills. This has led to some criticism of CALL, as it focuses mainly on the computer. Other acronyms were then proposed, i.e., TELL (technology-enhanced language learning), NBLL (network-based language learning), and MALL (mobile-assisted language learning) (Warschauer & Kern 2000; Bush & Terry 2007; Kukulska-Hulme & Shield 2008).

The early stage of Industry 4.0 also saw the development of Web 2.0. This second generation of Internet enables people to interact through social networking sites (SNS) such as Facebook,

Twitter, and Instagram, collaborate through microblogging tools such as wikis, participate in three-dimensional (3-D) online games involving multiple players, or share their literary works online (web fiction). Now communication across distance, time, cultures, and languages has become ubiquitous. Indeed, the Internet now provides a wide array of visual, aural, and written language inputs, most of which are in English. Along with the Internet, computers in all their forms (desktop computers, laptops, smartphones, tablets, iPads, etc.) are used as “a major source of comprehensible input,” and can be used not only for conscious language learning but also for language acquisition (Jarvis & Krashen 2014).

In response to this development, Jarvis and Achilleos (2013) proposed MALU (mobile-assisted language use), the concept through which nonnative speakers of certain languages flexibly use various mobile gadgets to access or share information and to interact with other people using the learned language for academic or social purposes. This concept covers both conscious language learning assisted by technology and language acquisition through second and foreign language use when learners access technology.

Considerable research has been dedicated to investigating the use of technology in second and foreign language learning. Most focus on the investigation of conscious language learning in a formal context: technology-mediated writing classroom (Riley & ZareEkbatani 2014), YouTube videos as a pre-teaching strategy (Seilstad 2012), technology roles in the English as a foreign language (EFL) classroom (Haswani 2015; Gonzalez-Vera 2016), and podcasts in the EFL classroom (Abdous et al. 2009). Only a few have been devoted to examining the benefits of using technologies to subconsciously learn second and foreign languages in a more casual setting. Among those few are the studies on the practices and perceptions of English learners (non-native English speakers) in their use of digital devices to enhance their English (Jarvis & Achilleos 2013; Jarvis & Krashen 2014). Both studies focus on adult learners, as the research participants are university students.

This study attempted to examine how successful EFL teenage learners, within the Indonesian context, use technology to enhance their English proficiency, whether through conscious or subconscious efforts. The research questions are: (1) What kinds of language exposure do the learners receive through technologies available in Industry 4.0? (2) What attitudes do the learners possess to successfully improve their English in the Industry 4.0 era?

2 METHOD

This is qualitative research. The data were obtained through one-to-one, semistructured interviews. A set of guiding questions and prompts in open-ended forms were used in the interviews. This type of interview suits our needs, as it allows “interesting development” and lets respondents elaborate more on certain issues (Dörnyei 2007). Four non-native English speakers (all Indonesian) voluntarily participated in this study: Andi, Lara, Denis, and Ana (all are pseudonyms). All of them were high school students aged 15 to 18 years old with an upper intermediate level of English, confirmed by their PBT TOEFL scores (more than 500). They never lived in an English-speaking country, do not take English courses, have parents who speak very little English or none at all, and have accessed Web 2.0 and smartphone technologies from a young age. The interviews were conducted in English in a relaxed manner and took approximately an hour for each respondent. The interviews focused on finding information on the students’ practices in using technologies that benefit their English proficiency.

3 RESULTS AND DISCUSSION

The results of the semistructured interviews suggest that there is a significant link between the respondents’ language competence and the use of technologies available in Industry 4.0. The respondents’ access to the technologies is considered beneficial to their language learning and competence.

3.1 Use of technology

Table 1 shows that all respondents have digital devices that they access extensively every day. They also claimed that they work more with their smartphones instead of laptops because of their practicality. They can also connect to the Internet most of the day, ranging from 5 to 15 hours a day, which means that they are exposed to Internet content for more than half a day. They used the Internet for academic purposes such as doing homework, looking for information to complete their assignments, reading comics/e-books/webtoons, exploring personal interests, getting entertainment (through watching TV series/anime/cartoons, playing online games/video games), and accessing their SNS (Facebook, Twitter, Instagram). The respondents stated that the availability of digital devices and Internet access are essential in their life and support their language competence.

<i>Interviewer</i>	: <i>Are computers and other digital devices essential in your life?</i>
<i>Andi</i>	: <i>I'll say yes. It's important because first thing first I can use it to do my homework but other people use it to play games or some other stuff. You can do your homework by yourself. You don't need to go to warnet (internet café). When you have your laptop it's easy for you to do your homework, to make a report.</i>
<i>Lara</i>	: <i>Yes, definitely. I use my gadget to help me do my homework, work on my arts, and to communicate with my friends</i>
<i>Denis</i>	: <i>Yes. I use them for lots of things. Essentially it's a part of me.</i>
<i>Ana</i>	: <i>It is, mostly because I'm already used to it. Not only for entertainment purposes, but also as a learning media to fill up my curiosity.</i>

All respondents are considered digital natives. They have had digital devices and the Internet available from a young age. Their lives revolve around computers, smartphones, video games, and other digital media and gadgets. Therefore, this new generation of learners thinks and processes information fundamentally differently from the previous generations (Prensky 2001). The respondents stated that they are used to receiving information quickly, not only in written forms but also in aural and visual ones. They often obtain various types of information and learning sources to help them do their homework and make a report. This characteristic of digital natives changes how they learn. The respondents prefer to take learning into their own hands with the help of digital devices and Internet technologies.

Table 1. Ownership of digital devices and access to the Internet.

	Andi	Lara	Denis	Ana
Ownership of digital devices	Laptop, smartphone, tablet, iPad	Laptop, smartphone	Laptop, smartphone	Laptop, smartphone
Frequency of using the digital devices	Always	5 hours a day	Always	8 hours a day
Internet access	Available	Available	Available	Available
Frequency of accessing the Internet	0 hours a day	5 hours a day	12–15 hours a day	8 hours a day
Aim of usage	Academic purposes, reading comics, entertainment	Academic purposes, reading e-books, comics/webtoons SNS	Personal interest, SNS, entertainment	Reading e-books, comics/webtoons, entertainment

3.2 Use of English in accessing technologies

The English language is the most preferred language for accessing and operating the technologies.

Interviewer	:	<i>Which language do you use when using digital devices?</i>
Andi	:	<i>Most of the time I use English but sometimes I use Indonesian.</i>
Lara	:	<i>Mainly English and some Indonesian.</i>
Denis	:	<i>I prefer English when operating my gadgets, but I use Indonesian now and then.</i>
Ana	:	<i>Only English, it is easier that way.</i>

The reason why they prefer to use English when operating gadgets is that they are more familiar with the English version of the technical terms used in their devices. For them, it is confusing when the language preferences in their gadgets are changed to Indonesian. The heavy use of digital devices means that the respondents received substantial exposure to the English language. This has made them prefer to use English as the operating language on their devices. The respondents also prefer to look for information from English sources. For example, Lara said, “When you want to look up for detailed information on something, you usually find it written in English, you know.” Other respondents also expressed similar views on this matter. They said that most of the content on the Internet is in English. This finding shows that digital devices and the Internet encourage substantial use of English.

Another respondent, Denis, said “Yeah, at first, I struggled to understand what I’m reading. But, I forced myself to keep reading because the information I need is available only in English. And now, it’s getting easier for me to understand them.” Denis’ case suggests that getting accustomed to English texts might help to improve his ability to comprehend English texts. This might be an indication that he subconsciously learns the language by accessing information available on the Internet. In other words, the process fits the definition of language acquisition instead of language learning. According to Krashen (2002), language acquisition refers to the process in which students master the language focusing on the function rather than form through their involvement in a meaningful exposure to the target language.

3.3 Personal interests provided by the Internet

Each respondent has certain personal interests that require the assistance of digital devices and the Internet. Three types of personal interests beneficial to respondents’ English proficiency were identified in this study: online games, movies, and fan communities.

Through the interview, it is reported that respondents thought their English improved through video games since they play with gamers from other countries requiring them to speak English while playing the game.

Denis	:	<i>I used to play Minecraft and I played it often.</i>
Interviewer	:	<i>In what language is the game?</i>
Denis	:	<i>The game is in English of course. And other players mostly come from other countries so I interact with them using English.</i>

Minecraft is a globally renowned video game that requires its players to collect resources to creatively build or craft houses, machines, or whatever they like. This game can be played alone but it also allows multiple players to collaborate on a single virtual world. This collaboration provides many opportunities for interaction. Players coming from countries across the globe are connected to each other and they use English to communicate. The players

communicate to discuss strategies to successfully complete tasks requiring teamwork. However, they also interact with each other to express encouragement, offer compliments, or they just shout out to express their frustration. Minecraft provides an authentic environment to use English for its players.

Minecraft is an engaging game that makes the players strive to continuously develop their skills. It is not uncommon that players learn English for the sake of improving their gaming skills. Denis said, “I read books essential to Minecraft players, watch lots of tutorial videos to improve my gaming skills.” The guidebooks and videos are available mostly in the English language. This situation forces Denis to get accustomed to reading in and listening to English.

Movies have also been known as effective media to enhance language proficiency. Two respondents, Andi and Ana, developed a special interest in movies. When they watch movies, TV series, anime, and cartoons, they claimed that the movies are in English, Indonesian, or Japanese. However, whenever watching foreign movies, Andi and Ana preferred using English subtitles.

Interviewer	: <i>When you watch movies/TV series/animes in a foreign language, do you need subtitles? In what language are the subtitles?</i>
Andi	: <i>Yes, I do. For animes, they use Japanese of course but I watch them with English subtitles. But for other kinds I use English of course. English is easy to be understood.</i>
Ana	: <i>Yes so I could understand the context more clearly. Preferably English.</i>

Another personal interest that is considered beneficial to English proficiency is fan communities, often called fandom. A fandom is a community where fans of someone (usually a celebrity) or something (movies, anime, comics, books) gather in a forum either physically or online. The respondent who joined such community is Lara. Lara is a fan of anime (Japanese animation) and manga (Japanese comics) and stated, “I join international and local manga and anime communities.” Members of the community freely talk about their favorite manga and anime. Lara said that “even in my local manga community whose members are all Indonesian, we use English to talk to each other all the time.” She even developed herself from a manga fan into a manga artist. She draws her favorite manga characters or even creates a totally new character and shares her work with her communities. Along with her drawings, she provides descriptions and sometimes a short story about the characters she drew. Lara is only one example of how a digital native uses English (a foreign language) to compose texts and posts them publicly. The fellow members will then give feedback on Lara’s arts or sometimes they address the language (grammatical errors) in a supportive manner.

These personal interests show that technologies in Industry 4.0 make it possible for learners to communicate in an authentic borderless environment and even to pass the limit by creating an environment supporting their language competence. When learners play video/online games, for instance, they indirectly communicate with people from around the world, which requires them to use English as a lingua franca. This allows students to get authentic input of language spoken by both native speakers and non-native speakers of English. This also perhaps presents them with vocabulary that may be new and challenging for them. This can be regarded as a comprehensible input that becomes a significant indicator for improving learners’ competence in language acquisition.

Comprehensible input is considered as meaningful input that is a little bit harder than the acquirers’ current language competence. This input is essential to get learners’ attention and curiosity in learning the language and to keep them motivated to learn the language. The era of Industry 4.0 creates no borders for people to communicate around the world and provides a real use of language. In addition, when the access to authentic comprehensible input is limited or unavailable, the era enables learners to create an environment that resembles the real one as a platform to improve their language competence. For instance, Lara stated that she spent her time interacting with mostly Indonesian people, but she made use of English to

communicate. This proves that it is possible to create a language acquisition environment promoting language competence in a non-native environment where students can communicate confidently, share information and knowledge, and at the same time improve each other's language ability.

Language acquisition is proven to have a significant effect on enhancing students' language proficiency level. This is confirmed by the results of the TOEFL test obtained by the respondents, ranging from 537 to 567. According to the American Council on the Teaching of Foreign Language (ACTFL), those scores belong to the upper intermediate category. This category is under the umbrella of the advanced proficiency benchmark of ACTFL (Mastermind Europe 2018). This category is characterized by speakers' ability to easily and confidently communicate about daily routines, social conditions, and topics they are familiar with (ACTFL Proficiency Guidelines 2012).

The existence of digital technologies in Industry 4.0 enables learners to not have to depend on what they learn in the classroom. Since classroom learning can be limited, the technologies in Industry 4.0 foster students' language acquisition process by providing learners more chances to learn and practice the language through an informal setting. Krashen (2009) suggests the potential of the outside environment to boost learner's acquisition. He points out that the outside world enables learners to surpass their ability up to the intermediate level. The informal environment can provide learners with more comprehensible input and more unlimited exposure to real language use. Later, the technologies also accommodate learners' preferences to study individually. Learners have different study preferences. Some prefer studying in groups, while others do not. For the latter, studying through Industry 4.0 technologies gives them space to learn confidently based on their own learning pace. Eventually, this will also build learners' autonomy to look for information for the sake of their language learning progress. The respondents in this study also belong to those who prefer studying individually in an informal setting.

Interviewer	:	<i>Do you prefer learning English in a formal setting (school) or through the Internet?</i>
Lara	:	<i>I prefer learning through Internet. They don't teach slangs at school.</i>

Overall, respondents believe that the language acquisition process through Industry 4.0 plays an important role for them. The access to digital devices and other technologies (e.g., online/video games, YouTube, movies, dramas, TV series, cartoons, news, e-books, articles, journals, and social media) help them improve their English.

Another interesting finding in this study is that the learners' proficiency improved as a result of their interaction with the technologies requiring them to speak English, not with particular technology design for English language learning. All of the respondents have never accessed any sites or platforms specifically designed for English language learning. They just practice their English through digital devices and technologies (YouTube, video games, social media, etc.) that require them to speak in English. The respondents have also reported that they never attended an English course. This reveals that outside the English subject at school, they acquire English indirectly and subconsciously. Thus, the process that actually occurs is not language learning but language acquisition where people learn the language subconsciously.

From the preceding results, the answers to the research questions formulated before were obtained. First, the exposure of learners to technologies available in Industry 4.0 is especially through the ownership of the digital devices together with the applications and features they offer. In other words, digital devices, such as laptops and smartphones and their applications and features (e.g., Internet, onlinevideo games, YouTube, movies, dramas, TV series, cartoons, news, e-books, articles, journals, WhatsApp, and social media) contribute to significant progress in learners' language proficiency. From those media, learners learn new vocabulary, pronunciation, and confidence.

Second, the attitudes that the respondents adopt regarding exposure to technology to successfully improve their English in the Industry 4.0 era, according to the interviews, are being smart and wise toward the available technologies. Learners need to be smart and take the initiative in using technology to support their learning. As suggested by Krashen (2009), classroom learning is limited and learning in an informal context helps learners advance their language learning process. Learners should be aware of the limitation of classroom learning and develop their initiatives so as not to depend on learning a language from classroom interaction only. They should indeed be active in using technologies promoting language acquisition. By doing so, learners can have space to become exposed to the real use of language and to study at their own pace. Thus, learning autonomy will develop. However, learners' initiatives to learn English from the technologies do not necessarily stop them from attending the classroom. As Ana said, "earning English from the Internet is fun and all but teachers still helps me a lot." It has been known that the acquisition process focuses more on the message rather than the form. Therefore, the accuracy of what learners acquire still needs to be confirmed and that is the role of classroom learning. The learning process is where learners can clarify what they learn from the technologies and reach the expected accuracy.

Aside from being smart and taking initiatives, learners should also have a wise attitude toward technologies. Despite the positive effects that learners may gain from digital devices and technologies, the misuses and negative effects of technology also present threats of learners' dependence on technology. If learners do not know how to use technology wisely, it is possible for them to get exposed to the negative sides of technologies instead of learning from them.

4 CONCLUSION

The emerging Industry 4.0 has intrigued researchers and practitioners in recent years to study which attitudes EFL learners need to adopt in this 4.0 era. The respondents in this study were purposively sampled because their English was quite good as a result of their intense interaction with digital devices and technologies. The results of the study reveal that the technologies available in Industry 4.0 exposed learners to authentic input for language acquisition through digital devices together with the applications and features they provide. Those exposures were considered capable of increasing learners' listening, speaking, reading, and writing skills. Finally, to be EFL learners in the Industry 4.0 era requires learners to take the initiative, as well as be smart and wise regarding the technologies.

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Knowledge transfer at the border region in the era of Industrial Revolution 4.0

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ABSTRACT: According to Presidential Regulation No. 131 of 2015 (Presiden Republik Indonesia, 2015) concerning the Establishment of Underdeveloped Regions in 2015-2019, Bengkulu Regency is one of the underdeveloped districts that needs improvement and attention in various aspects of life, especially in terms of education as formulated by BPS (Central Bureau of Statistics) Bengkulu in 2018. Basic education is the basis of learning for students to continue their education, especially nowadays in the era of industrial revolution 4.0. This study was conducted at elementary school level in order to examine the impact of the process of knowledge transfer in the school in the industrial revolution 4.0 era and aims to find the factors that become obstacles of the knowledge transfer in the school. This study used a qualitative method with in-depth interviews and observations at X elementary school in Bengkulu as one of the underdeveloped districts. The results of this study show that the knowledge transfer process at X elementary school, which is located in a disadvantaged region, is indeed behind and does not reflect the achievement process towards education 4.0 that is promoted by the Indonesian government. One of the factors is elementary school teachers' lack of capability to transfer tacit knowledge to the students, as well as the lack of explicit knowledge, infrastructure, and methods of learning.

1 INTRODUCTION

Indonesia has thousands of islands that are subdivided into several regions and provinces. Because of the vast area in Indonesia and population distribution, the Indonesian Government has a decentralized system in various aspects such as finance, regional development, education and so forth. According to the Presidential Regulation (Presiden Republik Indonesia 2015), the uneven distribution of the development across the country affects the education, finance, and others, ultimately causing other aspects such as the spirituality, education, intellectuality to lag behind.

This study aims to describe the actual state of education in Bengkulu Regency in the era of industrial revolution 4.0. There is still a very large gap between the government data and the reality. According to the Ministerial Decree Number 79 of 2019 concerning the Establishment of the Recovered Underdeveloped Regions, Bengkulu Regency is one of the disadvantaged regencies which have shown great improvements. However, in reality, in terms of education, the quality of education is still relatively low even though at present some schools have been equipped with several facilities. The improvement of education quality requires quite a long time because the process of transfer of knowledge occurs from generation to generation with minimal knowledge. The essence of the problem lies in the lack of tacit knowledge possessed by the teacher, which creates an endless circle.

It has been disclosed by the Ministry of Home Affairs in November 2018 (Kabupaten Bengkayang 2018) that the trend of budget allocation of education outside of regional budget (pure State Budget) of Bengkayang Regency was 11.84%, but according to Ministry of Home Affairs in October 2018, the allocation of government aid funds (State Budget) is as follows: 0.73 M for PAUD-DIKMAS (early childhood education – community education); 0.00 M for elementary school; 8.84 M for junior high school; 0.45 M for GTK, and 0.00 M for cultural programs with a total budget of 10.2 M. According to the PDSPK verification data in November 2018, there were 3,072 PAUD students; 35,969 elementary school students; 13,800 middle school students; and 7,614 high school students. According to PDSPK data on November 2018, there were 88 students who dropped out of elementary school, 155 students from middle school, and 97 from high school. Moreover, as many as 1,638 students repeated elementary school, 83 repeated middle school, and 40 repeated high school. According to PDSPK data in November 2018, there were 291 severely damaged facilities in elementary school, 67 in junior high school, and 7 in high school.

Based on this fact, it can be concluded that the budget of the issued funds is not suitable for educational needs. This is supported by The World Annual Report 2009: Year in Review (World Bank 2009) on how the quality of education does not match the amount of funds issued. Budget fund for elementary schools is 0 billion, which is troublesome as elementary schools requires a lot of budget to develop their quality. Elementary school is a very important educational foundation, and requires greater attention than other levels of education. This becomes an issue in Bengkayang Regency as one of the underdeveloped areas.

According to Presidential Regulation No. 131 of 2015 (Indonesia 2015, Presiden Republik Indonesia 2015) concerning the Establishment of Underdeveloped Regions Year 2015-2019, Bengkayang is included in the list due to the region's low economy level of the people, human resources, facilities and infrastructure, financial state, accessibility and other regional characteristics (Presiden Republik Indonesia 2015). Central Bureau of Statistics Bengkayang (Kabupaten Bengkayang 2018) states that the education of Bengkayang residents is classified as very low. Among the population with elementary school as their highest education level, 28.17% are unmarried, 68.59% are married, while 3.24% are divorced, while among those with junior high education, 33.74% are unmarried, 64.70% are married, and 1.56% are divorced. The Central Bureau of Statistics also states that the quality of human resources is categorized based on their education level. The number of people with elementary school education or less is higher than that with junior high school education or less. This contributes to the limited understanding of the meaning of marriage among the people in the region. Ultimately, this results in the high percentage of marriage among young people and the higher divorce rate for those with elementary school education and below. This means that the quality of marriage is strongly influenced by a person's education level. The higher the education level of an area, the younger the age of marriage is. Nevertheless, the parameters used in this data are elementary and junior high school level. In conclusion, the highest education of the majority of the population is at the junior high level (Kabupaten Bengkayang 2018).

The level of education also affects one's well-being in terms of work, health and so on. According to the Bengkayang Central Bureau of Statistics in 2018 (Kabupaten Bengkayang 2018), the average percentage of population aged 7-24 years in Bengkayang Regency based on their education is as follows: 0.95% did not attend school, 35.17% were still in elementary school, 13.52% were still in junior high school, 16.93% were still in high school/university, 33.43% dropped out of school. Based on this data, it can be stated that the population's awareness of the importance of education can be analyzed from the percentage of education from junior high school.

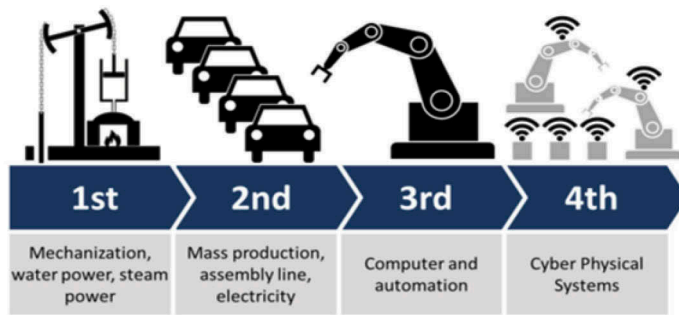


Figure 2. Industrial revolution 4.0.

Source: <https://medium.com/@pdiwan/is-education-4-0-An-imperative-for-success-of-4th-industrial-revolution-50C31451E8A4>.

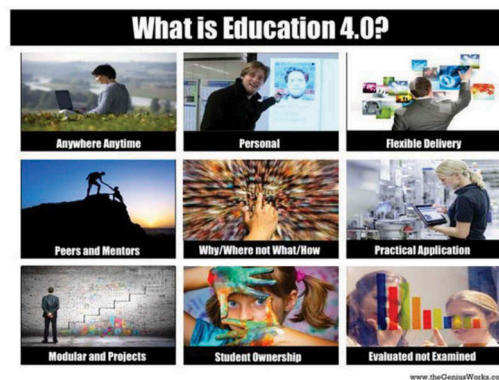


Figure 3. What is education 4.0? (Source:www.theGeniusWorks.com).

Education 4.0 is an education in the industrial revolution 4.0 era with several characteristics including flexibility (learning process can be done in a flexible place and time depending on the availability of the students), personalized learning (learning can be done through the learning tools in accordance with the capabilities of students without the limitation of time), flexible delivery, the emphasis on why/where instead of what/how (students will become more active in finding out about something new via the internet rather than just asking for answers from teachers), mentoring (students will get more extensive information from mentoring through information available on the Internet through the learning tools provided and the blended learning approach which combines e-learning and face-to face interaction (Vasantan 2016; Vasantan et al. 2016)), practical application (learning practice using learning applications to help students increasingly understand the use of applications), student ownership (student involvement will be more intensive in implementing a up to date curriculum without being tied to time and place), modules and projects (students can learn to complete a project assigned to them by applying their knowledge and ability), evaluation instead of examination (the level of student's ability will be evaluated with a various coaching and education rather than being tested or assessed to allow student development to progress more integrally as students get better guidance and solutions from the teacher), and the inclusion of government policy on education in the Industrial Revolution 4.0.

The Indonesian government is currently promoting strategic steps set out by the Making Indonesia 4.0 roadmap. This is the embodiment of the vision which plans to make Indonesia

one of the top 10 countries with the strongest economy in the world by 2030 (Satya 2018). Improving human resources is one of the priorities in implementing the Indonesia 4.0 making program. Therefore, Indonesia reforms the educational curriculum that emphasizes on STEAM (Science, Technology, Engineering, the Arts and Mathematics) by aligning the needs of the industry in the future (Hartarto 2018).

3 KNOWLEDGE TRANSFER

Knowledge can be divided into two, namely tacit and explicit. Tacit knowledge is knowledge contained in the human mind that comes from the learning process, experience, while explicit knowledge is knowledge that exists in books, mass media, multimedia, videos and others. The process of knowledge transfer can be divided into three, namely tacit to tacit, tacit to explicit, explicit to tacit. The process of tacit to tacit knowledge is a process of transferring tacit knowledge from someone to another person through sharing, discussion, teaching, and speaking. Tacit to explicit process is a process of transferring someone's tacit knowledge through written forms (books, articles, newspapers, letters, Facebook, etc.), pictures (videos, photos), sound recordings.

Knowledge transfer is a process that always exists in human life both in the family, education, business, and so forth. Knowledge transfer in the world of education requires an appropriate learning strategy so that the knowledge to be conveyed to students can be delivered optimally. The teacher's knowledge acquired from previous education determines the quality of the knowledge given to the students. The success of this knowledge transfer is also influenced by the learning methods used and existing local wisdom. This learning process can use several different methods based on the students' cognitive abilities, personalities, and motivations (Lakatos and Borsos, no date).

The knowledge transfer method in the learning process (Lakatos and Borsos, n.d.)

1) Cultural dialogue

Cultural dialogue is one part of the learning process which focuses on ethics and aesthetic values. Dialogue in the classroom can increase students' cultural knowledge so that teachers can understand how to transfer knowledge to students who are motivated by their culture.

Dialog is a conversation between two or more people to create an exchange of thoughts among each other. Through this dialogue, the teacher and students can get to know each other. In the world of education, dialogue can enhance the knowledge of the teachers and be the basis for choosing the learning methods.

2) e-Learning

e-Learning is a learning method that uses internet applications such as web-based learning, virtual classroom, or digital collaboration. The form of e-Learning can vary, ranging from media containing text, images, animation, or audio. The term also refers to the learning method for training, learning or any educational program with IT.

3) Distance learning

Distance learning is a learning method with distance communication using material that can be provided via email or video conferencing.

4) Teamwork

Team teaching is one good method to do as the difference of knowledge among the team members can complement each other. As a result, the knowledge gained by the students may be better than the individual teacher. In teamwork, members can act as coordinators, initiators, executors, creative people, options explorer, etc. In addition to team teaching, teamwork consisting of students is one of the processes of knowledge transfer that is effective and efficient as various knowledge possessed by each member can increase individual knowledge in the group.

5) Multimedia

Multimedia can provide quite a lot of information such as pictures, sounds and movies that can provide better information through technology. In the world of education, multimedia can be implemented through several approaches such as online training, distance learning (TV-teaching) and other products.

4 RESEARCH METHODOLOGY

This study employed the qualitative research method involving observation and in-depth interviews and phenomenology in an elementary school located in Bengkayang area with research participants of Grade 4-6 elementary school students aged 11-14 years. In-depth observations and interviews were conducted with several parents of students, teachers, students, alumni, and the principal. In addition, observations were conducted on various aspects of the school such as the facilities, learning methods, attendance of teacher and student attendance, and so forth. After the observation on the method of learning was done, the drill method (Kumalasari et al. 2016) with various exercises with student-oriented approach was applied to the students and the results were evaluated.

In this study, field observations were conducted first to observe the situation of the students' learning processes. Following that, English and Mathematics teaching was conducted to observe the students' learning abilities and learning patterns. In addition, in-depth interviews were conducted with alumni, the principal, teachers and parents of students about the education so far. This interview lasted for 8 months with an intensive approach.

Interviews were conducted with alumni and parents about the condition of the existence and discipline of teachers during school hours, the process of transfer of knowledge, as well as the application of local wisdom and culture. Meanwhile, the questions addressed to the principal included details on the quality of the teacher, the transfer process of existing knowledge, and existing school facilities.

5 RESULT AND DISCUSSION



Figure 4. Village X, Bengkayang Regency, West Borneo.

Based on the results of observation and the characteristics of education 4.0, the education pattern that is currently being applied to state elementary school SDN X is described in Table 1.

Table 1. Education parameters at SDN X.

No	Education Parameters 4.0	SDN X	Description
1	Flexibility	None	The learning process relies heavily on teachers. No teacher means no class.
2	Personalized Learning	None	Teacher-oriented
3	Flexible Delivery	None	The learning process requires the presence of teachers.
4	Why/Where instead of What/How	What/How	The learning process requires the presence of teachers.
5	Practical Application	None	Manual teaching learning process, without computerization
6	Modules and Projects	None	Manual teaching learning process, without computerization
7	Student Ownership	None	Manual teaching learning process, without computerization
8	Evaluation instead of Examination	Examine	Absence of evaluation of the learning process by students

The table describes that elementary education in this country is behind in terms of both quality and quantity of education, as well as in terms of the teachers and students, and the facilities of knowledge transfer, e.g. limited access to the Internet, computers, etc. Education in this underdeveloped village in its daily life relies on the presence of teachers and the provision of material from teachers. The student-teacher absolute dependence is visible from the students' lack of independence in learning. There is a tendency for students to expect that teacher will provide the information or knowledge they need without having to find their own solutions. The quality of teachers does not directly affect basic education.



Figure 5. Learning mathematics with the drill method.

This teacher-oriented drill method turns out to have a large impact on the quality of the knowledge transfer process. Table 1 illustrates the knowledge transfer methods applied to the elementary school. The knowledge transfer method used by Lakatos (Vasantan, 2016) that specifically recognizes cultural dialogue, local wisdom, teamwork and multimedia is then practiced in this study. This method really helps to improve the process of transferring knowledge that is appropriate to the culture and local customs, as well as identify the teaching and learning process that is interesting to elementary students, while simultaneously in line with the notions of Industrial Revolution 4.0 and education 4.0.

Table 2. Research results.

The knowledge transfer method used	Findings	Consequence	Action	Impact
Cultural dialogue (local wisdom)	New Year's celebration of rice harvest	Some students are absent from school.	Drill learning method with a lot of practice Student-oriented in order to motivate students to learn Instilling awareness of the importance of education	Student motivation in learning increases, allowing the knowledge transfer to perform better.
	The majority of residents are farmers (waiting for harvest usually 2 times a year) and the class is teacher-oriented.	Students are passive because they are very dependent on the teacher. Students are accustomed to remain passive and lacking the motivation to learn.		
	Communal life	Students are more receptive to other learning methods such as discussion.		
	The lack of understanding the importance of education	Some students prefer to work than be at school. Parents give school full responsibility for education. Some students drop out of school.		
Teamwork	The discussion goes smoothly and is very much alive.	Students prefer discussion.	2-way discussion	Increased learning motivation
Multimedia	Rarely watching a movie	Students are very enthusiastic.	Learn while watching videos of English songs	Increased learning motivation

6 CONCLUSION

Education in the Industrial Revolution 4.0 era is a breakthrough aspect that serves as a target to be achieved by Indonesia. On the other hand, education in Indonesia is still not evenly distributed. The quality of education in disadvantaged areas lags behind in various aspects including the spiritual, information, and other aspects, which eventually affects the transfer of knowledge to students significantly. Through learning through video and student-oriented approach, learning transfer is more easily achieved in accordance with the target.

The method of knowledge transfer in the elementary school needs to be reviewed with several application methods that are adapted to the capabilities and qualifications of the workforce and fund of the school. In regard to the knowledge transfer method, the teaching and learning process needs to be based on local wisdom to foster student motivation.

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Creativity and literacy development in the Islamic elementary school

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ABSTRACT: Creativity and literacy are two essential features in the digital age. This study aimed to determine the development of creativity and literacy in the integrated Islamic elementary school. Research results indicate that Islamic schools have many programs to build their students' creativity and literacy, both in the learning process and extracurricular activities. Teachers provide opportunities for students to express their ideas to develop their creativity. Habituation is chosen to cultivate students' literacy skill. The learning process in this school focuses on the ability to produce creative thinking, accommodating the students' needs and interests based on literacy development, and also directing the reading and writing process through four applied languages: Indonesian, Javanese, English, and Arabic.

1 INTRODUCTION

Education builds abilities and skills for students' lives. The digital era provides a variety of learning resources for students. Information can be obtained anywhere, but the process still returns to the user. Computers can process information accurately by programs that have been implemented, but they could not create innovation outside the programs.

The shift of human involvement in information processing by technology is inevitable. Nevertheless, there are still human abilities that cannot be imitated or replaced by machines and technology. Being a creative person becomes the most relevant contribution to address various emerging problems. Creativity is expected to be a useful solution for solving problems, as Sanjaya (2013) states that knowledge is considered accurate when it is useful for dealing with and solving problems or phenomena that arise.

Our world is changing. Problems emerge in a wide range of areas such as the environmental crisis, economy, population, food, human rights, and others. We cannot avoid problems. Every day humans confront so many various issues and need innovations to deal with them. Creativity enables humans to find combinations and possibilities to find solutions for the various problems. Creativity reduces human anxiety in completing a task. New ideas provide motivation to solve problems. Oyama et al. (2018) mention the Hemingway effect, that motivation to complete a task that previously failed to be completed would be higher the closer the person perceives he or she was to finishing that task. Greater motivation encourages people to overcome a problem. Moreover, this skill is highly recommended to bring new strategies to overcome new issues. When a machine is stuck in solving last year's problems, humans can modify and create new ideas applicable to the newest situation by using this skill: creativity.

If creativity is related to how humans are trained to process information, then there is another fundamental skill that is needed. Before processing the data, we first need the ability to obtain the data. The more information we obtain, the more innovative the idea will be. The seed of creativity is grown by collecting the right information. To gather the information, literacy is the most important competence. Literacy as a whole can be interpreted as the ability to

access, understand, and use something intelligently through various activities, including reading, seeing, listening, writing, and speaking (Faizah et al. 2016).

A previous study showed that students relied much more on copying and paraphrasing content (Killi et al. 2020) and that that students' literacy level is low. They could not combine information and just repeated the sentences. This situation is also occurs in Indonesia. Students show low ability in literacy and creativity. Looking at Indonesia's literacy ability index, in which it is ranked 64th out of 72 countries (Ministry of Education 2016), the government has launched a program known as the literacy movement. This movement targets various layers in many environments. Schools, as formal educational institutions, receive special attention. Through the school literacy movement, the Indonesian Ministry of Education hopes to increase students' literacy ability.

Fun schools shape children's creativity. Davies (2013) mentions that some situations may encourage children's creativity: flexible use of space and time, availability of appropriate materials, working outside the classroom, "playfulness", respectfulness between teachers and learners, opportunities for peer collaboration, partnerships with outside agencies, awareness of learners' needs, and nonprescriptive planning.

Today, Islamic schools are popular in Indonesia. They promise the balancing of knowledge and religious learning for their students. In addition to religious values, Islamic elementary schools must provide life skills such as literacy and creativity. This is very important to ensure adequate quality of learning to support students' lives in the future. Elementary schools should not miss providing skills needed in the future.

To observe the development of creativity and literacy, we conducted a study on the development of creativity and literacy in the Islamic elementary school.

2 METHOD

The study was conducted at an Islamic elementary school in Pacitan. The data were collected for one semester in the 2019/2020 school year. The research subjects were the principal, teachers, students, and library staff. The object of the research is the development of creativity and literacy. Data were collected using documentation, observation, and interviews to support observational data (Bungin 2010).

Semistructured interviews with all the research subjects were conducted.. The questions were arranged according to the research objectives and developed in the field according to the particular needs. In addition to interviews, data collection was performed by conducting observations. Observations were made to see the activities in the school. Activities observed were of two kinds, namely when learning took place and other activities outside of learning. Observation guide sheets were arranged to facilitate observations when collecting the data.

Data retrieval was also conducted by searching for documentation. Supporting documents can be in the form of achievement records, schedules, activity reports, activity proposals, and so forth. All data were then matched to determine their validity. If the data collected were not synchronous, then data retrieval was carried out. There are four very important stages that are interrelated in a research: data collection, data reduction, data presentation, and drawing conclusions or verification (Sugiyono 2018). The data that had been collected were analyzed and presented descriptively.

3 FINDINGS AND DISCUSSION

Table 1 provides data obtained from this research regarding the development of students' creativity and literacy in an Islamic elementary school.

All of the items in Table 1 have been implemented. All programs are run under the school library instruction.

Table 1. Literacy program.

No.	Activities	Executor
1	Wall magazine	School library
2	Book review	School library
3	Providing books	School library
4	Fifteen minutes reading in one day	Classroom teacher
5	One book for one child	School library
6	Reading challenge and reward	School library
7	Literacy competition	School library
8	Expression class	Extracurricular teacher
9	30 Minutes of reading (Arabic)	Classroom teacher

Table 2. Learning process in the classroom.

No.	Activities	Observed	
		Yes	No
1	Providing chances to ask questions	√	
2	Providing chances to share ideas	√	
3	Encouraging students to explore learning materials	√	
4	Recalling memories	√	
5	Not allowing students to discuss		√
6	Intimidating		√
7	Appreciating	√	
8	Telling stories	√	

Extracurricular activities are held by professionals on Friday and Saturday and consist of swimming, expression, martial arts, anchoring, soccer, volleyball, painting, mathematics and science, family skills, English club, scout, and quark. Four languages are offered in the school: Indonesian, Arabic, Javanese, and English. All of them are given in oral and in written form.

The results of the study are further explained separately in terms of the development of creativity and student literacy.

3.1 Creativity

The development of student creativity is carried out holistically both inside and outside the classroom. Creativity is developed both in terms of creative thinking skills and creating a product. Students practice their creative thinking skills while the learning process is taking place. In fostering these skills, the atmosphere and classroom management are well designed.

Classrooms are designed to form the letter “U” facing the whiteboard and the teacher’s desk in groups. This seating arrangement makes it easy for students to discuss and mobilize themselves. The learning process is designed to foster a variety of higher order thinking skills, including creative thinking skills, by using a student-centered learning approach, and the cooperative method seems to be more dominantly used.

The use of the cooperative method is one of the best ways to develop active and effective learning (Silberman 2007). This method allows students to develop their potential to the fullest by focusing on group and individual development. Slavin (2005) states that cooperative learning has a significant effect on student learning if groups are valued based on the individual learning of each member.

The teacher gives individual and group awards as a facilitator in the learning process. On each occasion, the teacher patiently provides opportunities for students to express their

opinions or ask questions. The teacher has a personal relationship with all students and always shows a positive attitude toward learning. Allman et al. (2010) state that a positive attitude is a powerful tool that can increase enthusiasm and self-esteem and create an atmosphere conducive to learning. In all learning sessions, the teacher links the material to the students' daily lives.

Contextual learning provides understanding following the conditions experienced by students. Nurlaela (2015) explains that developing creative thinking skills is divided into four pillars, known as the scientific approach components. The teacher uses these four basic building blocks of creative thinking skills, namely, associating, asking, observing, and trying. Associating is the skill of connecting several perspectives from a variety of different disciplines to form creative ideas. Asking questions is an activity that raises a series of questions that are formulated to get new ideas. Observing is defined as the ability to make observations and identify opportunities to develop innovation, while trying is students' activity of doing repeated experiments for something they want to know until they find an answer to their question.

The researcher observes a high tolerance for differences of opinion during the learning process. Motivation is given to students who could not reach the learning objectives, as Maltase et al. (2018) mentions that failure can be used for learning and training for perseverance. Learning is carried out by giving the broadest possible thinking space for students. Yusuf (2013) states that in order to develop children's reasoning and creativity, children need to be given opportunities to ask questions about, argue, or assess (give criticism) various aspects related to learning or events that occur in their environment. Different learning methods can be applied to develop creativity (Bezanilla et al. 2019). Therefore, giving students freedom and comfort to study is an important aspect.

Through the use of learning media, the teacher inspires students' curiosity. This curiosity arises in the form of questions and guesses that the students present to the teacher and their classmates. High curiosity is the hallmark of creative thinkers, and they need to retrieve information from many different sources (Adair 2008).

In the middle of the learning process, students are allowed to show some ice-breaking for refreshments. Maintaining brain fitness through some activities is very important to get creative ideas and smart thoughts in understanding or solving problems (Sudarma 2013). Various other developments correspond to the talents and interests of students outside the classroom.

Outside the classroom, the teacher develops creativity through various elective extracurricular programs. There are 12 types of extras offered to students: swimming, expression, martial arts, archery, football, volleyball, painting, mathematics and natural sciences, home skills, English club, scouting, and quark. Students are directed to pursue activities that interest them. Extracurricular activities are guided directly by experts and practitioners in their respective fields. This program is given to foster students' creativity in various fields according to their interests and talents.

It is observable through the indicators of student creativity in various fields and from the many achievements in the field of creativity. Throughout 2018, there were 37 achievements recorded in various fields, including writing, coloring, singing, swimming, drawing, memorize Qur'an, and others.

3.2 Literacy

In the literacy movement guidebook published by the Ministry of Education, there are at least six types of literacy. In this Islamic school, the development of literacy skills focuses on reading and writing. Development is chosen based on the level of urgency. Without fluency in reading and writing, learning is not correctly applied. Literacy reading is essential, as mentioned by Sutejo (2009) that the tradition of reading and writing is the essential means of carrying out the learning process.

Of the ten qualities set at school, two points indicate attention to the development of literacy skills at school, namely, point 5, that is, fond of reading and point 9, on reading the Qur'an. Literacy in the reading area was developed, covering Indonesian not only as the

official language of education. Four kinds of languages become the focus of attention of schools, namely: Javanese, Indonesian, English, and Arabic.

Based on the school literacy movement guidebook issued by the Ministry of Education, there are five targets for achieving school literacy (Faizah 2016). From the observation, research indicated that they found all participants are fun and friendly. All school members show empathy, care, and respect for others; foster a spirit of curiosity and love of knowledge; enable citizens to be able to communicate and contribute to the social environment; and accommodate school community participation and external environment.

Opportunities to develop student literacy skills are accessible at the school library. By reading for 27 weeks and on interventions, students' capacity in literacy is proven to increase (Mesa et al. 2020). The school has designed and implemented eight types of program focal points regarding literacy, which are bulletin boards, book reviews, book reading, fifteen minutes of reading in one-day program, one book for one child, reading challenges and reading awards, visiting the regional library, and holding competitions. Literacy includes reading, storytelling, and poetry.

Some competitions provide opportunities for class representatives to deal with other classes. Teachers sometimes send students with low literacy skills to represent their class. This action is carried out in the hope that it can foster student motivation and enthusiasm to be more active and love literacy activities. This strategy is proven to increase the confidence, motivation, and enthusiasm of students who have low literacy abilities.

Coordination between class teachers and library staff is well established so that the programs planned can be well implemented. Through coaching classrooms by teachers, students' need for reading awareness can be significantly built. Reading corner is a facility that is available because of students' awareness of getting used to reading books. Then, the students take turns in reading their books with their peers. Student confidence grows with encouragement and trust given by the teacher. Treating all school members with respect becomes an integral part of shaping literacy abilities in schools (Routman 2012).

Reading habits are formed not only at school. At home, students are encouraged to practice reading. Students who have completed the story will have to present it in class. Some students are asked to take turns in telling stories in front of the class before the learning begins. The teacher and students show appreciation of the story that is delivered from the students' reading results. The students' literacy ability is observable from the smoothness of the presented stories, as Kern (2000) argues that literacy is not only about knowledge of vocabulary and grammar, but also about textual organizational knowledge beyond sentence level, genre knowledge, as well as an oral and written language. By reading those books, children will also get character-building value (Ardhyantama 2017).

With limited space, the school library provides a variety of reading resources that are popular among students. The library functionaries then take the initiative to schedule a visit for the students in a week. This limitation makes the students impatient to wait for the day of their visit.

Based on the explanation, it is seen that literacy development in the Islamic elementary school follows the basic principles of developing the Ministry of Education's literacy movement. The five basic principles that apply are that literacy education is holistic, integrated, sustainable, contextual, and responsive to local wisdom (Saryono et al. 2017).

4 CONCLUSIONS

The research results on the development of creativity and literacy in the Islamic elementary school found that students' creativity is developed during the learning process and extracurricular activities. Two types of creativity are developed, namely creative thinking and carrying out creative activities or making creative products. Creativity development based on the students' talents and interests is accommodated in extracurricular activities guided directly by experts in their fields.

The seriousness of the school in developing students' literacy skills is observable from the compiled quality assurance. The library department manages the development of student literacy skills in schools. This department then coordinates with related parties. The focus of literacy developed is limited to literacy reading and writing in four languages: Indonesian, Arabic, Javanese, and English.

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Ethnomathematics learning with Sundanese culture for elementary school students

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ABSTRACT: Mathematics learning has not been able to connect the ideas of mathematics with culture. Ethnomathematics learning is introduced to fill in this gap, as it connects cultural and mathematical concepts through mathematics as a cultural product. This study aimed to discover students' responses by integrating a Sundanese game named *endog-endogan* in their mathematics learning. By involving 82 teachers and 273 primary school students, this study employed a qualitative descriptive method using classroom observation and interview. The results revealed that the students showed positive responses in which they were able to play together with other students. In addition, the 163 students felt excited about playing the game, 49 students were enthusiastic about learning mathematics, 49 students argued that learning mathematics was easy, and 12 students reduced misconceptions in subtraction operation. To conclude, mathematical abstractions could be reduced and promote Indonesian cultural products in the development of mathematical learning innovations.

1 INTRODUCTION

Nowadays, mathematics learning is still considered less optimal in terms of connecting the concepts of mathematics with culture. Teachers and the community commonly claim that mathematics and culture are not connected (Rosa & Orey 2011). This results in a conflict between students' culture in everyday life with mathematics (Prediger 2004). Meanwhile, connecting mathematics with culture can advance a country's education (Uloko&Imoko 2007). A new development in education depends on the ability to recover autochthonous practices of traditional cultures (D'Ambrosio 1995). Culture-based mathematics education can be integrated into the ethnomathematics concept. The term "ethnomathematics" is used to communicate the connection between culture and mathematics. The expression requires an active interpretation because it describes concepts that are themselves neither rigid nor singular – namely, ethno and mathematics (D'Ambrosio 2001).

Ethnomathematics learning has been conducted by Knijnik (2002) to introduce the Brazilian culture named "cubage of wood." Similarly, Mosimege's (2012) study implemented ethnomathematics learning with culture in Africa, while Kaahwa (2011) implemented it with the culture of Ugandan society. Indonesian culture is also well known by the world; hence, this study elaborates an Indonesian culture by modifying a Sundanese culture game in mathematics learning. It is expected that cultural acceptance becomes more contemporary and flexible to be understood by everyone. Sundanese is the second largest culture in Indonesia, which has a population of 46 million and several traditional dances, songs, instruments, sports, games, and traditional ceremonies (Abdullah 2017). The identity that unites Sundanese is its language and culture. One of the elements of Sundanese culture to be conveyed in this study is a children's game named *endog-endogan* because it can be drawn with concepts and freely and easily played by elementary school students in the class.

2 METHODS

This study employed a qualitative descriptive method that described the students' responses. This study involved 82 teachers, with each teacher guiding one to nine students totaling 273 primary school students. The students learned mathematics via ethnomathematics learning through the *endog-endogan* game. The study was initiated by setting up student participation in the *endog-endogan* game, after which the author conducted observation and interviews about their responses to ethnomathematics learning. The learning material was related to the arithmetic operations (subtraction), which was illustrated through a game by stacking each player's clenched fists as if they were eggs, and breaking them as if they cracked eggs while singing the *endog-endogan* game song (Figure 1). The teacher then asked the students regarding the concept of reduction as discovered through *endog-endogan* game. The results then were processed using a qualitative descriptive method, where the data collection was based on the students' responses.

3 RESULTS AND DISCUSSION

3.1 *Endog-endogan* game

The *endog-endogan* game is a traditional Sundanese game. It is easy to play because it uses only one hand as the media for the game. Hence, this game is very flexible and can be played anywhere and anytime. One of the benefits to be learned from this game is that the students must cooperate with each other to build up to a peak, and if they fall, they must always encourage each other to bounce back again.

The steps of learning mathematics in a subtraction operation are as follows:

- Preparing questions in advance for the child,
- Writing the questions on the board, say $6 - 2 = \dots$
- Preparing three children by clenching their hands as if they are eggs
- Singing modified *endog-endogan*'s songs:



Figure 1. *Endog-endogan* game with the subtraction concept.
Source: Researcher's Personal Photo

Endog-endogan endog genep peupeus dua, prek
 (Six eggs crack two, Prek[sounds])
 (The students think counting the rest)
Endog-endogan nu teu peupeu saya opat
 (There are four eggs that do not crack)
Goleang-goleang, mata sapi bolotot
 (Stir fry, cow eyes goggle)

Table 1 shows that, based on the student responses toward the *endog-endogan*’s game, 163 students were happy, 49 students were enthusiastic in learning mathematics, 49 students claimed that learning mathematics was easy, and 12 students reduced their misconceptions in subtraction operation. The concept of the subtraction operation in learning of Sundanese ethnomathematics through the *endog-endogan* game could be easily learned by the students because it was more contextual and directly interpreted by the studentsbecause of the interaction between students’ understanding and visualization. In the abstract stage, in the number 8, while the students were stacking their eight fists, the technique of breaking their fists in learning the subtraction operation could be applied when four fists were broken; then they could count the number of fists, which was four. Even lower grade primary school students would be able to see the answers directly so that when teachers used the abstract stage, it could be easily understood. Johnson (2006) affirms that this contextual learning is learning that prioritizes the connection activity between the material being studied and the actual situation (context) given, so that the learning of mathematics using the *endog-endogan* game was more meaningful for the students, especially the lower grade primary school students. The *endog-endogan* game would be constructed by the students into the concept of subtraction, and the mathematics could be constructed from a developing culture; hence, it could result in a mathematical product that had a cultural essence.

Table 1. Summary of the students’ responses to the *endog-endogan* game.

No	Number of students	Students’ responses	Analysis
1	163	One student was happy (T58), three students were carefree and happy and thus they were motivated (T1), two students were happy (T4), two students were excited and understood the <i>endog-endogan</i> game (T8), three students were excited with the <i>endog-endogan</i> game (T9), three students were happy (T10, T44, T51, T59), two students were happy (T11, T45, T47, T54, T55, T56, T65, T66, T67, T68, T69, T70, T71, T72, T73, T75, T76, T77, T78, T79, T80, T81, T82), four students were happy (T41, T42, T43, T50, T52, T53, T16, T17, T18, T26, T28,T30, T31,T32, T34,T35, T36, T37,T38, T40), five students were happy (62), nine students were happy (63).	60% of students werehappy because this game madeit easy to understand the subtraction problem and it can be applied to students’ daily lives.
2	49	Three students were enthusiastic in playing this <i>endog-endogan</i> game, and they were excited because they could play while learning (T2).Five students were very enthusiastic in playing game, and	18% of students wereenthusiastic about learning mathematics with this game because students gainednew knowledge in learning subtractions that wereeasily

(Continued)

Table 1. (Continued)

No	Number of students	Students' responses	Analysis
		they were happy to acquire new knowledge. Because basically math is not always related to a problem with numbers (T3), three students were more enthusiastic about the concept of arithmetic with <i>endog-endogan</i> games compared to common arithmetical operations (T6), seven students were enthusiastic in this <i>endog-endogan</i> game (T49), five students were enthusiastic (T14), three students were enthusiastic because they could play while learning (T17,T61), four students were enthusiastic (T19,T20,T48), eight students were enthusiastic and happy (T46).	resolved through a game of hands that are shaped like eggs.
3	49	Two students claimed that learning mathematics was easy (T5,T61), three students claimed that mathematics was easy through the <i>endog-endogan</i> 's game (T7, T58), nine students claimed that learning mathematics was easy and fun (T15,T33), two students claimed that learning mathematics was easy and happy (T45), seven students claimed that learning mathematics was easy and happy (T57,T60), five students claimed that learning mathematics was easy (T64).	18% of students easily solved subtraction problems because the answers could be observed directly by students and mathematics became less abstract.
4	12	Three students did not experience misconceptions in the subtraction operation (T22, T23,T24,T25).	4% of students did not experience concept errors because, with this game, mathematical concepts became more concrete and were directly related to the concept of numbers and games made by students.

This result was in line with Rios (2000), who stated that mathematics is defined as a cultural construction that produces cultural development. The mathematical abilities in learning the subtraction operation could be improved; thus the students could make some subtraction activities by implementing the techniques through cultural and mathematical concepts, such as the *endog-endogan*'s game activity so that the abstract nature of mathematical learning would diminish with the learning of ethnomathematics (Achor et al. 2009). Horizontal and vertical mathematical analysis (Gravemeijer et al. 2000) of this game is shown in Table 2.

Culture-based learning mathematics also made the primary school students embrace mathematical concepts easily because of regional language factors that help students understand. This is consistent with the findings of Hopp et al. (2019) that students who are bilingual would easily understand the lesson.

Table 2. The horizontal and vertical mathematical analysis of *endog-endogan* game.

Horizontal activity	Vertical activity	Picture
<i>Endog-endogan endog genep peupeus dua, prek</i> (Six eggs crack two, Prek) (The students think counting the rest) <i>Endog-endogan nu teu peupeus aya opat</i> (There are four eggs that do not crack) <i>Goleang-goleang, matasapibolotot</i> (Stir fry, cow eyes)	$6 - 2 = \dots$ $6 - 2 = 4$	

Source: Researcher's Personal Photo

4 CONCLUSION

Mathematics learning should be flexible in accepting change, including with crossover of science with culture. Sundanese ethnomathematics learning with the *endog-endogan*'s game is one of the innovations that can be used to improve students' understanding of the concept of the subtraction operation. Contextual mathematics enables students to learn mathematics easily and comprehend concepts better. One of the benefits of this learning is that the students are able to play together with other students so that an interaction in learning mathematics can be carried out. Moreover, the students' mathematical abilities can also be improved, and Indonesian culture can be promoted and preserved from annihilation, especially Sundanese culture.

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The effects of smartphones on social skills in Industry 4.0

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ABSTRACT: This research was motivated by the low social skills of the second-grade students in a private elementary school in Jatisampurna, Bekasi, Indonesia. Their low social skills were observed from the way they associated with their peers. Many children did not want to engage in group activities, as they preferred to do individual activities. This research aimed to determine the effects of the extent of smartphone use on social skills. The variables used in this study were the extent of the use of smartphones (X1) and social skills (X2). This study employed a quantitative approach with survey methods and path analysis techniques. It was conducted in grade 2 of a private elementary school in Jatisampurna, Bekasi from March to June 2019. The target population of this study was second-grade students in Jatisampurna Village who used smartphones, with a total of 50 pupils participating in the research. The sampling technique used was cluster random sampling. The results show that the degree of smartphone use had a direct positive effect on social skills.

1 INTRODUCTION

Education 4.0 is a general term used by educational theorists to describe various ways of integrating cyber technology, whether physical or not, into the world of learning. This is very influential in the field of early childhood education. Early childhood is a critical period for developing children's personality, an important aspect that will also influence their adulthood in the future. During this period, they begin to develop their basic abilities such as sensing and thinking. In addition, they also experience growth in their moral standards and form an identity at the same time. Thus, it can be said that the attitudes, habits, and behaviors formed during the early years of one's life will greatly determine how far that person is able to adapt later in their adulthood. This is a critical and sensitive period that will determine a person's attitudes, values, and behavior patterns in the future. The materialization of one's critical potentials, tendencies, and sensitivity, therefore, depends on whether or not they obtain the right stimulus.

One important ability that must be developed from an early age is in the area of social skills because they will determine whether or not one will be accepted in the social environment. These skills are used primarily in interacting with the social environment in social activities that benefit both individuals and communities. The social environment here is defined as one that can include the family, school, and community. However, if a child has poor social skills, he or she will tend to be an antisocial individual who does not care about his or her social life.

Based on a preliminary survey that we conducted at one elementary school in Jati Village, it was found that the social skill development of children in grade 2 at the school is still low. This can be seen from the way they interacted with their peers, with many of them not wanting to get involved in group activities. They preferred to do individualized activities. Another observed phenomenon was their low level of compassion toward their friends. When a child

fell during play time, other children only laughed at that child, with only one child having the initiative to help.

Many approaches can be used to help these children develop their social skills properly, one of which is by creating social interactions through games, communication, and activities in groups. Early childhood is a play period for children, in which they should spend their time doing fun activities and learning with their peers both at school and in the neighborhood. In reality, however, playing together is no longer the main activity for these children. When children get a new game, they will give all their attentions to the new game and start to ignore their friends. They can spend long hours playing with their new toy, forgetting the tasks they have to go through.

2 METHOD

This study used a quantitative approach, with a survey method and path analysis technique. The study was conducted from March to June 2019, and the target population was 50 grade 2 students in a private elementary school in Jatisampurna, Bekasi.

3 RESULTS AND DISCUSSION

Smartphone use in Indonesia has been increasing sharply. According to a Pew Research Center survey, Indonesia ranks number 6 among developing countries in the number of smartphone users, with the figure for young users (18–34 years) increasing from 39 to 66% between 2015 and 2018. Meanwhile, the percentage of smartphone users over 50 years of age also rose from 2% in 2015 to 13% in 2018. In other words, the results of the survey show that the Indonesian population was one of the main consumers of smartphones. Smartphones are used not only by adults, but also by children. It is not uncommon to see young children busy playing with their smartphones, sometimes for hours. In addition, children very often live in a world of their own when using their smartphones, especially in big cities like Jakarta. Young children, both from middle and upper classes, are all very addicted to their smartphones, playing with them all the time. Some parents also give smartphones as a reward for their children's achievement.

Social skills are needed not only by adults but also in early childhood to help them succeed in their social lives. According to Rogers and Ross (2007), a social skill in early childhood is the “ability to assess what is happening in a social situation; skills to perceive and correctly interpret the actions and needs of the children in the group at play; ability to imagine possible courses of action and select the most appropriate one.”

Meanwhile, Combs (1994) focuses more on the benefits of these skills in interactions with the social environment in social activities that provide benefits for the individuals and others. Unlike the two previous opinions, Markel (2009) emphasizes social skills in verbal and non-verbal attitudes. Social skills as verbal and nonverbal attitudes are used by children to get responses from people in their environment such as peers, teachers, parents, and relatives. Through this interaction, children learn to mingle with their environment and to solve problems so that they will get recognition from the people in their environment.

Bellack (2010) describes social skills as how children express their feelings in a social context as stated in the following quote: “Social skills are the ability to express both positive and negative feelings in the interpersonal context without suffering consequent less of social reinforcement. Social skills are demonstrated in a large variety of contexts and it invites the coordinated delivery of appropriate verbal and nonverbal responses. In addition, the socially skilled individual is tuned to the reality of the situation and is aware when he is likely to be strengthened for his effort.”

From some of the preceding definitions, it can be concluded that social skills in early childhood are skills possessed by children used for interacting and communicating, both verbally and nonverbally, with their environments including family, school and community so that

they get social experience that is beneficial to themselves and other people as well as develop themselves into individuals who have life skills. Goleman (2010) states that success in life is strongly influenced by emotional intelligence (80%) and intellectual intelligence (20%). Emotional intelligence is not a static intelligence inherited from parents, but it can develop through learning. The best time to maximize the development of emotional intelligence is at an early age so that children will be accustomed to controlling their emotional condition when they grow older.

Smartphones are available in many models and a variety of standard operating systems. Most of them now support Internet access, email, and other features that are not possessed by ordinary cellphones. In line with this, Juanto (2005) states that smartphones function like a computer that supports activities such as searching data, sending instant messages, playing songs, and playing video games. Zheng and Ni (2006) add that smartphones as a new class of mobile devices have many facilities that make it easier for the users to communicate and that have specifications like a computer. Meanwhile, Himmelsbach (2011) views smartphones in terms of their flexibility as a portable communication device integrated in a mobile phone that has an all-in-one function. Smartphones also undergo continuous development.

From the various foregoing definitions, it can be concluded that smartphones are portable communication devices with a function similar to that of a computer and an operating system. These devices support the needs of the users and continue to develop their features. According to Zaki (2009), smartphones have facilities similar to those of a computer that supports Internet access and other useful applications for users. Rittinghouse & Ransome (2010) add that smartphones are portable telephone devices categorized as a modern version of a computer, which is small and portable.

The results were obtained after analyzing the models used as the basis for answering the hypotheses and drawing conclusions of this research. The intensity of using the smartphones gives a direct positive effect on social skills.

H0: $\beta_{31} < 0$

H1: $\beta_{31} > 0$

H0 is rejected, if $t > t$ table.

From the results of the calculation of the path analysis of the direct effect of the intensity of the use of the smartphones on social skills, the value of the path coefficient was 0.464, where the value of the t -coefficient was 3.627. The coefficient value of the table for $\alpha = 0.01$ was 2.40. Because the value of the t -coefficient is greater than the value of the table, H0 is rejected and H1 is accepted, meaning that the hypothesis that the intense use of a smartphone has a direct effect on social skills is acceptable. The results of the hypothesis analysis show that the extent of using a smartphone has a direct positive effect on social skills. Thus, it can be concluded that social skills are directly affected (positively) by the extent of the use of smartphones. An increasing extent of smartphone use will result in an increase in social skills.

4 CONCLUSIONS

Based on the results of the study, it can be concluded that there is a positive direct effect of the extent of smartphone use on children's social skills in grade 2 of a private primary school in Jatisampurna, East Jakarta. The direct effect of the effect of the use of smartphones on social skills is evidenced from the value of the path coefficient, which reached 0.464 with the value of the t -coefficient of 3.627. The coefficient value of the table for $\alpha = 0.01$ was 2.40.

5 IMPLICATIONS

Based on the foregoing findings, the implications of the results of this study are that we need some efforts to improve the social skills of grade 2 students through the extent of smartphone

6 SUGGESTIONS

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Analysis of non-academic skills of *Pancasila* and civic education teachers in the era of Industrial Revolution 4.0

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ABSTRACT: To face the challenges of moral degradation in the era of Industrial Revolution 4.0 requires not only academic skills of an educator, but also nonacademic skills. Nonacademic skills of an educator are very important in the efforts to minimize the moral degradation of students in Industrial Revolution 4.0. The purpose of this research is to deeply examine the nonacademic skills required by a *Pancasila* and civic education teacher in the era of Industrial Revolution 4.0 both theoretically and practically. This research used qualitative methods consisting of observation, interview, documentation, and literature review as the data collection techniques. The literature review was done on articles published in 15 national and international indexed journals (Sinta 1–Sinta 4). The data were grouped and analyzed. The use of different data collection techniques in this study aimed to obtain valid data through data triangulation. The results of the research are presented in descriptive forms. The results show that the nonacademic skills of *Pancasila* and civic education teachers in the era of Industrial Revolution 4.0 are very important to instill to minimize moral degradation among students. The skills include flexibility, sociability, leadership, innovation, and productivity.

1 INTRODUCTION

Industrial Revolution 4.0 requires educators who are able to adjust their academic and nonacademic skills. In this era, the educators' mastery of academic and non-academic skills is obviously equally important. Based on *The Partnership for 21st Century Skills*, there are three skill components that must be mastered by an educator: learning skills, literacy or academic skills, and life or nonacademic skills (Widodo 2015; Setiyawan 2017). In the nonacademic skills (life skills), there are five skills that must be mastered by *Pancasila* and civic education teachers: flexibility, initiative, sociability, productivity, and leadership in order to minimize moral degradation among students.

Pancasila and civic education teachers are educators whose duties and responsibilities correspond to their profession, that is, to educate and develop the students to be democratic, aware of their rights and obligations as citizens, and able to compete (Fadilah 2018). *Pancasila* and civic education are school subjects to develop and preserve the Indonesian culture-based noble and moral values. For that reason, *Pancasila* and civic education teachers must behave both inside and outside the classroom in a way that reflects the characteristics of a *Pancasila* and civic education teacher (Aron, 2016; Sudrajat 2017).

There have been many studies related to the academic skills of *Pancasila* and civic education teachers such as classroom management, questionin, lesson planning, and some other academic skills (e.g., Richardo 2016; Rizal 2016). But, in terms of nonacademic skills (life skills), there is still not much discussion yet. Meanwhile, Curriculum 2013 emphasizes more the affective domain (attitude) rather than the cognitive and psychomotor domains to minimize moral degradation. This emphasis is in line with the opinion proposed by Lickona (1992) that education must build good character the components of which include moral knowing, moral feelings, and moral action (Lickona 1992). This is necessary to make the students understand, feel, and implement moral values.

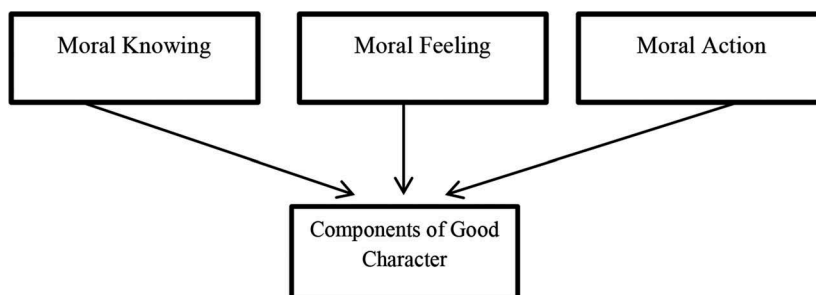


Figure 1. Components of good character.

This article focuses on non-academics (life skills) required by *Pancasila* and civic education teachers. It is expected that this article could provide a deep analysis of the life skills required by *Pancasila* and civic education teachers both theoretically and practically. The results of this study are expected to become one of the resources in responding to the need for improving *Pancasila* and civic education teaching and learning processes in today's Industrial Revolution 4.0 era.

2 RESEARCH METHOD

This research used a qualitative method by observing and interviewing *Pancasila* and civic education teachers concerning their general nonacademic skills in several schools. This study also analyzed documents (students' theses on nonacademic skills of *Pancasila* and civic education teachers). It was enriched by a literature review with a structural approach as the supporting data (Maftuhah 2012). The main sources of data in this research are the results of observation, interview, and a collection of 15 relevant journals indexed nationally and internationally. After that, library research was conducted (Irham 2016) in which all subjects in the data were analyzed using a systemic analysis model (Niagara 2012). Various types of information and related data were put in the inventory and then analyzed using three methods: induction, deduction, and comparison (Maftuhah 2012).

3 RESULTS AND DISCUSSION

3.1 *The skills of teachers in the era of Industrial Revolution 4.0*

To minimize the negative impacts of Industrial Revolution 4.0, teachers must be able to adjust their skills. In the learning process, teachers not only teach but also play a role in facilitating students to acquire Industrial Revolution 4.0 skills. For that reason, a teacher must possess personal, social, pedagogical, and professional competences (Komara 2018; Nurdiansyah & El 2018).

In Industrial Revolution 4.0, a teacher must have both academic and nonacademic skills. The role of *Pancasila* and civic education teachers is not only to transfer knowledge about how to be good citizens to the students, but also to motivate them. They also have to instill good attitudes and good character. Moreover, *Pancasila* and civic education teachers should serve as roles model for their students (Arlisa 2011; Nurjanah 2016).

3.2 *The skills of Pancasila and civic education teachers in Industrial Revolution 4.0*

3.2.1 *General skills*

The skills that must be possessed by a *Pancasila* and civic education teachers in the 21st century are not only academic skills but also nonacademic ones (Table 1). This is in line with Sobry's

Table 1. General teacher roles.

No.	General teacher roles
1	The teacher as an educator is in charge of giving instructions.
2	The teacher as a guide is obliged to provide assistance to the students so that the students are capable of finding their own problems, solving their own problems, knowing themselves, and adjusting to their environment (inside and outside of school).
3	As a leader, the teacher is obliged to supervise the student learning activities, make lesson plans, and manage the classroom.
4	The teacher as a scientist is seen as the most knowledgeable person.
5	The teacher as a liaison serves as the bridge to connect two circles; on the one hand he or she delivers knowledge, technology, and culture to the students and on the other he or she accommodates the aspirations, problems, needs, interests, and demands of the community.
6	The teacher plays the role of a reformer through the activities of delivering science and technology.
7	The teacher as a developer uses every available opportunity to help community developments, such as family planning activities, community guidance, cooperatives, and road construction.
8	The teacher as a person is loved by the students, parents, and community.

Source: Ministry of Education and Culture (2017).

(2007) opinion stating that, to create successful learning, a teacher must carry out several roles, namely as a model, a planner, leader, guide, and assessor of the student's learning progress.

3.2.2 Nonacademic skills of *Pancasila* and civic education teacher

Nonacademic skills of *Pancasila* and civic education teachers are the skills essential to build the students' positive perceptions and attitudes toward civics subjects in accordance with ideas, regulations, and psychological-pedagogical characteristics, and that will maximize the five character values established by the national education of Indonesia. In terms of nonacademic skills (life skills) of *Pancasila* and civic education teachers, Mader and Mader distinguish between a person's skills in dealing with others (interpersonal skills) and the skills in managing themselves (intrapersonal skills) as follows.

3.2.2.1 INTERPERSONAL SKILLS

- Flexibility. Flexibility means an ability to adapt to the social environment. Professional *Pancasila* and civic education teachers, according to the Ministry of National Education (2005), not only train, teach, educate, guide, direct, and evaluate students but also become a model for their students. In this case, an educator is required to adapt to the demands of an educational model in accordance with the needs of Industrial Revolution 4.0. The demands of the educational model will be realized only if there are paradigmatic changes and patterns of action in various contexts of the implementation of the education and learning process (Dwintari 2017). Therefore, *Pancasila* and civic education teachers must be able to adapt themselves to the current educational climate both within the school environment and outside the school. They are figures who are flexible to what is happening in the surrounding environment.
- Social skills. Good social skills are very important in a successful life. The skills enable individuals to interact effectively with others; work effectively in a team with diverse members; be open-minded; and use social and cultural differences to produce ideas, innovations, and better work quality (Efnitawarni 2016).
- Nonacademic skills. Nonacademic skills of *Pancasila* and civic education teachers in this social context are the ability to adapt appropriately to the demands in this era of knowledge (National Research Council 2012). The opportunities to develop emotional resilience and empathy must be explicitly designed (Leadbeater 2008). Steedly et al. (2008) also state the belief that children generally obtain positive social skills through daily interactions with their peers and adults, but in this case they must be monitored directly by parents and teachers. The social competencies that must be possessed by a *Pancasila* and civic education teacher are shown in Table 2.

Table 2. Social competencies of an educator.

No	Social Competences
1	Ability to appreciate social diversity
2	Ability to express opinions clearly, coherently, and efficiently
3	Ability to respect others' opinions
4	Ability to create a conducive environment
5	Ability to encourage community/individual's participation

Source: Curriculum 2013.

3.2.2.2 INTRAPERSONAL SKILLS

An educator is a leader for the students. Soemantri (2001) states that “*Pancasila* and Civic Education teachers must show a number of efforts in order to make their students acquire good characters, develop intelligence, and be helpful.” From this statement, it is clear that *Pancasila* and civic education class emphasizes the cultivation of the character of students (Kamidi 2016).

As a leader, according to Branson (2005), the teacher must include the three components of civic education: civic knowledge, civic skills, and civic disposition. This implies that there are several personality competencies that must be possessed by a *Pancasila* and civic education teacher as follows:

- Empathy
- Positive thinking
- Critical thinking
- Genuine (authenticity)
- Goal oriented
- Problem-solving ability

3.2.2.3 INITIATIVE AND PRODUCTIVITY SKILLS

Problem-solving skills are a life skill of individuals in using their thinking process to solve problems through gathering facts, analyzing information, compiling various alternative solutions, and choosing the most effective solution for the problem (Kartika 2016).

Problem-solving skills place more emphasis on the cognitive aspects. This is in accordance with Gagne’s opinion (Yamin 2010, p. 5) stating that “Cognitive strategy is one’s internal ability to think, solve problems, and make decisions.” Hence, it can be said that *Pancasila* and civic education teachers are required to have good cognitive skills so that they can take initiatives in gathering facts, analyzing information, and compiling various alternative solutions, creative and innovative. A person’s life skills develop continuously.

4 CONCLUSION

A professional *Pancasila* and civic education teacher must not only be smart in terms of academics but must also have nonacademic skills. This is needed in the education in Industrial Revolution 4.0 to produce competent students who able to compete globally in order to minimize moral degradation. Nonacademic skills of a *Pancasila* and civic education teacher support the strengthening of the students’ character. A *Pancasila* and civic education teacher becomes a role model for the students in the context of nonacademic skills such as sociability, flexibility, leadership, innovation, and productivity.

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Improving teachers' entrepreneurship skills in the Industry 4.0 through online business workshops

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ABSTRACT: This study attempts to address the issue of whether online business workshops can improve entrepreneurship skills of teachers. The purpose of the study is to determine the implementation and impact of online business workshops for Entrepreneurship teachers in schools. A qualitative approach with a descriptive method has been used. The data collection techniques used were observation and interview. The implementation of the online business workshop for Entrepreneurship teachers was carried out in two stages consisting of the delivery of the material and the practical phase. The implementation of the online business workshop led to: (1) increased teachers' entrepreneurship spirit (2) increased understanding of online business. (3) improved skills of teachers in creating and using online business platforms as promotional media, and (4) improved quality of entrepreneurship learning in schools. The implication of the research is that teachers have acquired better entrepreneurship knowledge and skills which can be easily passed to students in their respective schools. The study concludes that online business workshops for the development of the teachers' entrepreneurship skills should continue to be implemented, since it promotes digital marketing and advertising.

1 INTRODUCTION

The era of the fourth industrial revolution also referred to as industry 4.0 is where the world focuses on interconnectivity, automation, machine learning, and real-time data management (EPICOR 2020). In other words, the world is digital. Digitalization has occurred in various fields, ranging from the economic, social, cultural, to the education sector. In the face of the fourth industrial revolution, there is increase in global competition, governments must be able to prepare quality human resources through education. The government must adapt the existing education curriculum to the current conditions.

This change to the new paradigm of education also referred to as Education 4.0 is among others conveyed by Fisk (2017) as cited by Hussin (2018) who says that:

The new vision of learning promotes learners to acquire not only skills and knowledge that are needed but also to identify the source to learn these skills and knowledge. Learning is built around them as to where and how to learn and track of their performance is done through data-based customization. Peers become very significant in their learning. They learn together and from each other, while the teachers assume the role of facilitators in their learning.

Education in Indonesia currently uses the 2013 curriculum which focuses on character building for students. One of the components is to create independence and readiness of students to be able to adapt to the world of work (Setiaji et al. 2018). But, based on data from the Central Statistics Agency (BPS), it shows that in February 2018 the Open Unemployment Rate (TPT) in Indonesia was 5.13 percent or 6.87 people. While from the view point of level of education, TPT in Vocational High Schools (SMK) occupies the highest level among other types of education at 8.92 percent (Statistic 2018).

The data above shows that high school graduates who are projected to the workforce do not actually join as expected. The large number of graduates with the number of available job

vacancies is very uneven, so it has an impact on increasing open unemployment of SMK graduates. The same is with high school (SMA) graduates, because not all high school graduates can continue their studies at tertiary institutions. To overcome this, there needs to be a paradigm shift in thinking for students to not only want to be workers but think to create jobs, one of them is by entrepreneurship. Therefore, entrepreneurship education really needs to be given to students during their learning in school. With entrepreneurship education, students can develop their skills to open their own businesses. Cultivating the entrepreneurial spirit in students changes their mind-set to develop entrepreneurial interest, thus it can reduce the high unemployment rate for SMK graduates.

Entrepreneurship education is inseparable from the role of a teacher as an educator. Teachers must be able to teach entrepreneurship both in the concept and practice. However, in reality the implementation of entrepreneurship education in schools has obstacles, like the unavailability of competent teachers in the field of entrepreneurship. Most of the teachers teach more theory than practical entrepreneurship. This is because teachers do not work or have a business so experience about the business world is still very minimal.

Increasing the competency of teachers' entrepreneurship skills is very important in order to improve the quality of entrepreneurship learning in the classroom. This will enable production students who are competent in the field of entrepreneurship. Understanding and knowledge of entrepreneurship education must be possessed by the teacher so that it can then be taught to students using experimental methods (Gustafsson-Pesonen & Remes 2012). In the entrepreneurial learning process, the use of experimental methods is very necessary, because to produce a product, students must experiment using various methods.

Entrepreneurship education can be defined as the process of professional application of knowledge, attitude, skills and competencies. It is more than teaching students how to become independent business owners. It is about creating and nurturing a learning environment that promotes entrepreneurial traits and behaviors, such as becoming creative and independent thinkers, risk takers, assuming responsibility, and valuing diversity (Gautam 2015).

Entrepreneurship can be interpreted as the ability to create something new and different through creative and innovative thinking in creating market opportunities (Suryana 2003). Entrepreneurship is not only for the unemployed; everyone can become an entrepreneur. In education, entrepreneurship is known as 'edupreneurship'. According to Drucker (1985) in Altan (2015) Entrepreneurs are people who use and respond quickly to opportunities that exist.

In the implementation of entrepreneurship learning, high school Entrepreneurship teachers in Cimahi City have been able to motivate students into entrepreneurship. Every school now has products produced by students who take Entrepreneurship a subject. However, obstacles occur at the marketing stage. Most teachers still teach their students to sell traditionally or interact directly with consumers. Teachers have not taught online marketing strategies because they do not fully understand online business.

Online business is an activity carried out online through internet media with the aim of earning income (Yasmin et al. 2015). Online business is mobile where in conducting business activities can be accessed anytime and from anywhere, buyers can order products or goods online using digital media with devices such as smartphones, laptops, notebooks, computers and so on (Izza 2015). These conditions indicate that there are problems for some entrepreneurial teachers in the learning process, such as not having knowledge, skills or experience in the field of entrepreneurship. While training and education for entrepreneurship teachers are also rarely done. As the results of Van Dam's research (2010) reported that there is still a lack of research conducted on teachers relating to entrepreneurship education in the school environment. Furthermore, Hannula et al. (Deveci & Seikkula-Leino 2018) stated that entrepreneurship education is still not generally given in the entrepreneurship teacher training.

Therefore, this paper will then review the implementation process and the results of online business workshops to improve entrepreneurial teacher competencies, especially to improve teachers' understanding and skills in doing business online.

2 RESEARCH METHOD

The study implemented qualitative approach with descriptive research methods. The subjects of this study were Cimahi City High School Entrepreneurship teachers totaling 25 teachers from 14 schools who took part in an online business workshop held at Cimahi High School 5. The data collection techniques used in this study were interview and observation methods. Observations were made to view and analyze the implementation of online business workshops. While interviews were conducted in depth to obtain data regarding the initial conditions of the teachers and data from the results of the implementation of the online business workshop. The data obtained from observation and interviews were analysed through three steps; (1) data reduction (2) data display, and (3) conclusion drawing.

3 DISCUSSION

In entrepreneurship learning in schools, teachers have an important role in fostering the entrepreneurial spirit of students, so teachers must understand the concept of entrepreneurship. As stated by Silva (2013), teachers must understand the meaning and concept of entrepreneurship and know how to practice it (Deveci & Seikkula-Leino 2018)

In the initial conditions, in general, the teacher was familiar with online business. Most of them only become consumers of the online shop. This workshop aims to make teachers no longer as consumers but as online business practitioners. Based on the interview results, there are some teachers who already have their own businesses, but the marketing is still done off-line. Furthermore, there are teachers who say they are still confused about marketing entrepreneurial products in their schools. As stated by YR as follows:

“Currently Cimahi High School 5 has superior products processed from mushroom ingredients. Each generation has a special product from processed mushrooms. However, to be honest, it is indeed difficult for us to direct students in marketing products that have been produced at school. So far, the products have only been sold and marketed around the school or left in the school canteen”.

Online business workshops are education and training to improve entrepreneurial teacher's understanding and skills in online business. Besides being useful for learning in the classroom, through this workshop it can also improve the skills of teachers in doing business online so that it can be a side job that can be a source of teacher income.

The workshop was divided into two stages, namely the provision of materials and practice. The first stage was the delivery of online business material with the aim of increasing the teachers' knowledge and understanding of online business. The method used at this stage was the lecture method, because at this stage it was generally delivering theoretical material. The material provided included:

- Urgency of online business: Provision of this material as an opening to provide insight to teachers about digital world issues and the opportunities of online business.
- The concept of online business: This material provided an understanding of online business and introduced social media and marketplaces that can be used for online businesses.
- Online business vs. traditional business: This material explains the difference between traditional business and online business which is seen from the limitations of space and time, marketing channels, target market, the level of collaboration, sustainability, and the rule of law.

After delivering the material, the question and answer method is used. This aimed at finding out materials that are not understood by the teachers. Based on observations and interviews, the teachers revealed that they still did not have the courage to carry on entrepreneurship because of limited capital.

The next step was practice, using the individual training and mentoring method. The teachers practice to create an online store, a place for marketing their products. In this

practical activity it is necessary to prepare mobile phones that are already connected to the internet. The included:

- Choosing an online business by type, it could be fashion, culinary, services like online learning, production, distribution, or making an online marketing channel. The teachers were assigned to choose one type of online business that suits their passion. It is intended that the business is run in accordance with the interests and preferences of each individual.
- Creating an online shop on Instagram social media. This practice began by installing the Instagram application on each teacher's mobile, then create a business account with an attractive name and in accordance with the product to be sold.
- The practice of making an online shop with WhatsApp business started with installing WhatsApp Business application, then creating a store account and an attractive and appropriate store profile.
- The practice of creating an online store on Market place. This is in Shopee app. The steps included installing the application, uploading product photos and creating captions and content.

The provision of such material is very important for the teacher's basic understanding of entrepreneurship. As mentioned by Adeyemo (2009) which revealed that teachers must learn basic entrepreneurship education concepts. This shows the importance of a teacher understanding the concepts of entrepreneurship before they teach it to the students.

During the implementation phase of this practice individual assistance was provided to each teacher. This serves to help teachers deal with difficulties and obstacles in following these steps such as bad internet connection and less supportive mobile conditions. From this practical activity several online shops were generated on Instagram social media, WhatsApp Business, and Shopee. At the end of the workshop, there were given some tips and tricks in running an online business. The activity aims to motivate participants to be brave and start an online business.

The approach used in this workshop uses the andragogy approach. The andragogy approach is used because the trainees are trainees who are entrepreneurial teachers who incidentally are adults. They certainly have knowledge and various experiences in teaching entrepreneurship. So, the purpose of the workshop is not to teach but to help teachers to gain knowledge and skills. In line with the learning objectives andragogy according to Musa (2010) which is to help adults improve their abilities, both related to aspects of knowledge, skills, and attitudes so that behavior changes occur. As explained by RA namely:

"This training has helped us as teachers to improve our understanding of entrepreneurship, especially about this online business. We were given training on how to start and run an online business, then explained how to create an online store on several social media. This training is very useful so that later we can apply it also in teaching in class"

The results of this activity included assessing the Entrepreneurial teachers' abilities after attending the workshop:

- Increased teacher understanding of online business, will have an impact on increasing understanding of online business in students. If previously the teachers only taught offline marketing or taught online marketing based only on the theory and modest teacher knowledge, after attending this workshop the teachers were able to understand the concept of online business well. They can now teach online business correctly and in time to their students.
- Increased teacher skills in online entrepreneurship. The teachers were able to create several online shops on social media. If previously a teacher was selling products offline, after attending the workshop the teacher can have an online store to sell the product. Teachers can now teach students about the steps to create an online store that can be used for selling.
- Increasing the quality of entrepreneurship learning in schools. After attending this workshop, the teachers could provide online marketing lessons precisely according to the learning goals and objectives. The teacher is also able to provide learning in theory and practice well for students.

The training proven to have a positive impact on entrepreneurship teachers, so that teachers can build a business through online media and implement entrepreneurial learning properly. As a result of research conducted by Setiaji (2018) that from the training activities of entrepreneurship learning and entrepreneurship the teacher has mastered business building skills and can implement craft learning and entrepreneurship seen from the evaluation results in the form of business plans and learning designs.

4 CONCLUSION

Online business workshop activities aim to increase the understanding and skills of Entrepreneurship teachers on building online businesses. Overall, the workshop went well. The teachers showed a high level of enthusiasm in participating in the activities both during the listening phase of the material provided, during the question and answer session, as well as the practical stage of making several online shops. After this online business workshop, it is expected that the teachers will apply the newly acquired entrepreneurship knowledge and skills in schools and appropriately pass them over to their students. It is also important to continue this activity with further discussion on digital marketing especially familiarizing with Facebook ads, the most popular online marketing platform on social media. The development of this discussion serves to improve marketing strategies in entrepreneurship learning.

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Integrated learning of reading and writing in Industry 4.0

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ABSTRACT: Reading and writing are two of four language skills that must be mastered by learners. As reading and writing are related, the learning of writing and reading should be integrated. The aim of this article is to discuss the strategy, tools, and the implementation of an integrated model of teaching learning of writing and reading in Industrial Revolution 4.0, focusing on innovation and the use of information, Internet, and technology. This model also focuses on reading skill in the classroom so that students are able to use the insights that they have gained to improve their own writing skills. Theories of integrated reading and writing in the teaching–learning process are reviewed and discussed in the context of Industrial Revolution 4.0. Then, an implementation of teaching–learning for integrated learning of writing and reading is proposed.

1 INTRODUCTION

Learning to read and write is a basic skill that unfortunately not everyone acquires sufficiently. Morrow et al. (2003) state that the most complex task that people face is learning to read and write. Hence, innovative teaching–learning processes in integrated reading and writing must be created. Teachers must be eager to find the strategies that can be used to improve students' interest in reading. It is known that teaching a language that is not used as a language to communicate in a particular environment will be more difficult. The teacher has to be creative in determining the strategies to improve students' reading interest. The Fourth Industrial Revolution (IR 4.0) has an impact not only on the business, governance, and the people but also on education as well; thus the name Education 4.0 came into existence.

Dunwill in Hussin (2016) says that the advancement of technologies keeps on changing and transforming the teaching method and the setting of the learning process. In fact, there will be more opportunities in the future. Hence, there are some steps that the researchers would like to propose in this article. First, theories of integrated reading and writing in the

teaching–learning process are reviewed. Second, the context of IR 4.0 is discussed. Finally, the implementation of teaching–learning for integrated learning of writing and reading is proposed.

2 EDUCATION IN INDUSTRIAL REVOLUTION 4.0

According to Anggraeni (2018), education in IR 4.0 challenges the notion of innovation in the educational system. It can be said that the development of the digital era can be a solution to promote Education 4.0. The use of the Internet and technology truly supports the teaching and learning process. In addition, Education 4.0 is inspired by IR 4.0.

IR 4.0 provides three literacies: digital, technology, and human literacy. Adaptation of new literacy movements can be integrated and adjusted to the curriculum and learning system. This is line with the 21st century learning principle and approach suggesting that 21st century

learning concerns the formation of an information and communications Technology (ICT)-based digital lifestyle, learning ability and innovation, and the development of four core skills including critical thinking and problem-solving skill, communication skills, collaboration skills, and the ability to create new things (creativity).

Based on Anggraeni (2018), in promoting Education 4.0 in the classroom, characteristics of Education 4.0 concepts should be considered by teachers and students. According to Sadiyoko in Anggraeni (2018), there are nine characteristics of Education 4.0:

- It can be done anywhere and anytime.
- It is based on the students' needs.
- It has flexible delivery.
- It reflects peers and mentors.
- It is about practical application.
- It is modular and project oriented.
- It reveals the students' ownership in which the students participate to a great extent.
- It contends an evaluation process.

3 INTEGRATED LEARNING OF READING AND WRITING

Reading and writing have a close relationship. Reading and writing are two complementary processes that are essential for academic success. Integrating reading and writing skills in EFL learning improves and enhances all basic skills and subskills. Padmadewi and Artini (2017) state that reading is taught most effectively with writing, as a means of integrated processes. In addition, Giesen in Padmadewi and Artini (2017) asserts that writing activities can motivate students to read and to reread. Those activities stimulate students to read and require students to become actively engaged with a text. Writing allows students to enhance understanding and to improve the retention of what they have read. The integrated reading and writing activities provide advantages in reference to the content of learning because reading text from a given discipline gives information that students can use later in a written production. As a result, the activities contribute to revision and consolidation of the content. In addition, writing increases students' understanding and improves the knowledge of what they have read. According to Reid (1993), without the benefit of reading, students are not able to become effective writers. They need to see and experience how the written language works, while reading gives students exposure to vocabulary, sentence structure, and rhetorical structures of English writing. Writing activities give students opportunities to apply the vocabulary, sentence structure, and rhetorical structures of English writing in a written production. Students can use reading as a model for their writing or they can write about what they have read. Through writing, students can practice skills related to reading such as paraphrasing and summarizing.

4 IMPLEMENTATION OF INTEGRATED LEARNING OF READING AND WRITING IN IR 4.0

To support Education 4.0, there are some activities provided in integrated learning of reading and writing that emphasize using technology and focus on the students' participation during the teaching-learning process.

4.1 *Technology application*

Technology becomes an icon in IR 4.0 and also in Education 4.0. The following are some activities in an integrated reading and writing class:

- Supplementary grammar instruction is offered via computer software.
- The program uses a computerized support system.

- Open labs are available for students needing extra help, especially with writing.
- Tutoring is available in the computer lab.
- An online lab component is integrated.
- Students read and create “texts” in a variety of modes such as print, audio, video, graphics, and animation.

The lab provides students to learn about reading and writing. Moreover, the tutors must be able to provide the materials and also extra help for writing. As a result, students can improve their reading and writing in that lab by utilizing the lab facilities. In addition, according to Anggraeni (2018), giving assignments in WhatsApp and Instagram is one of the ways to promote the characteristics of Education 4.0. It means that the technology can be used not only as media in the classroom, but also as media in giving assignments to the students. Outside the class, the students are able to use technology to learn. Technology can motivate students to learn. By using technology, students’ enthusiasm in learning is increased, especially in reading and writing. Therefore, teachers should benefit from technology to improve their teaching, especially reading and writing. Genlott and Gronlund (2013) test a new method developed to improve reading and writing in integrated learning in early ages. They emphasize the use of ICT that supports the “Integrated Write to Read” (IWTR) method, which allows children in the first grade to use computers and other ICT tools for writing texts. Then, the activity is followed by discussing and revising texts together with the classmates and the teacher. Writing by hand is postponed to second grade. While the traditional method obligates students to go through two development processes in parallel that consist of a cognitive process (learning to read) and a motor process (learning to write with a pencil). IWTR works with one process at one time. The first process is one of a cognitive development. The second is a motor skills training that will be implemented starting from grade 2. IWTR extends previous WTR methods and allows students and teachers to experience more social methods of working using a website and peer comment for providing social meaning and feedback (Genlott & Gronlund 2013). They also believe that good results are affected by the technology used, the social arrangements, but in particular by the two together. They clearly state that technology has helped motor skills but it does not make so much of a difference when using a keyboard as compared to writing letters with a pencil. On a computer screen, everybody’s letters look good so they will be easier to be read by other students. Also, the students who are not able to read yet can join in all types of communication between classmates by using speech technology to read the different texts and they can write feedback to their classmates. Subsequently, they also believe that all the students’ writing skills regardless of their different level of development regarding reading and writing can be improved as a result of the technology that publishes their texts. The teacher and students can comment on each other’s texts, and the students revise the texts based on the comments. Those activities make an important difference. This is the students’ work that will be used for their assessment. It can be said that in learning reading and writing, technology plays a huge role.

4.2 *Group work*

In this activity, the teacher must apply collaborative learning by using group work that could lead students to be independent learners. Some characteristics of group work are as follows:

- Group activities are led by the first model.
- Students are engaged in group work.
- Students learn through collaborative activities.
- Collaborative groups are applied to promote processing text more deeply.
- Peer review groups are employed with structured response sheet prompts.

Those activities bring many benefits for the students, such as providing the opportunity for students to share their ideas or opinions with their friends. Students are also able to hear various opinions from their friends so they can learn how to solve the problem in a group. This is supported by Padmadewi and Artini (2017), who state that this kind of activity allows students

to interact, collaborate, and build the skill of teamwork. Boylan in Saxon (2016) also cites collaborative learning as one of several instructional techniques that is important in working with developmental education students. This is also the characteristic of Education 4.0 in which students have to participate to a large extent during the teaching–learning process.

4.3 *Classroom discussion*

Classroom discussion can be applied in teaching integrated learning of reading and writing to promote Education 4.0 that leads students to develop critical thinking through discussion. In a classroom discussion activity, the students can participate to a large extent. The following are the steps for a classroom discussion activity in the teaching–learning process.

- Students are engaged in discussions, and then they need to summarize the readings.
- Discussions are led using a social constructivist approach.
- Guided group discussions are held.
- Classroom debates are conducted. These will lead students into the essay topic.

Through classroom discussions, students can learn how to speak or share their ideas in a public forum. They can build the students' confidence. Hamman (2011) states that a class discussion is one way of cooperative learning that helps students understand the material better and develop new perspectives. By applying classroom discussions, students are able to understand materials easily because they acquire many perspectives or ideas from their classmates.

4.4 *Modeling*

Saxon (2016) described modeling as a step-by-step approach for teaching and regarded this type of practice as an effective approach for retention. In this activity, the students become models for their classmates in which they have to explain the material to their friends.

- Students write one essay with no instruction. Then, the process is modeled. Subsequently, the teacher has a conference with students at each phase of the writing process. Ultimately, they write the last essay on their own.
- The students become the models to explain how to write an essay.
- Sentence modeling is done. Sentences from the readings are used to show students how to write effective sentences.

From those activities, the implementation of integrated learning in Education 4.0 is innovative. The teacher uses technology in teaching. The students also learn how to use technology and understand the technology as a tool for learning. The teacher organizes some activities that lead students to be independent learners. Group work and classroom discussion are applied to make the student become more active and critical. They are free to share the knowledge or ideas with their friends and to make decisions based on group agreements. This activity leads students to be more critical and creative to convey their ideas and to solve problems. Then, as a facilitator, the teacher provides the opportunity for students to be models for their friends. Students should teach or explain the materials to their friends. Those activities really support Education 4.0, in which students must be autonomous learners.

5 CONCLUSION

The implementation of integrated learning of reading and writing in Education 4.0 must be interesting and innovative. Teaching integrated reading and writing can be done by implementing some activities such as group work, group discussion, and modeling. The teacher should facilitate students to be the autonomous learners. Students can utilize the technology maximally to study or to improve their skills in reading and writing. By using technology, students are able to study anywhere and anytime. Ultimately, the teacher can lead students to read critically so they can write critically.

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Teaching strategies to promote 21st century skills using technology

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ABSTRACT: The traditional classroom instruction no longer prepares learners for the future workforce of the 21st century. Technology advancement has transformed old jobs and created new ones along the way. Thus, 21st century learners need to learn new sets of skills that are transferable between jobs, namely critical thinking, communication, collaboration, and creativity (the 4Cs). Being expected to teach using technology, teachers play significant roles in helping students acquire the 4Cs. However, they lack knowledge of effective strategies. In response to this need, this article presents teaching strategies using technology that can help promote the 4Cs. Three strategies are discussed in this article: (1) learning about Web 2.0 tools; (2) utilizing the SAMR (substitution, augmentation, modification, and redefinition) model; and (3) engaging in collaborative problem-based learning using the web.

1 INTRODUCTION

In the 21st century, technological advancement has transformed the workforce significantly. The system in the world of work has been modified by technological changes, either altering or replacing human workers. It is predicted that in the future, automation, digital disruption, and artificial intelligence will continue to create new types of occupations not yet existing today (McKinsey Global Institute 2017). In 2006, the World Economic Forum reported that around 65% of children enrolling in primary schools now will end up working in jobs that are either completely new or old but drastically different as enhanced by technology. The major shift in the old jobs is caused not only by technology, but also by changing demographics and globalization. Hence, the new generation needs to have skills that are transferable between any types of jobs in order to survive in the globalized society of the future. Some of the skills are critical thinking, communication, collaboration, and creativity (the 4Cs), more widely known as the 21st century skills in education.

Playing an important role in preparing the new generation for future job innovations, teachers seek effective strategies to equip learners with the 4Cs. Yet, they are met with challenges, especially the demand to integrate technology to improve their teaching. Mouza (2002) (cited in Kumar et al. 2008) states that there is a major push toward integrating technology into classrooms. He believes that technology has become easily accessible and has a great potential for interactivity that can be used as a powerful educational tool to promote learning. In accord with this, Malik (2018) points out that learning will be greatly enhanced when innovative teachers make use of technology in the teaching and learning process. Such effective integration of technology can engage learners, facilitate learner-centered learning, personalize learning, and support collaborative learning. Therefore, teachers need to understand the various roles that technology can play in the learning process and integrate it without interfering with learning.

Selecting and employing appropriate technology tools to enhance learners' 4Cs skills may contribute to producing skilled and more employable graduates (Levin-Goldberg 2012).

However, there are not yet many publications on this topic. Thus, this article tries to enrich the literature that teachers can refer to when seeking effective strategies to develop students' 21st century skills using technology. Three strategies are highlighted in this article: (1) learning about Web 2.0 tools; (2) utilizing the SAMR (substitution, augmentation, modification, and redefinition) model; and (3) engaging in collaborative problem-based learning using the web.

2 21ST CENTURY SKILLS

The term 21st century skills refer to knowledge, skills, work habits, and character traits that are essential to survive in the 21st century era. Educators, employers, and the general public believe that the key to success for the new generation lies in mastering those skills (McCoog 2008). The Partnership for 21st Century Skills (2002) identifies critical thinking, communication, collaboration, and creativity as the most crucial skills in education (Plucker et al. 2016).

Critical thinking involves a judgment or evaluation for analyzing claims, arguments, and evidence and for making inferences using deductive and inductive reasoning to solve a problem or make a decision (Lai & Viering 2012). Being able to think critically means having the ability to assess received information and make judgment in order to decide what to do accordingly.

Communication and collaboration skills have been highlighted in several discussions on 21st century teaching and learning. Involving the ability to listen, speak, observe, and empathize, communication skill facilitates networking with peers, colleagues, and other people in general. As stated by Pellegrino and Hilton (2013), alongside collaboration skill, communication skill is vital to promote teamwork. Collaboration refers to working with others to complete a common task or a shared goal. Collaboration is conceived of as a social skill, alongside assertiveness, responsibility, and empathy (Malecki & Elliott 2002).

Creativity is described as the capability to create new, diverse, and unique ideas. Many researchers have defined this term as unusualness, appropriateness, and transformation in varying combinations (Epstein & Phan 2012). Being creative means nurturing a different perspective in looking at things and not being limited by rules, customs, and/or norms.

3 OPPORTUNITIES TO DEVELOP LEARNERS' SKILLS USING TECHNOLOGY

Innovative technological tools provide not only challenges but also opportunities to help teachers prepare the new generation for the 21st century workforce. The fact that the work culture continues to change in accordance with technology advancement stresses the importance of conducting technology-supported learning in today's classrooms (Angers & Matchmes 2005).

Learning involves helping learners not only master the skills and knowledge needed, but also identify the resources to learn them (Fisk 2017). With this vision of what learning means, teachers would assume the role of facilitators in learning in order to enhance learner autonomy. He further proposes nine trends related to education in the 21st century. These trends may be signs that teachers are urged to transform their teaching, and therefore become opportunities for them to use technology to develop the learners' skills as well as their own.

The first trend is that learning knows no bounds. It can take place anytime and anywhere supported by e-learning tools. It poses great opportunities for remote and self-paced learning. The second trend is that learning can be personalized to individual students. Weaker students are no longer forced to keep up with the stronger ones, as they can move on to harder tasks at their own pace. Third, the trend of blended learning and a flipped classroom give students a choice of how they want to learn. Next, more project-based tasks should be employed so learners can practice solving real-world problems and projects. Then, with technological advancement, more fields of experiences such as collaborative projects, mentoring projects, and internships would be made available for students. Moving on, as statistical analysis can be done using computers, manual mathematical literacy will no longer be relevant. Thus,

learners should be exposed to data interpretation, which can also predict the future trends. Next, in this era of personalized learning, individualized assessment should be done as well. Then, the opportunity for students to have a say in the curriculum design becomes wide open. Lastly, learners should be given the chance to be more autonomous, which then shifts the teachers' role to that of facilitators. All of the nine trends lead to the mastery of the 4Cs. Therefore, teachers should be knowledgeable about different strategies in promoting them and apply the ones that work for them.

4 STRATEGIES TO PROMOTE THE 21ST CENTURY SKILLS USING TECHNOLOGY

Several pedagogical strategies can be employed to modify traditional classroom instruction using technology to develop learners' 4Cs skills. The integration of technology is meant to create a richer learning environment while fostering the skills. The following strategies would best serve as an authentic representation for 21st century work preparedness: (1) learning about Web 2.0 tools; (2) utilizing the SAMR model; and (c) engaging in collaborative problem-based learning using the web.

4.1 *Learning about Web 2.0 tools*

Oliver (2007) and Yuen (2010) believe that teachers must be knowledgeable about Web 2.0 tools and applications in order to integrate technology effectively in their teaching. Being familiar with Web 2.0 tools, teachers are believed to be more willing to inquire further to be able to practice it more comfortably. Go2Web20, Learnitin5, and the Online Education Database are some accommodating resources from which they can learn about Web 2.0 tools and applications. Moreover, they can also join free webinars that are available through Teachers Curriculum Institute or simply watch YouTube tutorial videos. Those will help them learn about the tools, what they do, and how to operate them, as well as discover the available features and learn how they work. To avoid being overwhelmed and discouraged by the seemingly unprecedented tools, they should not attempt to comprehend them all at once. It is better to try focusing on becoming accustomed to a few first and gradually add more to work with.

4.2 *Utilizing the SAMR model*

It is tempting to believe that providing learners with technology devices can be categorized as technology integration in the classroom. Yet, simply providing the access to technology will neither enhance learning nor develop students' 4Cs skills. The technology should serve as a tool to facilitate the learning process through technology-driven activities designed by the teacher. Invented and developed by Puentedura (2011), the SAMR model is a technology integration model that can be employed to develop learners' 21st century skills. Here, the technology usage in the classroom is divided into four levels, as shown in Figure 1. Romrell et al. (2014) report that the use of the SAMR model provides educators with a framework to understand at which learning level a learning activity falls when creating tasks involving technology in the classroom. They further argue that by utilizing this model, learning activities are truly personalized, situated, and connected via the use of technology. This has opened up opportunities for teachers to be able to differentiate instructions through personalized learning activities. Their finding supports that of Chou et al. (2012), who discovered that each level of the SAMR model allows teachers to establish different levels of content difficulty for each individual student, which is the basis for differentiated instruction.

The lowest level of technology usage here is the substitution level, where the technology simply replaces the traditional tools without any functional change, such as replacing pen and paper with a word processing application in writing an essay. Evans (2008) conducted a study

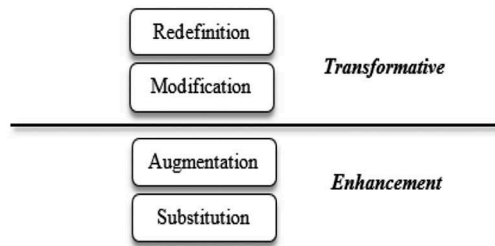


Figure 1. The SAMR framework (Puentedura 2011).

using technology at this level, where he used podcasts as a form of review for students before final exam. Traditional methods of reviewing with textbooks and notes were replaced by watching podcasts. The participants of the study preferred this technology-enhanced method because of its flexibility and mobility. The use of technology here enhances learning, yet no functional improvement to the learning process takes place.

Next is the augmentation level. In this level, the technology serves as a direct tool that generates some functional improvement. Following on the previous example, the sophisticated editing functions in the word processing application are used in writing the essay. Jude et al. (2014) propose some activities that fall into the augmentation level in their study, such as using a blog to facilitate discussion and collaboration within a class, using Google Docs to share documents, and utilizing videos within the classroom to reinforce the concept that is being taught.

The difference between the first two levels is whether additional features are used to enhance the task. However, the technology does not transform learning greatly and only basic learning skills take place at these levels. They are categorized as the enhancement stage of the SAMR model. The next two levels are the transformative stage. At this stage, technology integration contributes to more significant task designs.

The third level is modification. Within this level, the technology allows for the learning activities to be modified or redesigned in some way (Puentedura 2014). An example of modification is a study conducted by Hockly (2012). The researcher used two technology-assisted activities, SMS (short message service) reading and recording. Students were required to read short stories sent in SMS to help improve their reading ability. They could reread the stories as many times as they needed to understand them before continuing to the recording activity. After that, the students recorded themselves and retold the stories and uploaded them online to be reviewed by their peers and teachers.

The final level is redefinition. This is where the technology plays the most important part in the creation of new tasks that could not have been done without the involvement of technology (Puentedura 2014). Hockly (2012) sets a great example of a technology-enhanced task at this level. He had his students create their own treasure hunt where they needed to go around a town taking pictures of landmarks and then created an interactive multimedia quiz for other students. This would be inconceivable without technology, as they needed to incorporate pictures, audio, video, and also text in the quiz.

By utilizing the SAMR model, students are given the opportunity to communicate and collaborate with their peers in order to complete each task with higher levels of critical thinking, which improves student engagement and innovation (Cruz & Martinez 2012). Using the model, teachers are expected to not only stop at the enhancement stage, but also design classroom instruction at the transformation stage. As stated by Oostveen et al. (2011), deep meaningful learning is far more likely to occur when the technology provides transformative opportunities.

4.3 Engaging in collaborative problem-based learning using the web

One needs to be able to reason inductively and deductively, analyze, synthesize, and evaluate evidence, compare and contrast perspectives, and finally draw conclusions in order to solve real-

world problems. Thus, when learners are exposed to these kinds of activities, they will nurture and develop more skills. Also, when doing something they can relate and connect to, learners become more motivated and engaged (Bridgeland et al. 2006). Although this can be done without the use of technology, the integration of technology can augment their engagement and performance (Richardson 2011). The resources available on the web can be used to research, communicate, collaborate, and eventually complete the tasks, for example, using web quests to promote active learning and critical evaluation of information. However, teachers must be sure to create relevant and authentic problems the solutions to which require deep thinking. Any problems for which answers can be searched via search engine bars are not categorized as quality problems, regardless of their real-world relevance. The technology, specifically the Internet, should be used only to generate the data needed to evaluate the problems.

This strategy is more commonly known as problem-based learning (PBL). A large number of studies confirm that PBL benefits learners by improving their performance, exposing them to diverse perspectives, and providing them with opportunities to work collaboratively (Fruchter 2006), contributing to the development of the 4Cs. Levin-Goldberg (2012) propose the following example of a PBL task using the web. In small groups, learners should play the role of businessmen planning to expand their company. They are given instructions such as mentioning in which region or country they would open it and explain the reasons, make use of Google Earth to specifically locate and show the area, identify the resources available in the area, and decide how they will recruit employees and develop the marketing plan. Then, they are given time to surf the web to obtain the information needed, discuss within the groups to answer each question, and create a multimedia presentation of the results. This type of assignment fosters not only communication and collaboration skills, but also critical thinking skills, as the students need to research extensively and carefully to determine which resources are valid and credible to obtain relevant data. It also fosters creativity skills for they are asked to design a marketing strategy and a recruitment plan.

Students' 21st century skills will potentially be developed when they are exposed to problems they might encounter in real life. Identifying the problem, gathering data about the problem, providing plausible solutions, and finally deciding on which of those solutions will effectively solve the problem will help learners acquire a substantial knowledge base, deepen their understanding of important concepts and principles, and enhance skills that are relevant to their future careers (Dolmans et al. 2005; Killen 2007).

5 CONCLUSION

Technology advancement has transformed the 21st century workforce. This means that the new generation will end up working in new types of jobs that do not yet exist. Therefore, equipping them with skills that are transferable between jobs, namely critical thinking, communication, collaboration, and creativity, may best prepare them for future success. Teachers play a significant role in facilitating learners in developing the skills and they are expected to integrate technology in doing so. This article highlights three strategies teachers can refer to: (1) learning about Web 2.0 tools; (2) utilizing the SAMR model; and (3) engaging in collaborative problem-based learning using the web. Technology advancement is to be embraced and used as a powerful means to better the teaching and learning process. Referring to the strategies presented in this article may fruitfully enlighten teachers in teaching students the 4Cs using technology.

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The effectiveness of sociopreneur learning model in instilling entrepreneurial character in the 4.0 industrial era

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ABSTRACT: This research aimed to find out the effectiveness of the Sociopreneur Learning model in instilling entrepreneurial character in the 4.0 industrial era in higher education. This study used the quasi-experimental research. The subjects of this research were students of S-1 in the Faculty of Economics. The samples were chosen by using random sampling. The data collection techniques were observation, polls, and test. Data analyses used were descriptive statistics and inferential statistics with one way sample T-Test. The results showed that the effectiveness of the implementation of the Sociopreneur Learning model was suggested by the average test result of 73.31 (the value of $\text{sig} = 0.003 < 0.05$). Correlation test showed the value of $R = 0.745$, meaning that reasoning and entrepreneurial ability had a 74.5 % relationship, and there was a considerable entrepreneurial character difference after following learning using the Sociopreneur Learning model.

1 INTRODUCTION

The rapid development of the changing times in the era of the 4th industrial revolution impacts the field of education, including that at the university level. The institution becomes a bridge towards the better. The Era of the 4.0 industrial Revolution, according to Schwab (2017), is characterized by the birth of massive digital technology affecting human life around the world. The 4.0 Industrial Revolution encourages automation systems in all activity processes. The increasingly massive Internet technology connects not only millions of people around the world, but has also become the basis for online trading and transport transactions. The emergence of online transport businesses such as Gojek, Uber and Grab shows that the integration of human activity with information and economic technology has increased. The development of autonomous vehicle technology, drones, social media applications, biotechnology and nano-technology further confirms that the world and human life have changed fundamentally. However, the Industrial Revolution also has negative impacts. For example, human roles are taken over by machinery/technology thus giving rise to increase unemployment and the values of the nation's character begins to decline, such as the moral degradation of the nation.

In order to prepare the young generation to face the challenges of the increasingly globalized era, the government of the republic of Indonesia has done various ways to develop the best educational system. One of them is with a learning model that is applied according to the needs of learners and the development of the era. This is an effort to overcome the problem that is currently faced by the nation. Universities have a responsibility to develop the students' entrepreneurship and entrepreneurial ability confidence to prepare or encourage entrepreneurship (Kurniawan 2016).

The University of Nahdlatul Ulama (UNU) Yogyakarta presents with a commitment from the people of Nahdliyin to implement and to control the establishment of Indonesian

characters. UNU Yogyakarta as an educational institution has a responsibility to foster the values of national character and to improve the quality of the Indonesian generation through the curriculum of the block system in all of its courses. One of the characters instilled is entrepreneurial character.

Prof. Klaus Schwab, a world renowned economist, founder and executive chairman of the World Economic Forum (WEF) introduced the concept of the 4.0 Industrial Revolution. In his book, "The Fourth Industrial Revolution", Schwab (2017) states that the Industrial Revolution 4.0 has changed the life and human work fundamentally. Unlike the previous Industrial Revolution, this 4th industrial revolution has a wider scale, scope and complexity. The new technological advances that integrate the physical, digital and biological worlds have influenced all disciplines, economics, industry and government. Areas that have been torn down by new technological advances include (1) Artificial Intelligence robotic, (2) Nano Technologies, (3) Biotechnology, and (4) Quantum computer technology, (5) Block chain (such as Bit coin), (6) Internet-based technologies, and (7) 3D printers.

The rapid development of science and technology in Industrial Revolution 4.0 has made considerable impacts in human life, such as the ease gained from the innovation of digital technology and fast and efficient service through an online system with a wider range of connections which is easier and cheaper. However, Industrial Revolution 4.0 also has negative impacts. Human roles are widely taken over by machinery/technology which causes unemployment to increase. There are problems and challenges that must be anticipated by preparing a generation that is ready to face the challenges of globalization, namely through the development of national character education through Sociopreneur-based learning.

Character Education through Sociopreneur Learning puts a priority on social factors. Sociopreneur is a social-based business, an activity that is aimed to help others in its operations and provide education. Sociopreneur activists usually have an unyielding personality, persistent, independent, innovative, socially sensitive, and have a high empathy towards the society.

Sociopreneur Learning is essentially a learning model used as a basis for designing classroom learning to achieve learning objectives. The concept of Sociopreneur Learning is supported by theories of social cognitive learning, theories of study proposed by Piaget, Vygotsky, and Bandura. In social cognitive theory, what plays an important role in learning is the social, cognitive, and behavioral factors of children (Santrock 2009). Social cognitive theories emphasize how a person or learner includes culture into their reasoning, social interactions, and self-understanding. Their activation is a major determinant and a guaranteed learning success, while the arrangement of conditions makes learners easy to learn.

Sociopreneur Learning Model as an innovative learning model has a number of aspects to consider: (1) potential community, (2) product or service innovations, (3) sustainable business model, (4) business or ecosystem networks, and (5) strategic alliance (Zimmerer 1996). The Sociopreneur Learning model uses a direct instruction model, a cooperative learning, and problem-based learning.

The implementation of Sociopreneur Learning model has some steps. The first step is planning. It is the beginning of the process of designing a learning model. At this stage, the concept of how and what will be done in the learning are planned. In this phase, you select the learning themes, choose the learning materials, formulate competency standards, basic competencies and indicators, and determine the learning steps. The second is the implementation stage where learning is carried out according to the learning scenario that has been designed. The last step is called the valuation phase. Arifin (2010) Explains the evaluation is one of the important components to know the effectiveness of the learning. The evaluation stage is a stage where teachers can gather information and know the success rate of the learning process. The results of evaluation provide feedback for teachers to improve the program and learning activities.

Sociopreneur Learning model as an innovative learning model is not easy to implement because it requires adequate facilities and self-adjustment and a strong will to adapt to the developments. Sociopreneur Learning model combines both theory and practice, and requires quite complex learning management. Despite the difficulties, Sociopreneur Learning model

has several advantages: (a) learning-centered, (b) creating a diverse learning atmosphere, (c) encouraging learners to be active, creative, and innovative, (d) increasing students' confidence, and (e) utilizing a variety of learning resources, and (f) increasing the occurrence of positive interactions among learners, teachers, and community environments.

2 METHOD

This research used quasi-experimental research. Research design used one group pretest-posttest. Variable measurements from one group (pre-test) were then given treatment and performed a second measurement (post-test) of free variables, as well as the results of the pretests measurement compared to the results of a post-test measurement (Nursalam 2003).

Table 1. Research design.

Sample	Pre-test	Treatment	Post-test
S-1 Program, Economics Faculty	0 ₁	X	0 ₂

Source: (Sugiyono, 2003)

The research took place from April 2019 until June 2019. The subjects of research were the S-1 students at the Faculty of Economics at Nahdlatul Ulama Yogyakarta University. The samples were determined by random sampling technique. The data collection techniques used in this research were observation, poll, and test. Observation was used to obtain data of the activity during learning. Questionnaire was used to get data on the reasoning ability of sociopreneur students. Tests were used to collect data of learning output. The research instruments used were observation sheets, polls, and test items. The data obtained were then analyzed. The data obtained by tests were analyzed by using Kolmogorov Smirnov. To know the success of sociopreneur learning model in shaping the character of student self-reliance, one way sample T-Test was used. To describe the reasoning of students mastery on the entrepreneurial skills, the the percentage technique was used.

The criteria used to interpret the students reasoning ability are as follows: (1) $P \leq 30$, very low reasoning ability, (2) $30 < P \leq 55$, low reasoning ability, (3) $55 < P \leq 75$, moderate reasoning ability, (4) $75 < P \leq 90$, high reasoning ability, and (5) $P > 90$, very high reasoning ability. Then to know the relationship between reasoning ability variables and the entrepreneurial skill variables, the Pearson Product Moment formula was used.

3 RESEARCH FINDINGS AND DISCUSSION

The results of the implementation of Sociopreneur Learning model are presented in Table 2.

Based on Table 2, the average score of the students in sociopreneur learning classes was 73.31 (sig value = $0.003 < 0.05$). That means that the students were able to reach

Table 2. Results of data analysis of Pretest-Posttest.

Categories	Average	Percentage	T-test	Corr. Test	Sig. (p)
Experiment	Pre-test	60	23.31%	r = 0.745	0.003
	Post-test	73.31	2.219		
Non Experiment	Pre-test	64	1.83%		0.178
	Post-test	65.83			

the minimum standard of achievement. On the reasoning aspect, students with very high reasoning ability reached 33.33%; students with high reasoning ability 38.88%; and students with low reasoning ability 27.77%. It can be concluded that more than 70% of students met the criteria. Correlation test showed that the value of $R = 0.745$ which means that reasoning and entrepreneurial ability have a relationship of 74.5%. In entrepreneurial skills, it can be seen that there was an average difference of entrepreneurial ability between students who attended Sociopreneur learning model (experimental group) and the students learning with the conventional method (control group). It was shown from the test-t result of 2.219 with the value $p \text{ value} = 0.030 < 0.05$. While the average entrepreneurial ability of the students in the experimental group was 73.30, the control group was 65.83. The data showed that sociopreneur learning model was more effective than learning the conventional model with a sig. value of $0.178 > 0.05$.

The increase in the student learning results in the experimental group turned out to be higher than that of the control group. Through a direct observation on the students, followed by a group discussion, sociopreneur learning model develops the ability to collaborate and cooperate with each other. This corresponds to Darsono (2001) stating that an activity is organized by educators so that there is a change in the learner's behavior. The learning result is an indicator of the change of learner's behaviour. One indicator of knowledge improvement is the occurrence of improved cognitive learning output of the students. Success had also been created due to the inter-supportive, mutual help, and care among the students. This is in line with the research results by Pebrunto et al. (2018), which finds that growth orientation and assessment for improvement are positive results of the influence of entrepreneurial competence.

This sociopreneur learning model also trained the students to be responsible for completing their respective projects. Puspitasari (2018) mentions the process of becoming a sociopreneur requires a variety of skills and competencies that correlate to the social business performance. It can also develop problem-solving skills so that students can develop their reasoning ability, in forming self-reliance through project-designed activities. Ownership of the students' entrepreneurship character is the basis that strengthens them in conducting business projects during the education process in college (Hongdiyanto 2014). The character of entrepreneurship is also discussed by Koerniawan & Dewi (2016). There are seven spirits as the foundation of an entrepreneur, namely passion, independence, marketing sensitivity, creativity and innovation, risk taker, persistence, and high ethical standard.

Sociopreneur learning models contributes to the ability of reasoning skills in solving a problem because in a member of the group there is a discussion so that there are face-to-face interactions. Turker & Selcuk (2009) emphasize the importance of a supportive university environment (educational support) to foster a student's entrepreneurship interest. In addition, the ability of the students, both their cognitive ability, social skills, and verbal ability will develop. Cognitive ability can develop because there is a demand for creative and mathematical mindsets in resolving problems, finding solutions, applying investigative strategies, and sharing information with fellow members and other groups during discussions in one class so that they will develop speech (verbal) skills.

4 CONCLUSION

Based on the results of the study, it can be concluded that sociopreneur learning model is effective as indicated by the average test results of the experimental group of 73.31 (value sig. = $0.003 < 0.05$). Correlation test shows the value of $R = 0.745$, meaning that there is considerable entrepreneurial character difference after following learning using the sociopreneur learning model. In other words, the sociopreneur learning model is effective in instilling entrepreneurial character in higher education.

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Using a visual dictionary to teach English to hearing impaired students

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ABSTRACT: In recent years, Indonesia has promoted equality and equity in education to ensure that all children including those with special needs obtain a quality education. In special schools, specially designed instruction that meets the unique needs of children with disabilities becomes the main concern. First, this article briefly reviews studies on special education. Second, it presents the current practice in teaching hearing impaired students including some challenges encountered by the English teacher in Indonesia. Finally, teaching English to hearing impaired students using a visual dictionary will be proposed.

1 INTRODUCTION

In Indonesia, there are three categories of schools based on the types of students, namely regular schools, inclusive schools, and special schools. Regular schools provide education for normal learners (without disabilities), while inclusive schools provide opportunities for children with some disability to study together with normal students in the same school (Education and Culture Department of Indonesia 1986). The government facilitates education for severely impaired students through special schools (Act Number 3/1989 and Government Regulation Number 72/1991). Special schools design instructions that meet the unique needs of impaired students. Special media, teaching techniques, equipment, and/or facilities are required in the teaching and learning activities.

The government has set the curriculum for each type of school. The curriculum sets the graduate competences, content (core and basic competences), principles of teaching and learning, and assessment techniques. The curriculum is considered the minimum standard. Teachers are encouraged to adapt the curriculum to meet their students' needs as long as they also meet the minimum standards.

The Indonesian government sees language teaching as an important part of education that significantly contributes to the attainment of national education goals. In special schools, the teachers are strongly encouraged to apply proper methods of teaching to meet the needs of students with a disability such as hearing impaired learners.

Hearing impaired students have problems in acquiring language that increase when they learn a foreign language. It is found that learning English as a foreign language is difficult for hearing impaired students. The results of standardized reading tests have consistently shown that deaf and hard-of-hearing students graduating from high school read at approximately a fourth-grade level (Traxler 2000, cited in Trezek & Malmgren 2005). They have a problem in comprehending and recalling what they read and are not so successful in writing because they do not use the derivational affixes while they construct sentences (Girgin, 2007; Karal & Silbir 2010).

Strategies in teaching language to hearing impaired students become one of the major determinants in successful learning. There are some aspects that should be taken into account in

choosing the teaching strategy in order to accommodate the needs of hearing impaired students. A study by Anggraeni (2015) suggests that the media and materials used in teaching students with hearing impairment should be improved by providing simpler and more interesting teaching media in the classroom. Another study by Antonanzas and Lorente (2017) found that students with hearing disabilities are comfortable with a visual representation of information because it is more effective for them. The finding is supported by Birinci (2014), who suggests that visual materials are more effective than sign language, which does not include any visual materials.

Considering this, an English language teacher should have a wide variety of visual media that can support the students in learning. Naturally, hearing impaired students depend on their vision to get a chunk of information before it is processed as knowledge. This view is supported by Howard (2007), who states that visual aids are helpful because vision is the hearing impaired students' primary means of receiving information.

English teachers at special schools in Indonesia encounter some challenges in using visual media in the teaching-learning process. According to Khusniyati (2017), some of the reasons are a lack of facilities. The facilities supporting teaching and learning are far from sufficient. There are generally only two LCD projectors that the teacher can use at every school. In such a situation, the teacher cannot always use the LCD projector, as he or she must share the projector with other teachers. The teachers mostly give up and only use white board to draw to show the students some pictures. Another challenge the teacher encounters is the class grouping regulation at special schools. The limited number of classrooms means that hearing impaired students are grouped with students with multiple handicaps in the same classroom. The teachers find it hard to design teaching materials appropriate for students with many different types of impairments. According to Byram (2000), teaching materials must fit the needs of the students.

For hearing impaired students in special schools, visual media play a big role in the teaching and learning process. For the teachers, visual media are helpful in transferring knowledge to students.

2 DISCUSSION

Educational methods for people with hearing impairment have undertaken several important changes during the 20th century. Today, multimedia has been a keyword for students with hearing impairment who need to utilize visual and auditory cues simultaneously in order to communicate (Gybel 2004). Computer-aided education uses multimedia elements that appeal to many senses (Susan & Bonnie 2009). Some research studies show that technology-aided education is more motivational, intriguing, and amusing compared to classical education (Chang 2007; Baki & Güveli 2008; Junaidu 2008; Chuang & Chun 2009).

A visual dictionary provides not only a written explanation of words but also provides pictures and recordings of how to pronounce the words (Catalan 2003; Fan 2003). In the dictionary, words are grouped according to their categories such as fruits, vegetables, office equipment, and transportation. There are many free online visual dictionaries, both web-based such as Merriam-Webster and mobile-based that can be easily accessed on Play Store on Android and App Store on Apple. Merriam-Webster also provides an offline visual dictionary that can be accessed without the Internet.

For hearing impaired students, audio-visual features in the dictionary become a good starting point in learning (Nesi 2003). Audio-visual aids are training or educational materials directed at both the sense of hearing and the sense of sight (Ashaver & Igyuve 2013). Students can use pictures as visual cue and audio for additional information. Tufekcioglu (2005) points out that teaching materials included in any kind of activities performed within the process of educating hearing impaired students should take the best advantages of their residual auditory capacity. Audio features of the dictionary support hearing impaired students to maximize their residual hearing in learning. Furthermore, the use of a visual dictionary enhances classroom engagement, social interaction, and self-expression (Wilson et al. 2018).

The easily accessed visual dictionary enables students to learn English by themselves outside the classroom (Rezaei & Davoudi 2016). Students can access the dictionary anywhere and anytime. They can relearn the learning materials at school even without the teacher's help to pronounce certain words because the students can simply play the recording in the dictionary over and over. The flexibility of the visual dictionary also helps the teacher in providing instruction to the students (Wood 2001), for instance, asking the students to learn certain words by themselves in the beginning of the class or asking them to learn some new vocabulary items at home.

3 CONCLUSION

Visual aids are helpful because vision is the hearing impaired students' primary means of receiving information. A visual dictionary provides thousands of pictures to ease the students' learning of a new vocabulary. A visual dictionary not only provides hearing impaired students with pictures but also the sounds of how to pronounce words. As for the accessibility of the application, this dictionary allows students to learn independently at home anytime.

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Promoting extrovert learners' problem-solving skills in ELT classrooms

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ABSTRACT: Educationists demand that teachers promote students' problem-solving skills as one of the important 21st-century skills. Success or failure in learning a second/foreign language might be associated with individual differences in problem-solving skills and reasoning. Individual personality, for example, extroversion and introversion, might also be a factor in problem-solving skills among students. They therefore need to be treated based on their individual differences. Extrovert students have social, active, and optimistic personalities. This article is a library study discussing ways to promote extrovert learners' problem-solving skills in learning a language. It examines efforts to foster extrovert learners' problem-solving skills in the ELT classroom in the literature.

1 INTRODUCTION

The effects of personality traits on learning language have moved to the top of the list as a topic of study among many language acquisition researchers over the past decades. They state that personality can be defined as the compilation of intrinsic and extrinsic traits affecting the behavior of a learner in learning language (Biedron 2009; Abdullah et al. 2016). According to Brown (2007), personality traits and language are connected, and this has guided teachers in drawing near their students to teach English as a second/foreign language. However, not only should teachers be required to know and understand learners' personalities for achieving success in learning a language, but learners also should have insights into their personality because personality traits have an impact on language learning (Hasan & Yulianti 2018). From this explanation, personality factors contribute to the process of learning a language successfully if teachers and students work collaboratively and understand them.

Extroversion is included in the five-factor model, which characterizes such learners as sociable and impulsive, who dislike loneliness, have a propensity for taking risks, and receive energy from outside sources (Zafar & Meenakshi 2012). Supporting the statement, Hasan and Yulianti (2018) mention that extrovert learners are gregarious and taking an attitude to do it first and understand it. They have the tendency to work comfortably in a group and possess social and interactive learning, so that they thrive in communication and interaction with others. As stated by Hussin (2018), the preferences of learners of 21st-century skills, involving active collaboration with team members and learning at places that make them interested and fully engaged in the learning process, might be related to the traits of extrovert learners. They can be accommodated in problem-solving and collaboration. Since extrovert learners are interested in working with others and actively discuss their thoughts and ideas, social learning activities, including problem-solving with others and discussions, are appropriate and beneficial for them (Zainal & Mohamad 2017).

In view of the traits of extrovert learners, teachers might be able to promote problem-solving abilities as one of the 21st-century skills to be possessed by them. According to the

World Economic Forum (2016) cited in Hussin (2018), one of the top 10 skills students need to have in 2020 is problem-solving skill. Problem-solving skills refer to a capability to use cognitive processing to comprehend and overcome problem situations where a solution is not immediately obvious and involves the willingness to engage with such situations (Lamb et al. 2017). It means that if this capability is related to extrovert learner traits, these students might be trained to engage in addressing and resolving problems collaboratively and cooperatively. Therefore, problem-solving skills can be promoted among extrovert learners who are interested in what is happening around them and are highly motivated to discuss and compare their ideas and thoughts with others and participate in functional practices.

However, many experts consider extrovert traits just a stereotype related to learning a target language in a classroom. Some prior studies, therefore, claim perspectives different from those in the preceding statements (Brown 2007). Panaiteanu (2018) states that girls with a low level of extroversion (referring to introverts) have confidence in problem-solving skills. Condon and Ruth-Sahd (2013) support Panaiteanu's study that introverts' problem-solving skills outperform those of extroverts. Hence, even if low-level extroverts and introvert learners have a higher level of problem-solving skills, it does not mean that extrovert learners cannot be assisted in developing problem-solving ability or in learning language successfully in the classroom. The issue might be quite debatable. Moreover, there has not been an adequate study examining the ways to support extrovert learners' problem-solving skills. Therefore, this article presents an overview of specific traits of extrovert learners, highlighting the features of problem-solving skills, and shows what teachers can do to promote extrovert learners' problem-solving skills in the ELT classroom.

2 TRAITS OF EXTROVERT LEARNERS

Based on several research projects, extrovert learners possess three particular traits when learning a language in a classroom: they are social, active, and optimistic. Extrovert learners are considered social learners because they are keen to interact with people outside their learning environment and build relationships with them (Fazeli 2012; Köksal et al. 2014; Abdullah et al. 2016). Supporting the earlier statement, they also like to join group activities and work better in a team, so they have more language use opportunities (Zafar & Meenakshi 2015). Hence, they demonstrate a social and incisive verbal learning style rather than a written one. Moreover, extrovert learners tend to be more active when learning. They are interested in asking and answering questions (Sanjaya et al. 2015; Hasan & Yulianti 2018). They are more engaged actively in conversations both inside and outside the classroom. Apparently, Zainal and Mohamad (2017) agree that since extrovert learners are willing to become involved in social communication and the environment, they practice the language used both inside and outside a classroom with others, with the practice in language use leading to better solutions through communication. In addition, extroverts are identified as optimistic learners. It can be seen that without inhibition, they talk more fluently (Razawi et al. 2011; Fazeli 2012). These extroverts are also good communicators and filled with positive energy. Thus, extroverts are people who have more involvement in communication and the environment, since extroverted students like to interact with others (Fazeli 2011). From the preceding discussion, it can be synthesized that three particular traits of extrovert learners—that they are social, active, and optimistic—can support them in learning the foreign language more successfully, which may evolve into problem-solving skills.

However, there is also a different perspective on extrovert learners. According to Eysenk's studies cited in Zafar and Meenakshi (2012), extroversion is negatively correlated with learning because of some neurochemical phenomena in the human brain. Hence, introverts and not extroverts will be better language learners. Supporting Zafar and Meenakshi (2012), introverts have an advantage in learning and are more likely to have better study habits (Sharp 2008). This shows that there are different opinions about a typical learner who will become a successful language learner. Introverts have more opportunities to learn a language because of their study habits. Thus, there is no best approach between the individuals, introverts or

extroverts, so that different efforts are required to take into account the traits. Irrespective of the personality type, learning a target language successfully is important because it requires using problem-solving abilities and reasoning (Sharp 2008).

Conversely, to challenge the preceding explanation, extroverts tend to rely on the social environment when learning, so it provides an opportunity to achieve effective language learning (Biedron 2009; Hasan & Yulianti 2018). This is in accordance with Hasan and Yulianti (2018), who claim that extroverts look for stimulation and assistance from outside themselves, finding the outer world a source of energy to construct their thoughts and ideas. Biedron (2009) agrees that extroverts demonstrate positive emotions, surgency, and the tendency to look for stimulus and the company of others, and they are inquisitive. From the preceding explanations, extrovert learners like to discuss and share with others when they need help or assistance. They will consult with others to clarify the statements or responses. They construct their ideas and thoughts through gaining stimulus from and dealing with social communication with others and supporting the environment.

Furthermore, previous research showed that the interrelationship of extrovert learners with a social environment is also related to other skills (D’Zurilla et al. 2011; Budiarti & Ruslan 2018; Panaistu 2018). Panaitescu (2018) showed that girls with a low level of extroversion have a higher confidence level in problem-solving abilities compared with girls with a high level of extroversion. Extroverts tend to adopt problems focusing on copying style and seeking social support. They interact with others to find the solutions to problems and ask important questions. Based on Budiarti and Ruslan (2018), high critical thinking of extrovert girls in problem-solving overtakes assessment, clarification, and inference steps successfully while they only provide alternative solutions on the strategy step. Then, medium critical thinking skills of extrovert girls pass on assessment and clarification while students who use inference are not able to explain tasks. Low critical thinking of extrovert girls also overtakes clarification and assessment, but they fail on the inference and strategy steps. D’Zurilla, Maydeu-Olivares, and Gallardo-Pujol (2011) scrutinized the relationship between personality traits and social problem-solving ability. An extrovert trait is found to be positively related to constructive problem-solving and negatively related to dysfunctional problem-solving, but extrovert traits also have a significant relation with impulsivity/carelessness. On the other hand, Condon and Ruth-Sahd (2013) claim that introverts’ problem-solving and critical thinking abilities are definite strengths compared to extroverts. Even though extroverts spend less time to think and solve problems and situation, they are prone to sacrificing accuracy since they are faster to take action.

As found by the previous researchers, there is a correlation between extrovert learners and problem-solving though there are still not enough studies that strongly determine that extrovert learners have a high level of problem-solving skills, but “they are better than introverts on some kinds of cognitive tasks; they are better at multitasking, better at handling information overload, and better at working under time and social pressure” (Condon & Ruth-Sahd 2013, p. 508). Therefore, it can still be stated that extrovert learners have the opportunity to become good problem solvers if ways are found to foster their problem-solving abilities, and it is thus necessary to discuss how this can be accomplished.

3 PROBLEM-SOLVING SKILLS

Problem-solving skills are one of the important abilities to be acquired in the 21st century. Problem-solving is the key to “learning and knowledge work skills attending to these new work skill demands in the 21st-century global economy” (Trilling & Fadel 2009, p. 49). Moreover, problem-solving skills can be developed successfully by purposeful projects of learning conducted by employing issues (Trilling & Fadel 2009). Based on the World Economic Forum (2016) cited in Hussin (2018), problem-solving skills are one of the competencies to thrive in the 21st century, and hence are required of learners. Therefore, the focus of problem-solving skills promoted by teachers in the ELT classroom and related to 21st-century skills is that students might have skills to ask and reply to questions, critically evaluate others’ statements,

face and overcome problems, communicate and work with groups in learning, present ideas and thoughts, and construct new knowledge through a cognitive process.

Then, problem-solving skills can evolve easily inside and outside the classroom beginning with directed instructions constructed by teachers. According to Okike and Amoo (2014), problem-solving skills emphasize a process of finding solutions to a given problem or discovering a way to achieve the given objectives utilizing cognitive abilities. Abazov (2016), however, has a different perspective on the process of problem-solving. He promotes a five-step process of gaining problem-solving skills that involves categorizing the basis of the questionable situation, which is clearly differentiated, and then addressing and ultimately solving the problem. The problems are capably analyzed into detailed pieces and controllable elements by classifying the primary parts of the problem; and then reasonable links are constructed between dissimilar potential solutions through strengthening explanations and creating associations; executing the action plan and acting to solve the problems; and evaluating, looking back at each process, and then formulating it, so it can be learned again for other projects involving problem-solving. Therefore, teachers are supposed to take into account the effective steps in improving problem-solving skills that are appropriate with extrovert learners.

4 METHODS OF PROMOTING PROBLEM-SOLVING SKILLS FOR EXTROVERT LEARNERS

After recognizing the traits of extrovert learners and considering the importance of problem-solving skills, how do teachers then foster problem-solving skills for extrovert learners related to the traits of extroverts in an ELT classroom? Some hard work is done by teachers to accommodate extroverts' problem-solving abilities in ELT as follows.

4.1 *Providing social learning activities*

Extrovert learners need to work with others, for they seek stimulus and response from others to engage them in the cognitive process. Teachers can organize group discussion in the classroom, which is compatible with the traits of extrovert learners, including their preference for group activities, interacting with others, and engaging in discussions to find solutions. When conducting a group discussion, extrovert learners are able to share ideas, thoughts, and opinions, which raises learners' critical thinking and problem-solving abilities (Budiarti & Ruslan, 2018). When teachers assign a real-life discussion topic, extrovert learners attempt to interact with others to share and ask important questions to overcome a problem and find solutions (Budiarti & Ruslan, 2018). Panaitescu (2018) has a perspective similar to that of Budiarti and Ruslan (2018). He claims that extrovert learners need to be assisted and engage in more social interactions that help them to construct ideas and thoughts in solving problems. They then present their statements about the topics and explain the results of their discussion. Others respond to the other statements of each group in the form of comments, questions, additions, suggestions, and feedback. Those activities can foster problem-solving skills because the process of cognition is used to construct thoughts and ideas when discussing.

4.2 *Exposing and facilitating extrovert learners with others*

Teachers can consider the traits of extrovert learners as strengths to reveal problem-solving skills in the ELT classroom. For instance, teachers can ask these students to work on a group project in a team and learn autonomously, where extrovert learners are expected to use their cognitive ability. The students are asked to do a group project that uses the WhatsApp and Instagram platforms as recommended by Anggraeni (2018). The project consists of creating a video requiring the students to speak. Since the students work with others, a group project helps extrovert learners to more easily deal with problem-solving.

Related to the preceding discussion, group projects in which extrovert learners can collaborate with others can increase their problem-solving skills because they need other learners to mitigate their careless style (D’Zurilla et al. 2011; Anggraeni 2018). For instance, since extrovert learners are active and optimistic, they are asked to find discussion topics, browse the Internet for answers, and then create a conversation. They record and send it to the classroom WhatsApp group, and then the others give feedback to the conversation. Another example is asking them to create a one-minute video project about the explanation of the discussed topics (Anggraeni 2018). They need to discuss the topics first with others and might use a problem-solving technique. Then, they post the video on Instagram and others should give feedback and comment on the other group’s videos. They put in an active effort to construct their prior knowledge to find the appropriate topic and also think about the feedback that should be given to others.

Another way to facilitate extrovert learners is that teachers can accommodate discovery learning, which is more effective for extroverted students when teaching English writing in the classroom (Sofeny 2017). It complements the advantages of discovery learning, such as building on learners’ background knowledge and understanding, fostering active engagement of learners, providing problem-solving and creative skills, and promoting lifelong learning. As stated earlier, it is useful for developing the extrovert learners’ problem-solving skills. The extrovert learners can be asked to work and learn with others autonomously and then teachers give constructive feedback about their English writing in the class.

4.3 *Assigning particular tasks for extrovert learners*

In promoting extrovert learners’ problem-solving, there are tasks that can be employed, such as puzzle-solving and opinion-gap tasks. Ahmadian and Yadegari (2009) claim that extrovert learners are good at doing tasks. Those tasks can improve the extrovert learners’ problem-solving skills because they facilitate their construction of ideas and thought which utilizes cognitive ability.

Problem-solving skills can be developed through collaborative learning, which means extrovert learners working tasks in a group (Wismath & Orr 2015). The approaches of extrovert learners in solving problems involve gaining help in comprehending problems at the beginning, finding assistance when they are confounded, confirming their explication with others, comparing them at the end, and then looking for an alternative completion after overcoming problems. Teachers use the assigned puzzle-solving tasks that correspond to the means extrovert learners use to overcome problems.

As mentioned earlier, problem-solving skills can be developed through some tasks that are appropriate for extrovert learners. The first task is the puzzle-solving task. The learners generally begin to drive on a problem independently, read it to comprehend, then absorb puzzles and attempt to implement a basic strategy to solve the puzzles. Then, they ask for help from others, comparing diverse understandings and approaches. This directs them to a new point of view on how to contemplate problems, to scrutinize the details, and to move toward solutions. The type of puzzle used for students who like to work in a group is open-ended, since it requires more discussion cycles. Thus, being able to speak out loud and having points of view from others in the group help them to face puzzles better, help underlying thoughts and allow a link to strategic thinking.

An appropriate task for extrovert learners are opinion gap task activities in which they are assigned to the treatment of five types of tasks provided by the teacher. It fosters problem-solving ability in extrovert learners within group work (Marashi & Naddim 2018). The opinion gap tasks help students to think creatively and be confident and active in discussions and consultations that afford many possible solutions. This task is related to the traits of extrovert learners and supports cognitive ability, so it can be used to promote problem-solving skills.

The other task is the opinion-gap task, which involves extrovert learners’ cognitive abilities and processes. First, teachers divide the learners into groups consisting of three or four students and assign a topic to be discussed in a real-world context. After five

minutes, teachers ask the students to share their opinions with others, discuss together, and ask and answer questions. The topics can be social, political, educational, or related to daily life. Second, the teachers ask students to work in pairs. Each pair must express their point of view and share them in groups. The teachers select one or more groups to ask questions. Third, the learners are asked to form groups of four students. Each group gets a picture involving the issue they are going to convey. Fourth, the teachers play a five-minute movie on the screen. After that, the learners are asked to express their ideas and beliefs freely, and the others can agree or disagree with these ideas and explain their reasons. Fifth, the teachers ask students to bring a quote from a well-known person. Then, the teachers select one of the collected quotes as the discussion topic and students share their thoughts and comment about the others' ideas. Therefore, using particular assignments, the way to promote problem-solving abilities is by conducting problem-solving and opinion-gap tasks.

5 CONCLUSION

In conclusion, from the review of prior studies on extrovert learners and problem-solving skills, teachers can carry out certain activities to promote extrovert learners' problem-solving skills in the ELT classroom. English language teachers are required to understand and recognize the traits of extrovert learners, so they can settle on the appropriate efforts to foster extrovert learners' problem-solving skills in the ELT classroom as 21st-century skills. Related to the traits of extrovert learners in language learning, English language teachers can provide social learning activities for developing problem-solving skills through conducting social learning activities in which the learners can share and construct ideas, thoughts, and opinions; discuss with others; and offer comments, suggestions, and feedback. Then, the learners' problem-solving skills can be developed by doing the group project involving the learners' cognitive processes. Moreover, teachers can assign some tasks, such as puzzle-solving and opinion-gap tasks, that demonstrate problem-solving methods and the cognitive process to promote extrovert learners to think critically. After recognizing the particular traits of extrovert learners, teachers can employ appropriate learning activities to foster the problem-solving skills of these students.

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Teaching self-care skills to students with severe multiple disabilities

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ABSTRACT: This research was conducted to analyze the teaching–learning process for self-care skills as the basic independence skills for students with severe multiple disabilities. This descriptive quantitative research involved 28 students in two schools for children with severe disabilities in Yogyakarta. Research data were collected through interviews, observation, and questionnaires distributed to teachers in charge of teaching students adaptive skills. The instrument used in this research was the Adaptive Behavior Assessment System-II (ABAS-II). The results of this research show that students' self-care skills were regarded as poor, with an average of below 50%. Therefore, it is necessary that teachers improve their competence to be able to teach self-care skills appropriately to students with severe multiple disabilities.

1 INTRODUCTION

Students with severe multiple disabilities are those who experience more than one obstacle, making their learning needs more specific and complex (Hallahan & Kauffman 2014). Disorders and obstacles experienced by these students directly disrupt their development and they tend to face difficulties related to adaptive behavioral skills (Tomaszewski 2019). These multiple obstacles cover conceptual, social, and adaptive skills (Weiss et al. 2018). Students with severe multiple disabilities experience challenges in being able to perform adaptive behavioral skills independently (Dunlap 2009).

Adaptive behavior skills are important in forming one's independent behavior (Kouklari et al. 2018). They involve the performance of the required tasks in daily life including communication, social, and daily living skills, (Floyd et al. 2015, Tasse et al. 2016; Woodman et al. 2018; Bradshaw et al. 2019; Tomaszewski 2019) faced by students with autism and moderate and severe intellectual disabilities (Weiss et al. 2018). Meanwhile, Oakland and Harrison (2008) state that the scope of adaptive behavior covers 11 aspects: communication, community use, functional academic, home living, health and safety, leisure time, self-care, self-direction, social, working, and motor skills.

One area of adaptive behavior skills that students need to master is self-care, referring to skills employed to improve health and well-being in the form of the ability to overcome personal decisions (Richards et al. 2010; Diebold et al. 2017), and behaviors of individuals that allow them to care for themselves including meals, dress, decorate, toilet, and cleanliness (Oakland & Harrison 2008, p.179; Langone & Burton 2015; Ivy et al. 2018) that will affect their social life (Agllias 2012; Lee & Miller 2013; Harr et al. 2014; Raheim & Lu 2014; Salloum et al. 2015; Grise-Owens et al. 2016; Wilson 2016; Griffiths et al. 2017).

The observation in two special schools in Yogyakarta shows that teachers handling students with severe multiple disabilities focused more on teaching about independence skills instead of academic ones. Teachers taught cooking, eating, and cleaning in the school environment.

These activities were mostly performed by teachers, considering that students with severe multiple disabilities had serious difficulties in completing the tasks. In eating together, students were still assisted by teachers to eat their food, showing that students were not yet independent in fulfilling their own needs. Written programs or learning documents related to students' independence in meeting personal needs, or better known as self-care skills, as a basic ability were not available in the school either.

Regarding those problems, development in planning, implementing, and evaluating the learning of self-care skills is necessary, as – are basic skills that need to be mastered by students with severe multiple disabilities. The development is possible if the teaching–learning process is designed and implemented by competent teachers in terms of pedagogy, social, personality, professional, and three teacher competencies in the 4.0 era namely creativity, literacy, and higher order thinking skills.

2 METHOD

In this quantitative descriptive research, the data were collected from two special schools for students with multiple disabilities in Yogyakarta. Subjects in this study consisted of 28 students with severe multiple disabilities who had conditions such as impaired comorbid Down syndrome, impaired vision with comorbid autism, comorbid vision impairment with intelligence barriers, and cerebral palsy comorbid with intelligence barriers. Data were collected through interviews, observations, and questionnaires distributed to teachers in charge of teaching students with severe multiple disabilities. Information was obtained from teachers using interview guidelines on the learning of adaptive behavior skills among students with severe multiple disabilities. Observations on the activities related to learning adaptive behavior skills were conducted and questionnaires on the aspects of self-care in the form of Adaptive Behavior Assessment System-II (ABAS-II) adapted by Oakland and Harrison (2008) were distributed. The instrument divided the area of self-care into several aspects, namely eating, dressing, grooming, health and safety, and toileting. Each aspect is broken down into 13 tasks as presented in Table 1.

Table 1. Task description of the self-care area.

Self-care area	Task
Eating	Eating
	Drinking
	Wearing shirts
	Wearing T-shirts
Dressing	Wearing briefs
	Wearing trousers
	Wearing shorts
	Washing hands
Health and safety/ Grooming	Bathing
	Brushing teeth
	Combing hair
	Urinating
Toileting	Defecating

3 RESULTS

The observations showed that all teachers taught using direct learning techniques. There was no assistive technology used by the schools in the teaching of self-care skills to students with severe multiple disabilities except the use of wheelchairs to support mobility.

Table 2 presents the information on students participating in this research.

The data in Table 2 show that the number of male and female students differs by two, indicating that the difference is insignificant. Students with cerebral palsy and intellectual disabilities dominated the total number of cases, with 12 students, while there were 6 students with motor impairment and intellectual disabilities. Five students had visual impairment comorbid with intellectual disabilities. One student had comorbid vision impairment and autism and four children had comorbid deaf and intellectual disabilities.

The number of students who were able to perform a skill was then calculated in the form of percentage for each aspect using the following formula:

$$\frac{a}{b} \times 100\% = \dots\%$$

The percentage of each aspect was determined with regard to the students' ability in self-care skill mastery as shown in Tables 3 and 4.

Table 2. Students' information.

Number of participants		28
Sex	M	15
	F	13
Type of problem	Cerebral palsy + intellectual disabilities	12
	Motor impairment + intellectual disabilities	6
	Vision impairment + intellectual disabilities	5
	Vision impairment + autism	1
	Vision impairment + Down syndrome + intellectual disabilities	4

Table 3. Eating skills.

No.	Aspect	Percentage
1	Eating	60.7
2	Drinking	82.4

Table 4. Dressing skills.

No.	Aspect	Percentage
1	Wearing shirts	25
2	Wearing T-shirts	46.4
3	Wearing briefs	50
4	Wearing trousers	50
5	Wearing shorts	50

Table 5. Grooming skills.

No.	Aspect	Percentage
1	Washing hands	64.2
2	Bathing	21.4
3	Brushing teeth	10.7
4	Combing the hair	32.14

Table 6. Toileting.

N	As	Percent
1	Urinat	46.
2	Defecat	42.

Most students were constrained in performing dressing skills due to motor function problems and the absence of programs specifically designed to teach dressing skills.

Table 5 shows that students' skills were far below the average score in terms of grooming skills, especially in tooth-brushing skills, with only 10.7%. Meanwhile, Table 6, presenting toileting skills, shows a slight difference, below 50%.

4 DISCUSSION

Regarding the learning needs of students with severe multiple disabilities to achieve independence in taking care of themselves in daily life, namely in the area of self-care related to adaptive behavioral skills such as eating, dressing, grooming, and toileting, teachers are required to improve their skills and creativity. The data obtained from observations, interviews, and questionnaires in the form of the ABAS-II instrument adapted by Oakland and Harrison (2008) distributed to teachers show that students' abilities were very low, below 50% in every aspect of the skills. Difficulties in terms of perceiving the function of an object caused the students with severe multiple disabilities difficulty in coordinating their movement (Stearn 2017) so that basic life skill learning is needed to help the students become independent in caring for themselves. It is necessary to develop specific learning related to self-care skills for students with severe multiple disabilities (Diebold 2017).

5 SUGGESTIONS

The complexity of the obstacles experienced by students with severe multiple disabilities requires competent teachers who are capable of planning appropriate learning activities for students, and teaching students with severe multiple disabilities requires teaching development (Weiss et al. 2018). In Indonesia, teachers need to master the four teacher competences, namely pedagogical, social, personality, and professional. The four competences should be adjusted to meet the demands of the Industry 4.0 era today. Some competences that must be possessed by teachers in the 21st century include creative competence, literacy, and higher order thinking skills, which will enable teachers to develop more meaningful learning activities for students with severe multiple disabilities. The three additional competences can be applied in the preparation, implementation, and learning assessment processes.

As the designers, teachers must be competent. There are two strategies that can be applied to help teachers enhance their competences, i.e., (1) developing professional competence during the teaching career and (2) developing proper teaching plans (Mohamed et al. 2016).

Adaptive behavior skills need to be taught by competent teachers who are qualified in preparing appropriate learning activities for students with severe multiple disabilities. First, teachers need to have extensive knowledge about the educational curriculum, literacy, and application of the curriculum (Graham & Harris 2013; Leko et al. 2015; Herppich et al. 2017). Second, teachers must have adequate social competence, which allows them to be good listeners, and have strong intelligence in assessing dynamic situations from various perspectives as they communicate and work together (Tynjala et al. 2016). Third, teachers need to be able to administer an initial assessment to identify difficulties and the possible solutions (Herppich et al. 2017). Fourth, teachers need to be capable of designing systematic learning activities relevant to students' needs (Ruppar et al. 2016). In addition, teachers should be able to determine the forms of assignments and feedback in assessing students' learning (Allal 2013; Furtak et al. 2016; Herppich et al. 2017). Fifth, teachers also need to master diagnostic competence and maintain a favorable learning environment. Sixth, teachers have to be competent in performing learning assessment and evaluation (Herppich et al. 2017).

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The role of financial technology in developing financial literacy of younger generation in the border area

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ABSTRACT: The objective of this study is to explore the behavioral factors behind the young people's use of financial technology in their daily lives and its impact on their ability to improve financial literacy. The significance of this research is to identify the extent to which the use of this technology is able to increase the knowledge about financial management among the youth at the border regions of Indonesia. Financial literacy is one of the most significant factors in building economic resilience as part of the national resilience pillars. This research was conducted using qualitative method with phenomenological approach. The participants were young people aged 17 to 35 in accordance with the WHO's age classification. They came from Bengkayang, West Kalimantan, Indonesia. This research found that there were two factors affecting participants' financial literacy rate in relation to the use of financial technology. They were internal factors, which were derived from within the participants themselves, and external factors, which were in the form of outside supports. The internal factors influencing participants' behavior towards the use of fintech were product knowledge, perceived usefulness, and perceived ease of use. Meanwhile, the external factors involved were supporting technology, access to information, and social environment.

1 INTRODUCTION

There are two phenomena occurring in Indonesia, namely the high number of internet technology usage and the government's focus on infrastructure development in Indonesia's border areas. Indonesian Internet Service Providers Association (APJII) stated that the internet in Indonesia are used predominantly by people aged 19 to 34 (49.52%). This group dominates new professions in cyberspace, such as celebgram (Instagram celebrities) and YouTuber (YouTube content creator). The growth of digital start-ups is always driven by them, whether they are founders or consumers. In the second place, as many as 29.55% of Indonesian internet users are people aged 35 to 54. They are in the productive age and are adaptable to changes. Teenagers aged 13 to 18 occupy the third position with 16.68%. Meanwhile, parents over 54 only account for 4.24% of the total number of internet users (APJII Statistics for 2017). Based on these data, this study focuses on the younger generation in the border area.

Recently, the development of internet technology is so rapid; the number of internet users is increasing every day. According to a report by the Indonesian Internet Service Providers Association (APJII), the population of Indonesia currently reaches 262 million people and more than fifty percent or approximately 143 million people have been connected to the internet (apjii.or.id quoted May 4, 2018). The age group dominating internet usage in Indonesia are those aged 19 to 34 (49.52%). The growth of digital start-ups is always driven by them, whether they are founders or consumers. In the second place, as many as 29.55% of Indonesian internet users are those aged 35 to 54. They are in the productive age and are adaptable to changes. Teenagers aged 13 to 18 occupy the third position with 16.68%. Meanwhile, parents over 54 years only account for 4.24% of the total number of the internet users (APJII 2017).

Based on these data, it is not surprising that these young people (aged 19 to 34) are the generation that is responsive in encountering digital developments. They tend to respond faster if

there are new applications that provide benefits and vice versa. This generation tends to reduce all kinds of excessive bureaucracies (Cran 2014). The emergence of various applications on the internet that can be easily accessed by smartphones becomes a fresh air for the younger generation. They have begun to utilize them to help with their daily activities and support their lifestyle. Financial technology is one of the examples of such applications. The use of financial technology is even expected by the Financial Services Authority (OJK) to help achieve the financial inclusion target of 70% (www.ojk.go.id quoted May 4, 2018).

This research was conducted in Bengkayang, West Kalimantan, Indonesia. The reason why the researchers chose West Kalimantan is because it is one of the provinces in Indonesia which borders directly with neighboring Malaysia. The border area is one of the priorities in the President Joko Widodo's administration. This is stated in Nawa Cita, nine programs initiated by the government to show the priority of the change of path in order to achieve a politically sovereign Indonesia, become economically independent, and preserve its unique cultures. The third item in Nawa Cita reads "Building Indonesia from the periphery by strengthening regions and villages within the framework of a unitary state."

2 FINANCIAL TECHNOLOGY AND FINANCIAL LITERACY

According to the Organization for Economic Co-operation and Development (OECD 2016), financial literacy is defined as the knowledge and understanding of financial concepts and risks, along with the skills, motivation, and confidence to apply the knowledge and understanding to help them make effective financial decisions, improve financial well-being of individuals and communities, and participate in the world's economy. According to Xiao et al. (2006), there are several dimensions of financial literacy. They are knowledge of basic personal finance, money management, credit and debt management, savings and investment, and risk management. The data from OJK in 2016 indicates that Indonesia's financial literacy rate was only 29.7%. It means that out of 100 new people, only around 30 people have adequate knowledge, skills, and trust regarding financial products and services (well literate).

Financial Technology is the use of technology in a financial system that produces new products, services, technology, and/or business models and that can have an impact on the monetary stability, financial system stability, and/or the efficiency, smoothness, security, and reliability of payment systems. The development of financial technology on the one hand is proven to bring benefits to consumers, businesses, and the national economy. However, on the other hand, it might pose risks in that if not properly mitigated, it can disrupt the financial system. FinTech emerged as changes in people's lifestyles are currently driven by the demand of the fast-paced life from the users of the information and technology. With FinTech, the problems in transactions and payments, such as not having time to purchase goods to a shopping place and to a bank/ATM for transferring some money, and the reluctance to visit a place because of its unpleasant service can be minimized. In other words, FinTech helps transactions and payment systems become more efficient and economical but still effective. The use of financial technology to support financial literacy has been disclosed by Bank Indonesia through its official website www.bi.go.id which states that Financial Technology is the use of technology in the financial system that produces new products, services, technology, and/or business models and can have an impact on monetary stability, financial system stability, and/or the efficiency, smoothness, security, and reliability of payment systems. Bank Indonesia has also set policies regarding financial technology through PBI No.19/12/PBI/2017 concerning the Implementation of Financial Technology. The policy is aimed at providers of Financial Technology conducting payment system activities.

Based on the references around Financial Technology above, it can be implied that the technology aims to facilitate the community in meeting their daily needs, in this case, more specifically about finance (financial management behavior). Therefore, the definition of someone having an attitude about finance or behaving towards finance can be seen from four things (Dew and Xiao, 2011): Consumption, cash-flow management, savings and investment, and Debt Management (Credit Management), the ability of a person to take advantage of the debt

so as not to go bankrupt, or in other words, the use of debt to improve his welfare. Qamil and Jamil (2016) stated that financial knowledge has a positive impact on financial behavior. It is not in line with the result of Herdijono & Damanik's research (2016) which found that someone who has high financial knowledge is not guaranteed to have good financial behavior. The results of this study are in line with Kholilah & Iramani (2013) and Nababan & Sadalia (2012) who argue that financial knowledge does not have a significant effect on student financial behavior. Hence et al. (2016) concluded that financial education in low and middle-income countries is less effective so it does not affect the financial behavior.

The other factors that can influence financial behavior are the environment, association and ways of socializing, parental control, habit factors, locus of control (Joo et al. 2003), impulsive behavior, life satisfaction, stress (Norvilitis & Maria 2002), parent socialization (Palmer et al. 2001), materialism (Pinto et al. 2000) and other factors related to culture and psychology that have not been studied. Thus, there are still many phenomena that affect someone in managing their finances. Indonesia consists of various regions that have very typical customs and habits, including in the border areas such as Bengkayang Regency. The financial behavior patterns of Bengkayang people will be influenced by these cultural customs, but there is no theory that says that financial behavior is influenced by the local lifestyle and culture. It is expected that this research can provide a new concept and finding.

Financial behavior is related to a person's ability to make decisions about their finances, and the ability to manage them. A person's ability to manage finances is known as financial literacy or non-standard language is called financial literacy. Financial literacy is a component of human resources that can be utilized to improve financial welfare, (Houston 2010). In line with this opinion, Remund (2010) stated that financial literacy is a measure of the extent to which someone understands key financial concepts. In other words, they have the ability and confidence to manage personal finances, both short-term and long-term financial planning, properly and aware of changes in economic conditions.

Chiara Monticone (2010) explained that a person's level of financial literacy is influenced by demographic characteristics which include gender, ethnicity, education, cognitive abilities, family background, wealth, and time preference. Capuano and Ramsay (2011) emphasized that personal factors (intelligence and cognitive abilities), social and economics can affect one's financial literacy and financial behavior. The financial literacy level of each person is different. It causes a significant difference from one individual to another in the process of collecting assets, both for the short and long term. Huston (2010) stated that factors such as habits, cognitive, economic, family, peers, community, and institutions can have an impact on financial behavior. Someone is called financially literate when they have the knowledge and ability to apply that knowledge.

From the description above, it can be concluded that financial literacy in relation to financial behavior is the ability to manage finances in everyday life so that economic prosperity can be realized. Similar to financial behavior, financial literacy is also influenced by internal factors such as cognitive and psychological abilities as well as factors outside the individual such as social and economic conditions (Wahyuni 2015). This research is expected to identify a new theory with the existence of cultural factors that will affect financial literacy. In addition, the use of financial technology among younger generation is also a major focus in this study. It is because as quoted from the official website of the FSA, the use of technology will increase financial literacy level. Thus, it should be maximally utilized, including in the border areas.

3 RESEARCH METHOD

This research employed a qualitative method with a phenomenological approach. Phenomenology was used to explain the meaning of the concept or phenomenon of experience based on awareness that occurs in 7 participants. Phenomenology is conducted in natural situations, so that there are no limits in interpreting or understanding the phenomenon being studied and the researcher is free to analyze the obtained data. The data analysis technique used in this

study was descriptive narrative. This technique is applied through three channels: data reduction, data presentation, and selection of conclusions/verification.

4 RESEARCH FINDINGS AND DISCUSSION

The data generated in this study were obtained through Focus Group Discussion (FGD) with interviews conducted by researchers. After collecting the data from observations, interviews, and documentations, the researchers analyzed them to find out the supporting factors behind the younger generation's use of financial technology applications (FinTech) in their daily lives and compare them to research discussing about financial technology (FinTech) on the ability of young people to improve financial literacy. Hence, the researchers analyzed further the participants who used FinTech and who then resolved several factors or overcame existing problems.

Based on the results of the interview, it can be concluded that the factors that cause the younger generation to use FinTech include product knowledge, perceived convenience, environment, and perceived benefits. There are 3 of 7 participants who showed the product knowledge factor. Product knowledge is the main reason they use in FinTech because of the offered benefits, even though the presence of FinTech in the border area is still limited. Perceived convenience also arises when participants do not bring cash; technological developments make it easier for participants to transact. Moreover, environmental factors also affect one of the participants. Participants with a great curiosity and who do not want to stay outdated feel motivated to use FinTech. The benefit factor appears in one of the participants which is when they do not have enough money to purchase the desired item and there is an influence from the salesman who offer the FinTech promo, it makes the participants interested in using FinTech. These findings are categorized as internal factors within consumers that encourage or influence them to use financial technology.

Various types of financial technology in Indonesia have been recognized by young people in the border regions of Indonesia. It makes young people in the border area know the importance of saving. However, they are not yet fully acquainted with investment. Hence, this study found several things that influence the knowledge of young people in the border area on the financial literacy and technology which are more influenced by 3 things consisting of supporting technology, access to information, family environment and association. The tendency of aspects that influence is external influences from outside. It is likely young women spend more time gathering and interacting with their peers. The explanations of each aspect are:

4.1 Supporting technology

Technologically, there are not enough vendors that support the existence of financial technology in border areas. It has influenced enough interest in the use of financial technology in border areas. It is supported by the statement of one participant:

"If the kinds of things are still understandable, I also used Gopay when I was on holiday in Jogja, but I already went home and deleted it again. It is useless is not here either."

4.2 Information access

Information Access in this context is the ability of the community to obtain information through print, visual, and online media. Based on the results of this study, information access has the potential for considerable influence. It was stated by one participant as follows:

"We usually get information from Facebook or IG (Instagram). There is also no magazine or newspaper here. Hence, mostly is from the internet. There are often advertisements about online credit. I also tried to register, but I was told that our area was not reached."

4.3 Family and social environment

The family and environment have the potential for giving influence. However, it seems not large enough. Significant influence actually comes from the social environment. Usually, young women take the time to hang out with their friends. It was on this occasion that there was a transfer of knowledge and information between them.

“I know from many friends who use OVO for shopping at Bali. Yes, I have followed it, then he taught me to install it. It’s also often online shopping. However, I have not yet used OVO. After using OVO, it is better not to bother to the ATM if you want to transfer. Especially now, I use M-banking.”

Based on the discussion above, the findings and concepts of this study can be described as follows:

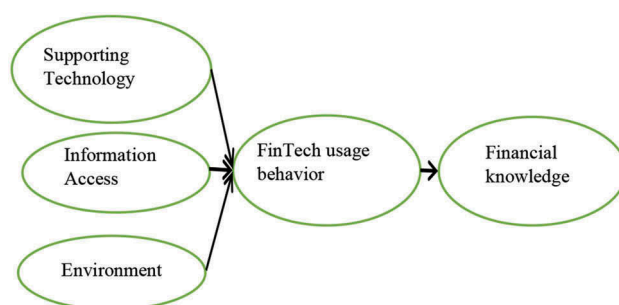


Figure 1. Conceptual Framework for Research Findings.

5 CONCLUSION AND LIMITATION

This study found two things that affect financial knowledge and the use of financial technology, namely internal factors, referred to the users themselves, and external factors, which are in the form of external support. Internal factors that encourage the use of FinTech include product knowledge, perceived usefulness, and perceived convenience of use. Meanwhile, the external factors comprise of supporting technology, access to information, and the social environment. This research is exploratory research that produces concepts and ideas from the field exploration. These concepts and ideas need to be further investigated and can become a further research agenda.

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Undergraduate students' perception of edu-techno empowerment in classrooms

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ABSTRACT: Industrial Revolution 4.0 is a real phenomenon in modern higher education system in Indonesia. This challenges lecturers to integrate the use of technology in their teaching strategies. This paper presents the perceptions of undergraduate students toward Edu-Techno empowerment in teaching-learning process. Participants were undergraduate students of English Department in an Indonesian private university. This phenomenological qualitative research used interdisciplinary approach: education, psychology, and media. Semi-structured interviews were administered to obtain information on the specific theme of Fun-easy Learning Group as a part of the Edu-Techno application. By using Event Structure Analysis, seventeen students supported the use of Edu-techno empowerment in the class. Both male and female students showed 85% enthusiasm for the use of modern technology. The results showed that undergraduate students had positive attitudes toward the Edu-techno application for enhancing their knowledge. In the future, Edu-techno empowerment should be applied using different styles of education approaches.

1 INTRODUCTION

Students' perceptions of Edu-Techno have an important role in teaching and learning activities. Education in the Industrial Revolution 4.0 era demands lecturers and stakeholders to develop effective teaching methods by adapting the e-learning approaches. Smart-phones and tablet computers are popular gadgets used in the digital revolution era that can be utilized as a teaching and learning media that attracts students' interest. Modern technology used in teaching engages students with digital technology during the learning and assessment activities in the classroom. This also promotes modern technology literacy.

The use of Edu-Techo combined with the Fun-Easy Learning Group is a kind of technology education. In this research, undergraduate students expressed their positive attitudes toward the e-learning program in the class. The use of technology in education is relevant to other disciplines and it can trigger the diversity of research.

Some experts argue about the use of digital technology and social media in education. The development of technology has certainly brought remarkable changes to how learners accomplish their learning (Li 2015). Social media is a board term referring to blogs, micro-blogs, forums, dialogues, images, sounds, videos, networks, social web profiles and other social networks (Brandon & Tilley 2009). Other researchers investigated prospective teachers' use of social media and web technologies (Peck et al. 2002, Rakhmanina et al. 2017, Ünsal 2018, Valetsianos & Moe 2017). They did not only highlight the advantages of using social media, mainly blogs and videos but also introduced Education Technology in Higher Education.

In Higher Education, the communication between lecturers and students enhances students' comprehension. The theory of Introduction to Human Communication states that effective communication is done by giving meaning, constructing an idea, and creating responsible interaction with the contextual world. Such communication helps students become more thoughtful, confident, and become ethical communicators (Beauchamp & Baran 2019).

Perception refers to the process of how people obtain experiences and what they obtain through sensory receptors (Maulidah 2017). In short, it is the process of thinking or feeling.

Furthermore, the information that has been managed by people, can be either rejected or accepted by sensory receptors. The perception is related to the experience of how people do activities or see certain objects around. In the first process, people feel the awareness of what they do. Second, they face the reality. Third, interaction with what other people do in daily activities occurs. Finally, they see their own experiences and communication is built. Thus, the objects or events captured by the senses are stored in the forms of reflections. Hence, perception is the result of the process of people interpreting certain things based on their own experiences and stimulus that produce information. Moreover, perception can be affected by two factors namely internal and external factors. The internal factors include experience, belief, background, personality, attitude, and self-acceptance. Meanwhile, external factors consist of measurement, repetition, movement, familiarity, and new experience.

If the reception is correlated with the use of Edu-Techno, it represents efforts to develop and use technology to improve the effectiveness of teaching and learning activities. The use of technology in the teaching-learning process is assumed to have positive effects. The use of this strategy is the solution to solve various problems in the field of education. The term empowerment is defined as the effort to give power or authority to or to authorize (Tschohl 2010). The suffix ‘-ment’ can be defined as a result or product and the act or fact. It denotes the result or process of empowering by entrusting a person or people to do something. In short, the definition of empowerment refers to an authorized license.

The empowerment of technology should adjust to the cultural background and current learning development. Hence, it is necessary to decide on how to integrate those aspects in a good system that combines techniques and activities for the specific social context in which technologies are developed and used (Kaplan & Haenline 2010). Technology itself is a part of a cultural artifact. It is the whole of systems that the human produce and use. Empowerment also proposes a life-cycle or a series of stages by which technology becomes integrated within a society (Rodriguez-Gomes & Ibarra-Saiz 2015). The undergraduate students could also participate in the assessment based on their own experiences in using technology media. The significance of participation in the assessment process has been underlined in a number of studies (Griffin & Care 2015, Perrota & Whitelock 2017, Yao & Hill 2016).

The objective of this research was to investigate the education technology empowerment in classroom teaching of undergraduate students in a private university, Indonesia. Moreover, some students had learning problems related to the use of social media, including Edu-Techno. This research was done to propose possible solutions addressing students’ difficulties in using social media and Edu-Techno empowerment for learning purposes. This research also proposes some suggestions for future researchers to investigate the technology empowerment in education.

A preliminary research study was done by conducting direct observation in the classes in which social media was used for listening to music, social activities, reading blog posts, commenting the others’ profiles, peeking at someone else’s status, and participating in various social events. The university expected the students to grow as creative individuals who think outside the box through this empowerment. Several research questions were formulated as follows. (1). What are the environmental characteristics of undergraduate students regarding the use of digital technology in education? (2). How are the undergraduate students’ behaviors towards the use of social media in the class? (3). How are the undergraduate students’ attitudes in dealing with the use of the edu-techo in the class? (4). How are their perceptions toward the use of Edu-Techno in the class?

2 RESEARCH METHOD

This study was done in the form of phenomenological qualitative research in which data were collected through semi-structured interviews. It is an approach to qualitative research that focuses on the commonality of experiences obtained by members of a particular group and

comprehension of a certain phenomenon based on their experience perspectives (Husserl 1980). The fundamental goal of the approach is to arrive at a description of the nature of the particular phenomenon (Creswell 2013).

The participants were 20 out of 32 students who attended the Cross-Cultural Understanding class of the Faculty of Language and Communication Science. There were 13 females and 7 males in the class who were purposively selected based on the research objectives. It may also entail studying the whole population of some limited group or a small number of people participating in the study (Gor 2017). The instruments of this phenomenological qualitative research were used, followed by direct observations and semi-structured interviews. These interviews focused on the specific theme of learners' behaviors and perceptions toward Edu-Techno empowerment and were administered in a conversational style. These interviews were a strategy to investigate learners' motivation behind their choices and behavior toward the Industrial Revolution 4.0 (Raworth 2012).

A WhatsApp Easy-Learning was created, followed with direct observation. The observation was conducted for six months based on the following procedures. Undergraduate students were observed directly in the Cross-Cultural Understanding class. After 13 meetings, they underwent the semi-structured interviews which 10 questions were designed to find out more about their behavior, meaning, attitudes, and expectations about the empowerment of Edu-Techno through the Easy-Learning Group of WhatsApp. Each interview lasted for 7-10 minutes per student.

The data collection was done in two methods; library method and field method. There were three collaborative steps namely, data collection, data organization, and data analysis. Two types of data—the primary data and the secondary data were obtained—which were collected by tracking the timeline of the events regarding Edu-techno empowerment in the class. The primary data were obtained from observation and interviews. Meanwhile, secondary data were collected from some books, journals, articles, essays, websites and other theoretical writings concerning the topic of analysis. See Figure 1.

After organizing the data of research, data analysis was the final step out of the three collaborative steps of qualitative research. There are several qualitative analysis techniques available for the analysis of the history of a social process. This research discussed a relatively unknown technique, "Event Structure Analysis" that is used to analyze history as a sequence of events, and apply it to the analysis of a case study of planned social change (Stevenson et al. 2003). The theory of Mimetic (Barthes 1986) was also used to get a deeper understanding of the meaning of some symbols dealing with the process of accumulating the primary data both direct observation and interviews.

The analysis of the Interpretative Phenomenological Analysis began with compiling a set of descriptive comments on the interview transcripts. The main purpose of the descriptive comments is to describe the content of data. Furthermore, there are three keys to making descriptive comments such as descriptions, explanations, and emotional responses. The comment functions were arranged within Microsoft Word to make these descriptive comments. (Cooper et al. 2012).

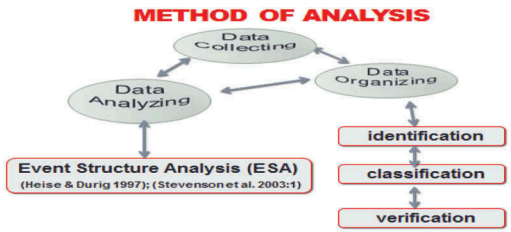


Figure 1. Three collaborative steps in qualitative research (Merriam 2002).

The results showed students' perception of their experiences and knowledge dealing with related to the empowerment of Edu-Techno. The finding is the results of the Interpretative Phenomenological Analysis process and the reflection on the focus of phenomenology – the real experience and meaning of a particular phenomenon. Research results were categorized into four: environmental characteristics, undergraduate students' behaviors, undergraduate students' attitudes towards the Edu-techno, and undergraduates' perceptions in Edu-techno empowerment. The semi-structured interviews covered 10 questions for all categories (See Figure 2). The focus of phenomenology was on the common elements of a phenomenon, rather than on the individual and when presenting excerpts from the interview transcripts. The participants' names were not included but they were the only abbreviation, such as FS1 (the female student 1), MS2 (the male student 2), and so forth.

When they were asked about the environmental characteristics of living among the millennial group in Industrial Revolution point 4.0, only a small number of students answered that it was necessary to keep good traditions for the future. However, the researchers also found that nearly all participants were interested in using modern technology in education.

"The transformation the society from modern to modern high technology triggered us to be literate in technology" (MS 1)

"We were very happy to communicate with our classmates or lecturers, mainly by using social media" (FS 10)

"Cheer up! Just follow it or we would be alienated from the relationship" (FS 7)

It indicated that learning Edu-Techno through Easy-Learning Group of WhatsApp includes experiencing a variety of feelings, both negative and positive. Some students appeared to feel confused when exposed to a new digital revolution both in the form of Edu-Techno and Easy-Learning Group of WhatsApp. Fortunately, most students were excited about a new teaching method that integrates the use of technology. Technology has great influences on the pattern of teaching. Furthermore, the use of social media among undergraduate students has become a way of life and personal activities are made public (Edge 2017). Social media does not take much of students' attention away from their schoolwork. It can facilitate them to communicate with other students in a more meaningful way (Davis 2018).



Figure 2. Semi-structured interviews in phenomenological qualitative research.

3.2 Category 2: Undergraduate students' behaviors toward easy-learning group as edu-techno in WhatsApp

The use of technology in teaching is in great demand nowadays. Social media for students as a dominant means of learning can be used to create and share knowledge. The use of technology in the form of Easy-Learning Group as Edu-Techno in WhatsApp facilitates rapid information sharing among social media users in the forms of status updates, information sharing, and up to date announcements. In the semi-structured interviews, students expressed their experiences in using Easy-Learning Group as follows:

"The Easy-Learning Group" actually helped us as a member of this group. Moreover, it contains much information dealing with our learning in the university" (FS 2)

"Social media made us more effective and efficient in time" (FS 13)

"Some files such as teaching materials, e-books, assignments, and any information relating to English teaching in WhatsApp group, were easily gotten" (FS 8)

Most undergraduate students felt optimistic that the Easy-Learning Group as Edu-Techno in WhatsApp would give them a positive effect. They showed positive behavior, moreover, there were not reluctant again to attend the course in the class. This research showed that the Easy-Learning Group as Edu-Techno in WhatsApp was experienced and understood as a way to build connections. Students were more active in discussions with their colleagues. It means that if modern technology is wisely utilized, users would obtain benefits in the form of collaborative learning for students (Chen et al. 2016). The use of social media in the classroom was not meant to be definitive, but it was comprehensive. It covered everything from teaching material and method of teaching (Poore 2015).

3.3 Category 3: The undergraduate students' attitudes in using modern technology in the class

By using Easy-Learning Group as Edu-Techno in WhatsApp, the students were required to keep updated with the latest information. They could download learning materials quickly from their gadgets.

"Easy-Learning Group required active learning. It is a process that we could not learn unless you actually did it. Once we did it, we kind of felt we had a better understanding of how Easy-Learning Group as Edu-Techno in WhatsApp was used" (FS 6)

"It is a good idea for improving our learning. It also triggered us to be critical thinking and had positive impacts on our styles of learning." (MS 5)

"Modern technology in teaching influenced my mind to be critical thinking and it had positive impacts for my style learning" (FS 4)

"I found that all I really wanted was to learn social media and to get experiences in using the tool of application as much technology expert as possible. That was it. So I declared a double major" (MS 9).

"I came to the class to learn and discuss with my peers" (FS 15)

The undergraduate students in this study found Edu-Techno through Easy-Learning Group was emotional, and they were also engaged in active learning. All participants noted that learning using Edu-Techno facilitated experiential learning. They also expressed the fact that learning through Edu-Techno by using WhatsApp group improved their initiatives in the learning process (Eynon & Grant 2017).

3.4 Category 4: Perception and suggestion for the empowerment of easy learning group

The undergraduate students perceived that several activities should be added to Fun-Easily Learning Group on WhatsApp. Three undergraduate students suggested that the group should be well-controlled in terms of learning materials and the discussion. Furthermore,

another suggestion relates to the necessity to make the group more meaningful by having routine discussions and followed by summaries.

“By doing the empowerment Edu-Techno, I was able to grow from that in terms of my intellectual knowledge and conducting actual technology application” (FS 17)

“It opened a lot of doors; I thought about things much” (FS 20)

“It was time to change our mindset, turning around to the new era of digital technology” (MS 11)

“In the millennial era, literate technology was better than illiterate ones” (FS 19)

“The assessment was greatly needed to know on how we understood the running of the program (MS 16)

The participants found what they learned in the platform related well to their prior activities and experiences which is one of the characteristics of phenomenological research. They supported the use of this learning platform and believed that this platform should be maintained and developed for future learning strategies for having great effectiveness and efficiency. They also could assess by themselves based on their own experiences in using technology (Scott et al. 1997).

4 CONCLUSION

The results of the research indicated that students made their learning experience more meaningful using the Edu-Techno with Fun-Easy Learning Group on WhatsApp as they could relate their learning to their prior knowledge and experience. Also, these research results suggested that they tend to make sense of their experience by relating what they were learning with prior education in social media and their personal experiences. Such experiences helped them to interpret and make meaning of their learning experience. In this case, students' perception was affected by their unforgettable experience, the spirit for the new era, and their educational background. Moreover, concerning the Industrial Revolution 4.0, the use of technology must be utilized most effectively. Edu-Techno empowerment is one of the apt solutions to enhance the engagement and efficiency of learning processes. In this context, the Fun-Easy Learning Group through WhatsApp is one of technology which can be empowered as an educational platform or called as Edu-Techno. The empowerment of Edu-Techno obtained participants' enthusiasm and positive attitude in learning. Several suggestions were proposed for lecturers who expect to use Edu-Techno in their teaching models. Lecturers are recommended to use other technology apps in the teaching-learning process that match their students' cultural backgrounds.

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Perception and expectation of university students as generation z: A qualitative study about learning scenario

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ABSTRACT: This study aimed to investigate the students' perceptions and expectations on the ideal learning design for the Z generation. This was qualitative research that collected data to answer various research questions. Forty-five students in Banten, Indonesia, were interviewed to collect the data, which were analyzed using content analysis, as proposed by Miles & Huberman. The findings showed that students (1) had specific learning characteristics, (2) expected specific learning scenarios that met their characteristics, and (3) required the support from the university to achieve the expected learning condition.

1 INTRODUCTION

In the context of learning, the Z generation is a generation that does not like conventional class systems. In other words, they prefer the learning process that is packed with entertainment (Gargi & Maitri 2015). They are also interested in web-based learning; and the mastery of various technologies such as blogging, podcast, cloud computing, open-source software, and social media (Rawal & Pandey 2013). Therefore, it is important for lecturers and higher education institutions to take into account the specific characteristics of this generation.

Research on generation Z has been previously addressed to lecturers, campus managers, administrators, counselors, and parents (Trevino 2018, Cohen 2016, Gargi & Maitri 2015). Some quantitative studies were aimed at students learning using certain product of technology, such as e-books, echo360 platforms, and Facebook group applications (Linnes & Metcalf 2017, Persada et al. 2019, Gottipati & Shankaraman 2017). With this condition, there was a gap in previous research studies that focused more on the perceptions and attitudes of lecturers, teachers, counselors, and campus officials (Yasar 2019). Since students are active members of the class, their actions and perceptions also play an essential role in shaping the classroom context. Therefore, educators need to understand student education theories (Cothran et al. 2003).

Currently, there is a demand to improve the quality of higher education institutions, one of which is improving the quality of learning. This can be achieved by involving students as one of the main elements in universities when designing learning scenarios. It will help lecturers modify their teaching design in the context of higher education. In this situation, the authors was interested in analyzing the learning process from the students' perspective in achieving the expected learning goals. Three specific questions were formulated to guide this study, namely:

(1) What are the characteristics of generation Z that become weaknesses and strengths?, (2) What kind of learning scenario do the youths as the Z generation prefer?, and (3) What support do they expect from campus to assist the learning process?

2 RESEARCH METHODOLOGY

2.1 Research design and participants

Based on the purpose of this study, qualitative research was considered to be the right method to use. Qualitative approach is a method that emphasizes research to examine the intricate details of a subject, test the relationship between social events, cultural phenomena & society through life, experience, behavior, perspective, point of view, emotions, and feelings (Creswell 2007). The participants in this study were 45 students from 4 faculties at Islamic State University of Sultan Maulana Hasanuddin, Banten, Indonesia. The relatively small number of participants was aimed to obtain in-depth information from each participant. If there are too many participants, the results of the study tend to lead to a surface perspective only (Creswell 2005).

Table 1. Participants' demographic information.

Variables		N
Gender	Female	32
	Male	13
	Total	45
Faculties	Economics & Bussiness	16
	Tarbiyah & Teachers Training	12
	Syariah	11
	Adab	6
	Total	45

In this qualitative study, four criteria were employed as the bases for selecting the participants. These criteria were the participants should (1) be born in 1998 and above, (2) currently be in semester III or higher with a GPA above 3.50, (3) have social media accounts, at least for Instagram and Facebook, and (4) be actively engaged in various student activities and scientific activities. This participant retrieval is referred to as a sampling technique with a specific purpose (Teddlie & Yu 2007). The goal of a purposive sampling strategy is to select information-rich cases to be able to explain the questions in research (Ubah & Bansilal 2018).

2.2 Data collection instruments & procedure for analysis

In this study, the data collection was carried out using semi-structured interviews. The use of this instrument is considered potential to explore personal experiences in-depth and allow researchers to add questions to the process of clarification and elaboration (Guthrie 2019). Questions in this interview were addressed to examine participants' individual learning experiences and learning expectations. Furthermore, to obtain validity and reliability on these questions, the researcher asked two experts in education and qualitative research experts to correct and provide suggestions (Semin 2019). Furthermore, a pilot study was conducted on five students who were not in this study group to find out if the questions in the interview were clear enough.

All participants who met the requirements were informed about the details of the study and then they were asked to give written consent. Interviews were conducted in Bahasa Indonesia and face to face with duration of about 60 minutes for each participant. All conversations were recorded using a digital recording device with the consent of the participants, and then the data was transcribed verbatim by the researcher (Josilowski 2019). Interviews were conducted in a particular room to reduce interference during the interview process (Lee et al. 2019).

The data that were generated from participants' answers were collected into a database, and then were analyzed using content analysis techniques that are often used in qualitative research (Miles & Huberman 1994). The purpose of choosing content analysis techniques is to get concepts and associations that can explain the data (Yildiz & Gizir 2018). This content analysis consists of three stages, namely forming codes, grouping codes based on similarity, and data abstraction (Elo & Kyngas 2008).

In validating the findings, researchers conducted the stages of member checking and peer review. Member checking can also be interpreted as a focus group discussion activity involving participants and researchers (Carlson 2010). Furthermore, peer review is the process of checking and examining the findings of research conducted by other members of the research team or colleagues (Ragone et al. 2011).

3 RESEARCH RESULTS

3.1 General characteristics of Z generation

In the interview, the participants were asked about their characteristics as members of the Z generation. Their answers were grouped into two major categories, namely positive and negative characteristics of generation Z. The results were described as follows.

Table 2. The positive characteristics of generation Z.

No	Positive characteristic	Example of statement
1.	Multitasking	P021- <i>"I am among those who can do more than one job at almost the same time."</i>
2.	Confident	P002- <i>"I am an individual who is confident in my abilities."</i>
3.	Tolerant & open-minded	P012- <i>"For me, differences in religion, ethnicity, and color are not a serious problem in making friends because, for me, the difference is beauty."</i>
4.	Optimistic	P004- <i>"I am convinced that every problem has a solution."</i>
5.	Adaptive to technological developments	P007- <i>"I feel that my strengths are the ability to understand and use IT more."</i>

Table 3. The negative characteristics of generation Z.

No	Negative characteristic	Example of statement
1.	Introvert	P006- <i>"I am a closed and introverted person."</i>
2.	Quiter	P036- <i>"I often feel frustrated if expectations are not achieved and tend not to be confident unless with their group."</i>
3.	Being dependent on gadgets	P044- <i>"I find it difficult and feel that something is missing if a day I do not use a smartphone or am in an area that is not reachable by signals."</i>
4.	Unable to manage time	P011- <i>"I spend more time playing online games."</i>
5.	Less socializing in the real world	P027- <i>"I feel more comfortable communicating through social media than talking directly with someone."</i>

3.2 Expected learning scenario

Besides the information about the characteristics of Z generation, this study also sought to explore information related to the learning scenario expected by participants. It comprised of some features, such as attractive learning, the use of technology, social media usage, audio visual-based learning, and flexible class. The data were described in the following table.

Table 4. Expected learning scenario.

No	Learning scenario	Participants' expectation
1.	Attractive learning	P042- <i>"I don't like the style of teaching of lecturers who are just lecturing, sitting in chairs, then giving assignments. This style for me is very old-fashioned."</i>
2.	The use of technology	P019- <i>"The learning process should use technology and the internet to create class forums for attendance activities, college assignments, quizzes or tests, and downloading course material."</i>
3.	Social media usage	P005- <i>"I think it would be even better if the class use some social media for learning certain appropriate material."</i>
4.	Audio visual-based learning	P037- <i>"The learning process must prioritize the audio-visual method."</i>
5.	Flexible class	P011- <i>"Meetings in courses should be flexible. That is, meetings are not always face-to-face in class. Now and then, it is necessary to use a video conference model or internet-based assignment."</i>

3.3 Expected university support

The participants were also asked to give information about the campus facilities to assist the expected learning scenario. The expected support was described as follows.

Table 5. Expected university support.

No	University support	Example of statement
1.	Physical and non-physical development of the campus	P010- <i>"The campus environment should balance the physical development (building) with infrastructure development related to improving the quality of IT in the campus environment."</i>
2.	Online-based services	P041- <i>"In my opinion, the campus should have shifted entirely to online-based services. For example, the signature of faculty and study program officials should no longer use the manual system."</i>
3.	Excellent educational services	P005- <i>"The campus should provide satisfactory academic services to students."</i>

4 DISCUSSION

The findings indicated that the participants had positive and negative characteristics. Some personal characteristics regarded as positive characteristics comprised of multitasking, confident, tolerant and open minded, optimistic, and adaptive to changes in technology. This was in line with Smith-Trudeau's statement (2016), which argues that in the field of teaching and learning, the Z generation had the following characteristics: namely they (1) are digital integrators, (2) have entrepreneurial spirits, (3) are close to family, (4) are confident and open-minded, (5) prioritize honesty, (6) are more diverse, (7) want feedback as soon as possible, and (8) prefer personal communication to teachers.

In addition, Z generation had negative characteristics. The majority of participants mentioned that they were introvert, quitter, dependent on gadgets, unable to manage time and less socializing in the real world. Moreover, they loved to interact more through cyberspace, and tended to have difficulty filtering information obtained. A study stated that 83% of Z generation students were overwhelmed by the amount of data in the internet, and 60% said that they were not proficient in assessing the quality of information obtained (Purcell et al. 2012). In similar vein, Moore, Jones, & Frazier (2017) revealed that the Z generation had access to various sources of information. Still, they needed assistance on how to process that information.

Another interesting phenomenon found in this study was that the participants preferred learning with the use of information and communication technology. Nearly 90% of participants stated that learning using technological tools could increase their motivation to learn. Thus, lecturers and campus administrators must consider the need to explore and understand the elements of technology, social media, and social networks in the learning process for the Z generation (Cilliers 2017).

Moreover, they preferred to learn in groups. It was undoubtedly very different from the previous generation, who tended to like learning by applying a system of rivalry. As the Z generation, participants felt more open, comfortable, and easy to express their opinions or ideas when together with their peers. This was supported by Zimmer cited by Fisher (2018) which showed that 80% of the Z generation wanted a learning process with their friends, and 80% of students stated that learning by using online videos was very helpful in classroom learning.

Related to the university support, most of the participants stated that there were still many lecturers who used less attractive, conventional methods in teaching in classroom, such as lecturing, giving many assignments, and others. The majority of lecturers from the X and Y generations had different characteristics from this Z generation. In other words, college learning is currently prolonged to change, so there is a considerable gap between the two ages (Swanzen, 2018). Prensky as cited Jones & Shao (2011) argued that the difference between lecturers as digital immigrants and students as digital natives became the single biggest problem facing the world of education today because the characteristics and preferences of students at this time was very incompatible with the teaching method of the lecturers.

The results of this study indicated the participants expected their campus to switch its service, such as new student registration services, library access, the Study Plan (KRS), and Study Result (KHS) form filling to electronic systems and no longer used semi-electronic methods. Construction of campus building facilities was considered essential, but this should not be the main focus of development at this time. Rickes (2016) said that the current paradigm of higher education has shifted to the focus of the curriculum, the choice of programs that are in line with student talent, and the improvement of technology skills. Furthermore, Jaleniauskiene & Juceviciene (2015) added that interpreting the term modern campus should not be in a narrow perspective, which is only emphasized in the aspect of formal learning. In other words, non-classroom education must also be designed by considering flexibility factors, in terms of time, place and learning space.

5 CONCLUSION

The presence of the Z generation in the Indonesian campus still has not received serious attention. Many campuses and lecturers treat the Z generation the same as previous generations. Participants as Z generation hoped that learning design on campus should be based on their needs and expectations. This research at least contributed insight and information to lecturers and universities about the importance of understanding generation Z in designing learning scenarios.

The research article had two main conclusions: (1) the need for changes in the learning process in the classroom and (2) the need for support from the campus and the lecturers in creating learning that is in line with generation Z. The Campus must immediately adapt to this generation, so later it will produce graduates who have skills in the 21st century. One thing to consider is that the learning patterns for the Z generation were different from the ones for the previous generation.

6 LIMITATIONS

It was admitted that the study had the limitations on the relatively small samples, which caused a lack of representation. However, qualitative research does not aim to make generalizations for larger groups of research subjects. That is, choices using a qualitative approach are driven by conceptual questions and not by concerns for representativeness (Miles & Huberman, 1994). The results of this study cannot yet be used as full guidelines for making radical changes in learning on campus. There is a need for further studies on ideal learning scenarios for generation Z of lecturers, education experts, and campus officials. However, the findings can be used as a starting point for every lecturer to change his teaching style following the expectations and needs of students as the Z generation.

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Participation in building human resources: Independent strategies for facing a demographic expansion in a remote island

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ABSTRACT: This research was conducted to examine the strategies of residents in Sapeken (a remote island) in facing a demographic expansion, especially in terms of human resource development in improving the competitiveness of fishing communities. This study used the descriptive-qualitative method by collecting data through in-depth interviews and observation, as well as data tracking online and offline. This research used Arnstein participatory theory. It was found that the population density on this island exceeded the average population in large cities. Beside working as fishermen, many people maintain economic independence by becoming small and medium-level traders, especially home-based businesses. The incomes of the residents are used to contribute to the success of the implementation of education, both in the personal context to finance the education of families, and to provide charity to religious and public education institutions. Thus, education is the main factor in dealing with the demographic expansion. In the future, having faster leverage and stronger, and more intense synergy is needed among civil society, with the assistance of universities and local governments in accelerating the development of human resources. Community participation is at the level of a partnership, including in the degree of citizen power.

1 INTRODUCTION

Countries worldwide are currently facing problems with high population levels in each state. Indonesia ranks as the fourth largest population in the world, after China, India, and the United States. According to the US Department of Commerce Census Bureau data for 2014, China ranked first with a population of 1,355 billion followed by India, which has a population almost the same as China with 1.236 billion, followed by the United States with a population of 318,892 million, while Indonesia ranked fourth with a population of 253.60 million (Purnomo 2014).

Japan and Korea are two countries whose populations, especially the elderly populations, have grown faster compared to other countries in Asia. Likewise, in Singapore, the elderly population, in particular, has experienced a relatively rapid growth rate (Banister et al. 2010; Park et al. 2012; Peterson 2017). Interestingly, the three countries have made anticipatory efforts to resolve the rate of population growth, especially among the elderly population (Chawla et al. 2007, United Nations 2007; Heryanah 2015; Goodhart & Pradhan 2017,).

Indonesia is estimated to be at the peak of the first wave of a demographic expansion in 2017 until 2019 (Oberman et al. 2012; Hayes & Setyonaluri 2015; Ginting et al. 2018), while the second wave of demographic expansion will take place in 2020 until 2030. In those years, the population of people of a productive age (age 15–64 years) will be at the maximum level compared to the nonproductive ages, namely the age of 0–14 years, and aged 65 years and over. This can also be interpreted as the increasing number of potential workers who can improve the Indonesian economy (Jati 2015).

The Director of the Population Control Policy Integration-BKKBN (*Badan Koordinasi Keluarga Berencana Nasional* or Population and Family Planning Board) states that the demographic expansion does not automatically increase Indonesian economy and the welfare of its citizens. It requires adequate human resource requirements, high competence of the citizens, competitive levels of education and skills, and other things that support the economy such as the availability of jobs (Adib 2016).

The education factor and the quality of human resources that Sunarto considers as the requirements for facing the demographic expansion are justified by the Minister of Education and Culture of Indonesia, Mr. Anies Baswedan. According to Mr. Anies, education in Indonesia is still in a bad position, as evident by indicators such as the low quality of education, the low level of education services, as well as the low quality of higher education and low literacy level of students. Naturally, this will have a direct impact on the graduates of primary and higher education produced (Widodo 2016).

The dilemmas faced by the Indonesian people also occur in the archipelago. With abundant demographic conditions and poorly distributed development in the country, there are many Indonesians who are not as fortunate as those who live in Java or other cities and cannot afford a good quality of education. People in the archipelago who work as fishermen are synonymous with underdevelopment in the field of education. The residents on Saur Island and Saibus Island, Sumenep, live in poverty. The poverty experienced by the islands' communities causes them not to take much care of their children's education (Rahman 2018). Many islanders spend their time in the sea crossing the island to work and find fish. So, in general, there is a minimal amount of interaction with the field of education. As a result, their children's education is left to the educational institutions, whether formal or Islamic schools (Nurwidodo et al. 2017; Subardjan 2017).

The fishermen inhabit Sapeken Island at the Sapeken Subdistrict, one of 127 islands in Sumenep Regency, East Java, which has a large and dense population. The population of the island, which covers only 5 square kilometers, is 8,900. The population density of the island is very high, even exceeding the population density of other large cities in Indonesia such as Jakarta, Bandung, and Surabaya. Despite having a large population, Sapeken Island is categorized as a metro island (Suprajaka et al. 2012). Prior to this study, research on demographic expansion had already been conducted by other researchers, including Putro (2016), who described the education of immigrants in Papua with educational capital that was more than the local population changing conditions the economy of the local community.

This study used the perspective of participatory theory of Sherry R. Arnstein (Arnstein 1969). Arnstein (1969) formulated community participation as a form of citizen participation that is citizen power, in which there was a division of forces that allowed the have-not citizens who are now excluded from the political and economic process to be involved later. Community participation can be divided into eight levels. From highest to lowest, these are: (1) Citizen control: the community can participate in the system and control the entire decision-making process. The community has the power to regulate programs or institutions related to its interests. (2) Delegated power: the community is given an abundance of authority to make decisions on certain plans. To solve the problem, the government must negotiate with the people, without pressure from above. (3) Partnership: the community has the right to negotiate with the government, based on mutual agreement of power/responsibility shared between the community and the government. (4) Placation: the government needs to appoint a number of affected people to become members of a public body, who have certain access to the decision-making process. Even though in the implementation the community's proposal is still being taken into consideration, because the position is relatively low and the number is less than the members of the government, it is not possible to make decisions. (5) Consultation: the public is not only notified but also invited to share opinions, although there is no guarantee that the opinions expressed will be taken into consideration in decision making. (6) Informing: the power holder provides only information to the community related to the activity proposal and the community is not empowered to influence the results. Information can be in the form of rights, responsibilities, and choices, but there is no feedback or power for negotiations from the public. (7) The therapy-holder gives the reason for the proposal by

pretending to involve the community. Although involved in activities, the aim is to change the mindset of the community rather than getting input from the community itself. (8) Manipulation: people are only used by name. Activities are used to manipulate information to gain public support and promise better conditions even though this will never happen. From the typology proposed by Arnstein, community participation is classified into three large groups, namely (1) nonparticipation, which includes manipulation and therapy; (2) community participation in the form of receiving several provisions (degrees of tokenism), including informing, consultation, and placation; and (3) community participation in the form of the degrees of citizen power, including partnership, delegated power, and citizen power.

In the perspective of community participation in the development of human resources in Indonesia, several studies have been conducted in relation to participation in education (Chusnah 2008; Nurjanah 2018; Ittihad 2019) and community participation in village development planning (Asjhari 2013; Ikbal & Jabbar 2019). However, research on community participation to deal with the demographic expansion, especially in the remote areas, is still very rare. This issue serves as the basis of the significance of this research. This research is the first in assessing community participation in remote areas in dealing with the demographic expansion through human resource development. Because of this specificity, this study may serve as a reference for future researchers and is indeed expected to pave the way for research related to the theme. This research was conducted to find out the answers to the following questions: How do residents in a remote island such as Sapeken carry out the strategies in dealing the demographic expansion amid the lack of government attention and available human resources? What are the results of the strategies in improving the quality of island human resources?

2 METHOD

This research used a qualitative descriptive method, with a single case study on Sapeken Island, Sumenep Regency, East Java, where the population density was above the average of major cities in Indonesia, as well as other islands in the Indonesian archipelago. The research focused on the strategies carried out by residents on the small island of Sapeken, Sumenep, East Java Province, in dealing with the demographic expansion. The theory used in this research was the Arnstein participatory theory (Arnstein 1969). This study collected data by conducting in-depth interviews with a number of informants on Sapeken Island, ranging from parents, community leaders, government officials, activists, educators, and students to scholars who successfully entered the workforce. In addition to in-depth interviews, data collection was also done by direct observation of the activities of the citizens from the economic sector, starting from markets, shops, educational institutions, schools, boarding schools, and others.

3 RESULTS AND DISCUSSION

Sapeken Island is a region of Sapeken Village, Sapeken Subdistrict, Sumenep Regency, East Java Province that has an area of 5.27 square kilometers, consisting of 11 hamlets, 12 RW (community units), and 51 RT (neighborhood units), which are inhabited by the Bajo people as the majority, some people of Mandar and Madura, and some traders from Java, of which the majority are Muslim, with religious organizations such as *Persatuan Islam* (Persis), *Nahdlatul Ulama* (NU), and *Muhammadiyah*. The number of residents of Sapeken Island is 8,894, with 2,523 family heads.¹ On average, residents of Sapeken Island work daily as fishermen and traders, with a small portion being civil servants (*Aparatur Sipil Negara*/ASN). Judging

1. Interview with Mr Anwar Sadat, Head of Sapeken Village, in his office, May 1, 2018

from the island's size and population, the island of Sapeken is fairly dense, as the total island area of 5,000 square meters is occupied by almost 8,900 inhabitants.²

In the economic sector, the population of Sapeken Island is independent. Instead of relying on government assistance, the islanders work as fishermen. This can be seen from the composition of the population who on average work as fishermen. Fishermen on this island are grouper and lobster fishermen or catch other fishes that have high economic value. In terms of income, the average fishermen earn IDR 2 million to IDR 3 million per month, while the cost of living ranges from an average of IDR 1 million to IDR 1.5 million. This means that every family has the opportunity to save IDR 500,000 to IDR 1 million.³

Besides being a fisherman, more than 30% of families own their own businesses in the form of kiosks or small shops. At least 800 families have businesses ranging from small, medium, to large scale. Turnover per day of small traders on Sapeken Island is around IDR 400,000 to IDR 500,000, while traders in the middle category earn around IDR 3 million to IDR 5 million. The turnover of traders in the large category ranges from around IDR 10 million to IDR 20 million. Those categorized as small businesses are kiosks and grocery stores that are usually integrated into houses. In addition, there are snack, drink, and food vendors who sell their products in food stalls. Medium-sized businesses are businesses in the form of stand-alone shops and are located in markets, docks, and economic centers of the island; they sell clothing, electronics, fuel, fish/ice, and others. Meanwhile, the large traders are involved in fish cage businesses, distribution of fuel oil, and large stores.⁴

The mobility of the residents of Sapeken Island is quite high compared to that in major cities in Java and Bali. This mobility occurs along with the abundance of marine products, in the form of lobsters and fish sent to Java and Bali both in live, frozen, and dry forms. Every day there can be two or three ships belonging to fish entrepreneurs who leave for Bali and Java to send fish catches produced by local fishermen. In Bali, the commonly used ports are Sangsit, Singaraja, and Tanjung Benoa. Besides Bali, Java and Madura are also destinations that are often visited by residents of Sapeken Island for business and other purposes. Banyuwangi and Panarukan, as well as Kalianget Port in the Sumenep Regency of Madura, are locations that are usually visited by Sapeken fishing boats.⁵

The activities and lives of residents on Sapeken Island resemble those in the typical cities, especially during the day. In the morning, together with students going to school, fishermen also come with boats carrying fish in warehouses and fish buying centers, while a little late in the day, residents from various islands come to Sapeken Island for various purposes, such as business and government affairs. They then return to their respective islands in the afternoon. In the afternoon, fishermen are busy with various preparations to go into the sea. Because of the hustle and bustle of the economic activities of the residents, some often dub Sapeken Island as Little Surabaya.⁶

Variations in the fish species that are caught by the Sapeken Island fishermen have boosted their income. There are various types of fish that have a high economic value such as groupers and the like, as well as lobsters. The type of grouper fish caught by the fishermen costs from IDR100,000 to IDR 1 million, alive. If it is frozen, the price can be lower, but it is still more expensive than the price of fly fish and cob. The lowest price of frozen fish is IDR 50 thousand and the most expensive IDR 100,000 per kilogram. Apart from grouper fish and lobsters, the sea products that are usually sold by fishermen are sea cucumbers. The selling price of sea

2. Interview with Mr H. Nursalim, a staff of Civil Registration and Population Office in Sapeken District, May 2, 2018.

3. Interview with Mr Nining, a grouper fisherman, in his house at Kampung Mandar Sapeken District, May 3, 2018.

4. Interview with Mrs Nurul Supiati, fuel traders, in her store, May 3, 2018.

5. Interview with Mr Wawang, the owner of primary food carrier, in his house, May 3, 2018.

6. Interview with Mr KH. Ad-Dailamy Abu Hurairah, public figure in Sapeken District, in his house, May 4, 2018.

cucumber fishermen is quite promising, starting from the cheapest of IDR 60,000 to the most expensive of IDR 200,000.⁷

The level of participation of residents in Sapeken Island in the education sector is quite high. This can be seen from the efforts of oncor and other fishermen who always set aside a portion of their proceeds for educational institutions where their children are schooled. As stated by Mr Jailani, "At the end of the oncor fish season, a small part of our income is donated to the construction of *pesantren* facilities." This was confirmed by H. Nasir, a fish entrepreneur who is also the coordinator of the construction of the facilities for *pesantren* or Islamic boarding schools. "It is a habit for fishermen to voluntarily hand over some of their earnings to us to be coordinated and used for to build school facilities. On the other hand, other fishermen who specialize in grouper and lobster cultivation do charity activities in the education sector with their initiative to contribute directly to those in need. "We directly contribute based on the needs. If someone needs help constructing a physical building, we donate the materials, but if they need money, we can offer them funding through the management," Ilham, a grouper fisherman explained.⁸

The level of citizen participation in the world of education has an impact on the growing number of educational institutions on Sapeken Island, both in quantity and quality. There are a total of 27 educational institutions and schools on Sapeken Island including 9 kindergartens, 9 elementary schools, 5 junior high schools and equivalents, and 4 senior high schools (Hidayaturrahman 2018).

The spirit of independence in the education sector is also taught by administrators and teachers who are active in various educational institutions in Sapeken. One of them is delivered by H. Nur Asyur, who is one of the teachers at the Islamic Boarding School of Abu Hurairah Sapeken. "In boarding schools, we always put the emphasis on independence, especially in regard to the daily needs among students, like eating, washing and others."⁹

Because of the spirit and independence that are instilled in their educational institutions, high school or Islamic high school (*Madrasah Aliyah*) alumni in Sapeken pursue higher education in bigger cities. However, their financial limitations cause many of them to live in mosques or college dormitories as administrators and in other capacities. This is experienced by Sudarman, one of the *pesantren* (Islamic boarding school) alumni who has now become Dean at the State Islamic University of Imam Bonjol in Padang, West Sumatera. Sudarman admitted that after graduating from *pesantren*, he went to Padang to go to college, and during his studies, he lived at the campus mosque. "I have a great determination to earn my degree, but as I didn't have enough money, I used to live in the campus mosque."¹⁰

The strength of determination and the spirit of independence of the youth of Sapeken Island got them through university education and made them successful in various fields and professions, including (1) Khairul Faisal, currently a journalist for the Jawa Pos (Jakarta office); (2) Rahmatul Ummah, a book editor and writer in Lampung; (3) Usman Adhim, a catering or culinary business-owner in Malang, East Java; (4) Syamsul Bahri, the organizer of the *Dewan Dakwah Islamiyah Indonesia* (DDII); (5) Taufiqurrahman, a *rawatib imam* at Ancol Mosque, North Jakarta; and (6) Busri Abdullah, a caretaker of Islamic boarding schools in Ciputat, South Tangerang, as well as many others.

According to Malthus et al. (1960), high population density or overpopulation affects many aspects of life in addition to food problems, to the extent that it results in discomfort and social tension. Another issue that is most obvious due to overpopulation is the occurrence of environmental impacts, in the form of natural damage, weakening indigenous culture, and traditional arts. This also spurred the enthusiasm of the younger generation who had

7. Interview with Mrs Musfirah, a fish collector and sea cucumbers, in her house, May 2, 2018.

8. Interview with Mr Ilham, a grouper fish businessman, in his house, June 3, 2018.

9. Interview with Mr H. Nur Asyur, a teacher in Abu Hurairah Islamic Boarding School, in his school, June 5, 2018.

10. Interview with Mr Sudarman, Vice Dean of Adab Faculty of UIN Imam Bonjol Padang-West Sumatera, in his campus, July 7, 2018.

graduated from senior high school and *madrasah aliyah* to go to major cities and settle in these cities after successfully becoming scholars. According to Diaurrahman, who chose to settle in Malang and teach at one of the vocational high schools, “It just feels more comfortable to live and work in Malang.”¹¹

Researching demographics issues cannot be separated from the existence of the first theories generated by experts. The use of theory in research is intended to direct the focus of the research conducted. Analyzing the strategy of developing human resources also cannot be separated from participatory theory. Generally, the citizens of the Sapeken Island have high participation in the issue of education.

According to Arnstein participatory theory, based on the data, community/resident participation is at the level of partnership, including in the degrees of citizen power. This is in line with several research findings that suggest that the tendency of the level of community participation in rural areas in Indonesia based on the typology of ladder of citizen participation is at the level of partnership participatory (Boy & Jamli 2009; Putri 2015; Abdurrahman et al. 2018). When public participation has reached citizen power, then the authorities really treat it in different ways. When they arrive at the Partnership level, they treat the public like co-workers. They work together in designing and implementing various public policies (Putri 2015). According to Sumaryadi (2010), participation means the involvement of a person or community group in the development process both in the form of statements and in the form of activities by giving input of thoughts, energy, time, expertise, and capital and/or material, and taking advantage of and enjoying development results.

Participation is the will to help the success of each program, according to the ability of each person without having to sacrifice their individual interests (Mubyarto 1997). Participation is intended as a continuous two-way communication process (Arimbi 1993). In other words, community participatory is communication between the government as the policymaker and the community as the counterpart who directly feels the impact of the policy (Laily 2015).

Participation is a catalyst for the development of human resources that can synergize with the government and society and universities. The spirit of participating in the community with its independence is a big motivation in accelerating the improvement of the quality of human resources. There is now a need for planning and designing in accordance with the needs and demands of the modern era. One aspect that is needed is the involvement of universities in directing the spirit of participation and independence of the island community in the field of education that is indeed demanded by the times to prevent the island community from being left behind. This is also an important part of civil society participation in enhancing development in remote islands.

Theories that emerge in demographic theory such as the “classical” theory of Thomas Robert Malthus look more at demographic problems in the economic approach and cannot fully describe the state of citizens’ participation and independence in facing the demographic expansion in remote islands. As Malthus noted, the main issue is how to meet the main necessities for daily life, such as food, rather than more complex problems that occur once people have had their basic necessities met. Whereas the development of the population is adjusted to a series of measures, the development of food is in accordance with arithmetic aspect (Todaro 2003).

Malthus was criticized; his thoughts were not fully accepted by other experts (Friedrichs 2014). Malthus is considered not to have taken into account the progress of transportation and advances in agricultural technology that enable the mobility of goods and food materials from one place to another, from places that are a source of food, and have a large supply of food ingredients, even transporting excess to areas with minimal food (Aragrande & Argenti 2001; Friedrichs 2014; Kiladze 2017) as well as advances in agricultural technology allow agricultural products produced in large quantities and multiples, so that it can be distributed to residents in need. According to Faqih (2010), the opposition to Malthus theory actually seeks

11. Interview with Mr Diaurrahman, a teacher in public vocational school in Malang City-East Java, in his school, July 10, 2018.

to understand that the problem of the population should not only be approached through an economic perspective but also in other ways, such as the social perspective. In this case, Malthus also fails to consider advances in science and technology as a factor.

Arsene Dumont, who followed socioeconomic trends, states that the development of the population stems from the socioeconomic situation of the community. According to Dumont, the issue of the world's population is not merely a matter of food but is also related to social issues in particular, as it could also be social problems that are also directly or indirectly related to the economy. With his theory of social capitalism, humans always want to achieve the highest position and status in society. To realize this, one tends to plan all the big events in one's family (Soeroso 2003).

A person's socioeconomic status can be seen from the stratification or social status. Several aspects that reflect the social status of the population or an individual are occupation, income, and education. The more prestigious one's job is, and the more one's income increases, the higher his social status (Kromydas, 2017; Manstead, 2018). This also applies to the level of education; the higher it is, the more directly proportional it is to social status (Nurqolby 2016).

Human resources will be the main determining factor in the process of growth and development. The demographic expansion that occurs in a country or region can be approached with the development of human resources, especially in the education and economic sectors (Peterson 2017; Agung et al. 2018). The two sectors are two sides of an interrelated coin that cannot be separated. A qualified education will break the chain of poverty and improve one's status because the economic level also increases, which will also be a way for someone to get a qualified education. Thus, the role of human resources for development, especially economic development, is huge. Without the development of human qualities, a country will not be able to achieve a high level of development. Moreover, demographic expansion will only be a disaster, not a blessing (Kasto 1995).

Development of independence through education for remote communities is also in line with the focus on human development, as proposed by Amartya Sen. According to Sen, human development is called capability; hence, Sen's theory is more likely to be called the capability theory (Deneulin & Shahani 2009; Robeyns 2016, 2017). In this theory, human development is more focused on how to build human abilities. Among the many ways to build skills or capabilities, the most basic is to build through education (Muljarijadi 2017).

4 CONCLUSION

Community research done in a remote island such as Sapeken Island is interesting because of the considerable economic potentials of the local residents to independently generate education in their area, thus ultimately create an independent and educated young generation. As fishermen, the local residents of the island show independence and eagerness to obtain a good education, from the basic to tertiary level. They allocate part of their income regularly from fishing for their children's education with the hope that the next generation can have a better living. Moreover, the fishermen are also willing to sacrifice their earnings to donate to educational institutions on their island, whether religious or public schools. Nevertheless, in the future, the island community should not be left alone. They need assistance from the government and universities, so that progress that addresses the development of the time can be realized quickly in a directed manner. According to Arnstein participatory theory, community participation is at the level of partnership, particularly the degree of citizen power.

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*Teacher education and professional development to promote teacher
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Chemical literacy profile of chemistry preservice teachers in teachers college

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ABSTRACT: The objective of this preliminary study was to obtain the chemical literacy profile of chemistry preservice teachers in Teachers College. A chemical literacy competency is important for every chemistry teacher and student, to easily understand, process, and apply chemistry knowledge to improve the quality of life. It was found that the participants' chemical literacy level was average, with a score of 59.38. The study also found that there were some misconceptions and difficulties in understanding chemistry concepts, so it was important for teachers to use a variety of teaching strategies, methods, and to integrate technology in the learning process. These findings can also be helpful in the process of developing assessments in order to develop chemical literacy and enhance teachers' content knowledge, pedagogical content knowledge, and technology skills specifically in the education in the Industry 4.0 era.

1 INTRODUCTION

The Program for International Student Assessment (PISA) is a study conducted to measure how far students have been prepared to encounter the challenges of modern knowledge-based society at the international level. It has become one of the references to assess the educational progress in many countries, including Indonesia. The focus of the assessment in PISA is in the areas of reading, mathematical, and scientific literacy (OECD 2016). In particular, it acts as an administrative evaluation in which the results will inform the educational progress of one country when it is compared to other participating countries. With the results of the study, each country can use the information in making policies and decisions related to education.

As one aspect of the PISA study, scientific literacy is defined as the ability to use scientific knowledge, identify questions, and draw conclusions based on evidence to understand and formulate decisions regarding nature and changes made to nature through human activities (OECD 2016). This definition shows scientific literacy as multidimensional knowledge, not just an understanding of scientific knowledge, but broader than that. An understanding of science and science-based technology is important for everyone, even those who do not have a career in science, but for society in making decisions on issues that are much debated. Examples of the required knowledge and applied science range from personal to local issues, such as handling of waste, to more global issues such as disaster mitigation and the impact of global warming (OECD 2016). In PISA 2006, scientific literacy was developed into four dimensions as competency or process of science, content knowledge of science, the context of applied science, and student attitudes toward science (OECD 2016).

As a part of applied science, chemical literacy is very important for everyone because it concerns all aspects of daily life. According to Glen (2010), studying chemistry will provide strong motivation for the development of technology that can make life better (Sujana et al. 2014). Mastering the chemical content knowledge and being able to apply the knowledge along with other skills may bring transformation in society. The society should be smart and ready for changes in this education 4.0 era. Data presented by PISA on students' scientific literacy

abilities in general illustrate how the curriculum is generally applied in schools. These data are important for the government and also for every teacher and education expert.

Teachers are responsible for providing knowledge and developing students' skills through formal education. Teachers as curriculum planners should create a framework for organizing, planning, and implementing the teaching through a program (Van Brummelen 2015). Teachers' teaching performance affects the students' learning process. In the learning process, the teacher has an important role that will have an effect on students' competency. Thus, teachers should be equipped to the best of their abilities. More and more competencies are required from a teacher, not only the 21st century skills but also the skills of building intelligent people and nations (Puncreobutr 2016).

Chemical literacy is very important for both teachers and students so that the chemistry content knowledge can be truly understood, processed, and applied in improving the quality of people's lives. Everyone is provided with the duty and responsibility to manage natural resources created and provided by God. To do so requires proper knowledge and skills, which will lead people to be responsible and care about the potential around them without having to sacrifice the universe (Pratt 2017). Many studies related to chemical literacy found that many students and preservice teachers already had the concept knowledge of chemistry but could not use and apply it in everyday life (Sofiyah 2015).

Chemical literacy refers to a person's ability to understand and apply knowledge of chemistry in everyday life (Shwartz et al. 2006a, 2006b. Shwartz (2006) and Rahayu (2017) asserted that chemical literacy included chemical content knowledge, chemistry in context, high-order thinking skills, and affective aspects.

This study was conducted to obtain a profile of chemical literacy of chemistry preservice teachers of Teachers College. This study provides relevant information on the action needed regarding the chemical literacy profile. Furthermore, information from this study can influence the approach, model, and strategy of lectures and the government policy (curriculum revision) at a higher level.

Thus, it is expected that through this study, preservice teachers will be mentally and intellectually prepared to teach chemistry in school and take part in developing the chemical literacy of each student.

2 METHOD

This research used a descriptive method research design with a quantitative approach in analyzing the data (Fraenkel et al. 2011). It was conducted from January to June 2019 and explored the chemical literacy of 24 sixth-semester chemistry preservice teachers of Teachers College. The instrument used in this study was a modified chemical literacy assessment adapted from Shwartz (2006).

The data obtained were analyzed using a quantitative and qualitative descriptive approach. Categories of chemical literacy levels in this study are shown in Table 1.

Table 1. Categories of chemical literacy level.	
Capability	Category
< 56	Low
56–75	Average
76–100	High

Source: Prastiwi et al. (2017).

3 RESULTS AND DISCUSSION

The data were collected by using chemical literacy assessments (modifying the chemical literacy test of Shwartz 2006). The questions and the answers were validated by chemistry experts who created five questions related to the fundamental concepts of chemistry such as the concept of atoms, molecules, chemical bonds, chemical reactions, enthalpy changes, and electrolysis. Nominal and functional chemical literacy was measured by using assessment of chemical content knowledge and assessment of applying the concepts in daily life. Chemical content knowledge was assessed in three different scores:

- Score 3: The explanation is entirely correct, precise, and accurate statement after statement.
- Score 2: The explanation is mostly correct; use of the term is correct but there is a false statement. Explanation is in the form of definitions without other explanations.
- Score 1: Wrong explanation.

The percentage of students’ answers to questions regarding understanding of chemical concepts is shown in Table 2.

As Table 2 reveals, most of the chemistry preservice teachers have sufficient understanding of atoms, molecules, chemical bonding, chemical reaction, and enthalpy changes. However, they mostly possessed an incorrect explanation of the electrolysis concept. To test the preservice teacher’ levels of nominal and functional chemical literacy, the researcher asked them about their understanding of chemistry concepts. Their answers showed that they were familiar with the concepts of atoms, molecules, chemical bonding, chemical reaction, and enthalpy changes, yet still gave incorrect explanations about the electrolysis concept.

Around 45.8% of preservice teachers incorrectly explained the electrolysis concept. For instance, one preservice teacher explained: “*Electrolysis is a reaction conducted to produce electricity by paying attention to the energy potential of each element that exists.*” This answer is wrong because the student explains another concept in the chemical reaction that produces electricity, which is the voltaic cell. The overall explanation shows the difficulties encountered by students in differentiating the concepts of electrolysis from voltaic cells. Some of the answers also showed misconceptions.

To measure the levels of chemical literacy, students were provided with a conceptual chemical literacy question. There were four contexts of daily life phenomena that involved chemistry concepts such as plastics/polymers, the use of soap, refrigerator working, and the use of MSG in food. Each question is given reading material regarding the application of chemistry concepts in everyday life and five statements as the explanation of the chemistry concept, with three choice options: *correct*, *wrong*, and *do not know*. Conceptual chemical literacy requires the preservice teachers to develop chemistry understanding contextually and be able to show the relation between the concepts and high-order thinking skills (Rahayu 2017).

Measurement of conceptual chemical literacy in the given context showed a high result in the context of the environmental effects of plastic, as shown in Table 3. The statement is given in the Indonesian language and is translated into English for publication.

As presented in Table 3, it is shown that most of the students’ answers are correct on the structure and characteristics of plastics/polymers, while some others are *wrong* and choose *do*

Table 2. Chemical concept understanding results.

Concept	% (scores 3)	% (scores 2)	% (scores 1)
Atoms	45.8	54.2	0.0
Molecules	41.7	58.3	0.0
Chemical bonding	66.7	33.3	0.0
Chemical reaction	58.3	37.5	4.2
Enthalpy changes	41.7	54.2	4.2
Electrolysis	16.7	37.5	45.8

Table 3. Preservice teachers' chemistry answers in the context of environment (plastics/polymers).

No.	Statement	Percentage		
		Correct	Wrong	Do not know
1	Plastic contains a carbon atom chain consisting of the same monomers forming a polymer.	83.3	16.7	-
2	Plastic is difficult to degrade because of the structure and nature of the carbon atom chain it has.	91.7	8.3	-
3	Polymers can be found naturally in animals and plants.	79.2	12.5	8.3
4	Each polymer-forming monomer in plastic is covalently bonded so that it is difficult to break.	83.3	12.5	4.2
5	Plastic is formed by a condensation and polymerization addition reaction.	54.2	20.8	25.0

not know for the chemical reaction part. It indicates that these preservice teachers did not fully understand the condensation and polymerization reaction. Contextually, this phenomenon is closely related to the students' lives. However, the answers showed a lack of understanding about the applied chemical reaction concept.

The lowest result is for the question of food context (using MSG in food). Table 4 shows that 44.2% of the students' answers were incorrect. Scientifically, incorrect statements are written in italics to differentiate from the correct statements.

The percentage of correct answers for statement 1 was about 62.5, as presented in Table 4. It indicated that most of the preservice teachers correctly understand that glutamic acid contained in MSG is not dangerous because it is important for human brain function. However, they do not fully understand the concept by assuming that consuming MSG is dangerous. The preservice teachers' answers outlined in Table 4 show that most of them do not understand the chemical reaction concept that occurs, which is a hydrolysis reaction.

The overall result indicates that their understanding of chemical reaction is poor. The percentage of students who answered *do not know* for all the statements in this question was also high. It also indicates that the preservice teachers have a very limited understanding of this concept, which makes them hesitate and choose *do not know*. The overall result of chemistry in the context assessment altogether is outlined in Table 5.

Table 5 shows that the level of chemical literacy of chemistry preservice teachers is in the average category (59.38).

Table 4. Preservice teachers' answers to chemistry in the context of food (MSG in food).

No.	Statement	Percentage		
		Correct	Wrong	Do not know
1	<i>Glutamate is an important neurotransmitter in the human brain that regulates memory and knowledge, so it is dangerous to consume it.</i>	29.2	62.5	8.3
2	MSG is very soluble in water but not hygroscopic.	50.0	29.2	20.8
3	MSG can be synthesized from natural ingredients such as sugar cane fermentation.	54.2	16.7	29.2
4	<i>Hydrolysis of MSG salts produces ions consisting of strong acids and strong bases.</i>	50.0	20.8	29.2
5	Glutamic acid, which is also contained in MSG, is not needed by the body because it can be produced by the body.	33.3	33.3	33.3

Table 5. Results of students' correct answers to chemistry in context.

Item questions	Context	% of correct answers
1	Household appliances (how the refrigerator works)	50.83
2	Health (soap)	64.17
3	Food (MSG in food)	44.17
4	Environment (plastic)	78.33
Average		59.38

Another problem identified that there were very limited numbers of students who explain the concept using symbolic and submicroscopic levels. Some students were considered to have a good understanding of the concept for defining a concept label, but there was no student providing a broader and deeper explanation of the concept (Shwartz 2006; Celik 2014). The student tended to define the concept rather than to explain it more deeply.

A survey was also conducted to identify what students expect from chemistry class. The result suggests balancing the macroscopic, submicroscopic, and symbolic representation of chemistry and to use more computer-based teaching material to help students visualize the concept. It becomes a challenge for lecturers or teachers to not only master the content knowledge and pedagogy, but also technology. Chemical technology literacy is now crucial as well.

The results of chemical literacy shown in Tables 2, 3, 4, and 5 indicate that the chemical literacy of preservice teachers can still be improved. The ability to choose the correct strategies for teaching chemical concepts also influences the understanding levels of the concepts. To help improve chemical literacy levels, teaching material needs to be well designed, and not only strategies developed but also literacy assessments (Sumarni et al. 2016) so that chemical literacy and higher-order thinking skills can improve. Conducting contextual chemistry teaching and learning will help promote chemical literacy and at the same time provide a real experience of how chemistry concepts can be used in the reality of everyone's life.

Therefore, this study shows that an understanding of the fundamental concepts of chemistry is needed to be able to provide solutions to many issues of daily life. The ability to solve problems is closely related to the mastery of chemical concepts obtained by students during lectures. It is importance to ensure that every chemical concept is understood and can be used appropriately to solve problems.

4 CONCLUSION AND RECOMMENDATIONS

In this study, the chemical literacy profile of preservice teachers was investigated. Regarding nominal and functional literacy, the preservice teachers were able to define and provide adequate understanding for most of the concepts. However, some participants still have misconceptions. Another result of chemical literacy regarding conceptual chemical literacy also shows that preservice teachers are able to understand and relate their chemistry understanding to daily issues. However, it also reveals that participants have a lower understanding of chemical reactions in given contexts.

Chemical literacy shows an understanding of chemistry content knowledge and how to apply the chemistry concepts in daily context using higher-order thinking skills. Therefore, it is important to evaluate the chemical literacy of preservice teachers, as they will be sent to schools throughout Indonesia. Teachers need to be prepared, as they will deliver the knowledge and improve the quality of teaching-learning, particularly in Industry 4.0 education. A chemistry teacher must be able to conduct the scientific process and bring the attitude and perspective of the scientist into the class (Rahayu 2017).

Thus, designing a more comprehensive test to measure chemical literacy levels is necessary so that the results are more valid and can provide appropriate information and recommendations. The use of multiple-choice assessments will not help improve students' level of chemical literacy, especially multidimensional chemical literacy. This multidimensional literacy needs multiple skills for students to be involved in the Industry 4.0 education transformation era.

It is also expected that it will be possible in the future to design instruments that can be used to measure multidimensional chemistry literacy of chemistry preservice teachers.

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The sports coaching model based on youth as rural sports activists

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ABSTRACT: This study discusses the use and implementation of a sports coaching model based on youth as rural sports activists. The research design used is a modified research and development from Borg and Gall. The steps of research and development began with studying the results of the needs analysis, developing a model, conducting a series of trials and revising the findings during the trial, obtaining the required model. The data analysis used was the thematic analysis. The results of the study illustrate that the developed sports coaching model can be used and applied as one of the community's participation as an effort to improve sports coaching in Tegal Regency, Indonesia. The results of the study can be recommended to the local government in determining the appropriate sports coaching policies in order to improve regional sports performance.

1 INTRODUCTION

The arrangement of the multi-event sports in Central Java Province of Indonesia is among the benchmarks that can be used as an evaluation of the sport coaching from each district/city in the Central Java Province followed by 35 cities/regencies. Based on the medal gained, Tegal Regency ranked 32 out of 35 cities/regencies in the PORPROV Central Java multi-event Games in 2018. The same results were also obtained by the contingent of Tegal Regency in the same multi event back in 2013. The results of the achievements still show some weaknesses in the process of sports coaching, particularly in some aspects such as athletes, coaches, management of sports organizations, sports facilities and infrastructure as well as local government policy.

The results obtained by Tegal Regency in the multi-event of the Central Java Province Sports Event, with the three-time participation, show the lack of continuous athlete coaching in all sports. As a result, there is still a shortage of potential and talented athletes. This is in line with the data obtained from sports instructor, coaches and athletes.

In order to have high quality athletes, recruitment of talented and potential athletes is started with the introduction of sports from the environments which are, in this case, family and community. Then, it is followed by the initial coaching stage from the schools at each sports club and the role of sports clubs that have been doing the coaching achievement. At this initial stage, the role of the local government in encouraging the community to do sports is very important. Therefore, it is expected that the community participation encourages the movement of healthy living and develops its participation in boosting people to help and to improve the potential of community in their region so that it can develop optimally. This is in accordance with the opinion of Darai Cooke (1996) which provides an overview of a strategic approach in developing sports towards the best performance. It starts with the role of the family as a strong foundation stage in sports and continues in the early stage of school. This was identified by the participation of school sports clubs and the steps of achiever sports clubs in recruiting athlete

candidates and potential athletes. At the same time, it is followed by the local government with its policy to encourage the community to do sport activities that lead to a healthy life and to bring out the prospective talented athletes who can be recruited by sports clubs. Those talented athletes, then, can be fostered and practice on an ongoing basis.

The sports coaching model based on youth as rural sports activists is a sports coaching model that has never been used so far in the process of sports coaching. This is the first urgency of sports coaching model based on youth as rural sports activists. The second important thing is that this coaching model can empower rural and urban youth. It is one step of work to overcome the problems that arise by considering the area of sports coaching throughout Tegal Regency. According to 2018 Tegal Regency statistical bureau, there were 287 rural/urban areas which are very potential to get the seeds of talented athletes and achievers who have not received any guidance in a good and regular sports practice. As a result, in the future, the seeds of talented athletes and many outstanding athletes will be obtained. The role of youth plays an active role in the development of rural communities. It is in accordance with the goals of youth development carried out by the local government. As agents of change that have national vision, the role of youth is to develop their potential so that they are able to move the community to be better (Permenpora 2013).

The third urgency of the sports coaching model based on youth as rural sports activists is one step to empower the function of youth as agents of change who have national vision. It is expected that they develop the potential of the community as an effort to answer the problems that arise in the community of Tegal Regency regarding the lack of improvement in sports achievement. The role of youth as rural sports activists is one step that can be done by people in their region to play an active role in community development, particularly in sports. This is in accordance with the strategic plan of the Ministry of Youth and Sports in 2016-2019 which states that youth are pioneers of development who respond to challenges and problems that arise in the community. This is also strengthened by Law No. 40 of 2009 concerning youth which provides direction for youth development that has competitiveness and plays an active role in national development, including in sports development aspects. Therefore, coaching towards sports achievement should be done optimally in all aspects so that it encourages the implementation of sports coaching in rural areas. Sports coaching can provide an improvement in regional sports achievements. Youth development plays an active role in building regional communities in accordance with the potential and the support from the community in its region.

2 RESEARCH METHOD

The research method used in this study was the research and development from Borg and Gall. Educational Research and Development (R&D) is a process used to develop and validate educational product. The step of this process are usually referred to as the R&D cycle, which consist of studying research findings pertinent to the product to be developed, developing the products based on these findings, field testing it in the setting where it will be used eventually, and revising it to correct the deficiencies found in the field testing stage. In more rigorous programs of R&D, this cycle is repeated until the field test data indicate that the product meets, its behaviorally defined objectives (Borg & Gall 1983, Akker 2009, Ali & Asrori 2014, Arifin 2012, Dick & Carey 1996, Seals & Richey 1994, Richey & Nelson 2009, Sugiyono 2011, Sujadi 2002, Tessmer 1998).

This research is a part of the overall research on the analysis of Tegal Regency regarding the sports competition between regions in Central Java Province. The competition was the multi-event of the Central Java Province Sports Week in 2018 which was less optimal, including some aspects such as coaches, athletes, sports facilities and infrastructure, sports management as well as local government policies. The steps of research and development began with learning something that would be developed from the results of the needs analysis, developing the model, completing the expert validation, testing the revision results, and then revising the findings from the trial until it finally obtained the required model.

3 DISCUSSION

The implementation of research and development includes: a need analysis, as a first step in this research and development, was done by collecting and analyzing data of achievement from Tegal contingent in the multi-event of the Central Java Province Sports Week in the past 10 years. Data collection was done by doing observations and interviews. The data collection was also supported by gathering some documentation to strengthen the obtained data. It is expected that the data collected can strengthen other data on the coaches and instructors of achiever sport and the policy makers of sports coaching from the Tegal Regency government. The results of the needs analysis showed that a coaching model was needed to improve the sports achievements of Tegal Regency.

A sports coaching model based on youth as rural sports activists was developed from the results of the needs analysis. It was reinforced by the previous data collection as a preliminary model. Then, an expert validation of the initial model was conducted. The experts were from sports policy analysis experts, sports instructors, sports coaches, and policy makers from the government. This produced a revised model of sports coaching based on youth as rural sports activists.

The next step was to carry out the first trial of the model based. The trial was done in a number of villages in one sub-district area. Then, the follow-up trials were carried out in some villages from several sub-districts throughout Tegal Regency. From the series of trials, it was expected that there would be a revision of the developed sports coaching model.

The revised model can become the sports coaching model in Tegal Regency that can be used and applied to improve the sports achievements of Tegal Regency.

Data were collected through interviews and questionnaires. It was also obtained and supported by the collection of documentation and observation to strengthen the data collected previously. Therefore, it was expected that the collected data can support each other.

4 RESULT DISCUSSION

4.1 *Definition of rural sports youth activist-based sports coaching program*

Rural Sports Youth Activists-Based Sports Development Program is defined as a model of sports coaching that is carried out by young people of rural/urban village in the area of Tegal Regency. The program is designed to arouse the enthusiasm in carrying out sports activities in the community. The program is carried out by local youth with the aim to encourage the community, particularly children, adolescents and adults according to their talents and interests on sport branches. It is expected that the program can become a part of their daily needs and it can produce numbers of talented and gifted athletes in some of sports branch. This is the concept of sports coaching by considering the territorial approach. As a result, the benefits of the sports coaching can be obtained such as to develop the community's potential in the sports field; to channel the talents of young people - athletes achievers to the level of Tegal Regency; to provide a reference for managing the sports organization and a reference to the monitoring team – the evaluation in the sub-district level on its implementation.

4.2 *Basic principles of PPOP program implementation*

The Rural Sports Activist-based Youth Development Program is developed by complying with some principles: Principles Adherence in accordance with the regulations in the communities of the region; Youth-based with efforts to empower youth in rural areas; Management that meets minimum service standards, Professionalism in terms of work performance and program analysis results; The structured implementation that starts from the planning, implementation and open reporting and can be known by interested parties and can be accounted for to the stakeholders; Equitable in the process of organizing for all communities by considering the limitations of the funds they have.

4.3 The recruitment process of PPOP program practitioners

The recruitment process for the PPOP Program practitioner considers the competence and potential of rural areas in accordance with the sports branch that will be developed.

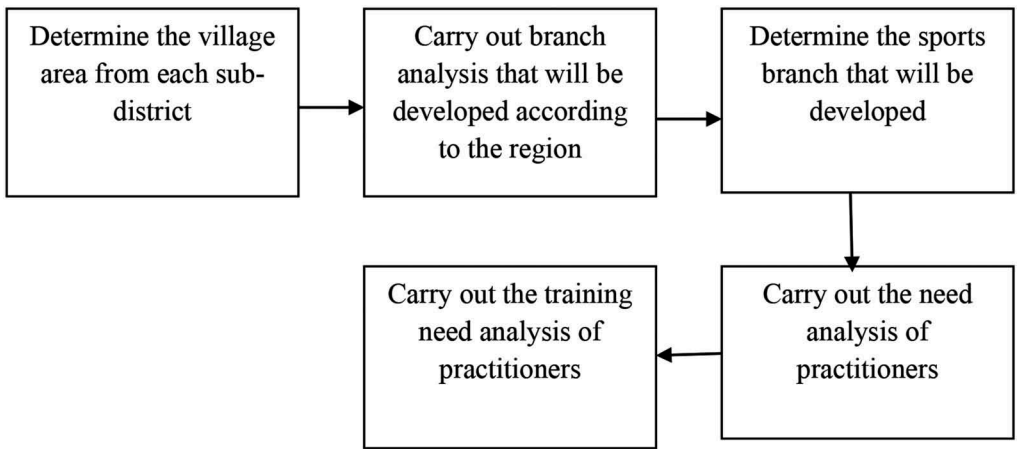


Figure 1. The recruitment mechanism of PPOP program practitioners.

The recruitment mechanism of PPOP program practitioners involves the following stages:

- Determining the village area from each sub-district
- Analyzing the branch sports that will be developed according to the territorial approach
- Determining the branch sports that will be developed based on the analysis results
- Analyzing the needs of PPOP Program practitioners voluntarily with regional data collection for youth who are members of youth organization, sports scholars and sports trainers in the rural areas.
- Analyzing the training needs for PPOP program practitioners in the form of education and training, coaching clinics, training on sports organization management.

To maintain the quality of the implementation of this program, assistance can be made for the implementation that does not have the trainer qualifications by a co-trainer from the sports branch in the sub-district level.

4.4 The mechanism of PPOP program implementation

The mechanism of the implementation of the PPOP Program is carried out by rural sports youth from the local rural/urban village. The program implementation is also coordinated with the rural office which is assisted by the Sub-District Government in coordination with Department of Youth, Sports and Tourism in Tegal Regency, and the administrator of the sports branch under the coordination of KONI Tegal Regency.

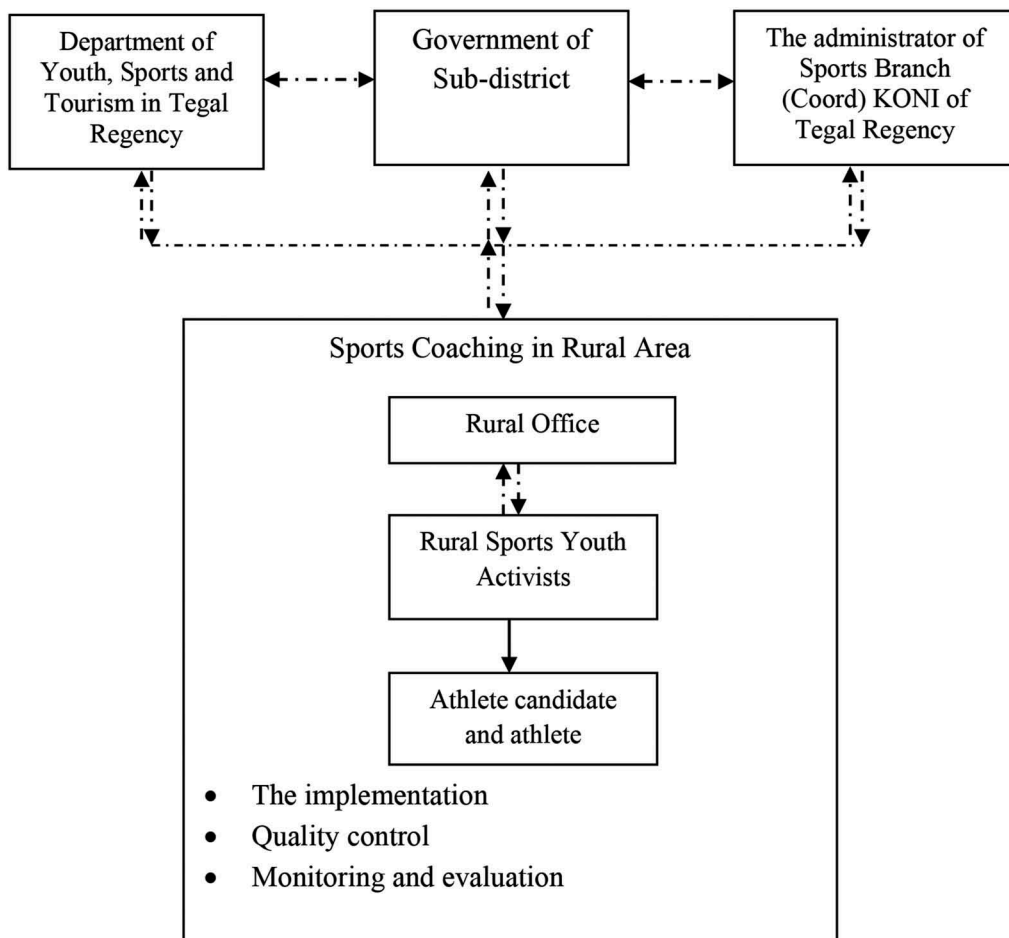


Figure 2. The mechanism flow of PPOP program implementation.

4.5 Implementation

The implementation of the PPOP program is adjusted to the agreed time of the implementation process by using the facilities available in each rural/urban area. It is done through some considerations of the training program such as the number of athletes and trainers by taking into account the training process management and the follow-up to the better level for those who are achievers.

4.6 Monitoring, evaluation and reporting

4.6.1 Monitoring

Monitoring and evaluation are parts of the overall quality assurance of the PPOP Program which are used as input for the authorities and as policy consideration, improvement and development.

The implementation of monitoring and evaluation refers to the assistance that includes planning, implementation, achievement and reporting of the program. It is carried out by some elements such as Youth, Sports and Tourism Department of Tegal Regency, the Administrator of Sports Branch in coordination with the *KONI* Tegal Regency. It is done at least

once in the year of the program and it is prepared by the officers who implement the monitoring.

4.6.2 Evaluation tools

Monitoring and evaluation implementation tools to find out the improvement and implementation of PPOP Program are in the PPOP Program Monitoring and Evaluation format.

4.6.3 Reporting

The end-of-year report of PPOP program is made by the practitioners. This is an accountable progress report for the activities carried out in the end of the current year and it is submitted to the authorities. The report is in the form of documents on the activities implementation and financial accountability that shows the quality and implementation of the coaching program. It is supplemented with information on program implementation; recapitulation of athlete and coach data; recapitulation of athlete competency improvement; as well as photos of the activities.

5 CONCLUSION

The sports coaching model based on youth as rural sports activists is a program that can be implemented as an effort to improve the sports achievements in Tegal Regency.

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Strengthening teacher competency in the 4th Industrial Revolution

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ABSTRACT: This article describes library research that aims to provide ways to strengthen teacher competence in the era of the 4th Industrial Revolution. Disruptive technology and the 4th Industrial Revolution will be challenges to the Indonesian workforce. In the field of education, these have relevance for teacher competency. The level of teacher competency has a great influence on educational success. However, in the past few years, the Teacher Competency Test (UKG) scores were still below average. Though this competency is the basis on which a teacher carries out his or her duties and obligations, the UKG score has not improved. The results of this study found that there are several ways to improve teacher competency: (1) organizing the Teacher Professional Education (PPG) program; (2) conducting classroom action research; (3) improving teachers' morale, ensuring the quality of teachers, and sending teachers to training workshops; (4) stipulating that teachers satisfy new requirements and giving them new roles derived from the teaching function; and (5) improving Educational Personnel Educational Institution (LPTK) quality.

1 INTRODUCTION

The quality of education can be determined by the quality of the teaching staff. However, until now, the quality of teachers in Indonesia has been very low compared to that in other developing countries as seen in the Global Education Monitoring (GEM) Report. The report shows that Indonesian education ranks only 10th out of 14 developing countries (UNESCO 2016), whereas its main component, namely teachers, rank last among the 14 developing countries in the world (Detik November 24, 2017).

In the effort to improve the quality of educational resources, teachers are the components of human resources that must be nurtured and developed continuously. The formation of the teaching profession is carried out through preservice education programs and in-service programs. Not all teachers who are trained in educational institutions are well trained and qualified.

The Regulation of the Minister of National Education of the Republic of Indonesia No. 16 of 2007 regarding Standards for Academic Qualifications and Competencies for Teachers states that the competencies that the teachers must possess include pedagogical, personality, professional, and social competencies obtained through professional education. Tribun (December 30, 2015) reported that the overall results of the 2015 Teacher Competency Test (UKG) administered to more than 2.9 million teachers in Indonesia were still below the Minimum Competency Standard (KKM) target set by the Ministry of Education and Culture. The average UKG score across Indonesia is 53.02, while based on government regulation, the standard minimum score that must be attained by teachers is 55.

Disruptive technology and the Industrial Revolution 4.0 can be challenges to the Indonesian workforce. Therefore, the government must immediately be aware of this by improving the quality and skills of human resources. In the field of education, this problem is related to teacher competency. Teachers should have competencies that are in accordance with the continuously changing

times. Teachers must also be able to use emerging technologies to support teaching and learning in the classroom. Today's students are critical and sophisticated in using technology. As professionals, teachers should be able to keep up with the times and adjust the way they teach and manage the materials well so that they can be easily understood by students.

The educational system is becoming more complex and continuously changing. Similar to other education levels, the Technical and Vocational Education System (PTV) is also undergoing a comprehensive process of transformation, as stated by Othman, Hamzah, and Udin (2011). This transformation process coincides with new demands on PTV in the era of the 4th Industrial Revolution. For this reason, teachers are expected to be able to keep up with the challenges and changes that occur.

It is imperative that teachers adapt to this drastic change so that learning may progress effectively in accordance with the characteristics of students today. In the era of the digital-based 4th Industrial Revolution, teachers are required to be able to utilize technology in learning. The uses of these technologies must be adjusted to the 2013 Curriculum, which places students at the center of learning.

Based on these issues, the objective of this study is to describe ways to improve teacher competency in the era of the 4th Industrial Revolution and increasing complexity of the educational system. Teacher training needs to be adjusted to the changes that are occurring.

2 RESEARCH METHOD

This study was library research utilizing a qualitative research design with books and other literature as the main resources (Hadi 1995, p. 3). The data were collected from the findings of previous studies related to technological challenges and teacher competency. The procedures of this research involved choosing, selecting, and eliminating data. Researchers observed and read previous studies related to the topic and carefully took notes of the findings that might be relevant to the research objective, which was to find specific methods that can be used to strengthen teacher competencies in the era of the 4th Industrial Revolution. The researchers then took the data samples and tabulated them, and finally conducted an analysis of the research findings using other literature sources.

3 RESULTS AND DISCUSSION

3.1 *Industrial revolution*

Rojko (2017) argues that the 4th Industrial Revolution is a strategic initiative that was recently introduced by the German government. The aim of this initiative is the transformation of the manufacturing industry through the digitalization and exploitation of new technologies. The production system in the 4th Industrial Revolution is flexible and allows products to be adjusted individually and specifically.

The German government introduced the term Industry 4.0 to show the potential of the Industrial Revolution 4.0. This term was extended to cover a wider range of fields than just industry, such as higher education. At the moment, the means and methods in teaching and education must adapt to new methods to keep up with the changes in technology (Abdelrazeq et al. 2016).

The above explanation implies that the 4th Industrial Revolution is an era in which all fields invite industry players to further maximize the role and function of the Internet in developing their business, including the field of education.

3.2 *Teacher competency*

Sagala (2009, p. 23) stated that competency is a fusion of knowledge (thinking power), attitude (heart power), and skills (physical power) that is manifested in the form of actions. In other words, competency is the ability of a person to show and apply his or her skills in life. In addition, Majid

(2005, p. 6) explains that the competencies possessed by teachers indicate their quality of teaching. Teacher competency is manifested in the form of mastery of knowledge and professionalism in carrying out the role of a teacher. From these explanations, it can be concluded that competency is a combination of abilities, knowledge, skills, attitudes, characters, comprehension, appreciation, and expectations that underlie a person's characteristics to demonstrate work and carry out tasks or work in order to achieve the quality standards associated with that work.

Law No. 14 of 2005 concerning Teachers and Lecturers states that professional teachers must have a minimum academic qualification of a bachelor's degree or applied science degree with four competency standards, namely pedagogical, professional, personality, and social competency. Government Regulation No. 19 of 2005 explains that pedagogical competency is the ability to manage students' learning, which includes understanding students, designing and implementing learning, evaluating learning outcomes, and developing students to actualize their various potentials. Educators who possess personality competency are steady, stable, mature, wise, and authoritative; can set a good example for students; and have good character. Professional competency is the ability of educators to master broad and in-depth learning material that enables them to guide students to attain the specified competencies. Finally, social competency is the ability of educators to communicate and interact effectively with students, fellow educators, educational staff, parents/student guardians, and the community.

According to the preceding explanation, pedagogical competency is the ability and willingness of teachers to regularly apply their attitudes and skills to influence students' learning ability. Personality competency comprises a number of competencies related to personal abilities with all the characteristics that support the implementation of the task. Professional competency includes a number of competencies related to the profession that demands various types of expertise in the field of education or teacher training. Social competency refers to the competency and ability of a teacher to communicate and interact effectively in the implementation of the learning process and the surrounding community.

The results of Mariyana's study (2012) illustrate the overall data on teacher competency, i.e., 23.31% for pedagogical competency, 29.80% for professional competency, 24.61% for personality competency, and 22.29% for social competency. From these results, it can be said that the quality of teacher competency is still far from what is expected. Therefore, it is necessary to find other educational strategies that can improve teacher competency.

Mulyasa (2012, p. 10) identified factors that caused low professional competency of teachers. (1) First, there are still many teachers who do not pursue their profession with full commitment. Some teachers have additional work or side jobs outside of their working hours to meet their daily needs, resulting in inadequate learning time to improve self-competency. (2) Second, there is no teacher professional standard as demanded in developed countries. (3) Third, current tertiary institutions that produce prospective candidates for teachers do not really take into account the expected outcomes for their graduates in their respective field of work. (4) Finally, there is a lack of teacher motivation in improving self-quality despite the fact that they have a great contribution to the success of learning in school.

3.3 *Strengthening teacher competency in the 4th Industrial Revolution*

Teacher competency is significant because it influences student learning outcomes. A study conducted by Sutardi and Sugiharsono (2016) showed that teacher competency has both positive and significant impacts on student learning outcomes with an effective contribution (R^2) of 7.8%.

In Kompasiana, Abdul Latip (2018) points out that there are at least four competencies that must be possessed by teachers in the 4th Industrial Revolution to prepare them to face the development of an evolving era. The four competencies are as follows:

1. The ability to conduct a comprehensive assessment. Assessment does not depends solely on cognitive or knowledge aspects. Therefore, the assessment conducted by teachers in the current era must be able to accommodate the uniqueness and excellence of individual students.

2. The ability to master competency in 21st century skills. To produce students with 21st century skills, teachers must also understand and possess these competencies. There are three important aspects of 21st century competence: character, skills, and literacy.
3. The ability to design modules according to student interests. In an era of increasing technological development, modules used in learning should not always use conventional modules such as paper-based ones. However, the availability of features for these online modules must be accompanied by the ability of the teacher to manage these features.
4. The ability to conduct innovative authentic learning. The learning presented must lead to joyful and innovative learning. It should aim to make students better trained and interested in developing their own abilities so that they are better prepared to face current developments.

The following are several ways to improve teacher competency in the era of the Industrial Revolution 4.0:

- Teacher Professional Program (Indonesian Ministry of Education and Culture Regulation No. 87 of 2007). According to Article 2, the objective of the Teacher Professional Program is to produce prospective teachers who have competency in planning, implementing, and evaluating learning, as well as following up on the results of the assessment by mentoring and training students, in addition to the ability to conduct research and develop professionalism in a sustainable manner.
- Classroom action research (Sukanti 2008). This type of research will improve teacher competency if carried out in class consciously and systematically.
- Improving the teacher's morale, ensuring teacher quality, and sending teachers to training workshops (Susilowati, Sutanto, & Daharti 2013, p. 80).
- Helping teachers to meet the new requirements and acquire new roles derived from the teaching function (Abdelrazeq et al. 2016). Universities must prepare and support teachers in their new teaching roles. Universities must also provide training and open opportunities for teachers to gain access to learning about new technologies and how to use them. Each new technology introduced to help teachers in classrooms must meet a set of requirements, overcome challenges, and be implemented.
- Improving Educational Personnel Educational Institution (LPTK) quality (Bhakti & Maryani: 2016). The strategies that can be adopted include (1) improving the LPTK curriculum based on Indonesian National Qualifications Framework (KKNI) and National Higher Education Standards (SNPT), (2) strengthening effective learning systems, (3) developing learning models based on student-centered learning, (4) strengthening academic education programs, (5) strengthening basic subjects education, and (6) developing LPTK quality.

Among several possible approaches, Teacher Professional Education (PPG) is the method that is considered most effective in improving teacher competency. It is based on research results of Triwinarni (2016), who states that there is an increase in the competency of PPG participants both personally and professionally. Professionally, the important impacts of the PPG program include increased insights in science and technology, as well as increased competency in preparing all aspects related to teaching and learning processes, such as developing learning tools and learning media, using varied learning methods, and managing school administration. On the other hand, in the personal sense, there is an increased sense of responsibility in carrying out their duties as of teaching and guiding students.

Pangestika and Alfariisa (2015) note that there are 45 universities from 27 provinces in Indonesia that offer the PPG program. The curriculum structure of the PPG program consists of workshops for developing learning tools, teaching exercises through microlearning, learning with peers, the Field Experience Program (PPL), as well as enrichment programs for learning and pedagogic fields. The learning system in the PPG program includes workshops for the development of learning tools and field experience programs that are held with intensive direct monitoring by supervisors and tutor teachers specifically assigned to these activities.

The research findings of Ningsih, Fatchan, and Susilo (2016, p. 2031) show that PPG program implementation includes several stages, namely the syllabus development stage by the relevant parties according to university policy, the precondition stage as a combination of

precondition and plenary stages, as well as the learning system stage consisting of several stages and learning activities.

The research findings of Hotimah and Suyanto (2017) show that the PPG strategy in developing pedagogical and professional competencies can be applied through workshops. Workshops aim to develop strategic pedagogical competencies by providing seminars on curriculum. More emphasis is given on the materials to ensure that participants will be able to deliver the learning materials well when they teach. Peer teaching and microteaching using the inquiry and discovery methods are also applied in order to help the PPG participants be more active in the learning process.

Kisrianto and Corry (2018) concluded that the PPG program that was attended by teachers provided a large amount of new knowledge in the scope of pedagogical and professional competencies. The educator certificates that are awarded to participants after graduating from the PPG program serve to support the teacher profession. The PPG program has been running well and on time, although there are still some complaints from the participants. Rambitan and Hardoko (2016) stated that the challenges of PPG occur both in the preparation and the implementation stages because of the poor management of the program at the district level, especially those in the remote, outermost, and border areas.

It can be concluded from the finding of the aforementioned studies that Teacher Professional Education (PPG) is significant because it aims to improve the teachers' competence as professionals in the field of education, to meet pedagogic, personality, social, and professional competencies, in accordance with statutory provisions. With increased competency, teachers are expected to be able to face changes and challenges in the era of the 4th Industrial Revolution.

PPG is currently offered only to students who graduate from the bachelor's degree program. It is suggested that the PPG program be applied to undergraduate students as part of their curriculum for several reasons. First, through such a scheme, it is expected that the graduates will complete both the bachelor's degree and the educator certificate at the same time. Moreover, this can also save time needed to meet the required qualifications. Lastly, this alternative is deemed suitable to deal with the possibility of a reluctance on the part of prospective teachers to continue studying or a lack of retention of the learning materials after graduation.

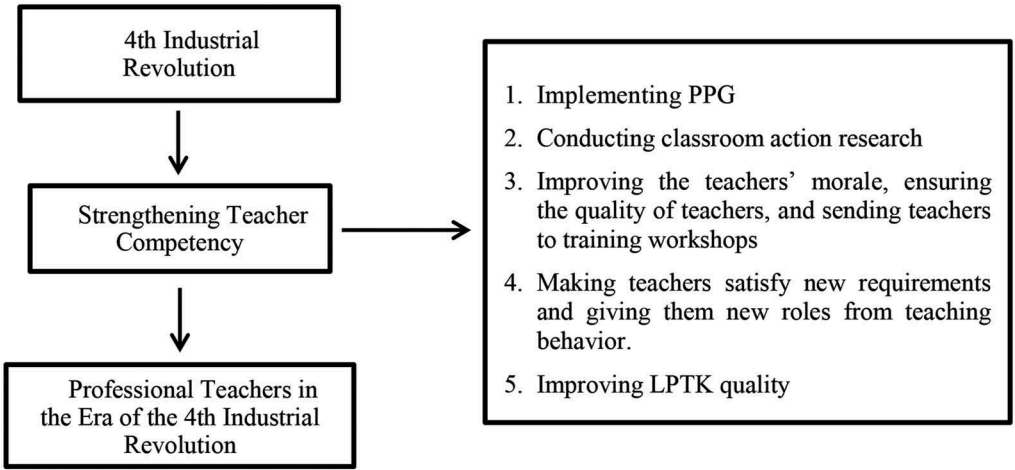


Figure 1. Framework for the study of strengthening teacher competencies in the 4th Industrial Revolution.

4 CONCLUSION

The 4th Industrial Revolution requires teachers to be able to keep up with the current developments. Teacher competencies in the era of the 4th Industrial Revolution can be improved in various ways, as shown in Figure 1: (1) implementing PPG; (2) conducting classroom action research; (3) improving teachers' morale, ensuring the quality of teachers, and sending teachers to training workshops; (4) stipulating that teachers satisfy new requirements and giving them new roles from teaching behavior; and (5) improving LPTK quality.

The Implementation of Teacher Professional Education (PPG) is considered effective because it aims to improve the competency of teachers as professionals to meet pedagogical, personality, social, and professional competencies in accordance with statutory provisions.

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The implementation of continuous professional development to improve the quality of education

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ABSTRACT: The focus of this research is the effectiveness of the Continuous Professional Development (CPD) planning, the effectiveness of the CPD implementation, and the effectiveness of the CPD follow-up in the Kumbokarno Cluster, Karangtengah Sub-District, Demak Regency. The data sources were elementary school teachers, school principals, and administrators of teacher working groups who have S1 academic qualifications and are certified. This was a phenomenological qualitative study. The data were collected through interviews, observations, and documentation. They were analyzed using Miles and Huberman's model consisting of data collection, data reduction, data display, and conclusion drawing. The results showed that the CPD planning in the Kumbokarno Cluster was effectively made, the CPD implementation was effective, and the CPD follow-up was not effectively done. It is recommended that the CPD be carried out completely on planning, implementation, and follow-up in order to improve the quality of education.

1 INTRODUCTION

A teacher is a professional educator who has an important task, function, and role in educating the life of the nation. A professional teacher is expected to be able to participate in national development to realize Indonesian people who are devoted to God Almighty, excel in science and technology, and have aesthetic, ethics, noble character, and personality. It is no exaggeration to say that the future of society, nation and state is largely determined by the teacher.

Therefore, the teacher needs to be developed continuously and proportionally according to the function of the teacher (Ministry of National Education 2010). As mentioned by The National Education System Act (2003), the Teacher and Lecturer Act (2005), and the Government Regulation on National Education Standards (2005), teachers as professionals are required to undertake professional development activities on an ongoing basis to support the development of their professionalism. The implementation of continuing professional development activities for the teacher is expected to improve pedagogical, professional, social, and personality competencies to meet the future needs and demands related to their profession (Ministry of National Education 2010).

The implementation of ongoing professional development activities is based on the Regulation of the Minister of State for Administrative and Bureaucratic Reform (2009). Professional development is expected to create professional teachers and foster the interests and talents of students in mastering science, technology, and art. Teachers as 21st-century learners must be able to follow the development of science and be able to provide knowledge, skills, and attitudes that address the competency standards students must have.

Continuing professional development is one of the stages of human resource management (HRM). According to Flippo (2014), HRM includes planning, organizing, directing, and supervising. The activities cover the procurement, development, compensation, integration, maintenance, and production of human resources to achieve various objectives of individuals, organizations, and society. Thus, CPD is part of the general human resources management function.

According to Rohiat (2012), in the management process, there are basic functions that are displayed by a leader, namely planning, organizing, leading, and controlling. Suparlan (2014) explains that various types of organizations have objectives to be achieved. For this purpose, four main functions must be performed; these functions are known as management functions.

The first function of management is planning, which is also known as the base function since it serves as the basis for the implementation of other functions. According to Plato (427-347 BC), the beginning is the most important part of the work, and beginnings are never easy.

Nuridin & Ismaya (2018), who cited Sikula, state that human resources of manpower planning have been defined as the process of determining manpower requirements and the means for meeting the requirements to carry out the integrated plans of the organization. Uwes et al. (2017) explain that planning is an activity to set goals to be achieved along with ways to achieve those goals. Planning will provide a clear direction for each activity so that each activity can be endeavored and carried out as efficiently and effectively as possible.

To achieve the goals, an organization must go through the planning function first. Benjamin Franklin expressed that “by failing to prepare, we are preparing for failure.” Meanwhile, Suparlan (2014) citing Drucker points out on how planning is an unending course of action. Planning will serve as a reference from the beginning to the end of the activity.

The second function is organizing, which is also known as the subsequent function and mainly related to the human component. However, it is related to the other financial component of resources. The employees must understand the vision and mission of the organization, and have a high commitment to carry out the main tasks and functions to achieve organizational goals.

The third function is directing. Working under this function helps management to control and supervise the activities of all staff and stakeholders, including providing technical assistance and guidance to all staff. Providing motivation, communication, leadership, and support to all staff or stakeholders are all important parts of giving direction, especially if the organization also implements a rewards system based on the performance. Productive organizations must be able to build a productive work environment, positive interpersonal relationships, and the process of solving problems wisely when an organization faces obstacles and problems. All can only be done with an effective communication system.

The last management function is controlling. Included in this control function is the setting of organizational performance standards based on organizational goals. Certainly, this control is carried out not only on the results achieved but also on the process. The control must also be carried out routinely because it is an ongoing process.

Demak is a regency that has been serious in implementing CPD. Only a few districts have seriously made CPD planning, ranging from teacher performance assessments to written policies such as District Head Regulations (*Peraturan Bupati*), Medium Term District Planning (RPJMD), and the Education Office Strategic Planning (called *Renstra*). The CPD implementation in Demak Regency has been running effectively. This can be proven from the fulfillment of the following three indicators. First, the regulations are governing the implementation of CPD. Second, there are details of the programs and activities. Lastly, there is an implementation of the Collective Work Program called *Kelompok Kerja Guru* (KKG) and Subject Teacher Association (*Musyawarah Guru Mata Pelajaran* or MGMP) (Nurkolis et al. 2017).

In some districts or cities, CPD has not been implemented thoroughly. Although strong support has been given by the headmaster, there is still a lack of motivation among the teachers. The supporting factors for the implementation of CPD for elementary class teachers in SDN Tarakan 2 are some examples. Some factors influence the effectiveness of CPD such as the lack of motivation from the class teacher, the lack of socialization, the difficulty of teachers to follow the development of communication and information technology, and lack of existing infrastructure (Maksum 2015).

Although the government has initiated the CPD program since 2009, the Department of Education and Culture of Sukabumi only began the program in 2015. The District Education Office finally realizes that CPD is very important to improve teacher competency and teacher careers (Lyesmaya et al. 2017).

According to experts, professional development is currently carried out traditionally with the following characteristics. It is decided from above. The approach used is “a fix-it”. It lacks ownership of the program from the teachers. It uses the “one-size-fits-all” technique, fixed and unscheduled delivery methods with little or no follow-up, has no contextual programs, and lacks proper evaluation (Diaz-Maggioli, 2004). For effective teacher professional development, it is suggested that it should use a visionary approach with the following characteristics: collaborative decision making, a “growth-driven” approach, collective program development with teachers, inquiry-based ideas, inquiry-specific programs, contextual and measurement programs which are carried out proactively, and teaching with andragogic approaches.

Some of the results of research on the effectiveness of the CPD implementation were controversial. One research finding shows that teacher working groups are effective as CPD as mentioned by Al Rasyid (2015). Another study shows that the implementation of CPD has not run optimally (Murni & Sumardjoko (2015). The obstacles in the implementation of CPD include the lack of time and abilities of the teachers as participants and the lack of supporting facilities and infrastructure of the institution (Wiranti 2015). Another study states that only a few teachers undertake comprehensive professional development (Wuryandini 2014). A case study conducted found that CPD had not been done thoroughly and there was a lack of internal motivation from the teachers (Maksum 2015).

Meanwhile, in developed countries, CPD is a necessity. According to an expert, the community has played an active role in CPD as in Australia (Henderson 2007). In Hong Kong, the development of professionalism in subject teachers has been rife in schools and principals have an important role in CPD (Chow, 2013). In the United States, CPD is done through collaboration between teachers by becoming a co-teacher for other teachers (Gallo-Fox & Scantlebury, 2016).

There was no comprehensive study on the implementation of CPD based on the management function of education. Therefore, the finding of this study will enhance the theory of the effective CPD implementation to improve the quality of education.

Based on the background of the problems above, this research focuses to examine (a) the effectiveness of CPD planning, (b) the effectiveness of CPD implementation, and (c) the effectiveness of CPD follow-up in the Kumbokarno Cluster, Karangtengah Sub-District, Demak Regency.

2 METHOD

This article is based on the results of a phenomenological qualitative study conducted from September 2018 to April 2019. The study was conducted in the teacher working group for elementary school teachers (called KKG) at the Kumbokarno Cluster, Karangtengah Sub-District, Demak Regency. This site was selected because the implementation of CPD had successfully helped the teachers in the KKG in meeting the competency standards as professional teachers, in addition to various achievements of the teacher working group. The Kumbokarno teacher working group consists of 1 core elementary school namely SDN Karangsari 1 and five disseminated primary schools consisting of SDN Karangsari 2, SDN Karangsari 3, SDN Karangsari 4, SDN Rejosari 1, and SDN Rejosari 2.

Data were collected by interviewing 6 teachers, 6 school principals of elementary schools, the head of the teacher working group, and 3 administrators of the teacher working group. The research participants must have a bachelor's degree and an educator certificate. The data were collected through interviews, observations, and documentation. The observations focused on the activities of the Kumbokarno Teacher Working Group. The documents consisted of the planning documents, meeting minutes, and reporting documents of Kumbokarno Teacher Working Group for CPD.

The study used Miles and Huberman's interactive analysis model. Moleong (2007) states that the interactive data analysis consisting of four steps, namely data collection, data reduction, data display, and conclusion drawing, is an integrated entity during, before, and after data collection. The first step of data analysis was collecting data through interviews,

observations, and documentation. All data were written on verbatim transcription. The second step was reducing data. The third step was conducting axial coding to make data display easy and compare findings. Finally, the fourth step was drawing the conclusions after the new meaning was found. In this study, this design was used to address the three main points of the research focuses, i.e. the planning of CPD, the implementation of CPD, and the follow up of CPD.

Sugiyono (2014) mentions that the data validity checking techniques are source and technique triangulations. This study used source triangulation based on the answers from teachers, school principals, and administrators of teacher working group. Source triangulation was also based on document analysis from planning to reporting documents. Technique triangulation was based on information gathered from interviews, observations, and documentation.

3 RESULTS AND DISCUSSION

3.1 *The effectiveness of the CPD planning*

The CPD planning mechanism in the Kumbokarno Cluster is based on preliminary information about how many teachers need training, the materials discussed, funding, the availability of other resources needed, including good facilitators, schedule for training, and infrastructure. The CPD planning in the Kumbokarno Cluster refers to the principles and objectives of the Ministry of Education. The basis of the planning is the result of self-evaluation and the results of the teacher performance assessment.

The first step is for the teachers to conduct self-evaluation. The results of the self-evaluation are compiled and used as a basis to develop a set of plans of CPD activities which will be conducted by the teachers. In the next step, the teachers carry out the planned activities. CPD planning in the Kumbokarno Cluster is based on the results of identifying the needs of teachers individually.

The results of this identification are obtained from the analysis of the teacher's self-evaluation results and teacher's performance evaluation by considering the teacher development plan. Planning schemes are evident in the planning documents such as district medium-term plan, district strategic plan of education and culture office, district head regulations, and regulations related to implementation as stated in the decree and list of district education office budget implementation called DPA (Nurkolis et al. 2017).

It is concluded that CPD planning has been delivered effectively. This conclusion is based on two criteria, i.e. (a) the conformity of the plan with the regulation from the Ministry of Education and Culture, and (b) the information and testimony from the interviews, observations, and documentations.

3.2 *The effectiveness of the CPD implementation*

The Kumbokarno Cluster delivers continuous professional development activities in several forms. The routine activity of the teaching working group that is carried out every Wednesday is called *Rebon* in Javanese. Through this *Rebon* activity, teachers in the Kumbokarno Cluster can exchange ideas in solving learning problems. Other activities are the implementation of classroom action research or school action research.

Another CPD activity in the Kumbokarno Cluster is to publish journal articles as one of the requirements for teacher promotion. Other CPD activities in the Kumbokarno Cluster are self-development activities carried out by teachers including training, workshops, or similar activities, which are carried out by agencies and self-funded. The implementation of CPD has had a positive impact on the quality of teachers, namely in providing services to students.

The result of the previous study by Nurkolis et al. (2017) showed that CPD in the Demak Regency was carried out well. There are four forms of implementation, namely structured activities in the form of training, workshops, seminars, and colloquia. Furthermore, assistance is provided to each teacher or principal by the facilitator. The

implementation of CPD can also be done through learning communities, such as activities in teacher working groups and independent activities carried out by each teacher. According to government programs, induction programs or internships by new teachers are other forms of the CPD implementation.

The researchers do not find any kind of CPD using the online platform. It is far different from other modern countries where the teachers tend to use online means to overcome time and spatial challenges (Trust et al. 2015). As a professional community of teachers, the type of CPD in this study is monotonous. Only one type of CPD is considered formal to the teacher community (Vangrieken et al. 2017), while the other two types available, i.e. member-oriented pre-set agenda and formative approach, are not implemented. The traditional forms of CPD are workshops, courses, and seminars, while the new model uses a variety of formats including the provision of in-class support (Borko et al. 2010).

It is concluded that the CPD implementation runs effectively as there are a variety of activities although they are mostly conventional. It is therefore recommended to try a new type of CPD with a modern platform in this internet era.

3.3 *The effectiveness of the CPD follow-up*

The follow-up plan of the CPD activities in the Kumbokarno Cluster aims to identify the weaknesses and strengths of teachers based on the results of their self-evaluation, and to map their needs in the CPD based on the results of the self-evaluation of teachers from all schools in the Kumbokarno Cluster. Then the priorities and focus of the CPD content are determined at the school or cluster level. Efforts to realize the follow-up plan of the CPD activities in the Kumbokarno Cluster are based on an inventory of what has been successful and what has not been achieved yet.

Henceforth, it was used as the basis for formulating the next year's CPD plan. Evaluation of the success of the follow-up plan for CPD is done at the end of each semester. This evaluation aims to analyze the teachers' needs and to determine what competency priorities should be improved by the teachers through CPD. However, the evaluation documents have not been found either from the sub-district level to the district level.

Based on the interview and document analysis on the CPD follow-up, no plan to use other techniques or models in CPD has been found. One model commonly used in many countries that will enhance teacher professionalism is co-teaching, in which teachers collaborate with a junior teacher or student teacher to deliver learning. Co-teaching serves as professional development for a teacher with a partner as stated by Gallo-Fox & Scantlebury (2016).

Teachers, school principals, and administrators have stated that the follow-up process that they did was not significant due to the lack of available documents. Follow-up should be based on a report either written or visualized. The absence of the necessary documents in the process suggests that the follow up was not effective.

4 CONCLUSION

The CPD planning mechanism in the Kumbokarno Cluster is based on preliminary information about the teachers' needs, the availability of costs, the availability of resource persons, and the right place and time. Funding for the implementation of CPD activities originates from the teacher professional allowance of 4% by the regulations of the Head of Demak Regency.

The Kumbokarno Cluster teacher working group for elementary school carries out ongoing professional development activities in several forms including *Rebon* activities which are held every Wednesday every month, dissemination of the results of classroom action research (called PTK) or school action research (called PTS), journal article publication, while the self-development activities carried out by teachers include training, workshops, and similar activities.

CPD activities can increase the professionalism of teachers which leads to better school services, and ultimately the best service for students. Constraints in participating in CPD include limited time, teacher interest, and lack of socialization regarding CPD. One way to overcome obstacles in participating in CPD activities is by actively participating in KKG and exchanging ideas with fellow teachers, sharing solving problems currently being faced regarding teaching and learning or other educational problems.

The follow-up plan of the CPD in the Kumbokarno Cluster includes identifying the weaknesses and strengths of teachers based on the results of their self-evaluation, mapping the CPD needs based on the results of the teacher's self-evaluation, and determining the priorities and focus of the CPD content at the school or cluster level. Evaluation of the success of the follow-up plan should be carried out continuously so that the results of the implementation of the CPD in the Kumbokarno Cluster are clear, and all forms of obstacles that impede the implementation of the CPD can be immediately overcome. There was no document found in the follow-up.

Finally, the conclusion drawn is that while the CPD planning and implementation are effective, the follow-up is not yet effective. It is recommended that the CPD be carried out completely starting from the planning, implementation, and follow-up in order to improve the quality of education.

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support was mentioned as one of the factors behind this problem, though teachers' professional development contributes to changing teaching methods that have a positive impact on learning (Villegas-Reimers 2003).

This reason is the basis for the importance of providing training and assistance to elementary school teachers. Realistic Mathematics Worksheet (RMW) is one of the learning tools used by teachers to help students understand mathematical concepts. RMW is an approach that uses contextual problems as a starting point to teach mathematics and needs to be linked to reality through student worksheets. Misdalina et al. (2009) stated that RMW is the use of reality and the environment surrounding students to support the mathematics learning process. Moreover, students are facilitated to observe or understand through imagining. RMW that are integrated with ICT help students learn mathematics from real phenomena and contextual problems. Students are allowed to construct their knowledge through guided learning using worksheets with nuances of realistic mathematics based on ICT.

This RMW is designed from the concrete to the abstract level. ICT-based realistic mathematics worksheets transfer science and technology through the optimal ICT as a medium for mathematics learning. RMW, as learning tools, promise optimism for teachers' knowledge and skills and increase students' motivation and learning achievements. Therefore, it is very important to master the ability to create, demonstrate, and convey mathematical concepts through ICT-based realistic mathematics worksheets. Those worksheets are guides for teachers in delivering ICT-based teaching materials as learning aids. This is in line with Koswara et al. (2017), who stated that the rapid and modern advance in ICT provides facilities for ease of learning, causing a shift in learning orientation from being knowledge-as-possession to knowledge-as-construction.

The Community Partnership Program Implementation Team initiated provision of training by involving a partner school of the team named The Cipta Cendikia Indonesia (CCI) Elementary School for the following reasons: (1) the location of partner schools is far from the city center; (2) the support provided to develop teachers' skills through GeoGebra software training is not optimal; (3) the participation of CCI teachers in training in use of teaching aids is low; (4) it is an effort to improve the quality of mathematics learning and to improve pedagogical competences and professional development of CCI teachers.

2 METHOD

The problem-solving implementations can be described as follows: (1) representing the theory of GeoGebra software in the form of a realistic guidebook on mathematic worksheets as teaching materials, (2) working on assignments/projects to make GeoGebra-based mathematics learning devices, (3) simulating tasks/projects that have been produced, and (4) filling out questionnaires. The Initiative Community Partnership Program was conducted using skills training through lectures and demonstrations (simulations). An evaluation of the successful points of the activities was needed. The evaluations carried out in this activity are as follows. The first is program evaluation. It is executed before and after carrying the activity is carried out. This evaluation aims to find out if the activity program is in accordance with the objectives to be implemented. The second is process evaluation. It is carried out during the training. The observed aspects are the attendance and activities of participants in the training. The third is the result evaluation at the end of the activity. The aspects evaluated were the knowledge and abilities of participants in designing the concept of building a flat-sided space assisted by GeoGebra software.

3 FINDINGS AND DISCUSSION

During the first activity, the speaker presented the training material in the form of knowledge utilizing GeoGebra in mathematics learning in a module entitled "Realistic Mathematics Worksheet Fun Learning Together Geometry for Elementary/MI Students." This module

presented many geometrical concepts of building flat-sided spaces that was demonstrated by using GeoGebra software. Participants were also given a manual to facilitate their use of GeoGebra software. Then the activity was continued by allowing participants to practice in a group or individually to create a project using GeoGebra software. One of the participant's results is presented in Figure 1.

The results of evaluating the implementation of the training activities from the participants' questionnaires are as follows: (1) The activity was consistent with the objectives. The aim of this initiative community partnership program is to increase the knowledge and abilities of CCI teachers to use GeoGebra software in mathematics learning. (2) The attendance of participants reached more than 85% and they were engaged during the implementation of the activities. (3) All participants were able to draw pictures of space using GeoGebraic furniture correctly during the lesson. In groups or individually, most of them found it difficult to make syntax or commands on GeoGebra, as they were not used to using GeoGebra software. Therefore, they were guided to read the instructions for using GeoGebra to help participants to learn how to use GeoGebra software independently. As a result, the participants were able to make syntax or teaching material on GeoGebra. Changes in teacher practices are a long-term process. To provide an explanation of how changes occur in teacher practices, it is useful to start by considering Guskey's model of teacher change (Guskey 2002). The ability of participants to design GeoGebra-based learning tools will improve if teachers continue to learn and practice using GeoGebra software, as shown in Figure 2.

The activities of RMW training assisted by GeoGebra software were well implemented and the participants were satisfied. The participants were enthusiastic during the lesson. Most of the trainees still use GeoGebra software. Previously, the initial ability of participants was limited to making presentations using Microsoft PowerPoint for teaching and learning activities as the concepts were presented in the static display, while geometry drawings were displayed on the print screen. In GeoGebra software the presentation is able to display dynamic geometry images in which students are stimulated to construct mathematical concepts directly. During the training, participants asked questions regarding the GeoGebra software material. Moreover, the participants asked for more material to discuss. The discussion takes place on the sidelines of

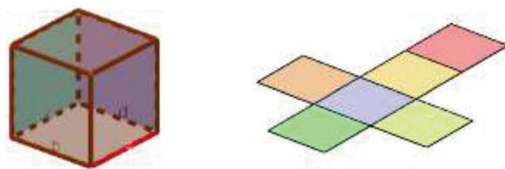


Figure 1. An example of the participants' project created by using GeoGebra.



Figure 2. GeoGebra software practice activities by elementary school CCI teachers.

the training, as Wuryaningsih et al. (2019) said; in order to achieve the best outcomes of students, teachers have to focus on all the process levels in their teaching, taking each of them into account. The teacher should design the lesson plan to develop three competences: knowledge, attitude, and psychomotor competency. The training stimulated the teachers to learn more and explore knowledge in relation to GeoGebra software for other mathematical concepts. If teachers master ICT-based worksheets in mathematics teaching and learning, they will be able to create a comfortable learning atmosphere for students and make students more enthusiastic to learn (Purwasih & Aripin 2017). Although this new pattern is designed to prepare teachers to apply pedagogical innovations in the classroom, there are other factors that will influence the teachers' adoption of ICT, such as their beliefs related to sociocultural factors (Twining et al. 2013). Training activities are expected to become an initiation for teachers to explore further and apply the knowledge explored on the learning process of mathematics in the classroom.

4 CONCLUSION

The results of this Initiative Community Partnership Program Service are summed up as follows: (1) CCI teachers have the ability to create and convey mathematical concepts using ICT-based RMW learning tools. (2) A module based on the RMW as a guideline is needed for assisting teachers in the classroom. (3) Workshops and ICT-based RMW learning media training is needed to improve the pedagogic abilities of CCI teachers. (4) By this community service, teachers are able to create explorative learning media based on the GeoGebra program that can be implemented in the mathematics learning process in the classroom. (5) Based on the trainees' responses in the interviews, it was found that all participants stated that the activities were in line with the training objectives, which are to increase the knowledge and abilities of elementary school CCI teachers in utilizing GeoGebra software in classroom learning. (6) All participants were very enthusiastic and happy to follow the training program. This can be seen from their active engagement during the lesson. (7) All participants were able to create a product correctly in the form of a visualization of GeoGebra-based material.

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Implementation of multiliteracies approach in mathematics teaching to support professional teachers in the industrial age 4.0

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ABSTRACT: Mathematics teachers must be able to adapt to the era of an industrial revolution. Future teachers are required to develop competency standards urgently needed in the 4.0 industrial era, namely collaboration, communication, critical thinking, and problem solving, as well as creativity and innovation. Multiliteracy learning with multicontext, multicultural, and multimodal characteristics applied to mathematics is expected to develop the ability of teachers to promote learning that supports mastery of the aforementioned competencies. This article presents a theoretical review of multiliteracy approaches in mathematics teaching. It argues that in Mathematics teaching, the multiliteracy approach was positioned as a process of thinking including experiencing (situated practices), conceptualizing (overt instruction), analyzing (critical framing), and applying (transformed practice). In accordance with multimodal characteristics, multiliteracy aligns with the use of multimodal texts such as picture books, digital books, video, and using certain technologies.

1 INTRODUCTION

Teachers have central roles in education. They have the freedom to manage learning activities in the classroom, which is not owned by other parties, even principals. Also, they determine classroom learning processes and objectives, which involve cognitive, affective, and psychomotor aspects. Moreover, they can decide the aspects of the curriculum, newly developed or ongoing, to implement or stress, in a particular class (Ornstein & Hunkins 2009). Drawing on their subject matter and pedagogical knowledge, they can translate the curriculum for students in a comprehensible way, making it applicable for effective instruction (Shavelson et al. in Paik 2011). They can even function not only as codesigners of curricular and instructional system but also as researchers to investigate the effectiveness of implemented curricula (Fullan et al. in Ornstein & Hunkins 2009).

Those roles of teacher have become more prominent along with the increasing need for teaching innovativeness that responds to graduates' competences to function in the industrial

era. The term Industry 4.0 was introduced by the German government in 2011 to indicate the potential of the fourth industrial revolution. Industry 4.0 is not only about smart and connected machines and system but also about waves of further breakthroughs in areas ranging from gene sequencing to nanotechnology, from renewables to quantum computing (Schwab 2016). The Industry 4.0 objective is the transformation of industrial manufacturing through digitalization and exploitation of potentials on new technologies (Rojko 2011). Based on this statement, the keywords in Industry 4.0 are transformation, digitization, and new technology.

The world of education today currently faces the challenges of the Industrial Revolution 4.0. era. It is forced to adapt the ideas of transformation, digitalization, and new technologies into the management of educational activities and curriculum including the learning process, materials, objectives, and assessments. This has created demand on curriculum reform whose goal is students' mastery of multiliteration abilities, namely reading, writing, and information literacy, and literacy in certain fields. As curriculum changes, so should the teaching and learning process. Teacher should be able to integrate information technology in learning and to present multimodal teaching materials. Finally, assessment also needs to reflect the reforms on instructional design and delivery and requires teachers to use techniques and instruments that can measure students' abilities related to literacy in many fields including language, culture, and technology.

The era of Industrial Revolution 4.0 is generally described as the era of multiliteration. Multiliteration pedagogy was introduced by Cazden et al. (1996). Multiliteration is seen as relevant to be applied in relation to the multicontext, multimodal, and multicultural nature of the 21st century. Several studies on multiliteration approaches have been previously carried out. However, most of the research focused on the language field while multiliteration is in fact applicable in all disciplines for its relevance in the era of Industrial Revolution 4.0 and of 21st century skills.

Therefore, it is essential to know how to apply the multiliteration approach in nonlanguage fields, such as mathematics. As Joutsenlahti and Kulju (2017) argued, there is an urgent need for research in the implementation of a multiliteracy approach in all school subjects by developing concrete yet theoretically relevant educational models. In fact, there are still very few studies that explored multiliteracy in mathematics learning. For example, González (2018) found that students developed two literacy skills in both mathematics and English simultaneously through collaboration, interaction, and knowledge representations. However, there are no studies that looked specifically into the application of multiliteration approaches in mathematics learning.

This study therefore aimed to describe (1) the concept of a multiliteration approach in a pedagogical review and (2) ways to implement multiliteration approach in mathematics learning. This research is expected (1) to present a theoretical review of multiliteracy in mathematical learning that is relevant to the demands of the Industrial Revolution 4.0. era, and (2) to be the cornerstone of implementation and theoretical foundation for further research in the related topic.

2 METHOD

In this study, the authors reviewed the literature about the multiliteration approach from the pedagogical point of view. Then, the authors described the relationships between differing concepts and notions and compared them. Finally, the authors then offered their concept and implementation of multiliteration in mathematics teaching.

3 RESULTS AND DISCUSSION

3.1 *Multiliteracy approach*

The multiliteracy approach is considered as 21st century learning. This is because this approach utilizes the discourse that students encounter in their lives, think critically, interpret

social and cultural contexts from the design of specific meanings, and put forward the ideas to apply to other contexts and cultures. These are the challenges of 21st century teachers. With regard to STEM teachers, Keiler (2018) asserts that students and teachers in 21st century STEM classrooms face significant challenges in preparing for education, career, and postsecondary citizenship, which signifies the urgency of this study. The multiliteration approach was conceived by Cazden et al. (1996) and incorporated in the New London Group. This approach emerged because the concept of literacy that was implemented in 21st century experienced various demands in terms of cultural development, language, and the media used. In terms of culture, because learners are now interacting with different cultures, they must be able to relate and work with peers and colleagues from diverse linguistic and cultural backgrounds (Chinnappan 2008). As a result, language usage has become richer and people have increasingly employed more than one language to communicate, which led to a development in the use of various languages. Cazden, Ismail, and Cazden concur that multilingualism is an increasingly significant phenomenon that asks for adequate educational responses in globalization context (Cope & Kalantzis 2008). In addition, as a result of technological developments, the media used by students has also changed. Students are no longer dealing with a single capital in life that is only in the form of text or pictures, but also media that can be audio-visual, real-time, and contextual.

Such language and technology development has also shifted the way people make meaning while communicating. The processes of making meaning are greatly shaped by these emerging developments. Cope and Kalantzis (2008) said that its contemporary forms are increasingly multimodal, in which the linguistic, visual, audio, gestural, and spatial modes of meaning were increasingly integrated in everyday media and cultural practices. This kind of media is called multimodal media. Multimodal teaching materials are not only printed writings but also writings that are on the Internet, pictures, films, and videos. These media provide visuals supplemented with texts that might both ease and challenge users' interpretation of meaning, as context must always be considered (Sari et al. 2013). The New London Group is considering multimodal ways in which meaning is made in places like World Wide Web or in other media such as video text, interactive multimedia, desktop transitions, or written text such as flyers found in shopping malls (Kalantzis & Cope 2008).

Related to the definition of pedagogy of multiliteracy, Cazden et al. (1996) state the term pedagogy of multiliteracy comprises four dimensions. These include situated practice, overt instruction, critical framing, and transformed practice. Situated practice is immersion in experience and the utilization of available discourses, including those from the students' life-worlds and simulation of the relationships to be found in workplaces and public spaces. Meanwhile, overt instruction is systematic, analytic, and conscious understanding. The term critical framing is related to interpreting the social and cultural context of a particular design of meaning. Furthermore, transformed practice refers to transfer in meaning-making practice, which puts the transformed meaning to work in other contexts or cultural sites.

Several years have passed since the first stipulation of the definition of pedagogy of multiliteracy. In 2010, Kalantzis and Cope (Cope & Kalantzis 2015) stated that in order to apply these ideas to curriculum practices over the past decade, they reframed these ideas and translated them into more immediately recognizable "Knowledge Processes," namely experiencing, conceptualizing, analyzing, and applying. Luke et al., in Cope and Kalantzis (2015), emphasize that the essential idea in the multiliteracies approach is that learning is a process of "weaving" backwards and forwards across and between different pedagogical moves that can be seen in Figure 1.

Experiencing is learning by doing through exploration, discovery, and invention (Crawford 2001). Cope and Kalantzis (2005) stated that "experiencing the known" involves the reflection on our own experiences, interests, perspectives, familiar forms of expression, and ways of representing the world in one's own understanding. Meanwhile, "experiencing the new" entails observing or reading the unfamiliar, immersion in new situations and texts, reading new texts, or collecting new data.

Conceptualization is a process that involves coming up with clear and concise definitions (Egiri & Wuritka 2015). Conceptualizing by naming involves drawing distinctions of similarity and

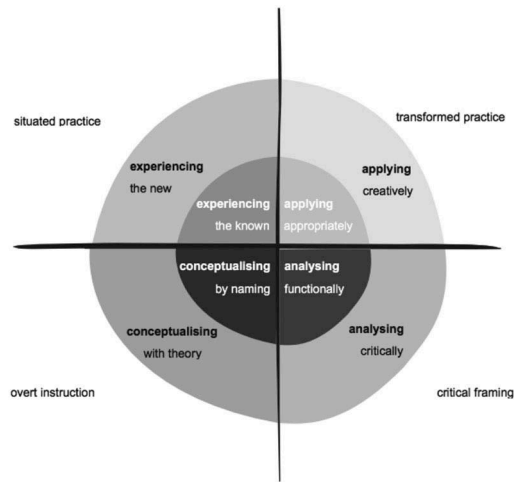


Figure 1. Mapping the original multiliteracy pedagogy against the knowledge processes (Cope & Kalantzis 2015).

difference, categorizing, and naming. Conceptualizing with theory means making generalizations and putting the key terms together into interpretative frameworks (Cope & Kalantzis 2005).

Analyzing consists of differentiating, organizing, and attributing (Anderson & Krathwohl 2001). Analyzing includes the processes of reasoning, drawing inferential and deductive conclusions, establishing functional relations such as between cause and effect, and analyzing logical and textual connections. Analyzing critically, that is, more critically than functionally, involves evaluation of your own and other people's perspectives, interests, and motives (Cope & Kalantzis 2005).

The applying strategy is learning by putting the concepts to use (Crawford 2001). According to Anderson and Krathwohl (2001), applying consists of executing and implementing. Cope and Kalantzis (2005) stated that applying appropriately entails the application of knowledge and understandings to the complex diversity of real-world situations and testing their validity. Applying creatively involves making an intervention in the world that is truly innovative and creative and that brings to bear the learner's interests, experiences, and aspirations.

3.2 Implementation of a multiliteracy approach in mathematics teaching

A multiliteracy approach is vital to deal with changes in education in the digital age, which is very important in learning mathematics in schools. The National Council of Teachers of Mathematics (NCTM 2002) states that there are six principles for school mathematics, one of which is that technology is essential in teaching and learning mathematics. It influences the mathematics that is taught and enhances students' learning. NCTM emphasizes that technology plays a role in the mathematics content taught by teachers and learning activities undertaken by students.

Based on the mapping of the original multiliteracy pedagogy against the knowledge processes (Cope & Kalantzis 2015) above, there is a process of thinking that can be implemented in all subjects, namely experiencing (the new and the known), conceptualizing (by naming and with theory), analyzing functionally and critically, and applying appropriately and creatively. As a process of thinking, these four dimensions can be implemented and brought into collaboration with certain models, approaches, and learning methods.

Downey (2015) states that some methods of incorporating multiliteracy into the mathematics classroom are (1) brainstorming through strategies such as Think, Pair, Share (Frangenheim 2007) or webbing, where a topic is written on the whiteboard and the teacher creates a web of information through the use of lines drawn from the initial topic; (2) integrating picture books such as *A Remainder of One* by Elinor Pinczes (1995), which can assist in the "couching" of

mathematical concepts or terms to be more familiar. Using a multimodal version of such texts, such as a YouTube clip, it would further help employ the semiotic systems that classify a person as being multiliterate; and (3) using technology such as WebQuests, which are “rich, real and relevant.” Joutsenlahti and Kulju (2017) stated that with multimodal languaging as a pedagogical model, students enjoyed using writing in the solution of real-world problems and suggested that the use of different modes of expressing mathematical thinking may both strengthen the learning of mathematical concepts and support the evaluation of learning.

Takeuchi (2015) highlights the teacher’s use of various languages and physical and symbolic tools, along with the teacher’s affirmation of students’ identities as multimodal users. Effective learners will increasingly need to be independent, flexible, collaborative, sensitive, knowledgeable, and able to work productively with linguistic and cultural diversity (Kalantzis et al. 2003).

In terms of the use of technology, Chitty (2012) stated that the teacher views the role of technology as a tool to support the cognitive development of students, to get and maintain student attention, to facilitate administrative tasks, and to facilitate and promote college readiness and student careers. Meanwhile, students view the role of technology as a tool for gathering information from the Internet and for improving students’ cognitive learning processes. In Khrisnan’s study (2018), teachers used multimodal books that were created using images, videos, and audio recordings on an online tablet application called Book Creator. Kupianen, Leinonen, Makinen & Wiseman (2016) discussed a digital book project as another type of multimodal text. They stated that within the subject area of mathematics, teachers had to start to think in terms of pedagogical knowledge and strategies within the multiliteracy framework; that is, the teacher could envision, for example, teaching by using drama, photographs, Quick Response codes, etc., as multimodal texts in teaching mathematical concepts and processes to the students.

These statements form an understanding of how to implement multiliteracy in mathematics teaching. Table 1 is a summary of the statements.

Table 1 . Summary of references about implementation of the multiliteracy approach in mathematics teaching.

Authors	Ideas
Cope & Kalantzis (2015)	Process of thinking in multiliteracies approach includes experiencing (the new and the known), conceptualizing (by naming and with theory), analyzing functionally and critically, and applying appropriately and creatively.
Downey (2015)	Some methods of incorporating multiliteracies into the mathematics classroom: 1. Brainstorming through strategies such as Think, Pair, Share (Frangenheim, 2007) or webbing. 2. Integrating picture books and a multimodal version of such texts, such as a YouTube clip, would further help employ the semiotic systems that classify a person as being multiliterate. 3. Using technology such as WebQuests, which are “rich, real and relevant.”
Joutsenlahti & Kulju (2017)	About multimodal languaging as a pedagogical model: 1. Student enjoyed using writing in the solution of world problems. 2. It is suggested that the use of different modes of expressing mathematical thinking may both strengthen the learning of mahematical concepts and support the evaluation of learning.
Chitty (2012)	The use of technology as a tool to support the cognitive development of students, to get and maintain student attention, to facilitate administrative tasks for the teacher, and to facilitate and promote college readiness and student careers; students view the role of technology as a tool for gathering information from the Internet and to improve their cognitive learning processes.
Khrisnan (2018)	Teacher uses multimodal books created using images, videos, and audio recordings on an online tablet application called Book Creator.
Kupianen et al. (2016)	Exemplifies the use of a digital book project, drama, photographs, Quick Response codes, etc., as multimodal texts in teaching students mathematical concepts and processes.

In short, multiliteration in pedagogical reviews includes situated practices, over-instruction, critical framing, and transformed practice. As a process of thinking, multiliteracy includes experiencing (situated practices), conceptualizing (overt instruction), analyzing (critical framing), and applying (transformed practice). As an approach, multiliteration can be implemented in mathematics learning through several specific models, methods, and learning strategies. Some of these include brainstorming; webbing; using drama or photographic activities; integrating multimodal texts such as picture books, digital books, and videos; and using certain technologies to support the cognitive development of students in the mathematics area.

4 CONCLUSION

The multiliteracy approach is a multicontext, multicultural, and multimodal learning approach. In a pedagogical review, the multiliteracy approach is relevant to be applied in various disciplines for Industrial Revolution 4.0 and 21st century. Multiliteracy is an approach that can be collaborated with some learning models, strategies, and methods. In mathematics teaching and learning, the multiliteracy approach is considered as a process of thinking, including experiencing (situated practices), conceptualizing (overt instructions), analyzing (critical framing), and applying (transformed practice). Since multimodal characteristics are appropriate, multiliteracy can be supported by using multimodal texts such as picture books, video, and certain technologies.

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Cultural approaches to citizenship education in early childhood: Teachers' experiences

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ABSTRACT: In this article, we explore the notion of early childhood education teacher related to cultural approaches for early citizenship education. Grounded theory was employed to examine teachers' experiences and perceptions of social citizenship in early childhood education context. The findings of this study indicate that teachers have a similar notion regarding the urgency of early citizenship education. They have tried to implement culture-based character education through familiarization, habituation, utilization of traditional games, routine programs, and behavioral assessments. The findings suggest that the methods implemented by the teachers were still conventional. Hence, the researchers recommended the teachers be given new insights and training on scientific development and the practice of early childhood education to promote their competencies for Industry 4.0 Education.

1 INTRODUCTION

The mission of developing education and advancing national culture in Indonesia always faces macro and micro challenges. Character education which has become a program of the Indonesian government is also involved in the polemic and challenges. With the assumption that a nation's culture is the nation's character, effective character education needs to start from as early as childhood education.

In the context of formal education mission, the teacher becomes the ultimate executor in the field, because the success of learning depends on him/her. In kindergartens, teacher-directed academic instruction has an important role, because play-based learning needs to be interpreted as child-centered practice (Pyle & Danniels 2017). At this early age, the use of games has proven to be successful in achieving educational goals according to context and social aspects of the game (Yelland 1999). But sometimes the teacher is biased in looking at culture due to his/her limited experience, knowledge, and skills. Teachers perceive their duty as supervisors especially when children play outdoor as most important, despite the fact that most of them actually carry out more indoor games (McClintic & Petty 2015).

In this Industry 4.0 era, the writers felt a strong need to reorient and use culture for references to increase teacher competence by inviting them to collaborate in research. In this regard, participatory community-based care and learning plays an important role in the tradition of early childhood development, as is exemplified in the case of the Guji community of Ethiopia (Pyle & Danniels 2017). Pyle and Danniels (2017) reported how the cultural space of young children provides unique features in early childhood care, play, and learning traditions in Africa. Collective empowerment is realized through CRE to address sociocultural issues that originate from the community (Aronson & Laughter 2015) and have an impact on schools and even in broader contexts; for example, for social workers to be regarded as culturally competent they need to develop some knowledge and attitudes (Jani et al. 2015).

Indigenous games can help children cultivate good behavior, tolerance, discipline, healthy spirit of co-existence, leadership qualities, hard work, and competitiveness, as shown by a study in Ghana, which resulted in a recommendation to establish African-centered education (Amlor 2016). There is also a sense of urgency to find ways and patterns of collaboration between families, communities and teachers that are dynamic, shifting, and evolving to apply Culturally Sustaining Pedagogies in the face of changing times (Paris & Alim 2017)

Integrating the latest technology in early childhood learning environments also brings many benefits. It can add value to children's learning games, especially by applying physical and virtual worlds like traditional games (Aronson & Laughter 2015). An example of effective toys used at early childhood education is the Educational Magic Toy developed with augmented reality technology (Plowman 2005).

This paper is a follow-up study of research that focuses on developing learning games through learning models (Istianti et al. 2016). Here, we describe how the developed learning games have an impact on teachers' experience, invoking the reflective phase of the teachers in their implementation of the model (Istianti et al. 2019). The paper will further explain how the early childhood education teachers see culture and approach it to use for learning.

2 RESEARCH OBJECTIVES

The main objective of the study is to explore the notion of early childhood education teacher related to cultural approaches for early citizenship education. Moreover, this study also investigates how the teachers make use of Indonesian traditional children games.

3 METHODOLOGY

The research is a qualitative study employing the grounded theory to examine teachers' experiences and perceptions of citizenship in early childhood education context. This research applied focus group discussions and observations to gather data. They were administered in eight kindergartens in four cities in Indonesia, involving 16 early childhood education teachers. Data were analyzed to explain the teachers' perceptions based on the current social behavior and early childhood theory.

4 FINDINGS

4.1 Teacher's romanticism, experiences, and professional impact

From the data collected from sixteen teachers of eight participating kindergartens, this study found that in the context of the use of traditional games, teachers were found to have a romanticism towards games. This is reflected in the expression of one participant who said:

When I see children playing with traditional games, and they run around laughing and having fun, I remember my childhood. I believe that these children will also experience beautiful things as I used to feel when playing this game, although later I realized that what we played before had quite a deep meaning.

From this expression, researchers see that teachers develop a deeper meaning to what they used to do when they grow up. Through his/her romanticism, the teacher agreed that traditional games were brought back programmatically in kindergarten.

Meanwhile, for optimization they agreed that there should be an approach and strategy to integrate traditional games into the learning design. The teachers see that games can be an answer to the question of how to realize character education in early childhood education. In this case, the teachers have attempted to implement character education through

familiarization and habituation based on local culture by using traditional games, routine programs, and behavioral assessments in their daily learning activities

4.2 Enriching industrial revolution 4.0 with traditional games and ethnic local language

When asked for their perception of introducing culture to students in this era, one teacher expressed

Actually, for culture we can make use of the traditional games, because parents created them not only to play, but also to educate children indirectly. Then through advice from parents during and after the games, character education is transmitted through the local language.

From this, we can see that the cultural approach that the teacher understands and intends to use refers to traditional games and language. In relation to the industrial era 4.0, teachers believe that the required skills can be nurtured and developed through traditional games and cultural approaches. This belief is based on an assumption that children should not only have competence, but also character. The Industrial Revolution 4.0 expects citizens with mature social and emotional skills. These skills include empathy, collaboration, and responsibility. The teachers agreed that the skills were best trained with the diverse Indonesian national cultures.

In relation to future preparations, the teachers think that the types of games are not limited to conventional and traditional types, but also those containing information and digital technology. Furthermore, ICT-based games can become a medium and resource for cultural preservation and recognition. The culture is to be transformed into social and emotional skills and later developed to face of the challenges of the Industrial Revolution 4.0 era in early childhood education context. Thus, to face the prospective challenges, early childhood education teachers need to be prepared and developed contextually and futuristically based on the rapidly changing times.

5 DISCUSSION

From the above results, we can see that teachers have romantic as well as practical experience with regard to the prospects of traditional games being used in transmitting cultural values. The unique romanticism can be integrated into prospective use that considers children in the present and future, so that children can have the same experience as the teachers. Of course, further consideration is needed, because the view could be biased or even not relevant to children's real experiences.

The experience of teachers and parents with traditional games has shaped their perceptions. Transmission and transformation of values occur when children play. Children's characters can be developed from parents' and teachers' interactions with traditional games in their childhood. This finding confirms Amlor's (2016) findings that traditional games have the ability to foster ethical behavior, tolerance, discipline, healthy co-existing spirit, leadership qualities, hard work, and a competitive spirit. Traditional games can thus be the appropriate media for character education. However, at present, the teachers are still implementing culture-based character education through conventional methods such as socialization, habituation, use of traditional games, routine programs, and behavior assessment.

Reflecting on Paris & Alim's (2017) idea of Supporting Cultural Pedagogies for collaboration among families, communities, and teachers, we can make games played in schools as a representation of the community around the school. Within this paradigm, we can educate and cultivate in students' values related to their environment as a rich source that they can use from generation to generation although we cannot discuss the exact process of the journey and life experiences of children during their education.

In connection with the romanticism felt by teachers and parents above, kindergarten students are expected to understand how the spirit of the times works. There is a connection

Even though we can change what is done by teachers, there is nothing new, because there are so many limitations and tasks that make it difficult for teachers to innovate. Traditional games should be played really well to function as needed. Currently, they are made as a filler only. From here, we can learn why cultural learning still uses the conventional method. Meanwhile, based on discussions on culture, teachers were found to still have a limited paradigm of how culture can be conveyed and taught to young children. However, we can strive to make traditional games serve as learning media so that students can welcome the era of the industrial revolution with local wisdom. This way, we can be competitive while still living in harmony and upholding the good values.

The findings of this study indicate that teachers have a similar notion regarding the urgency of early citizenship education. Teachers have tried to implement culture-based character education through familiarization, habituation, utilization of traditional games, routine programs, and behavioral assessments. The findings suggest that the methods implemented by teachers were still conventional. However, we need to be optimistic and strategic in utilizing traditional games for early childhood education. The use of traditional games aims to tie the past experiences of teachers and parents to the latest experiences of students when playing traditional games. Thus, the authors confidently recommend that for facing the era of the industrial revolution 4.0, teacher education for early childhood education needs to be enriched with the introduction of traditional games, to preserve and advance the national culture.

Ethical Clearance: Obtained from Ministry of Research and Higher Education, Indonesia

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Future of teachers' education: Expert validity instruments of the E-Learning Classroom Environment and Transformation (ECET)

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ABSTRACT: The objective of this study was to identify the dimensions, aspects, and items of E-Learning Classroom Environment and Transformation (ECET) instruments. The Research subjects were nine experts. Instrument modification from What Is Happening in this Class (WIHIC) had dimensions of teacher support, involvement, investigation, authentic task orientation, cooperation, equity, access, interaction, transformation, and technology. The results showed that the assessors provided advice and input in examining the appropriateness of the dimensions, items, and aspects. Instruments of ECET produced 54 items that were declared valid based on the experts' agreement. Existing statement items met various measurement criteria that can be used to measure the classroom learning of Teacher Professional Education students in Indonesia. The dimension that needed to be corrected was the authentic task orientation indicator. Almost all experts provided improvement on aspects of language.

1 INTRODUCTION

The Institute of Education and Education Personnel prepares students to become professional teachers according to their field of study. The program of teacher education institutions is in the form of learning related to subjects, pedagogy, and teaching practices in schools (Gaudin 2015). This concept of learning is important to describe and analyze learning and for development in the context of education (McNally et al. 2017). The initial intervention in developing a vision of teaching must instill the understanding of future teachers. Beginner teachers experience difficulties because there are differences between what is learned during the Teacher Professional Education program and at work (Brownell & Leko 2018; Pérez 2019). Teacher Professional Education graduates are expected to develop a deeper understanding of professional identity and think about teaching beliefs and images (Brownell & Leko 2018). The picture of teaching holds power through new experiences and knowledge and interacts with reality in the classroom learning environment (Wang et al. 2014).

The learning environment is often associated with one aspect of interaction in the classroom (Koul et al. 2018). Studying the learning environment in the Teacher Professional Education class has implications for developing the competence of Teacher Professional Education students. The importance of evaluating the Teacher Professional Education class is in discovering the activities of the learning process so that it reflects a good quality culture. The results of the assessment can be used to enhance the implementation of Teacher Professional Education learning and its effect on the quality of Teacher Professional Education graduates. Therefore, it is significant for the preparation of measuring instruments to be developed in providing information on the conditions of the Teacher Professional Education learning environment in Indonesia.

Instrument development is designed to assess the classroom environment as it adjusts the instrument to the research needs (Sandilos et al. 2017). One of the instruments that had been produced from the research is What Is Happening in this Class (WIHIC) (McNally et al. 2017). WIHIC has been used in several countries, adjusted to the country's culture (Koul

et al. 2018, McNally et al. 2017). Research has found that WIHIC has very strong psychometric characteristics when used in a sample of high school students (Koul 2016).

The validity of WIHIC has been very well tested (Charalampous & Kokkinos 2017a; Watt et al. 2017).

This study modified the WIHIC instrument by adding three components, those related to e-learning, classroom learning, and transformation, as a measurement tool for Teacher Professional Education class assessment adjusted to the classroom environment in Indonesia. The objective of this research was to describe the whole modification process through expert validity, which the WIHIC questionnaire underwent before the final modified form was adopted in the main study.

2 LITERATURE REVIEW

2.1 *Instrument E-Learning Classroom Environment and Transformation (ECET)*

E-Learning as an umbrella term describes any type of learning that depends on or is enhanced by electronic communication using access to the latest Information and Communications Technologies (ICT). E-Learning is defined as web-enabled teaching and learning. E-Learning can be defined as learning facilitated and supported through using ICT (Ogbonna 2019). It can cover an interaction of activities, from the use of technology to support learning as part of a blended approach (a combination of traditional and e-learning approaches), to learning delivered entirely online (Ilkan et al. 2017; Ogbonna 2019).

WIHIC is a validated classroom environment instrument developed by Fraser to assess the nature of classroom learning environments (Skordi & Fraser, 2018; Zandvliet 2019). The WIHIC questionnaire is a frequently used classroom environment instrument around the world, with the sample of evidence supporting its psychometric properties and cross-culture validity, albeit mostly in secondary classrooms (Charalampous & Kokkinos 2017b). WIHIC incorporates subscales addressing modern educational concerns. In all, seven subscales constitute the WIHIC, which are Student Cohesiveness, Teacher Support, Involvement, Investigation, Task Orientation, Cooperation, and Equity. It has been developed with the best features of the existing instruments, as it includes the silent scales of those instruments. In addition, it allows the exclusion of irrelevant scales to suit any classroom environment under study without affecting the reliability and validity of the original instrument (Khalil & Aldridge 2019; Stein & Klosterman 2019).

Knowledge transformation is critical to achieving a comprehensive framing when solving challenging problems (Tippmann & Scott n.d.). Knowledge transformation allows alternative problem formulations to emerge in generating problem formulations that look beyond the habitual, to generate ideas for improving and innovating (Ramakrishna & Paschke 2014).

Validity is an indispensable requirement in an instrument's development. The validation of instruments used in education should involve content analysis and empirical analysis of the scores obtained from the instrument and the respondents' responses to the items. Content analysis of an instrument is associated with a content analysis that later also needs an empirical analysis to prove the construct validity. Both of these analyses are intended to design instruments in the world of education qualified as standard measurement instruments (Taber 2016; Piccoli et al. 2017). Content validity is determined using expert agreement. The expert agreement, also called a measured domain, determines the content validity stratification (content-related). The measuring instrument, for instance, a test or questionnaire, is proved to be valid if the expert believes that the instrument measures the mastery abilities defined in the domain or the measured psychological constructs. To understand this agreement, a validity index can be used, including the index proposed by Aiken (Caycho et al. 2019). Assessment of the validity of this content is based on expert judgment. Experts obtain measurement specifications and measurement items. Experts match them and make judgments. The method of assessment depends on the expert to compensate for the bias. The examination was conducted by more than one expert. Aiken's validity index offers a range of choices from the least suitable to the most suitable ones (Ibáñez et al. 2019).

3 METHOD

3.1 Instrument

The development of ECET instruments using the ADDIE development model consists of five stages: (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation. This development model is one design of learning instrument expansion (Almomen et al. 2016; Kristanto & Mariono 2019). The evaluation was conducted at each stage to minimize the level of product errors or deficiencies. The stages of expanding this instrument have reached the development stage, which is expert validation.

The result of the concept study obtained in the conceptual definition of E-Learning, Classroom Learning, and Transformation in this study is the implementation of e-learning which had two indicators, initialed AS (access) and IC (interaction). The second dimension regarding the workshop used seven indicators, which comprise TS (teacher support), IV (involvement), IS (investigation), ATO (authentic task orientation), CO (cooperation), EQ (equity), UT (using technology), and the third dimension of Knowledge Transformation with TF (transformation) indicator. The measurement scale of the ECET instrument consists of five options: never, sometimes, rarely, often, or always.

Table 1. Guidelines of the ECET instrument.

Dimension	Indicators	Item no.	Total
<i>E-learning</i>	Access	1, 2, 3	3
	Interaction	4, 5, 6, 7	4
Classroom Learning	Teacher support	8, 9, 10, 11, 12, 13, 14, 15, 16	9
Dimension	Indicators	Item no.	Total
	Involvement	17, 18, 19, 20, 21, 22, 23, 24,	8
	Investigation	25, 26, 27, 28, 29, 30, 31, 32	8
	Authentic task orientation	33, 34, 35, 36, 37, 38, 39	7
	Cooperation	40, 41, 42, 43, 44, 45	6
	Equity	46, 47, 48, 49, 50, 51	6
	Using technology	52, 53, 54, 55, 56, 57, 58, 59, 60	9
	Transformation	61, 62, 63, 64, 65	5
Total			65

3.2 Participants

Respondents in this study were experts selected based on the criteria of having experience, mastering the concept of learning through e-learning, classroom learning, supervising the practice of field experience in schools, and having a doctorate educational background. The experts consisted of two men and seven women, comprising one person from the Faculty of Engineering, two people from the Faculty of Language and Arts, two people from the Faculty of Mathematics and Science, one person from the Faculty of Social Sciences, two people from the Faculty of Sports, and one person from the Faculty of Economics. The determination of expert criteria was the same as conducted in the study (Skriner et al. 2017). The selection criteria were based on previous findings regarding the demographic variables that differentiated experts' perceptions of the instrument.

The ECET instrument with input from nine experts in three dimensions, 10 indicators, and 65 statement items provided input for overall improvement recommendations: (1) clarity in each item must be adjusted to dimensions and indicators; (2) in language, there are many repetitions of words in writing items; (3) the editorial statement in the item must lead to the measured aspect; (4) according to the experts there were several items that should be fixed more specifically or not used because the statement items were ambiguous and did not lead to the objective aspect. These were item numbers 8, 55, 57, 58, 59, 60, 61, 62, 63, 64, 65,. After going through the expert item review process, 54 items were obtained with 10 indicators of improvement results as shown in Table 4.

Table 4. The results of phase II preparation of the ECET instrument, Indonesian version.

Table 5. Aiken's validity index results on the ECET instrument.

various articles. The focus of writing this article is to reveal the importance of expert validation in the development of ECET instruments, as has been conducted by Usry et al. (2018) to build more concrete evidence of content validity by using a large number of experts who are able to provide excellent evidence of reliability among experts.

The results of expert assessments were in the form of qualitative and quantitative assessment inputs to examine each item. The overall expert assessment emphasized improvement in the preparation of the ECET instrument, namely: (1) clarity on each item with a measuring dimension; (2) avoiding repeating words in the compiled statements; and (3) the editorial statement in the item that must lead to the measured aspect. The ECET instrument on the learning dimension of e-learning was one of the learning needs of PPG students. Suggestions were given to the access indicator (AS) in measuring aspects of the extent to which PPG students access the module online. The interaction indicator (IC) measured aspects of assessing how far students interacted through e-learning media.

The Classroom Learning dimension with the teacher support (TS) indicator measures the aspects in assessing the extent to which lecturers help, make friends, and are interested in students. Involvement (IV) measures aspects of assessing the extent to which students have full interest, attention, participation in class, and engage with other students in assessing the feasibility of new ideas. Investigation (IS) measures aspects of assessing the extent of emphasis on skills and investigations and their use in solving investigative problems. Authentic task orientation (ATO) measures aspects of the extent to which students can complete authentic tasks and assessments. Cooperation (CO) measures the extent to which students can collaborate during learning activities. Equity (EQ) measures the extent to which students are able to extract the contents of their knowledge so that it can be presented in a form that is easily understood by students when the Practical Field Experience activities take place. Using technology (UT) measures aspects of assessing the extent to which students use ICT in the learning process. Research results by Skordi and Fraser (2018) show that when the measurement objectives in the instrument are put together, the objective aspects of contemporaneous assessment and constructivism are visible in the learning environment.

The dimension of knowledge transformation becomes a necessity in implementing practical learning in the classroom, by applying learning tools that have been prepared and revised in workshop activities. The transformation indicator (TF) measures the extent to which students change the content of their knowledge, presented in a form that is easily understood by students during the Practical Field Experience. Reports on the results of a quantitative assessment of testing 54 items with a scale of measurements conducted by experts with the Aiken's validity index showed a range of values from 0.68 to 0.91. The criteria to show that the ECET instrument has a very good content validity value is based on the results of the study by Pain (2019) on which expert validity between 6 and 10 must have a minimum content validity value of 0.78. It provides information that the preparation of the second-stage ECET instrument is in accordance with the objectives measured by placement of dimensions, indicators, and statement items.

5 CONCLUSION

This study shows the need for expert validation to improve the ECET instrument of Teacher Professional Education students in Indonesia. An overview of the expert validation flow process and the results of the analysis have been presented. Assessment experts provide advice and input in examining the suitability of the dimensions, items, and assessed aspects. The dimension that needs to be corrected is in the authentic task orientation indicator of "students become lecturers." Almost all experts provide improvements in the aspects of language. The Aiken's validity index report supports the systematic results of the preparation of the ECET instrument of 54 items declared to be in accordance with the measurement objectives; existing statement items have met various measurement criteria that can be used to measure ECET of Teacher Professional Education students in Indonesia.

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Disposition aspect of the educational field experience practices of student teacher candidates

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ABSTRACT: This study aimed to analyze aspects of the assessment in the Teaching Field Practice (PPL) program at the Indonesia University of Education (UPI) by reconstructing assessment standards. Assessment for prospective teacher students in the UPI PPL handbook still contains weaknesses in the affective domain or personal social character (dispositions). To produce appropriate and specific PPL UPI assessment indicators, this study focuses on the review of standardized documents for the implementation of teacher education programs. Sources of data were obtained from UPI PPL assessment forms found in the PPL guidebook. This research used a descriptive method with case studies of particular issues in teacher education by analyzing, explaining, evaluating, predicting, conducting research, and developing indicators especially in the application of assessment standards. The results showed that aspects of disposition in the evaluation of educational PPL at UPI can be developed with detailed indicators based on teacher education standards. The disposition aspect developed at UPI consists of leadership, responsibility, emotional stability, communication, discipline, attitude, and manner of dress.

1 INTRODUCTION

The field experience program (PPL) at the Indonesia University of Education (UPI) was designed to train educational skills needed in relevant fields for undergraduate students. The purposes of PPL are to train students to master integrate teacher skills at the school so that they have readiness in performing their duties as professional teachers (UPI 2019). The purposes of implementing the PPL program are to strengthen mastery of academic competencies, develop professional identity as educators, and provide basic experience in carrying out educational learning under effective supervision from supervisors and mentor teachers (Kennedy 2010).

The targets of PPL include (1) getting to know the characteristics of students in terms of individual development and differences; (2) observing the physical, geographical, and social environment of partner schools; (3) reviewing the content standards and Graduates Competency Standards and curriculum/syllabus developed by teachers in partner schools; (4) observing learning activities; (5) reviewing the material, methods, media, and learning resources used by the teacher; (6) knowing the organizational structure and management of schools; (7) reviewing the process and results of student learning assessment by teachers; (8) developing a learning implementation plan for the relevant field of study; (9) implementing lesson plans in the context of organizing educational learning with supervision from supervisors and mentor teachers; (10) analyzing and following up the process and results of student learning evaluations; (11) carrying out diagnostic learning difficulties and remedial learning; (12)

identifying educational and learning problems in schools that can be examined in the context of thesis completion; and (13) reporting, discussing, and accounting for professional PPL processes and results (UPI 2019).

To achieve these goals and objectives, PPL at UPI is taken through seven main steps: (1) debriefing, (2) field orientation, (3) development of programs/plans for implementing teaching and learning, (4) limited practice training and modeling in a microteaching laboratory, (5) training in organizing teaching and learning, (6) preparation of reports, and (7) professional exams (UPI 2019). These steps must be passed by all parties involved in PPL, especially supervisors, practical students, and mentor teachers, with the final target of prospective teacher students being able to graduate after undergoing the seventh step, namely examinations. Therefore, the exam stage is very important in guaranteeing and determining the quality of graduates because it serves to filter the eligibility of the graduates to be teachers or not in addition to other functions (Allen 2006).

In the context of evaluating PPL program practitioners at UPI, the assessment process and PPL results have been completed with a number of assessment instruments, consisting of several assessment forms (Astin 1996). The assessments contained in these formats basically include elements of the domains of knowledge, skills, and dispositions. However, the composition and level of representation have not been balanced, especially for elements of disposition, which are still minimal. This can have implications for proportional valuations that are not balanced as well. In fact, assessment must contain clear and specific indicators to measure the competency of the practitioner. The measurement indicators should be relevant to the central tasks teacher education, which cover aspects of knowledge, skills, and dispositions (Feiman-Nemser 2003).

In addition, disposition assessment indicators as contained in the personal social assessment format in PPL UPI were still considered too general. There was no description of meaning or indicators for leadership values, responsibility, emotional stability, communication, discipline, attitude, and manner of dress. In the format of personal social assessment, for example, personal social elements that can be interpreted as aspects of disposition have no indicators that explain the meaning of these elements.

In the PPL Assessment Instrument, the disposition aspect has not been described explicitly and therefore not representative for assessing the ability of prospective teachers both at the planning and implementation stages of learning in the classroom. This assessment instrument has not been equipped with a standard assessment rubric so that the assessors consisting of supervising lecturers, tutor teachers, and school principals are too free to interpret the assessment items contained in these instruments.

Therefore, to meet the principles of valuation of PPL assessment—objectivity, fairness, and transparency—the assessment indicators should also be supplemented with indicators that are in accordance with the assessment standards (Frederiksen et al. 2012). PPL is an important part of the teacher preparation program. This study aimed to analyze disposition aspects of assessment in the PPL UPI program by reconstructing assessment indicators for disposition aspects in the existing assessment aspects by using assessment standards for disposition aspects of the teacher education program. To analyze the disposition aspects of PPL assessment, the case study approach for particular issues in the teacher preparation program was applied.

2 METHOD

This research was conducted to describe the factual conditions of the student teacher assessment in the PPL program for the disposition aspect. To achieve the objectives of the investigation, analytical descriptive methods were used that consisted of assessment, explanation, evaluation, prediction, operational research, and the development of indicators (especially the development of assessment rubrics). Meanwhile, to achieve the target in accordance with the method used, case studies with particular issues regarding the teacher preparation program in the implementation of the investigation were carried out through an in-depth review of the documentation in *UPI PPL Guidebook* (UPI 2019).

For the assessment aspect, a UPI PPL guidebook investigation was carried out to find out what components of the practical assessment can be improved. This aspect was focused on disposition. Investigations were carried out on the assessment instruments in the Personal Social Assessment format.

To reconstruct the assessment rubric with more specific indicators, a literature review from various sources was conducted relating to the assessment and internship programs. Evaluation and investigation were carried out on documents (internal assessment forms/rubrics for disposition assessment aspects). Documents reviewed related to education standards and teacher education assessments include (1) Interstate New Teacher Assessment and Support Consortium (InTASC) developed by the Council of Chief State School Officers (CCSSO 2012), (2) Standards for Teacher Preparation, (3) Assessment Form of Internal Progress, and (4) Internal Observation Form. These four PPL assessment documents have different characteristics and function. Comparative methods are used to identify the characteristics, strengths, and weaknesses of each evaluation document at UPI and other universities.

3 RESULTS AND DISCUSSION

Based on the analysis of *PPL UPI Handbook*, an assessment form was found that contained aspects of disposition in terms of personal social assessment. This form must be filled out by the mentor teacher when conducting an assessment of the prospective teacher who has completed the PPL education program.

The disposition assessment aspect in *UPI PPL Handbook* is still very general and there is no specific explanation to show the full assessment of the personal social performance of the student practice. The assessed aspects are leadership, responsibility, emotional stability, communication, discipline, attitude, and manner of dress. In the process of evaluating these aspects, assessors might interpret the aspects according to their personal assumptions. Table 1 contains information on the disposition aspect assessment form developed by UPI in the *PPL Education Manual* (UPI 2019).

To facilitate assessors in assessing aspects of the disposition, reconstruction and evaluation of various documents related to teacher assessor standards is carried out. The development of an assessment rubric is needed in the context of the operationalization of indicators to be achieved in an assessment (Frederiksen 2012).

The development of the assessment rubric carried out at UPI continues to this day. This means that *UPI PPL Handbook* in the context of UPI must also follow developments that are adapted to the standards applied in almost all Indonesian universities, which use the national standards of teacher education (SNPG or *Standar Nasional Pendidikan Guru*).

The evaluations of student teacher teaching practices are also conducted in many places. Some best practices, for example, were developed by the US government both at the federal level through the Association for Childhood Education International (ACEI), the Council of Social Foundations of Education (CSFE), and Interstate Teacher & Support Consortium

Table 1. Aspects of evaluating dispositions in PPL UPI.

No	Assesment aspects	Grade	Information
1	Leadership		Inside/outside the classroom
2	Responsibility		Against the duties of PPL mentor teachers
3	Emotional stability		At the time of appearance in class/outside the classroom
4	Communication		Inside/outside the classroom
5	Discipline		Against the rules that apply in PPL
6	Attitude		Inside/outside the classroom
7	Manner of dress		Inside outside the classroom

Source: UPI (2019).

(InTASC) as well as Michigan state regulations such as Entry-Level Standards for Michigan Teachers (ELSMT) and Elementary Certification Standards. Each state is allowed to develop evaluations that are tailored to the needs of each state (Mikulec & Miller 2012). In Michigan this also includes the federal No Child Left Behind (NCLB), where the core curriculum includes natural sciences, mathematics, English, literacy, language, art, citizenship and government Education, economics, history, geography, and foreign languages (Nierstheimer et al. 2012).

Table 2 presents some assessment standards that can be used as a reference and have relevance in the development of assessment rubric aspects of disposition in the assessment of PPL student teacher candidates.

Table 2. Disposition evaluation based on InTACS standards and relevance for disposition development at UPI.

Standard	Relevance for the development of dispositions at UPI
1 Student Development	(1) Learning lesson plans and extracurricular activities; and (2) interaction with parents, environment, and professionals
2 Learning Differences	(1) Preparing different learning styles; (2) lesson plans, teaching and learning processes (reward), extracurricular activities; and (3) facilitating different student interests and respect students' origins
3 Learning Environment	(1) Implementing lesson plans that involve family and environment; (2) students play an active role in learning (illustrated in lesson plans); (3) lesson plans use the environment for learning (implementation of learning); (4) respecting the opinions of others in implementing learning; and (5) wise and responsive teacher (as a good listener and observer in learning)
4 Content Knowledge	(1) The teacher understands the content that is implemented in the teaching and learning process and has new ideas
5 Application of Content	(1) In planning and implementing the lecturers relate the evaluation to local issues and global issues; (2) value student knowledge outside the themes discussed and the knowledge expands student knowledge; and (3) use the environment so students can explore, observe, and be able to connect with other subjects
6 Evaluation	(1) Peer evaluation in the learning process; (2) active in learning, in groups and individually; (3) the teacher gives time to each individual to give feedback; (4) uses a variety of evaluations to facilitate differences in student style; and (5) pays attention to the ethics prevailing in learning
7 Lesson Plans	(1) Facilitating lesson plans and implementing them in learning; (2) making lesson plans and involving input from students, peers, family, and environment; (3) lesson plans and syllabus planning; and (4) lesson plans are not rigid but adapted to the needs and environment of students
8 Teaching Strategies	(1) The teacher understands the strengths and needs of students as set out in the lesson plans that are made; (2) uses a variety of formats to facilitate differences in the way people communicate; and f(3) the teacher values flexibility and reciprocity in learning (including adaptation of learning to students' responses, ideas, and needs)
9 Professional Learning and Ethical Practice	(1) Lesson plans (process analysis, reflection to improve lesson plans and learning); (2) in learning (including culture, gender, language, abilities, ways students find out/learn); (3) as learners student teachers look for opportunities and utilize the latest educational and research rules as a source of analysis and reflection to improve practice improvement; (4) relate to ethics, standards of professional practice, relevant laws, and policies
10 Leadership and Collaboration	(1) The implementation of learning relates to stakeholders and users; (2) explicit in lesson plans and implements them in learning (develops the rubric); (3) a) able to take the initiative to build colleagues, b) able to take the initiative to develop colleagues, c) able to collaborate to build and develop colleagues; (4) a) able to contribute, b) able to collaboratively advance the profession, c) able to lead the profession improvement; and (5) a) able to lead in improving the profession, b) able to collaborate in making changes, and c) able to lead a sustainable change

Source: Council of Chief State School Officers (2011) with modification.

Referring to each standard presented in Table 2, several rubrics or indicators can be reconstructed as a reference in evaluating the disposition aspects of PPI UPI. Some indicators in the standard are relevant to the development of disposition assessment indicators at UPI. Therefore, after adjusting and analyzing each assessment indicator, a more detailed disposition assessment indicator is obtained. The appraisal is not confused with the assessment indicators that have multiple interpretations (Everhart & Hogarty 2009). Table 3 shows the indicators in the assessment of disposition aspects in PPL UPI.

Evaluation aspects in PPL activities related to teacher development are developed in accordance with what is offered by Feiman-Namser (2003), that aspects in evaluating teacher candidates include knowledge, skills, and dispositions. By presenting clear and detailed indicators, the supervisors and mentor teachers will evaluate PPL assessment more easily and the results can be well understood by students.

Analysis of various documents at UPI, particularly the assessment documents of observations at school as well as interviews with internal resource persons, field instructors, mentor teachers, as well as course coordinators, and course instructors shows that all supports to assessment of disposition are important in helping prospective teachers to become professional (Allen 2006). Based on the structure of the prospective teacher's courses at UPI, that assessment of disposition can be accessed starting from the second/third year (junior) when students take educational courses.

Professional dispositions are proposed and added to professional knowledge and expertise as aims of the teacher education program. Disposition is considered as repetition in behavior compared to habits, attitudes, skills, traits, or characters. Professional dispositions are treated

Table 3. Indicators in the assessment of disposition aspects in PPL of education at UPI.

Assessment No	Assessment aspects	Assessment indicators
1	Leadership	1. Making lesson plans 2. Mastering class 3. Evaluating the implementation of lesson plans 4. Guiding the extracurricular activities 5. Leading in completing official work according to applicable rules 6. Creating a learning community
2	Responsibility	1. Making lesson plans (12 times) 2. Conducting 32× lesson plans meetings 3. Making a student progress report 4. Making a final evaluation of students by facilitating differences 5. Managing learning communities
3	Emotional Stability	1. Receiving feedback 2. Having ability to communicate with the school 3. Having ability to convey difficulties encountered
4	Communication	1. Being able to communicate what to achieve in learning
5	Discipline	1. Being on time 2. There is a tolerance for being late for a reason (in many cases) 3. Complying with school rules
6	Attitude	1. Appreciating colleagues and staff 2. Respecting students 3. Respecting parents 4. Having a good attitude in taking the initiative in responding to problems in school 5. Maintaining the confidentiality of the problem according to the rules 6. Making time for students who need help
7	Dress Code	1. Wearing appropriate clothes 2. Wearing acceptable make-up 3. Wearing acceptable accessories that are not excessive 4. Wearing clothes that do not interfere with motion when teaching

as “habits of thought” that enhance expertise and are ideally defined by trained behavior (Katz & Rath, 1985).

The development of professional disposition carried out by Eastern Michigan University (EMU) (Darling-Hammond 2010) includes 11 aspects that are further developed into 18 points that need to be evaluated by a practitioner. Some important points in the evaluation of disposition to become a professional teacher are as follows:

- Professional Ethics
- Collaboration
- Commitment to Difference
- Differences (Listening)
- Commitment to Teaching
- Emotional Maturity
- Initiative
- Initiative (Source)
- Responsible (Reliable)
- Responsible (On Time)
- Quick Response on Professional Feedback (Receiving)
- Quick Response on Professional Feedback (Responding)
- Self-Reflection (Reflecting)
- Self-Reflection (Testing Yourself Perspective)
- Focus on Students
- Conversation
- Writing
- Oral Communication

The listed disposition assessment is carried out with reference to the description that is suitable for the prospective teacher (Fuller et al. 2000). The practical values will indicate the points (1 to 4) obtained from each aspect that must be observed and evaluated. From all of these points, students will get information on strengths that can be maintained and deficiencies that can be improved against the disposition of the practitioner to become a good teacher candidate (Guskey 2003). The final results of the professional evaluation of a prospective teacher are given a value of Excellent, Above average, Medium, Below average, or Low.

The disposition discussed by Sockhett (2009) distinguishes between character as kindness and character as personality. Character as a good will be achieved in the quality of individual initiative in the face of adversity and is self-motivated. The assessment of these complex ideas is illustrated by distinguishing the educational objectives of the teacher's character, especially social justice depicted by the three categories of character, intelligence, and caring, and shows the complexity of each through self-knowledge, true nature, and compassion as examples. Finally, using William Hare's work (in Sockhett 2009) on openness (accepting opinions), it is argued that transparent evaluations are needed where the criteria are easily understood or clearly stated for the evaluator and evaluated. PPL students can then create a self-evaluation protocol for good behavior to broaden their understanding and professional development. Students not only understand but are also able to decide pedagogically. Character can be formed or has become innate so that it becomes an individual's personal characteristics. As a prospective teacher in a school, higher education institutions should help shape good character or personality.

Why does disposition have an important role in creating professional teachers? Frederiksen et al. (2012) concluded that there is a relationship between effective teachers and teacher dispositions. Assessment of effective teachers has also been developed by Michigan State University, with aspects of disposition included in the InTASC, which comprises 10 standards (Mikulec & Miller 2012), covering knowledge, skills, and dispositions.

4 CONCLUSION

The development of disposition aspects needs to be adjusted to the needs and curriculum developed by UPI. The goals of the social or personality aspects developed at UPI are mainly to improve the teacher's personal competence: leadership, responsibility, emotional stability, communication, discipline, attitude, and manner of dress. The PPL assessment standards that exist at UPI partly cover the disposition assessment indicators that are developed, but need to be improved so that they are more transparent and make it easier for tutors to assess practices during the PPL process.

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*Curriculum and learning materials, teaching-learning process, and
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Evaluating English language learning materials to strengthen learners' competencies in the Industrial Revolution 4.0, 21st century, and Society 5.0

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ABSTRACT: Learning materials play an important role in teaching English as an international language (TEIL) in Indonesian contexts. They serve as a trigger and activities to develop learners' competencies as stated in a curriculum. However, those used in classrooms are not always empirically suitable for learners' characteristics and are not really relevant to the current demands, competencies needed in the Industrial Revolution (IR) 4.0, skills in the 21st century, and society 5.0. To meet the demands, the existing materials should be empirically investigated, revised, redeveloped, and used to strengthen learners' competencies demanded in the current and future era. This article discusses the needs and framework to conduct English learning materials (ELM) evaluation. The discussion embraces criteria of good ELM, the needs to evaluate the existing ELM, types of ELM evaluation, criteria for ELM evaluation, ways to conduct ELM evaluation, and the benefits of conducting ELM evaluation.

1 INTRODUCTION

The world is changing rapidly as a result of the massive technological revolution, which is also commonly known as Industrial Revolution (IR) 4.0. Each revolution manifests itself in the way both individuals or societies live as well as their behaviors. However, it brings not only great benefits but also challenges in many aspects for those facing such a transformation. In recent years, societies have been expected to deal with the rapid pace of technological developments, where IR 4.0 takes place on a global level. Interacting with IR 4.0 forces societies to cope with changes where everything is automated and digitized. Furthermore, many experts emphasize that improvements regarding automation and operational efficiency and effectiveness are the main objective of IR 4.0 (Morraret al. 2017; Nagy et al. 2018).

IR 4.0 taking place in the 21st century has always been related to the increasing efficiency and productivity of technological capabilities. However, as stated previously, all these changes undoubtedly affect societies' ways of living. They affect the way people live, work, study, shop, and play. To survive all changes in this era, experts decide that people skills should be identified as the highest priorities because people of IR 4.0 are believed to shape the future through its positive effects on life. People of IR 4.0 are required to be creative, innovative, and knowledgeable to create as well as to operate technologies used to govern their health, stability, economy, and education (Morrar et al. 2017; Xu et al. 2018).

Apart from the impacts brought by IR 4.0, Skobelev & Borovik (2017) explain that in spite of the fact that IR 4.0 is only at the initial stage of its development, the image of a new paradigm of Industry 5.0 has already emerged. The increasing popularity of a digital economy and uncountable number of practical applications have created a strong basis for development of IR 4 technologies, and in the long term serve as the launch pad for creation of Society 5.0, also known as a super-smart society. Society 5.0 is an information society built upon Society 4.0, aiming for a prosperous human-centered society. Society 5.0 is expected to understand a general public where individuals can appreciate life and all potential limitations.

Moreover, Beers (2011) mentions numerous life skills needed by Society 5.0 to achieve success in the 21st century world, such as creativity and innovation, critical thinking and problem solving, collaboration or working with others respectfully, information management, cultural awareness, career and life skills, effective use of technology, as well as communication. These skills can be acquired through proper education activities. Bruce (2014) claims that among many other life skills needed by Society 5.0, language mastery becomes the most basic of these. In the 21st century, the ability to communicate in two languages with ease is no longer a rare intellectual accomplishment, especially for English. This international language is considered as the main key for Society 5.0 to survive in this digital era.

To place this in historical context, the beginning of IR 4.0, technology revolutions enabled massive printing that generated an unprecedented amount of publications in English. The roots of technology innovation can be found in Europe and America during the 19th century. That is why English is used (Crystal 2003). English is considered the medium of a great deal of the world's knowledge, especially in such areas as science and technology. English has become one of the most prominent competences for success in the 21st century world and therefore, learning English is essential for Society 5.0 in this digital era.

2 ENGLISH LEARNING IN THE IR 4.0, THE 21ST CENTURY, AND SOCIETY 5.0

As stated previously, the IR 4.0 taking place in the 21st century is characterized by the development of information and communications technology (ICT). This era has made it possible for society to gain unlimited benefits from changes occurring nowadays, such as distant face-to-face communication and others. This development influences not only scientists but also multiple disciplines, including teachers. Today, teachers are expected to gain and renew their teaching perspectives, becoming literate and skillful in using technologies facilitating their teaching. From another viewpoint, ICT development in the 21st century also challenges students to create a more positive character as well as competences that will work as the basis for developing several soft skills needed to become successful in the 21st century (Suherdi 2012).

Pellegrino and Hilton (2012) mention three domains of competences that teachers and students possess as part of Society 5.0: cognitive, interpersonal, and intrapersonal. Cognitive competences involves the ability to think and relate to particular issues: reasoning, problem-solving, and memory. Interpersonal competences concern humans' ability to communicate information to others and to interpret people's messages verbally or nonverbally, as well as to respond appropriately. Lastly, intrapersonal competences embrace emotions and feelings, e.g., self-regulation, managing one's emotions, and setting and achieving one's goals. Each competence takes part in human development and learning and supports academic learning content.

Along with the development of science and technology, language skills play important roles in improving both students' and teachers' competences mentioned earlier. In this century, English has gained in popularity and demands in teaching and research. English language teaching and learning have become much more crucial to support society in dealing with the development of ICT. For this reason, English learning should be included in the curricula, and should be rooted in the whole continuum of an individual's language learning. The materials should support English learning effectively considering the importance of ICT, ICT-based resources, and facilities. Teachers need to be aware of the consequences for the development of English teaching technologies (videos, YouTube, Duolingo, etc.) to increase students' English communicative competence.

3 THE ROLE OF MATERIALS IN ENGLISH LEARNING

In language learning, there are several components to consider for effective learning. One of the most crucial is materials (Richards 2001). There are various forms of English learning materials (ELM): presentation, workbook, videos, puzzle board, and many more. Basically, materials can come in any form as long as they can facilitate the process of students' language

learning (Tomlinson 2011). Materials continue to serve significant roles in English teaching and learning as they provide useful and efficient sources for both teachers and students. Most of the time, materials in English learning are used as primary language inputs that students obtain. They also function as the major source of language activities or exercises practiced in the classroom. Rondon and Vera (2016) state that there are numerous activities that can be practiced from the materials; for example, from reading a novel, the following activities can be implemented: doing a role play, creating a song, making a comic strip, creating a newspaper, and writing a horoscope for the book characters. These sorts of activities can certainly develop students' English competences, as they empower students to create spontaneous interaction in the class.

In other cases, materials are used as the main instruction supplements for teachers. Inexperienced teachers can use materials as the source of ideas on how to plan as well as run the lessons. There are four reasons for using materials in an English language class: as a source of language, as a learning support, to provide motivation and stimulation, and as references. In a pedagogic setting, materials should not only motivate students but also provide examples of targeted language in natural contexts, based on levels of difficulty. It is believed that materials slightly higher than students' current level of English proficiency can trigger students to develop their English competences. The more difficult materials allow them to learn new grammatical structures or vocabulary. Therefore, materials used for learning English should be chosen appropriately based on existing guidelines as well as criteria of good materials (Dorda 2008).

4 CRITERIA OF GOOD ELM

Materials as teaching and learning resources need to be prepared and selected accordingly. Selection of teaching and learning materials is the act of choosing the best sources, the most suitable from particular learning activities in order to reject what is inferior and unacceptable. Good learning materials should (1) be closely related to the curriculum applied and support the recreational needs of students; (2) motivate both students and teachers to develop their language ability; (3) be suitable for the age of the students with regard to their emotional, intellectual, social, and cultural conditions; and (4) introduce a range of insights on all issues related to the culture of the target language (Shi 2014). Furthermore, Tomlinson (2011) lists 15 criteria of good learning materials. They should (1) achieve an impact; (2) help learners to feel at ease; (3) help learners to develop confidence; (4) ensure that what is being taught is perceived by learners as relevant and useful; (5) require and facilitate learner self-investment; (6) be acquired by the learners in terms of points being taught; (7) expose learners to language in authentic use; (8) draw learners' attention to linguistic features of the input; (9) provide learners with opportunities to use the target language to achieve communicative purposes; (10) take into account that the positive effects of instruction are usually delayed; (11) take into account that learners differ in learning styles; (12) take into account that learners differ in affective attitudes; (13) permit a silent period at the beginning of instruction; (14) maximize learning potential by encouraging intellectual, aesthetic, and emotional involvement that stimulates both right and left brain activities; and (15) provide opportunities for outcome feedback.

In a more specific context, teachers are encouraged to design their own materials because the materials designed become more coherent and applicable for students' needs. It is also believed that English materials designed by the teachers can enhance students' learning experiences. Howard and Major (2004) propose 10 guidelines for designing good ELM as follows.

- ELM should be contextualized. On this point, there are three criteria. First, the ELM should be contextualized to the curriculum intended. Second, ELM should be contextualized to the experiences, realities, and first languages of the learners because it is important for teachers to include an awareness of sociocultural appropriateness. ELM should link explicitly to

students' background knowledge: first languages and cultures. Third, ELM should be contextualized to topics and themes meaningful and purposeful for the target language.

- ELM should stimulate interaction and be generative in terms of language. Howard and Major (2004) emphasize that the provided materials offer the same situations reflecting the type of interactions that the students will engage in outside of the classroom. This means that materials should stimulate the process of learning real communication: "having something we want to communicate," "someone to communicate with," and "some interest in the outcome of the communication." It is important to keep the norms of interaction as well as real communication challenges within the materials.
- ELM should encourage learners to develop learning skills and strategies. This includes teaching students how to actually learn language. Good ELM help students take advantage of learning opportunities outside of the classroom as well as gain confidence to find their own solutions when they experience difficulties in communicating. In addition, ELM can also offer valuable constructive opportunities for self-evaluation that can help them assess their own learning and language development.
- ELM should allow for a focus on form as well as function. To encourage students to become independent language learners, ELM should encourage students to take an analytical approach to the language in front of and around them about how language actually works.
- ELM should offer opportunities for integrated language use. Focusing on one particular skill in language learning can lead to an unnatural style. ELM therefore should give students the opportunities to integrate all the language skills in an authentic manner: integrating listening and speaking skills and reading and writing skills.
- ELM should be authentic. In line with Howard and Major, Al-Azri and Al Rashdi (2014) believe that the role of authentic materials in language teaching is very crucial. Authentic materials scaffold students' learning of a target language more sufficiently. Furthermore, it is important for students to be regularly exposed to real languages through passages that are not specifically produced for language learning purposes.
- ELM should comprehensively develop skills, understandings, and language items. It is important to keep the materials clear and coherent, i.e., having the objectives of every task stated clearly or having specific learning goals for each activity and making sure that the activities are connected to each other to provide opportunities for repetition and reinforcement.
- ELM should be attractive. The criteria include (1) the physical appearance (the density of the text on the page, the type size, as well as the cohesiveness and consistency of the layout); (2) being user-friendly; and (3) durability.
- ELM should have appropriate instructions. The instructions provided should be written in an appropriate language for the target learners in order to make them effective.
- ELM should be flexible. The materials made should offer opportunities for both teachers and students to make choices in terms of content, approach, level, methodology, technology, teaching style, evaluation procedures, and expected outcomes.

5 NEED TO EVALUATE THE EXISTING ELM

Learning new languages is almost impossible without having some materials to help convey the content during teaching and learning. Learning materials have a huge impact, which means that they become an important component of teaching and learning. Tomlinson (1998) defines learning materials as anything that can be a help for the teacher to facilitate the teaching and learning process. Some people may think that materials are limited only to textbooks. However, materials can be in any form such as visual, auditory, kinaesthetic, and linguistic. Teachers should be able to choose good materials that can catch students' attention. Those materials should be designed based on the learners' needs. An evaluation needs to be conducted before creating or choosing the materials. Hassan (2014) argues that the currently

existing materials do not offer a maximum contribution to the teaching and learning process. Furthermore, two-thirds of the students state that the materials they use do not help them to learn the language.

There are many factors that shape learning, e.g., the content of the materials. Some students state that the materials contain too much theory, which makes it difficult to focus on the linguistic elements. Some students even state that the content of the materials does not sustain their future needs. Good materials are based on learners' needs, which can be varied and change from time to time. Evaluation of the existing materials should therefore be conducted to test their suitability. Khodadady and Karami (2017) furthermore claim that a number of learning materials on the market can be evaluated in order to pick an appropriate one. Mukundan (2007) in Khodadady and Karami (2017) states that the quality of the textbooks determines the success or failure of the teaching and learning process. It is important to evaluate the existing materials for teachers or curriculum developers so they can select the appropriate teaching and learning materials in order to achieve the learning goals.

6 TYPES OF AND CRITERIA FOR ELM EVALUATION

Materials evaluation is a dynamic process for which there is no particular formula or rules to provide a definitive result (Sheldon 1988). The materials available on the market are developed for commercial purposes but sometimes they are not based on principles of language acquisition and development and usually not designed based on learners' needs. ELT materials evaluation involves measuring the value existing in the materials by making a judgment about the effect using the materials in the classroom. The evaluation itself can be done before, during, and after using the materials.

Therefore, the evaluation should be based on students' needs. The criteria or checklist depends on the context or needs. Alemi and Sedelvandi (2012) use checklists developed by Litz (2005). The checklists consist of practical consideration, layout and design, activities, skills, language type, subject and content, and conclusion. For the psychological aspects, think of what kind of materials students would like, and the design is an important factor. It has to be interesting for the students. Ladoni and Gibb (2000) in Yazdanmehr and Shoghi (2014) state that the textual information contained in materials is very important. The textual information is enhanced by the use of various elements. They state that these elements can activate the students' cognitive processes when they first open the materials. Graphical language can help students to immediately recognize which part is important (Yazdanmehr & Shoghi 2014).

In addition, illustrations and typography are also effective in improving the text intelligibility and mental processing of the content. Good or bad typography determines how long students can explore and understand the materials, their degree of pleasure in studying the material, and the effect on the health of their eyes. Furthermore, the size and the weight of the materials such as textbooks also play important roles. Yazdanmehr and Shoghi (2014) include aspects to evaluate ELT materials in terms of visual graphics. These consist of typography, visual arts, page layout, cover design, and physical make up. This step is conducted before the materials are used by students. However, the order does not show any hierarchical priority between them. Furthermore, Ellis (1997) in Akhgar et al. (2017) state that predictive evaluation is related to the materials to use. They suggest that predictive evaluation can be done by teachers and experts. After using the materials, teachers or materials developers are expected to look for students' perspectives related to the materials. Akhgar et al. (2017) explain that there is an evaluation called retrospective evaluation that is used to analyze materials that have been used. Retrospective evaluation can be done empirically. However, teachers may be reluctant, as it is daunting and time consuming. Furthermore, Akhgar et al. (2017) state that there are two types of evaluation: macro and micro. Macro evaluation is related to the entire material while in micro evaluation is teachers or evaluators select particular parts of the materials. In another version, the evaluation of teaching materials should be conducted

in three steps (McGrath 2002; Anjaneyulu 2014: (1) pre-use or predictive evaluation which is related to the decisions about the potential value of materials for students; (2) in-use evaluation, which involves measuring the value of the materials while using them; and (3) post-use evaluation, which measures the effect of the materials on the users.

ELM evaluation is done for several reasons. One of them is the requirement that the materials should be based on students' needs. The evaluation further is conducted to see whether the existing materials are already appropriate or not. Laabidi and Nfissi (2016) propose some specific questions as the basis for evaluating materials. They are: "Is the textbook effective in terms of the physical appearance and format? Are the accompanying materials helpful? To what extent is the textbook effective according to the content? Are the exercises and the activities relevant to the students? To what extent are the distinctive cultures presented in the textbook? To what extent is the textbook effective according to the four language skills? To what extent is the textbook effective according to vocabulary presentations? To what extent is the textbook effective according to grammar presentations? To what extent is the textbook effective in terms of the language teaching methods?"

The 21st century's IR 4.0 has many ramifications for curricula, teaching, and learning. It is not merely about modernizing the technology in the classroom but also preparing students to be successful as members of society. In this era, teachers in Indonesia are required to have four competencies: professional, pedagogic, social, and personal competence. Subject knowledge is not enough to succeed in the IR 4.0. Further, Afrianto (2018) claims that students need to be familiar and experienced with (1) student-centered learning, (2) contextual learning, (3) community integrated learning, (4) collaborative learning, and (5) technology-based learning.

IR 4.0 has had many impacts in human life, including education. In terms of materials evaluation, the checklist must not be far from the five aforementioned aspects. It cannot be devoid of the use of information, the Internet, and technology support. Anggraeni (2018) claims that the availability of learning materials based on students' needs is also a part of the requirements in Education 4.0. She suggests that Education 4.0 should promote autonomous learning and make sure that the materials (1) are suitable for students to study independently; (2) focus on a set of proficiencies that can be studied and then applied in self-directed learning; (3) enable students to exercise responsibility of their self-learning; and (4) support students to decide their own way of learning.

In relation to the 21st century, the activities of the materials should give students an opportunity to be more informal and involve interaction with peers for the students to act as their own agents. The materials are required to be more relevant, up-to-date, and have more communicative tasks to build achievement and social classroom relationships. Social media can also be used as the media for the teaching and learning activity (Norahmi 2017).

7 WAYS TO CONDUCT ELM EVALUATION

One of the most popular methods in conducting materials evaluation is via a checklist method. The method is considered effective and practical. Jusuf (2018) suggests various models of the checklist method proposed by several experts, i.e., Tucker and Daoud and Celce-Murcia. The criteria are divided into two types: external and internal. The specialty of this type of method are the use of a value scale (importance in context) and merit scale (quality), with the value scale ranging from 0 to 5 and the merit scale from 0 to 4. The checklist includes value merit product as the multiplication result of value scale and merit scale. The scores provide not only an arithmetical total but also a graph that displays an actual and ideal profile of the materials (Tucker 1975). Daoud and Celce-Murcia (1979) have a checklist method that includes five aspects: subject matter, vocabulary and structures, exercises, illustrations, and physical makeup.

8 BENEFITS OF CONDUCTING AN ELM EVALUATION

McGrath (2002) says that conducting an English language materials evaluation can lead to several benefits for both teachers and students. Through materials evaluation, teachers are sensitized to students' reactions to the materials. Teachers can be aware of whether the situations and activities are appropriate and interesting for the students or not. The language used within the materials is neither too easy nor too difficult. Teachers can provide students with materials in students' mother tongues through video, audio, or other printed materials that are adequate. Then, the assumed time allocation for the completion of each activity can be more realistic.

Well-designed materials that support adaptation to student circumstances are considered visible tools in a balanced teacher–student relationship. Cunningsworth (1995) in Anjaneyulu (2014) confirms that materials evaluation will help teachers/evaluators to carefully choose materials according to whether they align with the students' needs, aims, methods, and values for specific subjects. Furthermore, the results of ELM evaluation can be the basis for English teachers to develop their own suitable materials taking into consideration their students' socioeconomic and linguistic backgrounds. A previous study noted that the best materials are those developed by English teachers, as they are the persons who understand who their students are.

9 CONCLUSION

Some conclusions can be drawn from the foregoing discussion. A suitable ELM can be derived from ELM evaluation, which can be conducted before, during, and or after the use of ELM. Evaluation conducted before use is also called perspective evaluation, before the ELM is mass produced. The one conducted during and after the use of ELM is called retrospective evaluation and can be divided into macro and micro evaluation. Retrospective evaluation can also be called empirical evaluation.

ELM evaluation is a cyclic process. Its results are used as the basis to revise the existing materials or to develop new materials. When the new materials are used, they can be empirically evaluated during or after use. The results of this evaluation will be the basis for the next new materials.

In relation to the IR 4.0, the 21st century, and Society 5.0, the checklists of ELM evaluation should include items related to ICT, the Internet, and the use of technology in the current era. It implies that the content of ELM should cover everything in the current and future era. Therefore, the materials developed based on the results of ELM evaluation really cater to students with suitable competences to live in the IR 4.0, the 21st century, Society 5.0, and future eras.

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Curriculum implementation model in decentralization context

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ABSTRACT: This study is based on the evidence that several schools implement a curriculum which is not in accordance with the students' needs and conditions. In fact, the government (in the province and district/city) and the school are recommended to implement the officially prescribed curriculum in Indonesia in accordance with their needs and characteristics to plan, develop, implement, evaluate, and determine the books supporting the lessons. This study aims to obtain information about the official curriculum implemented in all areas in Indonesia in the context of decentralization. Based on the theoretical and empirical analysis, a relevant model for implementing the curriculum is offered. The model is based on the student's needs, diversity of Indonesian regions, and the school.

1 INTRODUCTION

The official curriculum that applies in Indonesia (e.g. KTSP and the 2013 curriculum) should be implemented optimally in all schools for the sake of national development. By applying the decentralization approach in the curriculum implementation, the regional government and school may adjust the official curriculum with other curricula in accordance with the specific region's and student's needs. The local government and schools are permitted to be more creative in planning, developing, implementing, and evaluating based on the needs and characteristics of the regions and school. Minimum Completion Criteria (KKM) is the instrument supporting the policy.

The implementation of the official curriculum has not been optimal. There is an impression that the regional government (province and district/city education offices) and school do not implement the official curriculum optimally due to the lack of instruments in accordance with the school's and region's needs and conditions. Besides, it seems that regional education offices do not completely understand their roles in developing the curriculum in the context of decentralization. Below is the list of studies proving that the curriculum is not optimally implemented.

A study conducted by Ratna Juwita (Institute of Development and Empowerment for Principals) portrayed prospective principals' competencies in controlling KTSP (the 2006 school-level autonomy curriculum) implementation in 2016 in ten provinces (Aceh, Bangka, Belitung, Jambi, Yogyakarta, Central Java, East Java, West Java, West Kalimantan, and Maluku). The study produced data of the prospective teachers' managerial skills, the ability to design KTSP, and the ability to analyze syllabus and lesson plans.

Studies on the difficulties in implementing the 2013 curriculum in Madiun Regency found that: (1) the teachers did not understand the objectives of the 2013 curriculum and the scientific approach, (2) the language use in textbooks was somehow hard to understand and was not effective in improving the quality of learning processes, (3) the teachers were not capable of conducting learning processes encouraging the applicable skills, (4) the teachers were not capable of encouraging students to experiment and research during learning processes, (5) the teachers were not capable of promoting students' creativity. Moreover, students think that: (1) it was difficult to understand contents, examples, and the language used in the textbooks, (2) they

were rarely given time to do experiments and observation, and (3) during the learning processes, teachers rarely used information and technology as the instructional media.

Siskandar analyzed the roles of *Madrasah* teachers and the head of *Madrasah* in implementing the 2013 curriculum in 2016. It was found that teachers, the head of *Madrasah*, and stakeholders could not interpret the changes in a curriculum developed by curriculum and education experts. Various problems in curriculum implementation from the basic were: (1) the curriculum developers and teachers as well as head *Madrasah* do not have the same perspective on the curriculum, (2) there was no socialization about curriculum changes, (3) there were a limited number of facilities and infrastructure to conduct lessons, and (4) the curriculum distribution did not involve any clear technical instruction on the problems that may be found during the implementation in *Madrasah*.

The implementation of the curriculum of development results do not start from a narrow scope, but it is directly applied to a broad scope, involving many *madrasahs*, in various provinces, districts/cities, districts, and villages.

The results of a study on “2013 curriculum implementation in elementary character education in Karanganyar” conducted by Sumilah in 2016 show that teachers do not completely understand the 2013 curriculum structure. In addition, regarding the lack of knowledge and skills of teachers in curriculum implementation, planning and evaluation, the implementation in the field has not been able to develop the characters of elementary school students in the region.

This research study is aimed to study the model of curriculum implementation in the context of decentralization, so that the official curriculum that applies nationally can be implemented according to the needs and characteristics of the region and school. The model of curriculum implementation in the context of decentralization concerns the dimensions of the stages of curriculum development and the main aspects of the curriculum. The regional level and school have their respective authorities in developing the curriculum, including the main aspects of the curriculum and management of textbooks.

2 FINDINGS AND DISCUSSION

There are several research findings that support this study: The findings of a thesis entitled “The Educational Decentralization Policy: Implementation of the 2013 Curriculum Policy in the Educational Decentralization Era in Surabaya” reveal that the 2013 curriculum has been successfully implemented. The contributing factors of this success are communication, disposition, and bureaucracy structure.

The findings of a thesis entitled “The Implementation of School-based Management in the Curriculum Development of Islamic Junior High School Ma’arif 02 Malang” by Tjatur Yuli Winarsih in 2014 concludes that the one of the main contributing factors in curriculum development in addition to the leadership of the headmaster, teachers and staff, is the clarity of policies, including Law Number 20 Year 2003, Government Regulation Number 19 Year 2005, as well as the Regulation of the Minister of National Education Number 22, 23, and 24 Year 2006. On the other hand, the factors hindering the success of curriculum development include the role of parents that is less than optimal, the facilities and infrastructure, as well as the imbalanced ratio between the number of students and the number of classrooms, causing some classes to take place in the afternoon. The research finds that the curriculum development in school-based management has a positive impact on the headmaster, teachers, and students.

The findings of a thesis entitled “Development Model and Implementation of Unit Level Curriculum (KTSP) based on Stakeholders’ Support at the Primary and Secondary Levels” by Samsudi (2012) find that the KTSP model has a grass-root and mutual adaptation approach. In order to increase the stakeholders’ support in the development and implementation of KTSP, the school needs to be more proactive in inviting stakeholders at school in a discussion forum or open house event.

Based on the three relevant research findings, it can be established that there needs to be decentralization of official curriculum implementation that applies at the national level to

ensure the optimality of the regional and school role so that the curriculum implementation can address the needs and characters of the region as well as the school.

The enactment of Law Number 32 Year 2004 concerning Regional Government implies that the Regional Government has the authority to regulate and manage educational activities in each region according to their needs and characteristics. The policy is very relevant to be implemented in the context of The Unitary State of the Republic of Indonesia. The Regional Government has the authority to implement the national education system within the framework of the diversity and characteristics of the region and school.

Decentralization in the field of education is a fixed price and we need to support it to achieve this consequently. Decentralization of education is not reducing the authority and responsibility of the Central Government, but rather it emphasizes on the interests of the success of the development of diversity-oriented national education in the context of unity. National policies in the field of education (for example, national education standards) established by the center as policies that are standardized are often less effective because they do not take into account regional diversity and specialty.

We do not wish for a system of management and implementation of education that is not in accordance with the needs of region and school, which inhibits the creativity of region and school in implementing the curriculum, and perpetuates a waiting culture for instructions from the central government. Indeed, the decentralization of education aims to optimize and empower local government and school in the management of education in the region and school.

What about the curriculum? Is the curriculum field also a decentralized part? In accordance with Law Number 32 of 2004 concerning Regional Government, the curriculum is one aspect or part of a decentralized education system. Consequently, the region and school have their respective authorities to optimize their implementation in school.

One aim is to make the curriculum grounded in its implementation, according to the needs and characteristics of the region and school. Decentralization in the field of curriculum can be said as a process of delegating authority to administer the curriculum from the central government to district or city government and school.

How is the division of roles and authority of the local government in implementing the curriculum? Widyastono (2012) said that there are granting and sharing of authority in the implementation of the curriculum and it is leveled, starting from the authority of the Central Government (national), provincial government, district/city government, and education units. There are curriculum components that are centralized at the national level, and there are also components that are decentralized at the provincial, district/city, and education unit levels.

What aspects are the authorities of the region and school? On the same occasion, Herry Widyastono (2012) suggested that each level has a scope of curriculum implementation. At the national level, the authority is to develop the basic framework and structure of the curriculum, the determination of the learning load, and the academic calendar.

At the provincial level, the authority is carried out to develop a syllabus of subjects in accordance with the needs and specialty of the provincial level. At the district/city level, authority is given to develop the syllabus of the local content subject according to the district/city specialty and to coordinate and supervise the development and implementation of the operational curriculum of the education unit.

At the school level, it is done by delivering the curriculum operational based on the syllabus developed by the central and city/district government, the lesson plan by the teacher, the self-development program, and academic calendar.

In terms of curriculum implementation, we agree with the decentralization model offered by Herry Widyastono, although it still requires certain modifications, particularly in the aspect and actual implementation of the curriculum to address the school need and advancement in science and technology. For instance, there needs to be an additional development and monitoring and evaluation program of the curriculum continuity to ensure optimal curriculum implementation. Meanwhile, at the district/city level, there needs to be more programs on official curriculum engineering and empowerment according to the needs of the region and the school.

The visualization of the authority and aspects of curriculum that is developed and implemented based on the region and the school can be seen in Figure 1 below.

National Level	Regional Level	School Level
1. Basic framework of curriculum and curriculum structure of the education unit based on national standards (minimum completion criteria, content, process and assessment) 2. Syllabus format 3. Lesson Plan	1. The establishment of the minimum completion criteria of each subject in the education unit 2. The development of local content subject 3. Coordination and supervision	1. The development of syllabus and lesson plan for each subject based on the characteristics of the education unit 2. The implementation of learning according to the lesson plan 3. Quality assurance of curriculum implementation at school

Figure 1. Division of authority in the curriculum implementation based on the region and school.

3 CONCLUSION

Based on the above discussion, the following conclusions can be drawn: (1) the decentralization of curriculum at school has not been optimal, (2) the curriculum implementation model that is relevant to use in the context of decentralization of curriculum is one that takes into account regional needs and character, whether at the province or district/city level.

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Developing ESP learning materials for vocational high school students to promote vocational skills for Industry 4.0

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ABSTRACT: The Industrial Revolution 4.0 has influenced the system of education, including vocational high school. The Industrial Revolution 4.0 requires some skills to be adapted in the educational system, especially in the teaching and learning process. The aim of this article is twofold. First, this article discusses how a vocational high school can adapt to the current global trend of ESP learning materials to anticipate the constantly changing world and to promote the skills for Industry 4.0. Second, it reviews the best practices to develop ESP learning materials in a vocational high school to promote skills for Industry 4.0. This article highlights the importance of developing ESP learning materials for vocational high school students, enabling them to master both English competency skills and skills for Industry 4.0.

1 INTRODUCTION

Today, an issue related to the Industrial Revolution 4.0 has attracted more attention because it affects almost all aspects of human life, including education. Hadromi et al. (2019) state that the Industrial Revolution 4.0 can be considered as both a challenge and an opportunity for prospective vocational high school graduates. As a result, a revitalization of vocational high schools is required as an effort to provide industry with potential workers corresponding to the needs of Industrial Revolution 4.0. Four points are the focus of the revitalization of vocational high schools mandated in Presidential Instruction No. 9 of 2016. The four points cover curriculum revitalization, educator and education staff, partnership, and graduates. The favorable outcomes of the revitalization of vocational high schools on all four points are likely to support prospective graduates in developing the practical knowledge and skills that meet job qualifications in the Industrial Revolution 4.0 era.

According to Dwiyantri et al. (2018), education built upon Industrial Revolution 4.0 is likely to be carried out, including in vocational high schools. In other words, the teaching and learning process in a vocational high school should fulfill the qualifications of both education and Industrial Revolution 4.0. Bukit (2014) describes the characteristics of vocational high school as slightly distinctive from those of other types of educational institutes including (1) alignment with the individual performance in the industry; (2) highlighting the specific requirements based on the demanded necessity; (3) focus on psychomotor, affective, and cognitive aspects; (4) concern with the standard of success that is not limited to education; (5) sensitive to the development of the industry; (6) provide adequate and required facilities and infrastructure; and (7) have the support of the community. The United States and China have succeeded in providing a general image of the industrial approaches to be applied in educational institutions (Burmeister et al. 2015; Mukhtar & Ahmad 2015).

Greshman et al. (2011) suggest that vocational high school students who have low social skills tend to face more challenges in both educational and industrial areas. Thus, vocational High School graduates are required to be socially as well as technically competent so that they

can interact, adapt, and cooperate well in industry (Oviawe 2010; de Guzman & Choi 2013; Burmeister et al. 2015; Hadromi et al. 2015). The preceding explanations reveal an issue related to the crucial requirement of vocational high school students to adapt to the skills for Industry 4.0. As an attempt to prepare students to master the required skills, the government has categorized the subject of English to be taught in vocational high schools as English for Specific Purpose (ESP). The ESP in vocational high schools aims to fulfill the students' needs regarding their competency skills. Thus, the present article is projected to review the best practices in developing ESP learning materials to promote the skills for Industry 4.0. Specifically, the present study is written to fulfill several objectives. The first is to describe the theory of Industry 4.0. The second is to describe the theory of vocational education. The third is to discuss the theory of ESP learning material. The last objective is to portray the best teaching and learning practices in promoting skills for Industry 4.0 through ESP learning materials. In addition, this study is aimed to provide essential information for vocational teachers related to the importance of skills for Industry 4.0 to be adapted in ESP learning materials for vocational high school students.

2 INDUSTRY 4.0

The Industrial Revolution 4.0 refers to the structural transformation into digital systems through information technology (Durmus & Dağlı 2017). Wee et al. (2015) state that Industry 4.0 is designed to digitize the manufacturing sectors including manufacturing products and equipment, physical-cyber systems, and all relevant data. According to Aulbur and Bigghe (2016), there are four primary skills and requirements of industry 4.0 that need to be adopted in vocational education because those requirements have already been updated in accordance with the current technical and evolution of industrial technology. The essential skills and requirements are described as follows.

- Knowledge of information and communications technology (ICT). As ICT has the main role in Industry 4.0, knowledge of ICT is considered important. Knowledge of ICT involves knowledge about basic information technology and the ability to use and interact with computers and smart machines such as robots, tablets, etc. Moreover, knowledge of ICT also involves the capability to carry out communication processes using machines. It also includes the capability to understand IT security and implement data protection processes.
- Ability to work with data. Data become very essential in the educational field. The ability to work with data in the educational field includes the capability to process and analyze data and information obtained from the machines, understand the visual data output, and make decisions and basic statistical interpretations.
- Technical know-how. Technical know-how is related to interdisciplinary and general knowledge. It includes specialized knowledge of manufacturing activities and processes. Furthermore, it also includes technical know-how about the machines to carry out maintenance-related activities.
- Personal skill. Personal skills are related to adaptability and ability to change, make decisions, work in a team, communicate properly, and have the mindset to conduct lifelong learning.

3 VOCATIONAL EDUCATION

Wang (2012) suggests that vocational education is likely to be flexible in providing broad opportunities for everyone to get education, training, and retraining aligned with the needs of industry. Furthermore, the concept of “competency” in vocational education should be converted into “capability” enabling graduates to engage with the latest industrial requirements (Samani, 2018). In the context of vocational education, there are two types of capabilities that cannot be separated. Those capabilities comprise the students' capabilities according to their

fields of expertise and their capabilities to recognize and act in accordance with changing industrial requirements (Samani 2018).

Additionally, the Minister of Education and Culture (2013) states that the aim of teaching English at vocational high schools is to assist students in mastering English language knowledge and skills. Teaching English in vocational high Schools is also aimed to enhance students' mastery of English language skills in both oral and written communication at an advanced level. English language skills are considered important for vocational high school, as it is aimed mainly to develop graduates' self-improvement to promote skills for Industry 4.0 (Devina Nur & Munir 2009).

In response to the Industrial Revolution 4.0, the strengthening of the four elements in the vocational education system requires a revolutionary movement. One of the movements proclaimed by the government is the new literacy movement as a reinforcement for the old literacy movement. The new literacy movement is intended to focus on three main literacy programs: digital, technological, and human literacy (Aoun, 2017). These three primary literacy skills are predicted to be the essential skills needed for Industry 4.0 (Yahya 2018).

4 ESP LEARNING MATERIAL

Tomlinson (2003) declares that English for Specific Purposes is designed for students who learn English for a particular work or study-related reason. In other words, English for Specific Purposes is designed to meet the students' needs or based on the students' purpose in learning English. This notion is also supported by Ronaldo (2016) by asserting that ESP tends to be more focused on the students who learn specific skills in their studies to provide a significant contribution toward learning English in pursuit of those specific skills. Furthermore, Hutchinson and Waters (2008) state that ESP is an approach to language teaching that aims to meet the particular needs of the students. They also argue that ESP is not a language methodology; rather it is used to teach specialized varieties of English that consist of a specific type. Based on the preceding discussions, it is clear that ESP is designed for students who learn English for a specific purpose. The students need to be exposed to the material concerning their specialization to develop their English competency skills based on their fields of interest and skills for Industry 4.0.

According to Evans and St. John (1998), there are some characteristics of ESP that need to be carried out including:

- ESP programs are designed to fulfill the specific needs of particular disciplines by carrying out different levels of language education based on the students' aims and purposes.
- The programs are conducted based on the theoretical orientation (approach) along with instructional design (design and procedure).
- ESP materials and methods are developed or adapted to provide students with responsive instruction.
- ESP centers on a myriad of disciplinary knowledge, language, genres, discourses as social practices, and situational context.
- Both language and activities are appropriate for particular disciplines.
- In ESP programs, students obtain the knowledge or concepts based on their disciplines or specialization.
- The ESP program requires students to recognize how language operates within genres and sub-genres in their discipline or specialization.

Tomlinson (2008) proposes that ELT materials should be driven by the principles of language acquisition. In addition, all units of the English materials should be principled, relevant, and coherent to develop the students' language competencies. Moreover, he also states that any English documents that help learning are considered materials. That is to say, the English materials involve any documents that can be used to facilitate language learning. Therefore, Widijantie and Handayani (2018) suggest that English materials for the ESP program should be based on specific purposes, particularly for vocational education.

5 THE BEST PRACTICES TO PROMOTE INDUSTRY 4.0 IN ESP LEARNING MATERIAL

There are several best practices for the development of ESP learning materials to promote skills for Industry 4.0. The ESP learning materials should be elaborated in alignment with the students' needs and skills for Industry 4.0. In other words, the development of ESP learning material is expected to fulfill the students' needs and skills for Industry 4.0. The best practices to promote skills for Industry 4.0 in ESP learning material are explained as follows.

5.1 *Define the topic that is relevant to the students' competency skills and relate to technology*

According to Evans and St. John (1998), in ESP programs, students tend to acquire knowledge or learn concepts from their disciplines and specialization. In vocational high schools, these consist of different competency skills. Hence, the topic should be related to each competency skill depending on what kind of major is being pursued in the ESP. For example, in the hospitality major, the topic should relate to the activity in hotel, such as making reservations. In the culinary major, the topic should be relevant to food, such as the ingredients and procedures to cook food. In the fashion major, the topic should be relevant to the practices of making clothes, etc. That is to say, the students not only learn English language skills, such as listening, pronunciation, grammar, speaking, reading, and writing, but they also learn the English learning contents that are relevant to their specialization. Sinlarat (2016) states that learning management in Industrial Revolution 4.0 requires a new learning system. In other words, students learn not only how to read and write but also how to equip themselves with the best capabilities based on their specialization. In addition, to promote skills for Industry 4.0, the ESP learning topics and content should emphasize the integration of technology. For example, the teaching and learning materials should be delivered using technology such as mobile learning applications in teaching and learning ESP.

5.2 *Define the content that can enhance students' personal skills*

According to Aulbur et al. (2016), personal skills are about adaptability and capability to change, make decisions, work in a team, communicate properly, and have a mindset for life-long learning. The content used in ESP learning material should be designed to not only meet the student's needs but also stimulate the students' cognitive process to be critical thinkers. According to Tomlinson (1998), one of the basic principles of good English material is its ability to stimulate both right and left brain activities. The content is not only related to the mastering of second language acquisition but also provides new knowledge for the students. It should change the students' mindset that learning English is not only just to pass and get a high score at the examination but is also beneficial for them. In designing the ESP content, the teacher should consider the personal skill acquisition to train students to be good decision-makers. The teacher should also enhance communication skills through some methods, such as working in a team. Padmadewi and Artini (2017) suggest that teamwork is a kind of method allowing the students to interact, collaborate, and build their skills. In addition, Belcher (2012) states that another approach to engage students is problem-based learning (PBL). The activities based on those approaches provide the students with particular strategies for language learning and problem-solving.

5.3 *Using ICT tools as learning media in ESP learning materials*

The Industry 4.0 era is known as the technological era. To promote skills for Industry 4.0, it is essential to emphasize the use of ICT tools, especially in the classroom. There are two types of ICT tools employed in the teaching and learning process, namely hardware and software.

- Hardware includes kinds of ICT tools such as a computer, tablet, LCD, smartphone, etc.
- Software comprises two types, that is, online and offline software.

Examples of software used as the teaching and learning media are Edmodo, Quizziz, Padlet, etc. Those software can be used to make the teaching and learning process more interactive in the class. The software can be used not only as teaching and learning media but also as the assessment tools. The use of ICT in the teaching and learning process makes the students not only develop their English language skills but also learn the technology to support their skills in the Industrial revolution 4.0.

6 CONCLUSION

Vocational high school is an educational institution with the goal of preparing students for industry based on their specialization. Hence, the process of English teaching and learning English at a vocational high school is slightly different from that in a general high school. It is categorized as ESP (English for Specific Purpose). The ESP program attempts to prepare students to master the English competency skills that are useful for them in industry. ESP is an English program designed to fulfill students' needs in accordance with their purposes in learning English. The vocational high school is intended to produce graduates who are ready to directly enter the industrial work field. Thus, the students need to master both English competency skills and skills for Industry 4.0 comprising knowledge about ICT, the ability to work with data, technical know-how, and personal skills. There are some best practices to integrate the skills in the English teaching and learning process including (1) defining the learning topics that are relevant for the students' competency skill and relate to technology, (2) defining the learning contents that can enhance the students' personal skills, and (3) using ICT tools as learning media in the ESP teaching and learning process.

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Curricular effectiveness of five-day school week program: An overview

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ABSTRACT: Education has an essential role in preparing human resources for a favorable nation and country's progress. With modernization and globalization posing challenges to its current state, there is a growing need for strategies to improve teaching and learning to balance development and technology. In Indonesia, the five-day school week program is regulated by Article 2 of the Ministerial Regulation (*Permendikbud*), which states that students must attend schools eight hours a day or 40 hours over the course of five days per week. Through this program, teachers are supposed to be able to develop more creative learning plans so that assignments can be completed at schools. Students are also expected to be able to maximize their participation in co-curricular and extracurricular activities offered by the school for their potential development. Many research findings confirm that the five-day school week policy brings about changes in students and teachers. For instance, since students expend their energy at schools, fatigue and fewer additional activities outside of school becomes prevalent. Similarly, teachers and education personnel spend most of their time at school, and their performance in delivering learning materials in afternoon classes thereby diminishes. This study was intended to provide an overview and identify the curricular effectiveness of the five-day school week by literature review. It revealed that in Indonesia, the five-day school week program was not optimally implemented due to several factors, including the physical factors underlying teacher and student's performance and the psychological, economic, and sociological factors that shape the character education of students and their level of relationship with the parents.

1 INTRODUCTION

Indonesia is a developing country where many public and private school institutions contribute to its educational progress. Education has a vital role in preparing human resources for a favorable nation and country's growth. With modernization and globalization posing challenges to its current state, there is a growing need for strategies to improve teaching and learning to balance development and technology.

As regulated by Article 2 of the Ministerial Regulation (*Permendikbud*), a five-day school week program requires students to attend schools eight hours a day or 40 hours across five days per week. This provision includes a 30-minute recess per day or, in total, 150 minutes for five days in one week. In this context, schools have the autonomy to apply or increase the duration of the recess to longer than 30 minutes daily. The addition of recess time is not included in the recommended eight hours per day.

Five-day school week policy and its daily eight hours of study lengthen students' school time as an attempt to improve their competency and educational quality. This policy introduces a longer learning time at school (i.e., eight hours a day or 40 hours per week), which is believed to strengthen the character of students and enhance the quality of teaching and learning.

Ever since its implementation, many studies have found evidence of change. Students and teachers, as well as education personnel, expend the large share of their energy and time at schools. For this reason, students are known to have after-school fatigue and

engage in fewer additional activities outside of school. Meanwhile, teachers are expected to be able to compile more creative learning plans so that their assignments can be completed at schools.

In the five-day school week program, the learning services, which also cover co-curricular and extracurricular activities, are arranged in a way that puts forth maximum achievement with a tight schedule. As a result, program management has encountered various difficulties in preparing schedules and extracurricular activities, especially in private schools that offer more subjects than public schools.

Lyons (2002, p. 324) argues that a developed country like the United States has adopted three initiative strategies of school reform to enhance the overall teaching and learning process, namely: a) school-based management, b) small school initiatives, and c) recovery from school failure. In contrast, the education system in Indonesia has experienced significant development and, most importantly, a breakthrough. Through the Ministerial Regulation (Permendikbud No. 23 of 2017), the Ministry of Education and Culture enacted a policy of five-day school week and eight hours of study per day starting from the 2017/2018 school year. When appropriately realized, the policy is expected to provide improvements in the quality of teaching and learning. Accordingly, this study was intended to give an overview and identify the curricular effectiveness of the five-day school week. The discussion of this topic is based on three research studies on the implementation of this program.

2 THE EFFECTIVENESS OF A FIVE-DAY SCHOOLS WEEK PROGRAM IMPLEMENTATIONS IN THREE PLACES

The first is the program implementation in Salatiga. Muawanah (2018), through her research on 'The impact of a five-day school week program on Islamic educational institutions in the City of Salatiga (*Dampak Pelaksanaan Program Sekolah Lima Hari Terhadap Lembaga Pendidikan Islam Di Kota Salatiga*)', offers three conclusions. First, the five-day school week program does not use model 11, as stipulated in Article 6 of the Decree of the Head of the Education Office in the Province of Jawa Tengah No. 420/03737. Second, it indirectly affects Islamic educational institutions. Third, it has direct physical, psychological, and economic effects. Sociologically, the program is intended to bring parents and children closer together, but even this objective is not achieved because children of school age prefer to play with their friends or engage in various extracurricular activities that the school offers.

In line with this finding, the Minister of Education and Culture, Muhadjir Effendy, reveals that (<http://Republika.co.id>) the five-day school week policy is a way to strengthen character education, which highlights five major values, namely, religiosity, nationalism, cooperation, independence, and integrity. This five-day school week program is designed to encourage effective communication between children and parents and is consistent with the three pillars of education called 'Trikorā Pendidikan', the first point of which emphasizes a family to play its role in giving character education.

Five-day school week and its daily eight hours of study lengthen students' school time to improve their competency and educational quality. This policy introduces a longer learning time at school (i.e., eight hours a day or 40 hours per week), which is believed to strengthen the character of students and enhance the quality of teaching and learning.

Ever since its implementation, many studies have found evidence of change in students. For instance, students expend most of their energy at school and, as a result, they experience fatigue and low capacity to engage in any activities outside of school. Apart from these physical factors, the long hours that this program entails also diminish the close relationship between students and their parents.

Another finding is that teachers and education personnel also have to spend most of their time at schools and are expected to be able to compile more creative learning plans and complete their assignments at school. Furthermore, the teacher's performance and motivation to teach in the afternoon significantly decrease, and consequently, the learning materials are not delivered to the maximum. Teacher management and performance are less than optimal

because teachers are already tired from teaching, taking care of official administration, and creating learning media.

The second implementation is in Karanganyar. Handayani (2018), through a study entitled 'Evaluating the implementation of the five-day school week program using the CIPP Model. A Case Study of SMK 2 Karanganyar (*Evaluasi Pelaksanaan Program Sekolah Lima Hari (PSLH) dengan Menggunakan Model Cipp Studi Kasus di SMK Negeri 2 Karanganyar*)', concluded that the five-day program could not be implemented successfully during the 2016/2017 school year. Furthermore, the program implementation has led to unwanted effects.

The third implementation is in Magelang. A descriptive quantitative study by Ikhwandhia (2016) entitled 'Teacher and student's perceptions of the learning effectiveness of the five-day school week program at SMKN 1 Magelang (*Persepsi Guru dan Siswa terhadap Efektifitas Pembelajaran dengan Program Sekolah Lima Hari (PSLH) di SMK Negeri 1 Magelang*)', has found three contributing factors of learning effectiveness, which are the implementation of learning, time management, and learning outcomes. Through descriptive statistical data analysis, it divides the learning effectiveness into three categories: high, fair, and low. The teachers perceive that the five-day school week program is highly effective (95.80%), and only a few of them consider it fairly useful (4.20%). In other words, teachers can achieve learning objectives and carry out the teaching-learning process though less than optimal due to decreased performance and the paucity of creativity in developing unique learning methods, especially for the afternoon lessons. Meanwhile, students' perception of the program is differentiated into fairly (83.23%) and highly effective (17.67%), meaning that students can achieve learning objectives and participate in the teaching-learning process though less than optimal due to decreased performance in learning, chiefly during the afternoon classes.

This program can be well-implemented if it receives the full support of all of the school members. In this context, they play a vital role in achieving the goals of an educational institution by, among others, managing their work efficiently and effectively in terms of time and performance.

The teaching staff is school members with the ability to interact and improve their competency in carrying out their obligation. More often than not, teachers experience a particular difficulty in completing their teaching duty and administration tasks (i.e., lesson plans, syllabus, semester programs, annual programs, analysis of core and basic competencies, and assessment) simultaneously in five instead of six working days.

Intensifying activities in five days (with eight hours per day) requires educators and education staff to be more innovative and creative in their work performance. It can, in turn, give adverse effects, including constant fatigue, lack of concentration, and high boredom proneness.

According to Licona in Samani (2011, p. 50), psychological character education must include the dimensions of moral reasoning, moral feeling, and moral behavior. Santrock (2004:120) suggests that character education is a direct approach to moral education, that is, by teaching students with basic moral knowledge to prevent them from conducting immoral actions and endangering others and themselves. Muslich (2011, p. 17) claims that currently the education has too many portions of knowledge provision and offers less on values, attitudes, and character development.

Character education is also defined as an education of the values of human morality that need to be realized and transformed into concrete actions, and, in reality, it is often ignored. It plays a crucial role in improving students' overall behavior, including customs, values, potential, abilities, talents, and mindset. However, education empirically focuses on cognitive achievement, leading to students possessing unacceptable characters or manners.

Yulia (2017) also correlates the above theories and examines the position of character education in the five-day school week program in a study entitled 'The Five-Day School Week Policy (*Kebijakan Lima Hari Sekolah*)'. It discusses the determinants of successful educational program implementation, namely, the preparedness of the education unit and its teaching staff. In practice, only less than one percent of schools or education units throughout Indonesia are ready to actualize the five-day school week program, and not even one percent of educators have received training on strengthening character education under this scheme. For these reasons, formalizing the five-day school week program,

as recommended by the Minister of Education and Culture, becomes unfeasible. The Ministerial Regulation on School Days needs further review and a great deal of refinement to produce higher practicability and detailed arrangements. Also, teachers must receive training and participate in workshops to enhance their quality of teaching in enacting the five-day school week policy and increase their creativity in providing learning materials for afternoon lessons, preferably ones that incorporate riveting methods and boost students' enthusiasm for learning.

In conclusion, the five-day school week program is still not implemented optimally in Indonesia because of several factors, such as physical factors that shape the performance of teachers and students in the teaching-learning process and psychological, economic, and sociological factors that determine character education and the degree of relationship between students and their parents.

3 CONCLUSION

Based on the results of literature studies and discussion, the five-day school week program in Indonesia is not so effective and still cannot be implemented optimally. Therefore, a further thorough review is highly suggested. The learning ineffectiveness in this program is proven to be related to many factors, such as the physical factors underlying teacher and student's performance and the psychological, economic, and sociological factors that affect students' character education and relationship with their parents.

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The values of nationalism and life skills in the era of Industry 4.0 embedded in academic writing textbooks in Muhammadiyah universities in Central Java, Indonesia

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ABSTRACT: An academic writing textbook is one of the important elements supporting the success of student learning. In response to Industrial Revolution 4.0, textbooks used at the university level need to be examined. Textbooks help students to become superior and competitive citizens. Both nationalism and life skills are the main modalities to build high-quality citizens. There is a need to describe the contents of academic writing textbooks in several tertiary institutions. Field data were collected and analyzed to produce a complete description of the contents of a number of academic writing textbooks used at Muhammadiyah universities in Central Java, Indonesia. Based on the collected data, it can be concluded that nationalism has not been presented in academic writing textbooks, while competences and life skills are found in them.

1 INTRODUCTION

Effective education is education that can be well implemented and has adequate educational elements. Comprehensive elements of education in general include educators, students, teaching materials, and curriculum. In addition to these elements, there are others that play an important role in providing a well-managed process to improve the quality of education. A textbook is one of the important elements in the education process from elementary to tertiary levels. The role of a textbook necessitates the availability of quality textbooks in higher education. Through the use of quality textbooks, competent students will be developed. The Indonesian language course is a compulsory course for students at the university level. The purpose of the course is to equip students with four language skills, namely listening, speaking, reading, and writing. In this study, the researchers limited the research plan to writing ability because undergraduate students must be able to write academic papers for their final project (thesis) to fulfill the undergraduate requirement. This is in line with Article 4 paragraphs 3a, 3b, and 3c about the substance of the Indonesian language course that focuses on academic writing skills. Thus, the competency that should be mastered is to write academically.

The era of Industrial Revolution 4.0 requires that students have good life skills in order to compete with various parties. The textbook used today should contain nationalism and work skills to face the era of competition. The attitude of nationalism is the identity of citizens to defend and feel proud of their own country while work skills or life skills are the main capital in welcoming an era of increasingly fierce competition. The use of textbooks containing these two elements is now necessary to build a superior generation able to win in a competitive world. In line with this, the Basic Competence of the Indonesian Language Subject is formulated as “being a scientist and professional who is knowledgeable and has a positive attitude towards Bahasa Indonesia as the national language.” Based on the articles and verses, we can observe that the purpose of Indonesian language lectures is to develop students into individuals who have good language skills in the context of carrying out state activities and forming

nationalism attitudes and themselves as superior individuals who are ready to face the 4th industrial era. Academic writing textbooks used in tertiary institutions ideally also include elements of nationalism and a set of competences supporting the 4th industrial era. In fact, based on the researchers' observations, academic writing textbooks used at universities in Central Java are still oriented toward academic writing skills and do not present the concept of nationalism and the set of competences.

Teaching material is any material used by educators in the learning process as well as supporting an instructor to design assessment and development on an ongoing basis (Proitz 2013, p. 557). Meanwhile, Abidin (2012, p. 23) argues that teaching materials are all matters relating to learning material including knowledge (facts, concepts, principles, procedures), skills, and attitudes (values). Diana (2016, p. 18) argues that teaching materials are a set of facts, concepts, principles, procedures, and/or generalizations specifically designed to facilitate teaching. Tomlinson (2003, p. 2) says that teaching material is something that is used by lecturers or students to facilitate language and increase knowledge and language experience. Teaching materials display a complete figure of the competences students will master in learning activities. Teaching material is an important element in the curriculum. Pannen and Purwanto (200, p. 6) suggest that teaching materials used by lecturers and students during the learning process be well structured and systematically arranged and well-structured. Teaching materials are an integral part of curriculum development and learning system development. Based on these opinions, it can be concluded that teaching materials are materials used by educators during the learning process as well as underlying a teacher to design assessment and development in a sustainable manner that includes knowledge (facts, concepts, principles, procedures), skills, and attitudes (values), and specifically designed to facilitate teaching of language and increase knowledge and experience.

Tomlinson (2011) explained that there are some good characteristics or criteria for teaching materials: (1) Teaching materials have a comprehensive impact on learners. (2) Teaching materials must be able to help learners feel calm. (3) Teaching materials should be able to help improve learners' confidence. (4) The contents of teaching materials delivered can be easily accepted by students. (5) Teaching materials should be able to facilitate learners to find their identity. (6) Learners must be ready to work with the teaching materials that will be used. (7) Learners' attention should be clearly illustrated (focused). (8) Teaching materials should provide opportunities for learners to use their expertise/skills. (9) Teaching materials should have a positive effect on the speed and accuracy of instructions. (10) The teaching material must be something different from the previous learning style (as usual) based on the learner's experience. (11) The teaching material must be something different from the previous learning style (as usual) in terms of affective qualities. (12) Teaching materials should have a short pause at the beginning of the instruction. (13) Teaching materials should expand the potential of learning and increase the intellectual, aesthetic, and emotional involvement of the learner's right and left brain. (14) Teaching materials should not take much time in controlling the learner's conditions. (15) Teaching materials should provide opportunities for learners to provide feedback.

Textbooks are teaching materials that are arranged in such a way and contain material points that can be used by users in order to increase understanding of the content of the material being studied (Bullough 2015, p. 2). Textbooks can be interpreted as a tool used by teachers to help learners achieve certain competences (Zolfaghari & Ahmadi 2016, p. 2). The material is studied to be used as a competency in supporting the learner's life career (Dewhurst 2003, p. 3). Lecture teaching material is always adjusted to the applicable curriculum by considering the achievement of competences that students should master (Fisher 2003, p. 329). The material contained in textbooks should always be adapted to the times so that they can be correctly used as guidelines (Ballantyne, Green, Yarrow & Millwater 1999, p. 25).

Nationalism can be interpreted as understanding (teachings) to love one's own nation and country (KBBI, 2017: 4). Nationalism can also be interpreted as a sense of pride in language and culture (Brubaker 2017, p. 121). Other experts define nationalism as a form of defense of territorial territory from enemy threats (Ting 2008, p. 456; Chipkin 2016, p. 217; Everett, 2017, p. 202). On the other hand, Eva (2008: 2) asserts that nationalism is the identity of

someone who recognizes himself as a citizen who is obedient to the prevailing state system. Based on the preceding study of nationalism, it can be concluded that nationalism is a sense of love and pride for the nation, culture, and language and a willingness to maintain the territorial integrity of the state.

Learning practices in universities are dynamic and lead to a process of improvement or refinement in accordance with the times to produce professional staff (Bucklow 2000, p. 10; Clark 2000, p. 8). Basically, the government has a universal role as a policymaker in determining the direction of education (Devlin 2010, p. 113). Understanding and improving student behavior is the focus of learning in higher education (Williams 2016, p. 10). The ability to write academically is a form of achievement of student competences in pursuing their studies (Lonka 2014, p. 249; Janneke van der Loo 2018, p. 234), both writing individually collaboratively and effectively (Castello 2015, p. 161; Klein 2015, p. 202) with full confidence (Betran-court 2015, p. 3). In addition, other forms of student behavior that show learning achievements are to have a sense of love and pride in the country and have life skills to deal with developments of the industrial era. The inculcation of nationalism values and life skills of students in higher education can be done through a professional learning process (Wood 2011, p. 98). Research on academic writing in higher education has been carried out by experts and academic practitioners (Ortoleva 2016: 346). This is because academic writing is a major element in learning in higher education (Limpo, 2017, p. 99). Academic writing is a vehicle for channeling students' ideas to be able to publish academic work (Lonka 2014, p. 246). It is also used to develop and carry out academic innovations (Galbraith 2015, p. 221).

Based on discussions with lecturers in the field, currently there is a need to use teaching materials in the form of academic writing textbooks that contain the values of nationalism and life skills, especially in elementary school teacher study programs (PGSD) at Muhammadiyah universities in Central Java. This triggered the researchers to examine the actual conditions of the books, whether they have included the values of nationalism and life skills. The relevance of the materials/contents of textbooks to the students' needs becomes important to achieve learning objectives (Devlin 2010, p. 111). A number of studies on this area have also been carried out by McLeod (2015, p. 1), Dronkers (2016, p. 21), Alberts (2010, p. 83), and Avest (2016, p. 56). Life skills investigated in this research are competences possessed by someone to be able to carry out life in general in a wider community including the ability in organization/management and leadership and other abilities that support the success of one's life.

2 METHOD

The research method included conducting field studies and collecting data about textbooks used at Muhammadiyah universities in Central Java. The textbooks included those used by lecturers and students. In addition, the researchers also took other reference books from libraries as data sources. They involved two Muhammadiyah universities in Central Java as the sample. The two universities are representatives of those accredited A and B in Central Java. A content analysis study was conducted to investigate the values of nationalism and life skills embedded in these books. The main step of conducting this study was analyzing the first part of the texts systematically (Roth 2017). Then, pragmatism was employed to analyze the textbooks. They were described and analyzed one by one to find out the number of pages containing the values of nationalism and life skills. Furthermore, the data obtained were presented in a graph showing percentages of the appearance of the values of nationalism values and life skills.

3 FINDINGS

Some facts as a description of the conditions of the textbooks used in two Muhammadiyah universities in detail can be described as follows. Muhammadiyah University Purwokerto is located on Jl. Dukuhwalluh Kembaran, Banyumas Regency. Muhammadiyah University

Purwokerto has a PGSD Study Program that has been accredited A by the National Accreditation Board for Higher Education (BAN PT). The Academic Writing course is in the third semester. The lecturers responsible for the course did not have their own textbooks, either by themselves or by team members involved in the course. The lecturers still used reference textbooks in the library. The textbooks can be explained as follows.

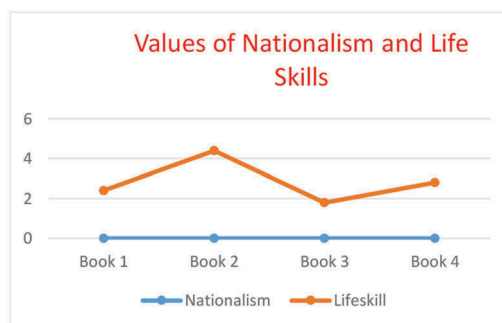
The first textbook is entitled *Quantitative, Qualitative Research Methods and R&D* by Sugiyono, the sixth edition published by Alfa Beta Bandung (February 2009). This book consists of 16 chapters. Chapter I contains the perspective of quantitative and qualitative research methods. Chapter II contains research processes, variables, and quantitative research paradigms. Chapter III contains the theoretical basis, framework of thinking, and the submission of quantitative research hypotheses. Chapter IV describes the experimental method. Chapter V is about populations and samples. Chapter VI concerns the scale of measurement and research instruments. Chapter VII concerns data collection techniques. Chapter VIII describes data analysis. Chapter IX contains examples of data analysis and hypothesis testing. Chapter X contains the focus and title of qualitative research. Chapter XI is about the population and sample of qualitative research. Chapter XII deals with instruments and techniques for collecting qualitative research data. Chapter XIII is about the qualitative research data analysis techniques. Chapter XIV is on validity and reliability of qualitative research. Chapter XV discusses the preparation of a research proposal. Chapter XVI contains research and development methods. The study of academic writing techniques in this book is presented in Chapter XV on how to prepare a good research proposal. Meanwhile, academic writing techniques up to the final research report are not discussed in this book. In this book there is no element or value of nationalism, but there is material that contains life skills such as leadership. The topics studied in this book are mostly about management and leadership in a company. For example, page 166 mentions an example of a study on the influence of leadership styles on a company's work climate. However, on other pages, there is no element or term of nationalism.

The second textbook is entitled *Qualitative, Quantitative and Mixed Research Methods*. The book published by the ninth Alfa Beta (April 2017) consists of 23 chapters. Chapter I contains the perspectives of qualitative, quantitative, and combination research methods. Chapter II contains the paradigm of quantitative research. Chapter III contains the basic theory, framework of thinking, and submission of quantitative research hypotheses. Chapter IV contains experimental research methods. Chapter V considers populations and samples. Chapter VI contains the scale of measurement and research instruments. Chapter VII discusses data collection techniques. Chapter VIII is about analysis of quantitative data. Chapter IX deals with examples of data analysis and hypothesis testing. Chapter X compiles quantitative research proposals. Chapter XI compiles quantitative research reports. Chapter XII is about theory in quantitative research. Chapter XIII considers data analysis techniques. Chapter XIV is about data collection instruments and techniques. Chapter XV discusses data analysis techniques. Chapter XVI concerns validity and reliability of qualitative research. Chapter XVII is about how to prepare a qualitative research proposal. Chapter XVIII compiles a qualitative research report. Chapter XIX is on basic concepts of combination research. Chapter XX is about method combination of models/sequential explanatory design. Chapter XXI deals with method combination model/sequential exploratory design. Chapter XXII is a combination of concurrent triangulation design methods. Chapter XXIII is about methods of concurrent embedded model combination. In this textbook, academic writing is analyzed in Chapter X concerning the preparation of quantitative research proposals and Chapter XI concerning the preparation of quantitative research reports. When the researchers compared it with the first textbook, the second one is considered more complete because the techniques of writing academic papers are completely interpreted in view of the way of writing research reports. In this second book there is no element of nationalism but there are values of life skills needed by students. The reading texts in this textbook tell about the company, business, and leadership.

Muhammadiyah University of Magelang has a PGSD Study Program accredited B by the National Higher Education Accreditation Board (BAN PT). In the academic writing course, the lecturers did not have their own teaching materials but still used reference textbooks from

The second textbook is entitled *Research Methods in Theory and Practice* written by Joko Subagyo. It was published by PT Rineka Cipta in 1997. This book consists of 8 chapters. Chapter I is an introduction to the general understanding of research. Chapter II is on the subject of sampling. Chapter III is a description of data collection instruments. Chapter IV considers the target respondents. Chapter V contains the formulation of the problem. Chapter VI deals with data and how to analyze data. Chapter VII examines library research. Chapter VIII concerns procedures for writing academic papers. In this book the discussion about writing academic papers is found only in the last chapter. This chapter consists of four parts: the first part is the introduction; the second part is about the types of consumers; the third part is about the basic framework of the preparation of the report; and the fourth section is about the procedures for writing. The procedure for writing academic papers only in one chapter is quite good in scope. The value of nationalism is not found in this book. However, the textbook contains the value of life skills needed by students. It presents examples of texts related to companies and businesses.

Figure 1 shows the frequencies of the elements of nationalism and life skills. With respect to these, each book can be analyzed as follows. (1) In the first textbook, there is no single page presenting the element of nationalism. In other words, the element of nationalism is 0 percent while life skills are presented in 30 pages out of a total of 120 pages or around 25 percent. (2) In the second textbook, there is no single page presenting the element of nationalism. In other words, the element of nationalism is 0 percent while the life skills are presented in 67.5 pages out of a total of 150 pages or around 45 percent. (3) In the third textbook, there is no single page presenting the element of nationalism. In other words, the element of nationalism is 0 percent, while the life skills are presented in 31.5 pages out of a total of 175 pages or around 18 percent. (4) In the fourth textbook, there is no single page presenting the element of nationalism. In other words, the element of nationalism is 0 percent while the life skills are presented in 38 pages out of a total of 136 pages or around 28 percent.



4 CONCLUSION

Based on the elaborated field data, it can be concluded that the value of nationalism has not been presented in academic writing textbooks, while competences and life skills have been embedded in them. In the first textbook the value of nationalism is 0 percent and that of life skills is 25 percent, in the second textbook the value of nationalism is 0 percent and that of life skills is 45 percent, in the third textbook the value of nationalism is 0 percent and that of life skills is 18 percent, and in the fourth textbook the value of nationalism is 0 percent and that of life skills is 28 percent.

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data. As a whole, all of the subjects in the school curriculum, when well designed, may equip the students with all of the Industry 4.0 skills.

Responding to the needs for students to attain Industry 4.0 skills, teaching and learning tasks in all of the subjects, including English language, must be designed in such a way that do not only promote the acquisition of subject-related competencies, but also Industry 4.0 skills. Fisk (2017) suggests that in the fourth industrial revolution, “Education 4.0” must be developed. Further he points out that the “future education” has nine characteristics that mark a significant shift from the previous education practice. Five of the features shall be mentioned here. *First*, with the e-learning tools development, learning can be done anywhere at any time by the students. *Second*, learning is personalized. ICT learning tools provide opportunities for students to study on their own pace. Fast learners may finish learning earlier and can do enrichment tasks, while learners having difficulties can spend more time and obtain support from the teachers and peers. *Third*, in spite of the same learning objectives, students may use different tools and resources in the learning process. *Fourth*, learning is project-based. And *Fifth*, learning process involves activities of interpreting or using data.

Considering the goals of ELT and the learning features of Education 4.0 proposed by Fisk (2017), the tasks which are used in the learning process must:

- develop the student’s ability to communicate in the four language skills;
- equip the students with adequate knowledge of language;
- instill values;
- promote Industry 4.0 skills; and
- be characterized by the features of Education 4.0.

The following section discusses how to integrate Industry 4.0 skills in the learning tasks in in the context of Education 4.0.

2 INTEGRATING INDUSTRY 4.0 SKILLS IN THE LEARNING TASKS

There are a number of ways that Industry 4.0 skills can be integrated in the English language learning tasks. I shall use Nunan’s view on task components (2004) for the purpose. He suggests that a task has six components, namely goal, input, procedure, teacher role, learner role, and setting. While the input, procedure and setting of a task are generally explicit, the goal, learner role, and teacher role are sometimes implied. The following figure shows the components of a task.

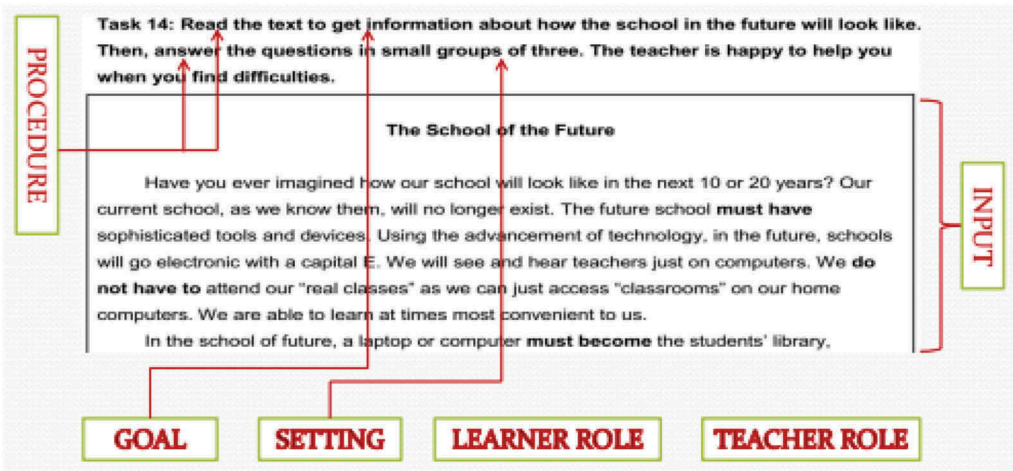


Figure 1. A task and its components.

Nunan (2004) defines goals as the general aims of a learning task and refers input to any kind of spoken and written texts the learner works with for the completion of the task. He specifies procedures as the activities that the learner does with the input in order to learn and points out that roles are the part the learners and teachers play in the task completion. He further states that setting are the arrangements of the classroom and the mode and environment of the task completion. In this article, while procedures, input, setting and roles refer to the definitions, task goals are defined as the specific communicative and/or pedagogical objectives that a learner will achieve upon the completion of a task.

2.1 Integrating the promotion of knowledge about ICT

Task: Read the following text and then answer the questions. Compare your answers with a classmate's.

AUGMENTED REALITY



Dokumen Kemdikbud
Picture 4.10 A student is wearing Virtual Reality

Augmented Reality (AR) is a huge game-changer towards how the students learn. If you are familiar with Harry Potter movie in which you can see interactive paintings lining up the school hallway, you must be then clear about AR. AR is a reality-based display environment. It uses the capabilities of computer **generated** display, sound, text and effects to develop the user's real-world experience.

Nowadays, AR is widely used in many sectors, particularly in education as it makes learning both more fun and easier. Using either a pair of glasses or a smartphone students can learn more about physical objects around them. It makes the students easier to grasp not only the difficult concept but also abstract content easily. Accordingly, they can gain a better knowledge of any lessons.

...

Questions

1. What is Augmented Reality?
2. Why is AR widely used in education?
3. How can AR help students' learning?

...

(Adapted from Afrilyasanti and Indriastuti 2019)

Another way of promoting knowledge about ICT, especially ability to use and interact with computers, tablets, etc. is through the task procedure. In this regard, the activity in the completion of the task requires the learner to use ICT tools. The following task is an example of such a task. In the task completion the learner is to use and interact with ICT tools.

Task: Listen to a conversation about a smart mirror and virtual reality. While listening, complete the conversation. Scan the QR code to listen to the conversation.



<https://www.masterfile.com/search/en/robot+women+and+men>
Picture 4.3 Two students who are having a surgery training using virtual reality

Dialogue

- Alma** : Welcome to our medical department, Hiro. Let me show you around and tell you about the technologies used here.
- Hiro** : Great. Thanks. What are those people wearing and what are they doing?
- Alma** : Oh, both that man and that woman are
(1) surgeons. They are wearing virtual reality tools not only to learn new skills but also to practise doing surgery on a 'virtual patient.' This is because VR lets us interact with 3D worlds. So, we can feel true-to-life sensations along with visual experiences. By using VR for (2) training, both the costs and the risks to patients are reduced.

...

. (Adapted from Afrilyasanti and Indriastuti 2019)

In this task the learner needs to scan the QR code to listen to the dialogue in order to complete the conversation. It means that the learner uses and interact with ICT devices. Looking further at the input, this task also presents knowledge about ICT (smart mirrors and virtual reality) and introduces new grammar items, i.e. correlative conjunctions *both ... and ...* and *not only ... but also ...*.

2.2 Integrating the promotion of ability to work with data

Earlier it was mentioned that the ability to work with data entails ability to process and analyze data obtained from machines, understanding visual data output, and making decisions, and basic statistical knowledge (Aulbur et al. 2016). In English language learning, working with data may refer to a variety of activities such as analyzing a number of sentences to come up with the pattern, learning grammar items by reading a number of sources available on the Internet, getting ideas from a number of references before writing a composition, and reading texts containing data and/or data analysis results. The following example of task has the learner read a number of sources on the Internet to learn about correlative conjunctions. The learner is asked to produce a mind map based on the data (explanations) on the three websites. In this way, learners improve their ability to work with data.

Task: Visit the following websites to learn more about correlative conjunctions at home at your convenient time. Share what you learn from the websites with the class. Prepare a mind map for your presentation.

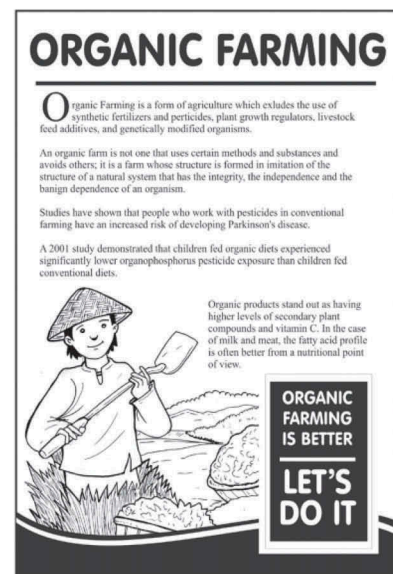
1. <https://www.khanacademy.org/humanities/grammar/parts-of-speech-the-preposition-and-the-conjunction/correlative-conjunctions-and-starting-sentences/v/correlative-conjunctions>
 2. <https://www.myenglishteacher.eu/blog/correlative-conjunctions/>
 3. <https://www.youtube.com/watch?v=Ty-GiqlZMyc>
-

When you analyze the task, you will find out that the task above does not only facilitate the learner to work with data, but also to use and interact with ICT tools. Thus, this task at least promotes two kinds of Industry 4.0 skills, namely ability to process and analyze data and working with ICT devices.

2.3 Integrating the promotion of personal skills

As stated in the previous section, personal skills refer to adaptability and ability to change, decision making, working in team, communication skills, and mindset change for lifelong learning (Aulbur et al. 2016). The first strategy to promote personal skills is through the setting of the task. When a task is done in pairs or in groups, learners will develop their ability in working in team. Another strategy is by designing task procedures or activities that require the students to answer questions or discuss a factual problem in order to come up with an agreed solution and then present their answers or agreed solution to the class or another group. By answering questions or discussing a problem for an agreed solution in groups, learners will improve their ability in communicating ideas and making decisions. When the learners are then given opportunity to present their answers or solution to another group or to the class, they will further develop their communication skills. The following example of task adapted from Priyana et al. (2008) potentially develops such skills.

Task: In groups of three, study the following poster and the answer the questions. Then report your group's answer to the class.



Questions

1. What does the poster tell us?
2. Who publishes the poster?
3. What is the poster intended for?
4. What is the benefit of organic farming according to the poster?
5. What should the government do to enforce the organic farming in Indonesia?

(Adapted from Priyana et al 2008)

The setting of the task above is group work and the procedures are answering questions and reporting the answers to the class. The last question in the task (question 5) highly likely engages students in opinion exchanges and/or a discussion to produce agreed solutions. Hence, the task potentially promotes the student's ability in working in team, communicating ideas, and making decisions.

There are many activities which are commonly used in ELT that can strengthen personal skills. Activities such as games (see Wright, Betteridge, & Buckby 2006 for different types of games), jigsaw, information gap, problem-solving, decision-making, and opinion exchange (Pica, et al. 1993) can potentially develop both the student's language competence and personal skills, especially decision making, working in team, communication skills.

3 CONCLUSION

This paper has briefly discussed how to design English learning tasks to promote Industry 4.0 skills without neglecting the development of the student's language skills. Of the four categories of Industry 4.0 skills (Aulbur et al. 2016), at least three of them, namely knowledge about ICT, ability to process and analyze data, and personal skills can be promoted through learning tasks. The promotion of the skills can be integrated in the task components (Nunan 2004), especially in the input, procedures, and setting.

As evident in the examples of tasks presented in this article, a task may develop one, two or more Industry 4.0 skills. For example, the input may facilitate the acquisition of knowledge about ICT, while the procedures facilitate the promotion of ability in dealing with data, and the setting develop personal skills. It is to note, however, that the promotion of Industry 4.0 skills through learning tasks must not overshadow the development of the

learner's knowledge about language and four language skills that include grammar, vocabulary, pronunciation, listening, speaking, reading, writing, and discourse and pragmatics (Richards 2015).

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Finally, this article demonstrates how a metacognitive strategy can enhance EFL students' reading comprehension in Education 4.0, and the following points will be discussed: reading comprehension, Education 4.0, metacognitive strategy, and metacognitive strategy as an alternative strategy to enhance reading comprehension.

2 READING COMPREHENSION SKILLS

Reading is a crucial skill in language learning, as foreign language learners need reading to improve their other language abilities (Richards & Renandya 2002). Indonesian students urgently need to improve their reading. However, it should be noted that not only is reading important but also reading comprehension. Reading without good comprehension leads to ineffectiveness in gaining knowledge from the text. Thus, poor reading comprehension should be improved to enhance the students' performance in the classroom.

Reading comprehension provides the ability to gain meaning from the text in connection with the readers's background knowledge (Meneghetti et al. 2006). Its purpose is to construct meaning from the contexts (Sweet & Snow 2002). It also involves higher-order and literal comprehension (Roe & Smith 2012). In this perspective, literal comprehension is the ability to obtain ideas that include cause-effect relationships and sequences that are presented in the text directly. Higher-order comprehension is the ability to obtain messages in the text and involves interpretation and analysis of information. Roe and Smith (2012) further noted that examples of these abilities are understanding pronoun and adverb referents, making inferences about main ideas, perceiving implied cause-effect relationships, determining purpose, concluding, problem-solving, and assessing. Reading comprehension is therefore necessary because it involves problem-solving as one crucial skill in this era.

3 METACOGNITIVE STRATEGY

Metacognitive strategy is a technique to complete a task that can increase the awareness and the thought process of the individual (Jansiewicz 2008). Therefore, this strategy would help students to increase their comprehension when they work on assignments.

Baker (2002) points out that the purpose of metacognitive strategies is to teach students how to be effective, set objectives, and become autonomous learners. Furthermore, Baker and Beall (2009) argue that metacognitive strategies are related to how people think and learn. They include three techniques: planning, monitoring, and evaluation. In reading, metacognitive strategies can be considered as self-regulating and self-monitoring activities of the students in both the process and the result of reading (Usman et al. 2017). Thus, through a metacognitive strategy, students are able to predict, monitor, and evaluate the content of texts even before they start to read (Usman et al. 2017).

To become successful learners, students must use some metacognitive strategies. For instance, students have to develop a plan before reading a text, monitor their text understanding, have knowledge strategies to break down meaning in text, and evaluate their thinking after reading (Duman & Semerci, 2019).

4 EDUCATION 4.0

Education in Industrial Revolution 4.0 emphasizes the way individuals to obtain and comprehend knowledge rather than what knowledge they get during the learning process. The paradigm of Education 4.0 is whether students know the ways of "learning how to learn" rather than what they learn (Çakıroğlu 2007). This leads to the term metacognition. Metacognition emphasizes an individual's competence and awareness about their learning and thinking (Gelen, 2004).

Arifin (2019) from Ristekditi claims that metacognition is considered one of the skills needed in this era as the students' foundation in learning how to learn. Furthermore, OECD (2019) suggests that metacognition is needed for the skills to be learned in 2030. It includes the ability and capacity to use one's knowledge to carry out processes of learning in a responsible way to achieve a goal. In that sense, OECD (2019) distinguishes three different types of skills: cognitive and metacognitive, social and emotional, and practical and physical.

From the education sector, the Industrial Revolution 4.0 played the role of facilitating educators and students in developing their creativity. Here, the teacher needs to be creative to teach the students, especially in student-centered learning. With respect to metacognitive skills, the teacher or lecturer needs to be creative to improve EFL students' reading comprehension by using a learning strategy. The metacognitive strategy was suggested as the learning strategy that is effective in improving students' reading comprehension.

5 METACOGNITIVE STRATEGY AS AN ALTERNATIVE STRATEGY TO ENHANCE READING COMPREHENSION

According to Usman et al. (2017), metacognitive strategies were successfully implemented in their study. The strategies can address several problems, not only a reading comprehension. The study found that the students could pick out the correct answers from the material provided in the reading passage (84%) and metacognitive strategies could provide alternative way for the students to answer the questions correctly (68%). They can help the students to understand the material easily and clearly, especially in reading comprehension (72%). Thus, metacognitive strategies could not only improve students' reading comprehension but also their ability in learning.

There are several steps in metacognitive strategy that are used in teaching reading comprehension. Metacognitive strategies are divided into three categories: planning, monitoring, and evaluating (Zhang & Sheepo 2013).

5.1 *Planning*

Planning is a step that affects students' performance and involves the selection of convenient strategies and resources. Reading topics and other features should be analyzed and reflected on by students to gain an idea of the text (Benchmarkeducation 2011). There are also examples of activities in planning, including making predictions before reading the text, creating a strategy in sequencing the text, and allocating time carefully before beginning a task. Planning is a crucial step for students because it can facilitate them to prepare before reading and to think of the details in advance (Zhang & Sheepo 2013).

5.2 *Monitoring*

In the monitoring step, the students monitor how well they are learning the material and find out their level of understanding. Reading comprehension is influenced by one's ability to monitor comprehension during reading (Thiede et al. 2003). In this process, the students monitor how well they are learning the material, which is a step determining the current level or state of learning. Usman et al. (2017) points out several strategies used for this monitoring aspect, for instance make connections, inferences, use context clues, use text features, identify text structures. and use graphics.

5.3 *Evaluating*

Evaluating is also an important aspect of language learning. Evaluating has many purposes, such as gathering data or information, collecting feedback, and doing assessments. In addition, Wilson and Dobson (2008) argue that an evaluation would develop the learning goals.

Students with experience in evaluation will have a better ability in the next learning process and improve their learning plan or strategy.

Metacognitive strategy can be in the form of the Cognitive Academic Language Learning Approach (CALLA), which is a cognitive theory-based instructional model created for the second and foreign language learner (Chamot & Robbins, 2005). The purpose of CALLA is to train students to be self-directed learners through various strategies applied at school. This model can be used in EFL, bilingual, ESL, foreign language, and general education classrooms. CALLA was developed by A. U. Chamot and J. M. O'Malley in 2005, and this model has been implemented in almost 30 school districts in the USA and several other countries.

Table 1. CALLA content and language learning strategies (Chamot 2005).

Strategy	Description
Plan/ Organize	Before beginning a task: - Students have to set their goals. - Students have to plan the task or the sequence of the content. - Students should choose strategies to plan on how to accomplish the task. - Preview a text.
Monitor/ Identify	While working on a task: - Students have to check their own progress on the task. - Students should check their own comprehension as they use the language. Do the students understand? If not, what is the problem? - The students should check their output as they use the language. Do it make sense? If not, what is the problem?
Evaluate	After completing a task: - The students should assess how well they have accomplished the learning task. - The students should assess how well they have used learning strategies. - The students should decide how effective the strategies were. - The students should identify changes they will make the next time they have a similar task to do.

Based on the previous study about metacognitive strategies using CALLA conducted by G. Prakoso (2016), two instruments were implemented namely reading tests and questionnaires. The researcher used modified CALLA to improve reading comprehension of students.

The results showed that the usage of strategies by students who were taught by using explicit modified CALLA was better than that of students who were taught implicitly. According to Oxford (1990), students can develop an awareness of the learning strategies used by giving them explicit instructions. Without metacognitive strategies, some readers may have difficulties with difficult text. Therefore, explicit CALLA was needed to improve students' reading comprehension.

6 CONCLUSION

One of the most significant findings to emerge from this study is that the metacognitive strategy is worth considering to apply in language learning. It is used to enhance students' reading comprehension skills. Enhancing students' reading comprehension through metacognitive strategy can be accomplished through planning, monitoring, and evaluating by using collaborative Classroom Action Research (CAR). CAR places researchers as the observers and the English teachers in the classroom organize the teaching and learning activities in a cyclical process that consists of planning, monitoring, and evaluating. These three steps can improve students' reading comprehension by activating students' schemata and background knowledge. Also, evoking the students' prior knowledge will help them to comprehend the text easily.

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Classroom practices for promoting students' English learning motivation in Industrial Revolution 4.0

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ABSTRACT: Industrial Revolution 4.0 requires that all components in the educational system adapt to changes that occur. Therefore, teachers of this era should have professional management in many aspects of educational practice. This article investigates how students' motivation is promoted by teachers' classroom practice management in English learning. It focuses on how classroom practices can be used and adapted in Industrial Revolution 4.0. The content is organized of: first, theory of classroom practice; second, the context of Industrial Revolution 4.0 relevant to classroom practices; and third, the purpose of classroom practices to promote students' motivation for learning English in Industrial Revolution 4.0. It is a point of view of the authors to know more about the relationship between variables to keep abreast of Industrial Revolution 4.0 in education.

1 INTRODUCTION

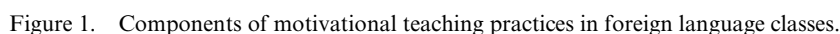
Education continues to move and develop following the rapid flow of globalization changes until now it is entering Industrial Revolution 4.0. It is undeniable that we should balance the current era's development. The impact of the development touches many aspects, including education. Education is required to create the right situation for students' character building suitable for Industrial Revolution 4.0. It is also necessary to investigate how students' character is built during the learning process. It is important to pay attention to students' state of mind when receiving lessons, which is related to their learning motivation. Students' motivation throughout the learning process will influence how they will receive knowledge. The question arising in this research then is how to strengthen students' learning motivation. In this study, the authors try to explore how motivation arises during the learning process by linking it with classroom practices in which teacher-student interactions take place and how classroom management practices encourage students' enthusiasm about learning, especially English language learning.

English has an essential position in the current industrial era, which is permeated by competition in all sociocultural and economic aspects. Industrial Revolution 4.0 requires that every student be proficient in English. The English language, which is used as a cross-country communication medium, should be given priority in the current Industrial Revolution 4.0 era. It is the role of English as a unifying language to solve the problems of misunderstanding between languages. An effort is necessary to adopt a language that can be understood and used by everyone in the world. It makes English proficiency indispensable for every student to keep up with the swift flow of the Industrial Revolution 4.0 era.

The authors are keen to highlight the ongoing problem of low English proficiency among Indonesian students. This low proficiency is directly proportional to the level of students' motivation for learning. Low learning motivation is very influential on the outcomes to be achieved by students. But with a deeper look, it is the role of the teacher that has a greater influence on students' English learning motivation.

Motivation is known as the key to learning in general, energizing and encouraging us to carry out a conscious and deliberate activity to create success or failure of each activity (Brown 2006; Dennis et al. 2008; Sinclair, Towndrow, Koh & Soon, 2008; Saqlain & Islamy 2014; Alizadeh 2016). Motivation is a much-needed psychological quality that leads people to achieve a goal. For language learners, mastery of a language may be a goal. Motivation is a star player in the cast of characters assigned to foreign language learning scenarios around the world. Motivation is something that can, like self-esteem, be global, situational, or task-oriented. Learning a foreign language requires some of all three levels of motivation (Brown 2007). For example, a learner may process high “global” motivation but low “task” motivation to perform well on, say, the written mode of language. Motivation is also typically examined in terms of the intrinsic and extrinsic motives of the learner. Those who learn for their own self-perceived needs and goals are intrinsically motivated, and those who pursue a goal only to receive an external reward from someone else are extrinsically motivated.

Motivation is an important part of the language learning process, as quoted by Madya (2013) in the context of a motivating teaching practice framework in foreign language classes by Dornyei (2001), as presented in Figure 1:



3 EDUCATION IN INDUSTRIAL REVOLUTION 4.0

English learning is one of the necessary aspects in Industrial Revolution 4.0. Besides, it plays the role of an international language, and it becomes critical for students to learn English at any place and in any situation to support Industrial Revolution 4.0. English as a subject then occupies an important position that merits attention. It is included as one of the subjects taught in the classroom given its importance in the education process.

In Industrial Revolution 4.0, education is required to create a generation of people who will be able to compete in and adjust to Industrial Revolution 4.0 through the diversity of technological use. Before going further, it should be understood what changes occur or are brought by Industrial Revolution 4.0, how tasks will differ in the future, and what skills will be required.

In Industrial Revolution 4.0, the levels of automation and interconnectivity in the manufacturing process are higher. In this case, it is expected that eventually each individual can rely on technology in all the work without a need for undue exertion in doing the job. This development will support increased opportunities for job rotation and enrichment.

A question regarding the tasks that must be carried out in Industrial Revolution 4.0 is whether there will be a significant reduction in monotonous and ergonomically challenging work. Information and data will be key elements that must be processed by employees in their daily work. Artificial intelligence will enable collaboration between humans and machines. And interaction is not limited to only pressing or touching buttons, but also includes sound and movement. Workers will use devices such as smartphones and tablets for communication and machine operations. New jobs will require employees to be part of the planning process and to be involved in improving the process and optimization activities. Employees will be asked to do less manual work and more process control and supervision tasks.

With the changes in the work environment and the expectation of tasks to be performed by the community in Industrial Revolution 4.0, skills need to be changed. Important skills that will be needed can be classified into four main categories.

From the data that support Table 1, the authors conclude what circumstances must be created in the classroom during the learning process for the success of the skills required in the preparation for Industrial Revolution 4.0.

Table 1. Important qualifications and skills required in industrial revolution 4.0.

Knowledge about ICT	• Basic information technology knowledge • Ability to use and interact with computers and smart machines such as robots, tablets, etc. • Understanding of machine-to-machine communication, IT security, and data protection
Ability to work with data	• Ability to process and analyze data and information obtained from machines • Understanding of visual data output and decision making • Basic statistical knowledge
Technical know-how	• InterdisciplinaryInter-disciplinary & generic knowledge about technology • Specialized knowledge about manufacturing activities and processes in place • Technical know-how of machines to carry out maintenance-related activities
Personal skills	• Adaptability & ability to change • Decision making • Working in A team • Communication skills • Mindset change for lifelong learning

4 CLASSROOM PRACTICE IN INDUSTRIAL REVOLUTION 4.0

The classroom is a face-to-face meeting between teacher and students. It is undeniable that the meeting between teachers and students now can be conducted online through the channels provided by different technologies. The activities in the classroom that must be considered by teachers in addition to knowledge transfer is to pay attention and make sure that in the future students will be able to compete in the era they are going through as well as Industrial Revolution 4.0. The following are the data regarding the principles of teaching that are still suitable for use in the era of Industrial Revolution 4.0.

From Table 2, it can be concluded that the teacher must ascertain how adjustments must be made to increase student motivation in learning, especially English. Adjustment of a good learning sequence and adequate motivation will create the desired learning achievement in Industrial Revolution 4.0. Classroom management practices that can be used by teachers to promote students' motivation in English learning in Industrial Revolution 4.0 based on the research of Afrianto (2018) are described in the following sections.

Table 2. Principles of teaching.

Skills	Principles of teaching
Listening	1. In an interactive four-skill curriculum, make sure that you do not neglect the importance of techniques that specifically develop comprehension competencies. 2. Use techniques of motivating from the inside, known as intrinsic motivation. 3. Encourage the use of authentic language in a meaningful context. 4. Give appropriate feedback and correction. 5. Associate natural speaking and listening. 6. Allow students to start oral communication. 7. Encourage the development of speaking strategies.
Speaking	1. Use techniques that cover the spectrum of student needs, from a focus on language accuracy to a message-based focus on interaction, meaning, and fluency. 2. Provide intrinsic motivation techniques. 3. Encourage the use of authentic language in meaningful contexts. 4. Give appropriate feedback and correction. 5. Increase the natural connection between speaking and listening. 6. Allow students to initiate oral communication. 7. Encourage the development of speaking strategies.
Reading	1. In a four-skill curriculum, which is interactive, make sure that you do not neglect the importance of teaching specific reading skills. 2. Use intrinsic motivation techniques. 3. Balance the authenticity and readability of the texts chosen. 4. Encourage the development of reading strategies. 5. Include bottom-up and top-down techniques. 6. Follow the business (survey, ask, read, display, review). 7. Divide the techniques for the pre-reading, on-reading, and post-reading stages. 8. Integrate certain evaluative aspects into the techniques used.
Writing	1. Combine good writer's practices. 2. Justify process and product. 3. Calculate the cultural background/literacy. 4. Connect reading and writing. 5. Give as many opportunities as possible to write authentically. 6. Frame the techniques in the prewriting, drafting, and revising stages. 7. Try to offer techniques that are as interactive as possible. 8. Maintain sensitivity in using methods to respond and correct student writing. 9. Give clear instructions to students about the official conventions of rhetorical writing. 10. Maintain sensitivity in using methods to respond and correct student writing. 11. Give clear instructions to students about the official conventions of rhetorical writing.

4.1 *Student-centered learning*

The classroom should be developed using a learning approach that focuses on students. While teachers themselves act as facilitators in the learning process, students have positions as learning subjects who actively manage and develop their potential and interests. Students not only do the work of listening and memorizing the subject matter that has been given by the teacher, but they also act to form their skills and knowledge, adjusted to their capacity and level of development, while directed to contribute to solving real problems in their everyday lives. Inquiry learning, project-based learning, scientific approaches, or problem-based learning are some learning models that can be used by teachers in the context of applying student-centered learning.

4.2 *Contextual learning*

The learning materials provided for students must be relevant to their daily lives. Learning must be designed only to answer existing problems. Teachers should encourage students to find meaning, beliefs, and values in what they understand and apply in their daily lives. They assess students who learn directly with the real world. Problem-based learning and contextual learning are some of the approaches that can be used in this case.

4.3 *Community-integrated learning*

It could be said that community-integrated learning is similar to the contextual concept where the teacher must try to prepare students to be citizens who have responsibility for their country. For example, a community service event can be organized where students can learn to take a part in and carry out certain activities in the living environment and can do dedicated work. This learning is directed to train students in analytical (decision making) rather than mechanistic (routine) thinking.

4.4 *Collaborative learning*

Early students should be taught to be able to collaborate with others, including with people whose views and cultural values are different from theirs. In completing a project, students must be taught how to appreciate each person's strengths and talents and how to behave in taking roles and adjusting appropriately. In this context, teachers must apply more cooperative learning principles during the learning process.

4.5 *Technology-based learning*

In Industrial Revolution 4.0, which is characterized by the Internet of Things, Internet of People, i-Cloud, big data, connectivity, and digitalization, it is very important for teachers now to combine their learning and teaching activities with the latest information technology that is currently developing. For example, they need to merge offline learning modes with online tools (blended learning/hybrid learning). In short, the integration of learning with the Internet and/or network will greatly influence the effectiveness and acceleration of achievement of learning outcomes in the current digital era.

5 CONCLUSION

We are currently in the era of Industrial Revolution 4.0 where people are required to be able to utilize technology to the maximum extent possible in reducing the workload. This is also seen as an urgent matter, and it all starts from the practice of education in schools. To face the swift currents of Industrial Revolution 4.0, schools are required to be able to shape students who can compete in and face Industrial Revolution 4.0.

This is based on the formation of character and student interest from the interactions that occur between teachers and students, where the former are expected to increase students' motivation for learning to form a strong and competitive workforce in the era of Industrial Revolution 4.0. In this case, management of classroom practice needs a great deal of attention. Effective and appropriate classroom management to the formation of Industrial Revolution 4.0 skills is required to meet the demand for high-profile graduates. Therefore, classroom practices that promote student-centered, contextual, community-integrated, collaborative, and technology-based learning are vital.

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Communicative language teaching and its application in developing slow learners' 21st century skills

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ABSTRACT: English language teachers in this 21st century learning era are required to integrate their teaching methods with the achievement of 21st century skills for all students, including slow learners. Teachers implementing communicative language teaching must consider the adaptation of their classroom activities to slow learners' learning style and characteristics. Classroom activities underlying communicative language teaching (CLT) provide a benefits not only for communicative competence achievement and development of English language skills (listening, speaking, reading, and writing), but they also enable the construction of 21st century skills: communication, collaboration, critical thinking, and creativity. The aim of this article is to support the CLT classroom activities as proposed by Richards to be adapted for slow learners in acquiring 21st century skills and to show the effectiveness of CLT in developing 21st century skills. Therefore, this article reviews 21st century skills, characteristics of slow learners, and the directions of CLT in developing slow learners' 21st century skills.

1 INTRODUCTION

Classroom activities under the communicative methodology framework, such as task completion, opinion sharing, information gathering, information transfer, reasoning gap, and role plays (Richards 2006, pp. 19–20), are considered to be effective in providing opportunities for students to communicate in the target language (Desai 2015; Tuxtamishevna 2018) and in developing their 21st century skills.

Students are required to have new sets of skills to prepare them to be skillful personnel and successful participants in the globalized society of the future. With the increase in the global economy, students need to be trained for new careers (Van Roekel 2010). It applies to all students and becomes a big challenge in the teaching–learning process where classrooms are attended by students with diverse intelligence levels, motivation, learning styles, necessities, aspirations, and cognitive requirements (Suarez et al. 2017). Some students are categorized as slow learners who require more attention and need to be treated distinctively without being discriminated against.

In Indonesia, it is the government's commitment to realize the constitution on education. The 1945 Indonesian Constitution (*Undang-Undang Dasar* 1945), Article 31, Section (1), gives a mandate that every citizen has the same opportunity to have an education. Therefore, children with special educational needs also have the same opportunity to learn together with other children. Slow learners are categorized as special educational need students (Suparno 2018). The government demonstrates great concern about inclusive education. By learning together with their peers with different learning abilities and intelligence levels in English class, slow learners are trained to be familiar to communicate in English.

The purpose of an English class is to give students a skill to communicate in a foreign language used by almost all people in the world (Crystal 2003). Basically, there is a need for an

approach to teach students who have slower responses in learning; for instance, slow learners communicate in English contextually and meaningfully related to their daily life activity. Communicative language teaching (CLT) classroom activities provide an opportunity for learners to communicate in English. These activities utilize the functional aspect of language to communicate in the target language regarding students' daily lives (Desai 2015). Such kinds of activities make learning more enjoyable for slow learners who have difficulties in understanding abstract concepts. This article aims to explore the CLT classroom activities as proposed by Richards to be adapted for slow learners in acquiring 21st century skills and to show the effectiveness of CLT in fostering 21st century skills. To reach those goals, this article will discuss 21st century skills, the characteristics of a slow learner, and the directions of CLT in developing slow learners' 21st century skills.

2 21ST CENTURY SKILLS

The 21st century skills are (1) critical thinking and problem solving, (2) communication, (3) collaboration, and (4) creativity. These skills were initially acknowledged in 2002 by a nonprofit organization in the United States known today as the Partnership for 21st Century Skills (Trilling & Fadel 2009). Since these terms were brought up, achievement of these skills has influenced all aspects of education globally. How are 21st century skills categorized? Trilling and Fadel (2009) have provided discussions for answering the question. To give a rigorous explanation, they categorize the 21st century skills into three sets of skills. Those are (1) learning and innovation skills; (2) information, media, and technology skills; and 3) life and career skills. The 21st century skills are in the frame of the first set, namely learning and innovation skills. Learning and innovation, the first set of skills, are the most important skills because they are foundation skills obtained before acquiring other skills. Furthermore, Trilling and Fadel (2009) state that the 4C's skills are the keys to unlock a lifetime of learning and creative work, implying that becoming future skilled, innovative, and expert personnel can be achieved by mastering these skills.

Trilling and Fadel's first set of the 21st century skills focuses on critical learning skills and innovation: (1) critical thinking and problem solving (expert thinking), (2) communication and collaboration (complex communication), and (3) creativity and innovation (applied imagination and invention).

The consideration of critical thinking and problem solving as the new basics of 21st century learning as a result of the current research in cognition, the science of thinking, has undermined a traditional principle of teaching—that mastering content must come before an attempt to put it to good use. As it turns out, using knowledge as it is being learned—applying skills such as critical thinking, problem solving, and creativity to the content knowledge—increases motivation and improves learning outcomes (Trilling & Fadel 2009). This thought leads the learning process to prepare students to be experts in their field and in the future by challenging them to be thinking and problem-solving persons.

The revised version of the taxonomy uses the updated terms remember, understand, apply, analyze, evaluate, and create. According to Trilling and Fadel (2009), it provides definitive proof that “these processes can be learned at the same time or even in reverse order.” The statement is supported by the result of research in which combining many of these thinking skills can improve learning outcomes. Creating, applying, remembering, analyzing, understanding, and evaluating can be used together with well-designed learning activities and projects to improve the effectiveness and longevity of learning results. Based on these ideas, activities on communicative language teaching can be designed to cover the improvement of 21st century skills. Nevertheless, the portion of each skill development may be different. An activity has the possibility of having communication as the main skill achieved while another skill, such as critical thinking, is given less focus.

The National Education Association, in its guide, states, “It is our duty to do whatever they can, to help our students connect learning with real life, and to provide them with the necessary skills to prepare them for success.” The statement persuades educators to help learners to

engage in the learning by fusing real-life situations with the learning. This is in line with the idea of CLT that the principles of language teaching should involve students in meaningful communication and real-life situations. Under the direction of CLT, teachers must consider their efforts in students' success in gaining the 21st century skills.

3 CHARACTERISTICS OF SLOW LEARNERS

3.1 *Effective ways to work with slow learners*

Before going into a discussion on working with slow learners, it is important to give an illustration of who slow learners are. Many writers have provided descriptions of slow learners. Slow learners are children having no disability but their knowledge acquisition process is slower (Suarez et al. 2017). To achieve content acquisition and to understand things, these students need a longer time than average students. In coping with academic demands, they also have to struggle with perseverance. Similar to this, Muppudathi (2014) states that slow learners do not apply to children who have physical imperfections or those who are diagnosed as having no capability to learn. It is a term applied to students who can learn and absorb knowledge or any academic content but at a rate and depth lower than those of regular students. As a result of their observations, the authors agree with these ideas. Slow learner students can engage with the learning process. They are motivated to acquire knowledge. They also have a high curiosity about academic content. Their barrier is in comprehending new things. As a result, they will need extra time and other supportive factors such as tasks designed especially for them and the teacher's guidance.

Slow learners are considered to have difficulties in understanding abstract concepts that are not delivered to them in an authentic form. Theoretical ideas shared with slow learners but leaving out the genuine background will present problems for them (Pandey et al. 2016). Slow learners are able to perform different tasks at the same time or communicate their ideas to others in social interactions. They also have no difficulties in coping with mechanical exercises in their everyday lives. They will be challenged and motivated when they are given a chance to solve a problem dealing with what they have experienced before. However, they will feel burdened if they are asked to understand complicated instructions in which they need to extract clues to reason and consider the conceptual matter. In relation to memorizing, slow learner students can easily forget concepts introduced to them in a short time. Their slow pace in learning is reflected in their slow memory recalls. Besides those characteristics, an IQ test can also be used to identify slow learners. According to an Indonesian psychological institution, students who have an IQ score below 80 can be categorized as slow learners. Yet, this once again does not mean that these students have no capabilities to learn and to acquire knowledge. They can have successful learning when they are given more guidance and more attention. It is the teacher's responsibility to guide them and to comprehend the best way to teach them. The next section will discuss the teacher's role in teaching slow learners.

3.2 The teacher's role in teaching a slow learner

A teacher may have to deal with any kind of problem relating to the students, including students' disinterest in the learning process and their difficulties in acquiring knowledge. These are just a few examples. Through those problems, teachers are sensitized to be more concerned with their roles in teaching and learning processes. Borah (2013) discusses teachers' roles by suggesting what the teachers can do to steer slow learners in pedagogical areas, also on how to treat them correctly for the sake of their characteristics and learning goals. The teacher's role as a motivator is to give an understanding of the importance of attending the class and mastering the content knowledge. Moreover, the teacher as a pioneer means that the teacher can move the school's staff and personnel to create a slow learner-friendly environment for learning. It means that the teacher offers affection and does not discriminate against students. Subsequently, the teacher as an entertainer means that the teacher brings comfort to slow learners by providing them activities that they can

enjoy. Then, the teacher as the lesson definer means that the teacher knows exactly what slow learners can or cannot work out well based on the materials and the tasks they have to deal with. Furthermore, the teacher as pacesetter means that the teacher sets slow learners' paces in learning separately and differentiates them from those of the regular learners. Ultimately, the teacher as a facilitator equips the teaching and learning process with activities, media, and techniques supporting the development of slow learners.

4 PRINCIPLES OF CLT: ADAPTABLE FOR SLOW LEARNER CHARACTERISTICS

Communicative language teaching (CLT) has endured the test of time. It is one of the most effective approaches in the teaching and learning of languages. CLT in this era is still recognized as the best method of teaching English in second or foreign language situations (Liao 2004). When a weakness is found in CLT, it is caused by some misconceptions on how to implement it in the classroom (Adnan et al. 2012). At this point, it can be concluded that there are no problems with the principles of CLT, since when a problem occurs, it is not about CLT's but rather in how teachers apply it in their classrooms.

According to CLT principles, learning takes place only when the activities and tasks undertaken are comprehensible, contextualized, meaningful, and not mechanical. Students learn successfully when the input they receive from the teacher is related to their real-life situations. To encourage students, the teacher should use materials that are authentic or related to daily life (Richards 2006). It is in line with the traits of slow learners' that they have more capability in understanding a genuine situation that they can see, feel, and experience. For ELT teachers, the situation is easy to create. Activities such as role-play, games, and projects can support this. In teaching a foreign language, teachers are free to choose lesson materials found in the students' social-local environment.

Foreign language teachers should seize the aforementioned phenomenon as a great opportunity in collecting materials surrounding the students' environment freely by keeping the students on revealing the natural use of language, focusing on communication, involving meaningful use of language, using communication strategies, providing space for students to produce language that may be unpredictable, and most significantly, seeking to link language use in context. By doing this, the teacher of CLT has directed the learning to the fluency activities. Teachers are also advised to use the balance of fluency and accuracy activities and to use accuracy activities to support fluency activities. They are also encouraged to make greater use of small-group work. Pair and group activities give learners greater opportunities to use the language and to develop fluency (Richards 2006).

Savignon (2006) says that the substance of CLT is the engagement of learners in communication to allow them to develop their communicative competence. The thought implies that CLT steers the activities to acquire communicative competence. The principles of CLT methodology are described as follows: (1) make real communication of language learning as its focus, (2) provide opportunities for learners to experiment and try out, (3) be tolerant of learners' errors in building up their communicative competence, (4) provide opportunities for learners to develop both accuracy and fluency, (5) link the different skills such as speaking, reading, and listening in the same time as they are used in the real world, (6) let students deduce or discover grammar rules (Richards 2006).

One of the goals of CLT is to develop fluency in language use (Richards 2006). Fluency is a natural language use occurring when speakers engage in meaningful interaction and maintain comprehensible and ongoing communication despite limitations in their communicative competence. Fluency is developed through creating classroom activities. Students must negotiate meaning, use communication strategies, correct misunderstanding, and work to avoid communication breakdowns. The activities of CLT focus on (1) reflecting the natural use of language, (2) achieving communication, (3) requiring meaningful use of language, (4) requiring the use of communication strategies, (5) producing language that may not be predictable, and (6) seeking to link language use to context (Richards 2006). From these details, it can be seen that CLT emphasizes communication rather than grammar memorization. Grammar

mastery plays a central role in communicating accurately. A slow learner may find difficulties in memorizing and grasping the linguistic elements because they are assumed to be complicated. Slow learners with a strong attachment to their mother tongue should be fostered to study grammar using certain techniques to make their learning easier. The teaching style must be designed specially to give a resourceful pedagogic format and provide a learner-friendly environment for adaptation, practice, and revision (Azam 2014). Teaching grammar and vocabulary in CLT for slow learners can be embedded in several activities adaptable for them, such as games or learning media. Slow learners are also familiar with information and communications technology (ICT) tools so the use of these tools can be an alternative.

Tuxtamishevna (2018) says that teachers have to seek the most effective activities in learning to illustrate concepts in real-life situations. This will be very efficient for slow learners, who will use the activities to cooperate with others. There are possibilities that CLT and activities focusing on fluency can support more than one skill. For example, the principle of real communication in language learning helps to foster communication and collaboration skills. CLT focuses on interaction as a means, and ultimate goals of the study include discussing personal experiences with peers and outside the realm of traditional grammar, and promoting language skills in all types of situations to build slow learners' communication skills (Qiang 2017). The same occurs with the meaningful use of language. It can be used as the basis of activities requiring critical thinking and problem solving, communication, and collaboration skills. It reflects that activity under CLT preserves and integrates various skills though it is possible the skill may not be achieved. After appreciating the parallel between the principles of CLT and 21st century skills and the need to reflect them in precise classroom activities, this article proposes that the classroom activities achieved the goal.

5 CLT ACTIVITIES TO DEVELOP 21ST CENTURY SKILLS

There are four English language skills: speaking, listening, reading, and writing. Those skills can be developed through CLT. The basic purpose of CLT, however, is to develop communicative competence and it is not limited to grammatical or linguistic competence (Brown 2007). Each activity presented on this article is not supposed to develop only one skill of a slow learner, but hopefully, each activity can develop more than just one skill. Singh (2004), cited in Pandey (2016), says that slow learners possess delayed speech: articulation, vocabulary, brief sentence, and grammatical errors. These burdens lead teachers to create a lot of speech stimulation through playing and talking to peers with advanced knowledge, who become their interlocutors. Further activities to build slow learners' language are created by allowing them to tell about their experiences. They will feel secure with this activity because they are familiar with one another. The others just have to be good listeners. Freedom to deliver and realize their plans creates a feeling of participating in the learning and prevents boredom.

6 CONCLUSION

Communicative language teaching (CLT) is able to foster slow learners in acquiring English language altogether in developing 21st century skills. CLT has been recognized as the forerunner of communicative competence. The activities in CLT are adaptable for slow learners. Its principles also support the basic characteristics of slow learners' learning styles. Slow learners can develop their foreign language achievement if the teacher is able to choose the best method and implement it in creative activities. The pedagogical concepts to teach slow learners are in line with the general principles of CLT, allowing them to learn contextual and meaningful communication in real-life situations. Slow learners are normal students but they need more time to absorb knowledge. The first task is to distinguish all the characteristics of slow learners and identify these students. The teachers also should be patient, imaginative, and creative to cope with all the slow learners' distinctions. Using appropriate methods and techniques in adequate activities and exercises will provide a successful learning process for slow learners.

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Initiating and maintaining foreign language learners' motivation in Education 4.0 era

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ABSTRACT: Learners' motivation to learn a foreign language is a complex, dynamic process. Most theoretical models and researchers suggest that learners' motivation is not stable but dynamically changing over time as a result of personal progress as well as multi-level interactions with environmental factors and other individuals. Both teachers and learners engage in interactive relationships in the classroom. Teachers need to understand the complex sequence of events that lead them to initiate and maintain learners' motivation. Nowadays, teachers and learners are coming into the Education 4.0 era, where humans and technology are aligned to enable new possibilities, including those in the teaching-learning process. This paper aims to generate some ideas about initiating and maintaining students' motivation in foreign language learning in the Education 4.0 era through a number of steps: first, theories of motivation are reviewed; second, the context of Education 4.0 on is discussed; and third, practical ways of initiating and maintaining motivation are proposed.

1 INTRODUCTION

Motivation is frequently prescribed for the success of foreign language learning besides many other factors like intelligence, attitudes, and abilities (Dörnyei 2013, Gardner & Yung 2017, Gardner & Lambert 1959, Pawlak 2000). As Dörnyei (2013) revealed, "Motivation is responsible for why people decide to do something, how long they are willing to sustain the activity and how hard they are going to pursue it". It is a psychological process that involves cognition, behaviour, emotion, decision-making process, and biological aspects. Motivation has been generally conceptualized as a combination of effort, desire, and attitude related to learning a target language (Gardner & Yung 2017). However, learners' motivation to study language is complex and dynamic; it is not stable but changing dynamically over time as a result of personal progress as well as multi-level interactions with environmental factors and other individuals (Pawlak 2000, Yanguas 2011). Thus, motivation is well recognized as a combination of psychological, biological, and socio-dynamic elements that impact on the success in language learning.

Research in the motivation and language achievement area has expanded massively in recent years (Boo et al. 2015, Lamb & Arisandy 2019, Ushioda 2009). Notably among the research is Dörnyei's target language motivational self-system and Garner's socio-educational model of language motivation. Pawlak (2000) & Yanguas (2011) found that the nature and magnitude of motivation are both not stable; they change over time. Therefore, language teachers should attune to the motivational strategies used on specific learner groups in specific situations to enhance the effectiveness of instructed second language acquisition. (McEown & Takeuchi 2014) pinpointed that students' levels of language proficiency and original motivational intensity are influenced by teacher's effectiveness changes of the motivational strategies. Further research into motivation was conducted by (Fandiño et al. 2019) based on the theory

of self-determination, stating that the motivation to learn English is strongly influenced by external factors, such as, course resources, relationship with teachers, course activities, virtual methodology, and technology support.

Currently, students and teachers are entering the education 4.0 era, constructing a range of impressions of learning. Education 4.0 itself is a response to the requirements of Industrial Revolution 4.0, where humans and technology are aligned to enable new possibilities in the performance of various activities. The development of technology has changed everything: various media now are incorporated into teaching; online platforms are provided to make the learning process easier and simpler; abundant sources are now available; and interactions between students and teachers now are no longer handicapped by distance. Today's learning is without boundaries; it can be held anywhere and anytime and is supported by unlimited access to information, Internet, and technology (Anggraeni 2018, Hussin 2018, Puncreobutr 2016). However, the advancements of technology for promoting motivation are still faced with some barriers, for instance, untrained teachers or students as technology users, lack of equipment, unavailable Internet access, and distraction of other social media with the rapid expansion of a multitude of applications worldwide.

Several attempts have been made to explore motivation based on the self-system and socio-educational models of language education. However, much less is known about how to initiate learners' motivation and how to examine the ways in which students' motivation in learning English is sustained in the new Industrial Revolution 4.0 era. This narrative review provides an overview of current knowledge in three steps. First, a number of key articles on motivation in language learning and the phenomenon of the Industry 4.0 era are scanned for search terms, and theories of motivation are reviewed. Second, the context of Education 4.0 is discussed. Third, practical ways of initiating and maintaining motivation are proposed.

2 THE NATURE OF MOTIVATION

Prior studies have noted the importance of motivation as one of the main determinant factors of second or foreign language learning achievement. Canadian psychologists Gardner & Lambert (1959) found that individuals' motivation to learn a foreign language is nurtured by both attitudes toward the foreign language community and the goals, or orientations, sought through language learning. They identified two classes of motivation, the first of which is integrative motivation, which refers to the desire to learn a language to have contact with, and perhaps to identify with, members of the language community, and the second instrumental orientation, which refers to the desire to learn a language in order to achieve some practical goals, such as, getting a job or earning course credit points.

Theories of motivation have been proposed over the last few decades. There are three theories of motivation from three different perspectives: behavioral, cognitive, and constructivist (Brown 2007). From a behavioral perspective, motivation is known in a matter-of-fact term. Individuals are driven to acquire positive reinforcement and control by previous experiences of rewards, in which case they act accordingly to get further reinforcement. Skinner, Pavlov, and Thorndike placed motivation at the center of their theories of human behavior. It is believed by behaviorists that people's operant behaviors can be changed by an external condition such as reward, something more motivating, or something a person wants to avoid. Unlike the behavioural perspective, the cognitive perspective emphasizes learners' thinking process, with motivation perceived to come from a learner's cognitive processes, including goal orientation, self-efficacy, and interest. From the constructivist perspective, meanwhile, motivation is further emphasized in social context as an individual personal choice (Brown 2007). Based on this view, motivation is derived as much from human interactions with others.

Besides et al. (1997), through a traditional empirical study with a metatheory application, introduced self-determination theory (SDT), an approach to human motivation and personality. The theory focuses on the importance of humans' evolved inner resources for personality development and behavioral self-regulation. It examines people's innate psychological needs

and inherent growth tendencies as the basis of motivation and personality integration as well as the condition for initiate positive processes. Further, SDT highlights the regulations of individual human's behavior and how motivation can be different for each person. This theory focuses on how psychological needs and numerous variables in a social context are integrated and regulated in the individual (self), empowering people and allowing a good function. It divides two general types of motivation regulation based on intrinsic interests in the activity and on rewards extrinsic to the activity. This theory later becomes a reference for many recent studies such as (Fandiño et al. 2019, Pulido et al. 2010).

Intrinsic motivation is the natural tendency toward assimilation, spontaneous interest, and exploration necessary for cognitive and social development (Pulido et al. 2010). It is superior to external motivation (Maslow 1970). Of extrinsic motivation itself, Fandiño et al. (2019) prescribed four types: first, external regulation, which is controlled by environmental contingencies; second, interjected regulation, in which individuals primarily internalize contingencies; third, identified regulation, in which individuals acknowledge the importance of an activity; and, fourth, integrated regulation, in which individuals behave consistently with their needs. There has been strong evidence that external factors influence English learning through virtual distance learning modalities.

3 EDUCATION 4.0

Education 4.0 is inspired by Industrial Revolution 4.0 to achieve a synergy for achieving goals in the globalization era. The evolution of education 4.0 supports the teaching and learning process through the use of information, Internet, and technology. Qualifications and skills such as knowledge about ICT, ability to work with data, technical knowledge of how to operate ICT devices, and personal skills are needed to meet the demand posed by Industry 4.0 (Aulbur et al. 2016). Teachers, students, and stakeholders alike are required to have the necessary skills for Industry 4.0 because they an important role in the education system (Anggraeni 2018). The trend toward Education 4.0 has thus caused a shift in learning from teacher- to student-centered, traditional to digitalized.

Technology will never replace teachers' role in the classroom. Regarding the growth of science and technology in the context of schooling in Education 4.0, English teachers appear to have a great number of roles in the success of learning since they can equip students with the capacities for living and working along with the rapid changes in technology and industries. The goal of teaching is to prepare students to face the real world in the future and bring about meaningful changes by striving to become effective at managing the changing world. Harmer (2007) highlighted that good teachers are those who can adopt several different roles in the class, in which case the roles depend on what students are doing. With the development of technologies affecting the education system in the Industry 4.0 era, teachers are expected to be aware of what role is to be played (Angelianawati 2019). In teaching, a teacher must be able to adopt a certain role in a particular context of learning.

As contended by Tondeur et al. (2017), current evidence shows that although the use of technology during the teaching and learning process is steadily increasing, achieving technology integration is still a complex process of educational change. This is as evident in the extremely vast variety of the use of technology in schools. Inappropriate implementations of ICT (information and communication technology), for instance, along with the disruption from social media and Internet unavailability affect the stability of students' motivation in the Education 4.0 era. Hence, both learners and teachers are responsible to increase and control students' motivation in the learning process with integration of technology interventions as the evolution of Education 4.0 has given a new impetus to educational transformation in terms of pedagogy, content, curricula, and educational management (Kin & Kareem 2019).

4 LANGUAGE LEARNING MOTIVATION IN EDUCATION 4.0

The new generation of students have incorporated the Internet into their daily lives; they are highly active Internet users. Due to the high degree of Internet penetration and adoption, the Internet has the potential to be an excellent medium for the teaching and learning process. In the Education 4.0 era, students are fully engaged in their learning process (Aziz 2018). They welcome challenges and enjoy group discussions and highly interactive learning environments. They are much into digital devices. For them, learning can take place anywhere and anytime, and unlimited access to new information is available because today's learning is without boundaries.

Education 4.0 is predominated by technology-supported teaching and learning. Many tools are available in the digital world, and most of them are accessed by learners to help motivate their self-directed learning and promote their autonomy. Kin & Kareem (2019) revealed that learners enjoy using technology in foreign language learning and look to employ technology more than traditional materials and methods as it enables them to be engaged in their learning progression and allows them a more optimistic approach toward education. While technology can potentially support learners' autonomy, and thereby enhance motivation, introducing another foreign element into an already unfamiliar environment could serve to demotivate (Weinberg 2017). When used appropriately, however, technology can motivate students to learn a foreign language.

Education 4.0 is associated with the skills needed in the 21st century, such as, leadership, collaboration, creativity, digital literacy, effective communication, emotional intelligence, entrepreneurship, global citizen, problem-solving skills, critical thinking, creativity, innovation, cross-cultural understanding, career skills, and learning skills (Hariharasudan & Kot 2018, Puncreobutr 2016). Hence, learners' motivation might be enhanced as learning with technology appears to be a fun way to promote such 21st century skills.

5 INITIATING AND MAINTAINING LEARNERS' MOTIVATION IN EDUCATION 4.0

Initiating and maintaining students' motivation in the new era can be done by boosting intrinsic motivation and extrinsic motivation. (Fandiño et al. 2019) found that students tend to show a greater disposition to learn when they do so with an effective, purposive use of technology because online learning gives greater extrinsic motivation than do traditional methodologies. They reported that external factors like curricula, teachers, resources, cultural capital, and socioeconomic status can affect the sense and quality of motivation. They, thus, play an important role in increasing students' motivation to learn in this digitalized era.

In the classroom, teachers play a pivotal role in initiating and maintaining students' intrinsic and extrinsic motivation. According to Gardner & Yung (2017) and Fandiño et al. (2019), there are two factors teachers can use to control learners' motivation in the digital era. The first is personal factor, which is a mix of intrinsic and extrinsic motivation related to individual's psychological process and social specific development framework. To stabilize students' motivation, teachers should inform the meaning of English learning. Learning English brings benefits in that it opens up many possibilities for being widely spoken around the world and allowing students to be connected with other people. More importantly, English is used as the operating language of the Internet of Things (IoT) (Hariharasudan & Kot 2018b). It helps students develop the Industry 4.0 skills.

The second is contextual factor, including curricula, resources, teachers, and technology modality. Related to this factor, teachers should pay attention to the use of ICT tools and relevant learning contents in accordance with students' need. Teachers can use the best tools or platforms most students find interesting and interactive in teaching as they can attract students' active participation in real contexts. The use of these online tools or platforms offers students with the advantages of flexibility and self-control. Students' motivation in learning a foreign language also largely relies on teachers' efficient facilitation and appropriate

selection of contents. Furthermore, all the learning process should be conducted with students' recent needs for acquiring the Industry 4.0 skills taken into consideration. Students need support, feedback, and reward as the result of their learning. Given the interconnectedness of motivation, technology, and language learning, introducing the technology in education 4.0 into the language classroom will boost learners' motivation (Weinberg 2017).

6 CONCLUSION

This paper started with a statement of the importance of motivation as a key to the success of language learning on the account that motivation is responsible for why and how students pursue activities. Motivation in and of itself is deemed important and necessary in pushing students to learn moreover with the changes in the current education practice.

Today's education is driven towards Industry 4.0 which is marked by the integration of information technology. There arises the need for optimizing the roles of teachers in motivating English language learners since teachers are agents of change in the educational domain. In the Education 4.0 era teachers and students use information, Internet, and technology in the teaching-learning process. In this era, students are highly connected to technology in their daily lives. This requires them to use technology to survive the evolution.

Students' recent characters should be reflected in the teaching and learning process. Additionally, taking technology into the class can increase the effectiveness of the teaching-learning process. Teachers play many roles, including those of controller, manager, supervisor, feedback provider, organizer, facilitator, and motivator. In this case, English teachers must be able to determine how to initiate and maintain students' motivation by considering personal and contextual factors. The first is a mix of intrinsic and extrinsic motivation related to an individual's psychological process and social specific development framework. Indeed, teachers need to inform the learning objective and importance of learning for students' future lives. The second factor, the contextual factor, involves the importance of teachers choosing the best ICT tools and relevant learning contents according to students' needs in the class to help students get engaged in the learning process and control their motivation. The use of technology that suits students' needs and appropriate, insightful contents that motivate learners to learn English should be supported by further empirical research of students' perception on ICT use for their learning and experimental research of particular tools necessary for initiating and maintaining students' intrinsic motivation.

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Project-based learning practices in the 21st century to improve EFL learners' autonomy

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ABSTRACT: Project-based learning (PBL) has made it possible for learners to develop 21st century skills, namely critical thinking, problem solving, life-long learning skills, creativity, innovation, collaboration, and real-life-setting communication skills. While obtaining these skills, learners are required to develop their learning autonomy. This article discusses PBL practices and students' autonomy in learning English as a foreign language (EFL). To reveal the benefits of PBL in promoting learner autonomy in the EFL classroom, this study reviewed some theories of PBL and learners' self-reliance, and finally, a working model of PBL for EFL learning is proposed.

1 PROJECT-BASED LEARNING

Project-based learning (PBL) is an innovative approach that provides different ways of learning in promoting the 21st century skills that are crucial for students in facing future real-life situations. In this approach, students learn by finding something that interests them (Bell 2010).

Referring to the idea that students learn to improve their knowledge and skills by experiencing and solving real-world problems, PBL has been recognized to be effective and fruitful in promoting 21st century education. A great number of studies on PBL have been carried out on the global scale (Van Lam 2011).

Simpson (2011) argues that PBL is not new in education, and according to Beckett and Miller (2006) PBL has been investigated for centuries. Snedden introduced PBL into education in American agriculture classes. Then, in the 20th century, William Heard Kilpatrick developed PBL focusing on activity designed based on students' needs (Wolk 1994; Muniandy 2000; Beckett & Miller 2006).

From the definition proposed by some of the aforementioned experts, there exist similarities and differences of viewing the PBL approach. All of them argue that PBL is necessary to be implemented in the 21st century to make students succeed in their lives. In terms of differences, Bell (2010) highlights the implementation of PBL to promote 21st century skills. Another expert, Van Lam (2011), focuses on experiencing and solving real-life problems, and Simpson (2011) highlights students' needs that play an important role in implementing PBL.

PBL has also been applied in language learning because similarly, in language education, the students are prepared to face real-life challenges; so, they have to learn some skills such as critical thinking, the ability to analyze and solve problems, and the ability to socialize and work together as a team with partners. PBL is also a tool to solve real-world problems (Rousova 2008). It means that PBL provides authentic learning because students have to face the problems and challenges they may experience in their lives.

PBL also has some benefits in bringing students to apply 21st century skills. Previous research on PBL explains a way to derive certain benefits from it. PBL encourages students to learn and practice 21st century skills by doing and presenting projects. According to Simpson

(2011), the PBL approach links students to communicative competence, authentic learning, learner autonomy, cooperative and collaborative learning, higher-order thinking skills, language proficiency, self-efficacy, and self-esteem. In line with Rousova (2008), Simpson (2011) more specifically defines that PBL provides not only authentic learning but also 21st century skills for students to master.

The goal of PBL focuses not only on the content knowledge but also on the improvement of the learning process by giving students a chance to implement the knowledge they obtain into their lives (Barron & Darling-Hammond 2008). The projects open a door, allowing students to interact with their topic on a level that pushes their comprehension and involvement deeper. It may encourage students to become more fully aware of their own belief system (Minerich 2001). Finally, all three authors agree that PBL improves the quality of the learning process for students by providing a chance to apply the knowledge to the projects pertinent to real-life situations and contexts.

2 WHAT PROCESSES ARE INVOLVED IN THE IMPLEMENTATION OF PBL?

This section provides the procedures on how to implement PBL based on the model proposed by two experts. The first model was proposed by Papandreou (1993) and the second by Alan and Stoller (2005). The former scholar brings a model in “*An Application of the Projects, Approach to EFL*” illustrating the process of PBL, which works in six steps. In *Step 1, Preparation*, the teacher introduces the topic to the students and asks them to discuss and address questions. In *Step 2, Planning*, the teacher and the students determine the mode for collecting and analyzing information, and different works are assigned. In *Step 3, Research*, students work individually or in groups to collect information from various sources. In *Step 4, Conclusions*, students draw conclusions based on their analysis of the collected data. In *Step 5, Presentation*, students are supposed to present their final product to all the students in the class. In *Step 6, Evaluation*, the teacher comments on the students’ efforts.

Based on the aforementioned models, Alan and Stoller (2005) summarize and put forward the revised ten-step process in “Maximizing the Benefits of Project Work in Foreign Language Classrooms,” as follows.

- Step 1: Students and the instructor agree on a theme for the project.
- Step 2: Students and the instructor determine the final outcome.
- Step 3: Students and the instructor structure the project.
- Step 4: The instructor prepares students for the language demands of information gathering.
- Step 5: Students gather information.
- Step 6: The instructor prepares students for the language demands of compiling and analyzing data.
- Step 7: Students compile and analyze the information.
- Step 8: The instructor prepares students for the language demands of the culminating activity.
- Step 9: Students present the final product.
- Step 10: Students evaluate the project.

This latter model revised Papandreou’s (1993) model. As seen, the previous one consists of 6 steps in carrying out the PBL, from the preparation, planning, research, conclusion, presentation, to its evaluation, while the second model consists of 10 steps to maximize the benefits of the project. This model covers more complete and detailed processes on how to carry out a project beginning with the agreement between the students and instructor for deciding a theme for the project. The next is choosing the final outcome, and so on.

Moreover, all the steps in Alan and Stoller (2005) emphasize the agreement between the students and instructor. Students are more active from determining a theme for the project to evaluating the project. Good communication skills are needed by these students to successfully convey information to their peers and the teacher.

3 WHAT ARE THE BENEFITS OF PBL IN THE EFL CLASSROOM?

A plethora of benefits can be gained by students and teachers in implementing PBL in the EFL classroom. Researchers have mentioned the benefits of PBL ranging from the development of language skills to enhancing students' personal growth. First, a project covers the four language skills—speaking, listening, reading, and writing—and requires the use of a variety of activities. The project given by the teacher provides students with chances to “recycle known language and skills in a relatively natural context (Haines, 1989).” The four skills are used because students communicate with their friends and also teachers in English, so they have the opportunity to practice the language. They evolve listening skills by listening to their friends when discussing the project, and by such a discussion, their speaking skills are probably improved. They also reinforce their reading skills by reading some materials needed for the project and writing the project plan and reports can be a great means of developing their writing skills.

Second, students may develop their metacognitive skills while using PBL. This is because they are engaged in a project activity that “involves a variety of individual or cooperative tasks such as developing a research plan and questions, and implementing the plan through empirical or document research that includes collecting, analyzing, and reporting data orally and/or in writing” (Beckett 2002). As students design a plan on how to complete the project, decide the procedures for acting on the plan, write notes while communicating with their friends, and develop skills on how to collaborate during the project and how to finish it, these students' metacognitive skills are likely to develop.

Finally, students are usually expected to work together to achieve their end product, making it possible for them to develop confidence and independence (Fried-Booth 2002). In addition, project work incorporates collaborative teamwork, problem solving, negotiating, and other interpersonal skills that have been identified by learners as the important skills for a successful life (Stein 1995). Therefore, this means that PBL promotes students' 21st century skills.

4 WHAT ARE THE CHALLENGES IN IMPLEMENTING PBL?

As previously mentioned, PBL has some benefits; yet, it also has some difficulties that should be considered in implementing PBL in the EFL classroom. The following are a couple of challenges indicated by some scholars.

First, instructors may have difficulty in helping students to connect new learning content with their prior knowledge and in performing cooperative learning activities efficiently (Marx et al. 1997; Lee & Tsai 2004). Such challenges can appear because a class of students may possess various levels of background knowledge. Some may be familiar with the project and the materials, while others may not.

The second factor that impedes the implementation of PBL is students' ability to effectively communicate with each other while working in groups. Those who are not experienced with working in groups may have difficulties in negotiating and compromising (Grant 2002). Sometimes, it is challenging for some to negotiate with classmates when working on the project. It will be better if the teacher gives an instruction on how to deal with any possible problems before they work on the project. Conflicts can hinder the project from being perfectly completed.

5 LEARNER AUTONOMY

The word “autonomy” is actually not a linguistic term, and in fact it was imported from other fields (nonlinguistic) through psychology and educational theory (Harding-Esch 1977).

In language learning, a definition of autonomy that has gained widespread acceptance was formulated by Holec (1979), who describes it as “the ability to take charge of one's own

learning.” Elaborating on this definition, Holec states that “to take charge of one’s own learning” is to have and hold the responsibility for all of the decisions concerning all aspects of learning, that is,

- Determining the objectives
- Defining the contents and progressions
- Selecting methods and techniques to be used
- Monitoring the procedure of acquisition properly speaking (rhythm, time, place, etc.)
- Evaluating what has been acquired

The aforementioned suggested definition implies that autonomy focuses on students’ awareness to take the responsibility for their own learning. Students also know what to learn and why they need to learn it. Likewise, they are expected to be curious to explore more, to be independent, and become active learners.

In the EFL context, it is accepted that learners’ decision on how they learn and what activities they do, and their active participation in deciding what and how to learn could promote autonomy among learners (Lengkanawati 2017). Students and teachers, therefore, can work collaboratively to achieve the desired goals. In short, it has been true that learner autonomy plays an important role in the development of student learning, and through PBL, students can advance their self-reliance.

6 THE SUGGESTED MODEL FOR WORKING ON A LANGUAGE LEARNING PROJECT FOR SENIOR HIGH SCHOOL EFL LEARNERS

Specifying on adult EFL learners, this study proposes some steps on how to work on a language learning project for the grade XI students of senior high schools (SHSs). While considering the diverse learning materials embedded in the SHS English learning curriculum, the stages as adapted from the second model by Alan and Stoller (2005) are as follows.

- Step 1: Students and the teacher discuss the theme of the project, i.e. favorite activity, favorite place, or favorite food.
- Step 2: Students and the teacher determine the project’s final outcome, i.e., to present the project in front of the class or to submit the report only with video of the project.
- Step 3: Students and the teacher structure the project, i.e., how to write the report or present the project.
- Step 4: The teacher prepares students for the language required for collecting the data; i.e., the teacher introduces some vocabularies related to the project.
- Step 5: Students gather the targeted information. They work in groups to gain the information about the project they are to complete.
- Step 6: The teacher prepares students for the language needed in compiling and analyzing the data by explaining how to describe the data and introducing some vocabularies.
- Step 7: Students compile and analyze the data; i.e., group members submit the data or any information they have collected.
- Step 8: The teacher prepares students for the language demands of the culminating activity, i.e., guiding students for the project presentation.
- Step 9: Students present their final product, and this can be done in groups.
- Step 10: Students evaluate the results of other groups’ project while watching their presentations.

7 CONCLUSIONS

This article has presented PBL theories, the procedures on how PBL is carried out, its benefits, challenges in its implementation, and the theories of learner autonomy. Finally, it suggests a model for implementing PBL in the SHS English learning context, by considering the

reviewed expert theories. Ten working stages of PBL have been proposed by considering the more detailed and operational model of Alan and Stoller (2005). Since the suggested PBL design requires the students' full and active participation in each stage, it is expected that students can develop their autonomy.

This article is expected to provide insight for English teachers in implementing PBL specifically in grade XI of SHSs. However, there surely are some limitations in this article, and more elaborated investigations are needed to explore further PBL and learner autonomy in the EFL classroom.

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understand and follow HOTS learning? (3) What are the students' perceptions of HOTS learning? The situation and conditions that occur in Lombok with high learning demands were one of several reasons for this study.

The setting of this research is in Lombok, where an earthquake that registered 7 on the Richter scale occurred on August 5, 2018. The impact of the earthquake was quite significant and affected most aspects of people's lives, including the education field. Official sources from BNPB or Indonesia National Board for Disaster Management (www.bnpb.go.id) stated that the earthquake had a destructive impact on 671 educational facilities. As many as 124 PAUD (Indonesia early childhood care and education), 341 elementary schools, 95 junior high schools, 55 high schools, 50 vocational schools, and 6 SLB until August 15, 2018 were affected by the calamity. Such a shock to educational processes in these institutions has provided a momentum to reform instructional delivery at those affected schools to allow students and teachers to elevate their thinking constructively and respond to changing their school environment simultaneously.

This research is in line with the Research Master Plan of Universitas Ahmad Dahlan (RIP UAD) for 2017-2021 in the education and social humanities field, known as the development of innovative education/learning programs and implementing the role of education and psychology in overcoming problems, such as disasters. From the educational point of view, a learning model needs to be adopted to address emerging problems of the learning process at schools in Lombok region. The model is the constructivist model.

The constructive–metacognitive learning model was chosen because this model will directly force students to learn from each other, which will increase their cognitive potential. These metacognitive models have not much examined whether they can increase HOTS or not, especially with specific problems faced by students in Lombok after the disaster.

2 LITERATURE REVIEW

2.1 *HOTS learning*

The key to a better future is success in the quality of educational implementation (Retnawati et al. 2018). Certainly, a good education is one that develops students' potential optimally through the provision of quality learning processes. These learning processes can be facilitated through the integration of HOTS learning, which is a requisite for 21st-century learning and a necessity to answer the challenges in this era (Misykah & Adiansha 2018). HOTS-based learning helps students to practice their ability to deal with complex problems (Balakrishnan 2018), as it develops their ability to think at a higher level that is certainly not only restricted to understanding but also includes analysis, synthesis, and creation. HOTS learning can be applied because it has complex characters, does not have algorithms, has many solutions, has the ability to solve problems, and involves students in the activity (Jaelani & Retnawati 2016).

HOTS has three components: meta-components, performance components, and knowledge-acquisition components (Madhuri et al. 2012). In Bloom's taxonomy, HOTS reflects the highest levels of cognitive ability (i.e., analyzing, synthesizing, and creating) and the three highest levels of knowledge capacity (conceptual, procedural, metacognitive) (Retnawati et al. 2018). Therefore, HOTS learning does not stop at understanding but has entered into the creation of a product of thought.

2.2 *Purpose of HOTS learning*

In general, HOTS is emphasized for developing students' cognitive ability (Misykah & Adiansha 2018), focusing on the ability to analyze, evaluate, and create and produce a concept of thought or metacognition (Retnawati et al. 2018). HOTS also makes students actively involved in learning activities (Limbach & Waugh 2010; Akyol & Garrison 2011; Retnawati et al. 2018). Students majoring in mechanical engineering, for example, are engaged with HOTS-based and active learning activities given the nature of the field that involves processes of analysis, evaluation,

The participants thought that HOTS can be developed through observation-related activities in classroom. Science teachers, in particular, can train students to analyze the results of experiments, for example, observing photosynthesis in plants. In other classes, such as Craft, students are trained to analyze how to breed chickens in a school farm project, the results of which can be written as a report. Teachers therefore need to train students to undertake various observations.

From the observation, the researchers noted that, in one of the schools, the students did not get a detailed lesson explanation, so that the students taught themselves and repeated the lessons themselves, even when undertaking the observations. The participants then admitted that the teacher becomes one of the student support systems in learning. If the teacher explains the lesson interspersed with humor, students do not feel tense and are relaxed in attending to the lesson. The presence of teachers also stimulated more complex discussions, as subject teachers can provide opportunities for students to provide ideas related to the material being studied through class discussion. This results in students engaging with their differing perceptions while addressing the topic under discussion. After that, the teacher and students discussed the opinions raised by students. Such processes can trigger higher-order thinking for the students who were engaged with differing ideas and thinking, allowing them to analyze and evaluate those ideas. In turn, they were led to build their new perception or understanding of the materials taught.

In assessing, it was observed that the students undertook daily tests that included multiple-choice questions more often than essay type of questions. According to students, multiple-choice questions are easier and predictable, but disengage them from thinking and reflecting on what they have learned. In this research, the subject teachers usually provide multiple-choice test questions, supplemented by descriptive essay questions. Unfortunately, those exam questions were sometimes found to be in conflict with references read or assigned to students. A more authentic assessment was in fact preferred by the students. When the teachers in the related schools let their students test out the observation results by repeating the project in groups, the students became more engaged in planning and carrying out the experiments or projects until a report was written or presented before the class. When teacher guidance was also present, the students felt that active learning was at its best.

According to students, unequal participation by their peers created distraction and noise in class, as some were chatting or falling asleep, or some teachers made no effort in presenting the material. Yet, despite these unfortunate situations, HOTS-based learning could still be carried out well in those schools. This is indicated by the use of HOTS-related instructional methods such as observation, analysis, and summarizing in the class. The use of observation methods helps students to analyze directly what is researched (Rahma et al. 2017). The analysis method helps students separate out parts of the problem to help the problem-solving process (Gunawan & Palupi 2016). To understand a concept as a whole, summarizing is needed (Rochman & Hartoyo 2018). All those skills were observed to be practiced in the instructional activities in those schools.

In addition, based on the results of this study, it was found that the teacher also developed a stimulating and enjoyable environment for learning, even in unfavorable conditions. This is demonstrated in several ways, such as using humor in learning. Humor is useful for students to provide a positive path and helps to relieve tension in learning (Öztürk & Ok 2014). Thus, from a positive and pleasant environment, the learning method used by the teacher for students can be said to be in accordance with HOTS.

5 CONCLUSIONS

HOTS-based learning is a high level of learning that places an emphasis on students and is oriented toward developing students' potential. In addition, the concept of HOTS, which focuses on students' cognitive skills, involves the ability to analyze, synthesize, and create. After observing six students in six schools in West Nusa Tenggara, it was concluded that HOTS learning can be conducted with the instructional processes in the schools. In addition, as

perceived by their students, the teachers in West Nusa Tenggara could apply HOTS learning interactively and attractively despite some obstacles in the learning process.

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Tools for alternative assessments in English language teaching in Industry 4.0

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ABSTRACT: One noticeable utility of technology in education is in the process of assessment. Traditional assessment is still used in general because of its operational simplicity. However, many cases reveal that it is not enough to measure students' competence by itself. To fill the gap, alternative assessments can be an option. The aim of this article is to review tools that can support the implementation of alternative assessments in English language teaching. The ideas were collected through review of several theories and findings of research studies in the field. In synthesizing the ideas, this article first presents the basic concepts and characteristics of alternative assessments. The later sections cover some models in the implementation of alternative assessments by utilizing tools such as cloud storage to promote education in Industry 4.0. The discussion brings broader insight for teachers on the opportunities to conduct alternative assessments by using technology.

1 INTRODUCTION

Assessment is an important factor in the process of education. It helps to evaluate whether the students have mastered the specific content of a course or whether they have obtained linguistic elements from the teachers that will enable them to communicate according to their different levels of proficiency (Coombe et al. 2007). In other words, teachers need assessment to know the extent of students' abilities. It is also a necessity to evaluate the teaching and learning process based on students' proficiency levels. Tognolini and Stanley (2011) provide examples of assessment. Classroom tests, checklists, practical work, and project work are kinds of assessment. When teachers ask a question in class and when they observe what is going on in class they are also assessing.

Assessment is a popular and sometimes misunderstood term in current educational practice. Testing, assessing, and evaluating are commonly considered synonymous terms, but they are not. Brown (2004) mentioned that tests are prepared as administrative procedures that occur at identifiable times in a curriculum. They are used to evaluate students within a specified amount of time and for a specific purpose. Assessment, on the other hand, is an ongoing process that encompasses a much wider domain. Thus, tests are actually a part of assessment. Johnson and Johnson (2002) emphasize that assessment continually collects information about the quality or quantity of a change in a student, group, class, teacher, school, or administrator, while evaluation is conducted occasionally; and the information from the assessment can be used to make an evaluation.

This article will present some theories of assessment in language teaching, then review the movement of assessment in the era of Education 4.0. Finally, it will provide some useful tools to implement alternative assessment under the criteria of Education 4.0.

2 ASSESSMENT IN LANGUAGE TEACHING

There are common uses of traditional assessment in the current classroom instruction, such as tests, which are still the most favored language assessment technique used by the teachers. However, the assessment itself frequently does not assess the students' competence. For example, teachers ask their students to write dialogues in order to assess the students' speaking competence. The result of the assessment does not provide evidence because there is no demonstration of their competence that involves actual speaking performance. Furthermore, teachers often have difficulty in developing a test because of lack of training in test construction.

Following the National Education Standard (The Regulation of the Ministry of Education and Culture No. 66 Year 2013), the national examination is still conducted annually in Indonesia. It influences teachers' instruction in teaching only on the subjects included in the national final exam. Especially for English language teaching, less attention is provided for productive skills and traditional assessment is more dominant. Numerous exercises involving students and worksheets must be completed by the students, which eventually limits the students' creativity and puts pressure on them. These result in attitudes and behaviors that discourage students' genuine learning. Teachers are also required to pay attention to development trends in the field of education. Different skills are needed by students to survive in the era of industrial technology. To provide students with the required skills, as important as the materials are assessments conducted with the use of technology. It is crucial for teachers to find a way to conduct assessments that gives positive feedback on the students.

3 EDUCATION 4.0

The development of the Industrial Revolution 4.0 contributes to developments in the educational field. Fisk in Sadiyoko (2017) reveals there is a well-known term for following the development in the Industrial Revolution, especially in the educational context, which is Education 4.0. The term Education 4.0 has become a trendy nowadays. It reflects the notion of learning innovation and makes use of information technology in learning. Puncreobutr (2016) views the core of Education 4.0 as focusing on a learning management that helps students to develop their skills by implementing the new technology, following societal changes. It means teachers and students are able to make use of the development of information technology to support the teaching and learning process in this era.

In promoting Education 4.0 in the classroom, teachers and students need to consider characteristics of Education 4.0 itself in the teaching-learning process. According to Sadiyoko (2017), there are seven characteristics of Education 4.0:

- It can be done anywhere and anytime.
- It is based on students' needs.
- It is flexible in delivery.
- It reflects the roles of peers and mentors.
- It is about practical application.
- It reveals students' ownership, with students participating extensively.
- It contains evaluation processes.

The aforementioned characteristics should be represented in the process of teaching and learning, including in the assessment. A developmental approach in assessment where teachers and students could work collaboratively on authentic tasks that are longitudinal is recommended in this situation. This kind of assessment procedure could be found in some alternative assessments.

There are some different characteristics between traditional types of assessments and the alternative ones. Traditional assessments tend to focus on language and teacher-centered, isolated skills, emphasize results, lean toward one-way correctness, and are intended only to test/measure. Meanwhile, alternative assessments focus on communication and learner-centered

and integrated skills, emphasize process, accept multiple solutions, and intend not only to assess but also to teach.

4 ALTERNATIVES IN ASSESSMENT

Alternative assessment requires students to perform real-world tasks (authentic) that demonstrate meaningful application of language knowledge and skills (Brown, 2004). Teachers are not supposed to evaluate how much information students retain but rather how they use that information. This section reviews some examples of alternative assessment that are commonly found in a language classroom.

4.1 *Portfolios*

A portfolio is a systematic collection of students' work that displays their skills and accomplishments (Popham 2011). Johnson and Johnson (2002) provide some reasons why a portfolio is used as an alternative assessment. A portfolio gives students the opportunity to direct their own learning. Students can document their efforts, achievements, development, and growth in knowledge, skills, expressions, and attitude. Students can also use various learning styles and intelligences, and they also have more opportunities to assess their own learning. Dewi (2014) proposed an example of steps in implementing a portfolio:

- First, in the preparation step, decide what type of portfolio will be used.
- Then, identify the purposes and objectives of the portfolio.
- Next, select which categories of work samples should go into the portfolio.
- After that, have the students select the pieces to be included in their portfolios.
- Finally, decide how the portfolio will be assessed and evaluated.

As the portfolio is implemented, there will be a management step such as explaining the categories of work samples to be included in the portfolio, developing a scoring rubric, completing the student assignments, and conducting self-assessment. The last step is conducting during the grading period. Once all the work samples have been completed, the selections for the portfolio must be made and organized into a coherent representation of the students' or groups' work.

4.2 *Journals*

A journal is a log of one's thoughts, feelings, reactions, assessments, ideas, or progress toward goals, usually written with little attention to structure, form, or correctness (Brown & Abeywickrama 2010). Most classroom-oriented journals are what have now come to be known as dialogue journals. They imply an interaction between the teacher and the student through dialogues or responses. Through this, teachers can become better acquainted with their students to meet students' individual needs. Tuan (2010) emphasizes that journal writing could also foster writing motivation and enhance writing skill. Dewi (2014) proposed several steps that could be applied in implementing a journal for classroom instruction:

- First, students should be introduced to the concept of journal writing, such as by providing examples of journal entries, giving specific topics, and scheduling writing.
- Then, state the objective(s) of the journal, such as for language-learning logs; grammar journal; responses to readings; strategies-based learning logs; self-assessment reflections; diaries of attitudes, feelings, and other affective factors; and acculturation logs.
- After that, give guidelines on what kinds of topics to include and carefully specify the criteria for assessing or grading journals. Optimal feedback in teachers' responses should be provided. It could be in the form of cheerleading, instructional, or reality-check feedback.
- The step is continued to designate appropriate time frames and schedules for review, and finally to provide informative final feedback comments.

Scores might be given for the process of actually writing the journal, and a distinction might be made among high, moderate, and low effort or quality, but to accomplish the goal of positive feedback, comments and suggestions are clearly in order.

4.3 *Self and peer assessments*

Self and peer assessments offer certain benefits. Brown and Hudson (1998), as cited in Brown and Abeywickrama (2010), clarify that self and peer assessments improve direct involvement of students, encourage autonomy, and increase motivation because of the engagement. There are some challenges that might be faced by the teachers in implementing the assessment, such as the teachers' competence and workload; teachers' and students' time management; students' writing ability, learning autonomy, and low achievement; and local culture influences. Therefore, to answer the challenges, there are some alternatives that could be considered, such as integrating technology into the instruction that gives positive feedback for the development of the assessment instrument.

5 ALTERNATIVE ASSESSMENT FOR EDUCATION 4.0

The students whom teachers face these days are the generation of technology. There is a huge gap between what teachers used in the past and what they use today in terms of educational aids and teaching methods.

The core of Education 4.0 focuses on learning management that helps the students to develop their skills by implementing the new technology that follows societal changes. Considering the requirement, there are some Internet tools that can be utilized by teachers to conduct alternative assessments for their students.

5.1 *Google drive*

Google Drive is an integrated sharing and synchronization service available as a free Google app with 15 gigabytes of cloud storage. Griffith (2014), as cited in Slavkov (2015), mentioned that as of September 2014, Google Drive had more than 240 million users worldwide. With regard to writing, Google Drive's features are accessed through the Google Docs app and include document creation, storage, synchronous and asynchronous sharing, editing and commenting, revision histories (i.e., views of previous versions of a document owned by a single user or shared among users), document-specific real-time chat, and various distribution options across audiences. In the context of writing skill, the app's features become affordances in the sense of van Lier (2000). That is, using the existing general properties of the app with specific goals and purposes, grounded in the process approach to writing, affords the emergence of new pedagogical benefits.

An example of a course that involves Google Drive is provided by Slavkov (2018) in second language writing classroom. The site was accessed by using existing lab facilities or students' and teacher's individual computers. The Google Drive interface was organized in folders, sub-folders, and files. The course space was organized in five main areas (folders): (1) Individual Space, (2) Group Space, (3) Whole Class Space, (4) Materials and Resources Space, and (5) Teaching Space. In the Individual Space folder, students registered in the course have sub-folders (labeled with their names) they work on and where they store individual writing tasks throughout the semester. Since all the work for the semester is stored in Google Drive, the instructor can check at any point when students have started working on their writing assignments. The teacher may use this as an opportunity to assess the students' progress as a portfolio. The activity and revision history functions indeed have potential to advance the pedagogical view of writing as a process rather than a product. Considering the requirements of Education 4.0, the tool has fully filled a need of the teaching-learning process in an era defined by online technology.

5.2 *WhatsApp*

The next tool for alternative assessments is WhatsApp, a very popular social media platform among teachers and students that can be accessed daily on mobile phone or computer. Nitza and Roman (2016) stated that WhatsApp groups can be used for communicating with students, nurturing a social atmosphere in the classroom, forming dialogue and collaborations between students, and as a means of learning. An example of the use of WhatsApp came from a study by Candradewi (2018) involving WhatsApp in a speaking class. The subjects of her study were 2 lecturers and 30 students of an English for Survival class. English for Survival was a course that would develop students' speaking skill in the form of conversations with several topics such as introduction and small talk; expressing needs and likes; describing people, places, and things; and retelling past events. In the teaching and learning process of English for Survival class, the lecturers developed the students' critical thinking and creativity through English for Survival assignments in which they used the WhatsApp platform.

For instance, the lecturers asked the students to discover information about the topic that would be discussed; the students were able to access the Internet to get their answers and then would create a conversation. Next, they recorded the conversation and sent it to the WhatsApp group of the class, after which their posts would get feedback from their friends. It is also possible for the teacher to track the students' submissions over time to assess their progress as portfolio. Students can also comment on their peers' works as a kind of peer assessment. WhatsApp reflects the characteristics of Education 4.0 in terms of flexibility in delivery of the students' work, reflects the roles of students as peers and the teacher as mentor, and can be done anywhere and anytime.

5.3 *Instagram*

The Instagram platform is also applicable to support the teaching-learning process. Instagram is a familiar platform for the students. Alhabash and Ma in Anggraeni (2017) proposed that Instagram is today a platform that provides a photo and video-sharing mobile application that permits users to take pictures or videos, to comment, and to share them. Video recording itself has been used in language teaching and assessment as one of the components of an oral performance portfolio.

A study by Candradewi (2018) looked at Instagram as a tool in the English teaching process. The lecturer asked the students to create an at least one-minute video about an explanation regarding the topic discussed and the students had to post their videos on their Instagram pages and comment on their friends' videos. The students were enthusiastic in doing this kind of assignment because of its flexibility. They could do the work anywhere and anytime as long as it met the deadline. The assignment emphasizes the characteristics of Education 4.0 which are practicality, accessibility at any point of time, and student ownership, where students can participate to a great extent. The use of portfolio as an alternative assessment can also be implemented in this platform. By utilizing Instagram for storage of students' data, the teacher can look back and hold an assessment or evaluation on their skills at any specific post. Teachers can also give exercises from the post as a follow-up activity for the students.

5.4 *YouTube*

YouTube is a source of many videos that everyone can watch through the Internet. For English learners, it offers exposure to authentic English as well as the promotion of a learning style that is more autonomous and student centered. Watkins and Wilkins (2011) addressed in their paper various ways in which teachers can use videos on YouTube. Videos are mostly observed through sight and sound, and creative teachers can easily find new ways to use them in listening and speaking or English conversation classes. One of the examples is a movie trailer voiceover project.

The project requires students to recognize pronunciation by listening and challenge the quality of their speaking in English. In the activity, students select any two-minute movie trailer from YouTube. Then, students can download the video by writing its URL on a website (<http://youtubedownloader.com/>). After this, the students can transcribe the video by listening. They can turn on the subtitle of the video to check their transcription if available. With the aid of their transcriptions, students can then record their own voices while paying close attention to mimic the way the original speaker pronounces the word, stressing and try to synchronize. Students can play different roles as characters as well as a narrator for the trailer. Once the recording is done, they can use Windows video editors to redub the video with their own recording. This activity requires repeated close listening to write the transcript and then repeated recordings in which students attempt to re-create the original intonation, stress, and pronunciation. The teacher can assess both listening and speaking accuracy. This activity can also stimulate learners' autonomy.

YouTube has proven to be a valuable tool through which foreign language skills can be taught. Using YouTube both inside and outside the classroom can enhance conversation, listening, and pronunciation skills. YouTube videos can also be utilized to stimulate cultural lessons and enhance exposure to the variations of world English. Even reading and writing activities can be managed around YouTube videos. Classroom lessons and activities can be covered, as well as homework and projects requiring the use of online streaming videos. The platform is accessible as long as there is an Internet connection. It means the teacher and the students can do the project anywhere and anytime. YouTube has the qualities to be used as a tool in Education 4.0. It is feasible anywhere and anytime, meets the students' needs, and makes it possible for students to participate to a large extent in completing the work.

6 CONCLUSION

Promoting alternative assessments in line with the Education 4.0 is one possible way to follow the rapid movements in the educational setting. Since today's millennial generation students use technology a great deal in learning, tools that offer the possibility to implement alternative assessments such as Google Drive, WhatsApp, Instagram, and YouTube are suitable to be utilized as part of the learning process. All the examples of the alternatives are tools that the students and teacher can access through their smartphone and laptop/computer. The use of technology in any aspects of the teaching-learning process is a reflection of the characteristic of Education 4.0. Teachers can employ the tools creatively to perform alternative assessments to measure students' competencies in language skills. By utilizing the tools for alternative assessment, teachers will not only improve their competencies for future requirements but also provide students the skills that are necessary for the era of Industry 4.0.

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Peer assessment to enhance students' speaking skills

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ABSTRACT: Implementing peer assessment to improve students' speaking skills can bring students to a new kind of classroom situation. The study described in this article aimed to investigate the use of peer assessment in improving students' speaking skills. Previous research in the same field is compared to generate information on peer assessment and speaking skills. The findings showed that teachers can use peer assessment as a technique to make speaking activities more enjoyable in the classroom situation. It is expected that this study can help the teachers enhance their students' speaking skills through peer assessment.

1 INTRODUCTION

Teaching and learning speaking can be challenging for both teachers and students. Teachers need the ability to encourage students to speak by providing proper activities in the classroom, while students need the ability to speak English well by possessing all the language elements, such as vocabulary, grammar, and pronunciation. Thus, the most important thing in teaching speaking is to activate all language elements and also language functions in order to be able to communicate both effectively and appropriately in social and academic situations because the main function of language is communication.

English speaking involves some elements such as accuracy, appropriateness, fluency, and vocabulary building. All of those elements are truly important and students need to master them. Harmer (2001, p. 269) suggests that the ability to speak the English language fluently emphasizes both the knowledge of the language features and the ability to process the direct information at the same time when having a discussion, expressing an opinion, persuading someone to do something, and clarifying information. This becomes the main purpose of speaking.

There is a large volume of published studies describing the problems of teaching speaking. For instance, Brown (2004) suggests that English as a foreign language learners are generally poor at spoken English in terms of fluency, control of idiomatic expressions, and cultural pragmatics understanding when they are directly interacting with native speakers. In the same vein, Febriyanti (2011) found that some students tend to keep silent and could not express their ideas orally. This makes it challenging to enhance the students' speaking skills (Hosseini & Mowlaie 2016).

With respect to the problems in the teaching of speaking, teachers need to implement appropriate techniques to assess students' speaking skills. Proper techniques will help teachers know the progress of the students and find the best way to develop the techniques to enhance the students' speaking skills by reflecting on the results.

Applying peer assessment can be one of the solutions to decrease the obstacles in the teaching and learning of speaking. It is carried out by providing an opportunity to the students to assess each other. In addition, peer assessment can be considered as a good teaching and learning activity because it promotes the interpersonal skill of discussion and minimizes the

use of a marking load (Biggs & Tangs 2007). It marks a change from a teacher-centered to a student-centered approach and activates the engagement of students in the responsibility for learning, metacognitive skills, and a dialogical collaborative model in teaching and learning process (Spiller 2012).

2 LITERATURE REVIEW

2.1 *The nature of speaking*

Speaking is the active use of language to express meanings so that other people can make sense of them (Cameron 2001). It is recognized as an interactive, social, and contextualized communicative event. To be able to speak, English language students should have sufficient knowledge of the sound, structure, vocabulary, and the cultural system of the English language. In addition, they have to be able to articulate English sounds well by changing the positions of lips, jaws, and tongue. Then, the students should be consciously aware of the appropriate functional expressions as well as grammatical, lexical, and cultural features needed to express the idea, in order to be sensitive to the change of register or style necessitated by the person to whom they speak and also the situation in which the conversation takes place. Lastly, the learners must have the abilities to change their direction of their thoughts on the basis of the person responses.

The mastery of speaking skills in English is a priority for many second language or foreign language students (Richards 2008). Consequently, students often evaluate their success in language learning as well as the effectiveness of their English course based on how much they feel they have improved in their spoken language proficiency.

2.2 *Criteria for good speaking skills*

Speaking is not simply expressing something orally. Students need to develop competence in some features of speaking to gain good speaking skills. As proposed by Brown (2001, p. 168), those features are pronunciation, fluency, vocabulary, and accuracy. Pronunciation is the way a certain sound or sounds are produced and is the means by which speakers produce clear language when they speak. To communicate successfully, speakers need to be able to deliver a clear message for listeners. In teaching speaking, teaching pronunciation including stress, rhythm, and intonation is very important. Fluency is an ability to speak quickly and automatically. Based on the *Longman Dictionary* (2002, p. 580), vocabulary is a set of lexemes, consisting of single words, compound words, and idioms that are typically used when saying something. To be able to speak fluently and accurately, speakers of a foreign language should master enough vocabulary and have the capability to use it accurately. Accuracy is the ability to produce sentences or utterances using correct grammar (*Longman Dictionary* 2000). Speakers need to follow the rules of the language such as grammar and structure to be able to speak accurately.

2.3 *Teaching speaking*

Brown (2001, p. 7) states that teaching means showing or helping someone how to do something, giving instruction, guiding in the study of the something, and providing knowledge, thereby leading to knowledge and or understanding. Teaching guides and facilitates student learning and sets the conditions for learning. According to Nunan (2003) what is meant by teaching speaking is to teach English language learners to (1) produce English speech sounds, sounds patterns, words and sentence stress, intonation patterns, and the rhythm of the second language; (2) select appropriate words and sentences according to the proper social setting, the audience, the situation, and subject matter; (3) organize their thoughts in a meaningful and logical sequence; (4) use language as a means of expressing values and judgments; and (5) use the language quickly and confidently with few unnatural pauses, which is called fluency.

2.4 *Problems in speaking*

Brown (2001) addresses difficulties in speaking as follows. First is clustering. Fluent speech is phrasal, not word by word. Speakers can organize their outputs both cognitively and physically (in breath groups) through such clustering. Second is redundancy. The speaker has an opportunity to make meaning clearer through the redundancy of language. Students can capitalize on this feature of spoken language. Third is reduced forms. Contractions, elisions, and reduced vowels all form special problems in teaching spoken English. Students who do not learn colloquial contractions sometimes can develop a stilted, bookish quality of speaking that in turn stigmatizes them. Fourth is performance variables. One of the advantages of spoken language is that the process of thinking manifests a certain number of performance variables such as hesitation, pauses, backtracking, and corrections. Students can actually be taught how to pause and hesitate. Fifth is colloquial language. Teachers need to make sure the students are reasonably well acquainted with the words, idioms, and phrases of colloquial language and that they get practice in producing these forms. Sixth is the rate of delivery. Another salient characteristic of fluency is the rate of delivery. One of the teacher's tasks in teaching spoken English is to help students achieve an acceptable speed along with other attributes of fluency. Seventh is stress, rhythm, and intonation. They are the most important characteristics of English speaking. The stress-timed rhythm of spoken English and its intonation patterns convey important messages. The last is interaction. Learning to produce waves of language in a vacuum without interlocutors would rob speaking skill of its richest component such as the creativity of conversational negotiation.

2.5 *Definition of peer assessment*

Peer assessment refers to the activity that involves feedback or grades from one student to another based on the quality of one's work (Falchikov 2003; Spiller 2012). Topping (2009) asserts that peer assessment involves students judging other students in an equal status by considering the value, level, and quality of the product. In this case, the product includes written and oral presentations, portfolios, test performance, or other skilled behaviors. The students provide feedback by recognizing the strengths and weaknesses of their peers' work (Spiller 2012). In addition, the students utilize some criteria and standards to facilitate their reflections on the work of their peers (Falchikov & Goldfinch 2000).

2.6 *Advantages of peer assessment*

A considerable amount of literature has been published on the success of implementing peer assessment in enhancing student speaking skills. In particular, several studies reported students' improvement in speaking skills as a result of implementation of peer assessment implementation (Cheng & Warren 2005). Peer assessment is also claimed to decrease the central role of teachers, yet increase the engagement of students in their learning. There are some contemporary approach that are needed include student's responsibility, metacognitive skill, and collaborative model of teaching and learning process (Falchikov 2003; Spiller 2012). In addition, Gardener from University of Technology Sydney (2007) reported that employing peer assessment has been identified as bringing about some advantages, namely (1) helping students become more autonomous, responsible, and involved in the teaching and learning process; (2) encouraging students to critically analyze work done by others, rather than simply seeing a mark and having a score; (3) helping students to clarify the assessment criteria; (4) giving students a wider range of feedback; and (5) reducing the marking load on the teacher.

2.7 *Challenges in applying peer assessment*

Despite its benefits, some disadvantages of using peer assessment may potentially exist. Gardener from University of Technology Sydney (2007) stated that one serious problem with peer assessment arises when students lack of the ability to evaluate each other. In this

situation, they may not take it seriously by allowing friendships, entertainment value, and other subjectivities to influence their marking. In addition, they may not like peer assessment because of the possibility of being discriminated against and misunderstood. In addition, without teachers' intervention in assisting and guiding, students may misinform each other. For that reason, applying peer assessment by having teacher guidance is very important to face the challenging of applying peer assessment.

2.8 *The procedure for peer assessment*

According to Zaini et al. (2008, pp. 62–63), steps of an active peer assessment learning strategy of can be used to divide the learners into small groups working with the material segments that the teacher will cover. Each small group is assigned to study one topic of materials to teach it to another group. Therefore, the topics provided must be interconnected. Then, the teachers should ask each group to prepare a strategy for delivering materials to the classmates and advise them not to use teacher-centered methods or approach the assignment like reading a report. Also, teachers can make suggestions such as using visual aids; preparing the necessary media; employing relevant examples in the learning process through discussion, quiz games, case studies, and others; and giving others an equal opportunity to ask questions. Teachers should give students enough time to prepare the content both inside and outside the classroom. After that, each group submits the materials according to the assigned tasks. After all groups perform the task, the teachers conclude and clear up any difficulties in the students' understanding.

3 DISCUSSION

3.1 *The way to employ peer assessment for speaking skills*

Spiller (2012) and Falchikov (2003) explored several aspects for employing peer assessment in the classroom. First, according to Falchikov (2003), peer assessment will be better with practice. Practice will help the students to be more competent and to gain self-confidence. The activities that can facilitate students in conducting peer assessment are exchange and discussion of lecture notes (Spiller 2012). Next, the criteria used to measure or to judge the students' work must be stated explicitly, should be understood, and can be negotiated with the students if circumstances are appropriate. Falchikov (2003) exemplifies some methods of measurement that can be used such as checklists, rating scales, and model answers. Third, the implementation of feedback can be summative or formative. Fourth, teachers can establish an atmosphere of trust in the classroom situation and should ensure that the learning process should include a combination of peer learning and collaboration in a range of ways.

In a similar vein, Pang (2009) and Laur (2014) summarize the aspect of peer assessment in their studies into three phases. The first is preimplementation, which starts from preparing the teaching and learning media, training the students to become familiar with assessment circumstances, and deciding the criteria and measurement to be used during assessment. In the implementation phase, the teacher can demonstrate the implementation of peer assessment, monitor the process and adjust when necessary, and monitor the quality of peer feedback. In the postimplementation phase, the teacher and students discuss the outcome and reflection or identification of the challenge in implementing peer assessment for better performance and preparation in the future.

Through peer assessment, students acquire knowledge and skills by actively helping and supporting equally matched companions (Topping 2005). Students help each other to learn and also themselves learn during the process. Teachers gain increased control over the subject matter, and develop self-esteem, social skills, and improved attitudes about school. Teachers receive extra attention and emotional support during the learning process (Anderson 2007). The use of peer assessment helps students learn speaking, especially asking questions and

expressing opinions. On the other hand, not all students improve because they did not actively participate in the learning process.

Above all, the most important point of implementing peer assessment that can significantly affect the outcome of peer assessment is the type of measurement and its criteria of what needs to assess. In speaking assessment, the technique of measuring students' performance can either use the holistic or analytic scoring technique (Heaton 1989; Brown 2004).

4 CONCLUSIONS

Based on the result of the foregoing discussion, it can be concluded that peer assessment can be used to improve students' speaking achievement. It could be seen from the students' increased courage and confidence in speaking English, participation in classroom activities, involvement in conversation, and performance. In addition, students find it enjoyable to practice in front of the class. It was found that teaching speaking by using peer assessment strategy could increase students' achievement while learning. The conclusions related to the use of peer assessment are not based on students' assumptions but on the summative evaluation.

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Assessment of learning outcomes based on Google Forms to reduce paper use

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ABSTRACT: This study aimed to analyze the importance of civic ecology education as a preventive and repressive measure of the problem of environmental degradation. The subjects of this research were schools in three provinces of Indonesia and the purposive technique was used, considering the school status, school location, and data access. The research data were obtained from open interviews with informants at the schools that became the research subjects and supported with secondary data. The research data were tested for validity using source triangulation techniques and analyzed by using qualitative inductive analysis techniques. The results of the data analysis show that teachers have not used digital media in schools to evaluate student learning outcomes. Therefore, it is important to use digital media as an effort to solve environmental degradation by reducing the use of paper. The results of this study can be the basis for further research to analyze preventive and repressive measures that are appropriate for the problem of environmental degradation in Indonesia and the entire world.

1 INTRODUCTION

Environmental degradation is one of the most important problems in the world today. Pollution and environmental damage have occurred in the air, in water, and on land. Many problems arise as a result of pollution and environmental damage on Earth. For humans, health problems are the biggest problems arising from environmental degradation (Hoang et al. 2017; Hao 2018). Water pollution (Yolcubal et al. 2016), air pollution (Dahari et al. 2019), and environmental damage on land in the form of deforestation (Stoy 2018) are evidence of the importance of appropriate solutions to the problem.

Civic ecology is a concept related to the relationship between humans and the natural environment. It is an idea that directs human actions to integrate science in making wise decisions on the natural environment (Anderson 2019). The decision to dispose of rubbish, clean rubbish, cut down trees, plant trees, use plastics, use paper, and various sectors of human life that have a causal relationship with the natural environment is the scope of the study of civic ecology. Therefore, building civic ecology in schools is one of the solutions to environmental degradation today.

Paper production is one of the factors in environmental pollution on Earth because trees are the main raw material in papermaking, and water is the main medium for making paper. The data released by the Ministry of Industry of the Republic of Indonesia (Ministry of Industry 2019a) show that the use of paper in the world in 2019 reached 394 million tons and it is predicted that it will increase to 490 million tons in 2020. The data on paper usage are an important reason to use renewable media to reduce paper usage in Indonesia and the rest of the world. The education sector is one of the significant paper users in the process of implementing its curriculum (Wees 2009). Therefore, schools should be able to shift from the use of

paper as a primary medium to more renewable, innovative, and practical media. Google Forms is a new feature or application that can be used as a tool or medium to conduct mass surveys to gather information quickly and efficiently from various places. In the era of Industry 4.0, the majority of students are already competent in using and utilizing information and communication technology (Rashid & Asghar 2016). This application must be able to be used to innovate the learning process or assessment of learning. However, a fixed paper-based platform is the primary medium in the process of evaluating student learning outcomes in the form of quizzes, midterms, and final semester examinations.

Assessment is a tool that is shaped for observing the behavior of a student that can be used to describe what a student knows and understands (Pellegrino 2014). Chiappetta and Koballa (2010) state that learning must cover a variety of essential aspects, which include the formulation of the learning objectives, the planning of the learning, the management of the learning environment, expansion of the learning to a broader context, and the assessment of the learning. Assessment can be interpreted as a means of measuring the success of the content of learning material displayed and presented by teachers within the assessment standard (Faxon-Mills et al. 2013). Therefore, assessment of learning outcomes is an activity that is certainly done by a teacher.

Learning assessment is used to determine the ability of a student in connection with the results of the learning process being carried out. According to Rosa et al. (2016), assessment is a definite part of learning and is aimed at gathering information about the knowledge and abilities achieved and possessed by a student during and after the learning process. Therefore, reducing the amount of paper used in the education sector can begin by replacing the media for evaluating student learning outcomes in digital media.

2 METHOD

This study was a type of qualitative research that aimed to analyze the importance of paperless innovation in the education process at school. The subjects of this study were civic education high school teachers from three provinces: Yogyakarta Special Region, Lampung Province, and West Nusa Tenggara Province. Purposive sampling was conducted taking into consideration school status, location, and access to the research data in the school.

The research data were obtained from the results of open interviews with informants and supported with secondary data. The research data were tested for validity by using source triangulation techniques. The data analysis technique used in this study was a qualitative inductive analysis to analyze the importance for a school to use paperless exams to solve the problem of environmental degradation.

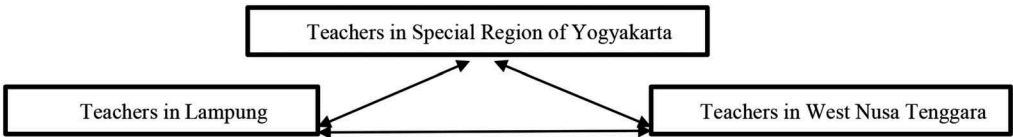


Figure 1. Source triangulation.

Table 1. Number of schools serving as research subject.

Schools	Yogyakarta	Lampung	West Nusa Tenggara
Junior high school	3	2	1
Senior high school	1	1	1

3 RESULTS AND DISCUSSION

Environmental degradation is a global problem that very urgently needs to be solved. Data released by the Central Statistics Agency (BPS) on deforestation in Indonesia show a very large deforestation rate in Indonesia. The most severe year of deforestation in Indonesia was 2014–2015.

A large amount of paper production in Indonesia is one of the main factors behind the deforestation rate in Indonesia. It is evident in Indonesia's paper production, which still remains high and has even undergone an increase in the current digital era. Data from the Ministry of Industry (2019b) show that Indonesia's total paper production in 2019 has increased by 8.3% to 13 million tons from 12 million tons. Likewise, the production of pulp as material for making paper in 2019 has increased by 5.5% to 8 million tons compared to that of last year. Therefore, it is very important to change the habit of using paper media to using renewable media that is more practical and safer for the environment.

The digital age should challenge educators, educational practitioners, and related parties to improve the effectiveness of education and the efficiency of assessment time by using digitally based renewable media. However, in their interviews, informants on the aspects of assessment and evaluation of the outcomes of the learning conducted at school stated that they still use paper as the primary media for the implementation of learning assessment and evaluation. It corresponds to data released in real time by The World Counts (October 7, 2019) showing the world's total paper production has reached 429,050,483 tons and keeps increasing every second. The negative impacts on the environment that arise are in the form of deforestation, large-scale water use, air pollution, and increase of industrial waste.

Results of research published by The World Counts show that people in the United States, Japan, and Europe use an average of 250–300 kilograms of paper per year. In India, the average person uses 5 kilograms of paper a year and in some other countries people use less than 1 kilogram. Based on the results of the studies, The World Counts states that if everyone on Earth uses an average of 200 kilograms of paper per year, after a certain length of time there will be no trees left on Earth. In the United States, paper production accounts for as much as 40% of the amount of waste that exists (The World Counts 2019). Therefore, it is recommended for the future that educators should prepare themselves to form an ecological citizenship (Beckford 2008).

Based on the interviews with the informants, it was found that there has been no form of assessment of learning outcomes in the form of quizzes, midterms, or end of semester examinations applying digital technology. Teachers still use paper as the primary medium in supporting the implementation of the assessment process in the classroom. Nine teachers from nine schools stated that they knew how to use Google Forms in filling out surveys, filling out event registrations, or various other activities related to information gathering. Despite their knowledge of the use of Google Forms in the assessment of students' learning, they still do not use it for that purpose.

The use of digital technology in learning or in evaluating learning outcomes at school in the era of Industry 4.0 is important. The reason is that environmental damage is a global disaster for every country and with a wide-ranging impact for each state (Nagra 2010). Assessment is a process of obtaining information on the achievement of desired goals and objectives

Table 2. Deforestation in Indonesia 2013–2018.

Years	Forest (ha/yr)	Non-forest (ha/yr)	Deforestation
2013–2014	292,533.90	104,837.90	397,370.90
2014–2015	815,607.50	276,574.00	1,092,181.50
2015–2016	431,266.30	197,910.60	629,176.90
2017–2018	297,183.20	182,827.60	480,010.80

Source: The Central Statistics Agency (BPS) Update November 25, 2019.

(Kizlik, 2012). A study by Jamieson and Azzam's (2012) shows that the use of technology in assessment and evaluation activities can provide accurate results, reduce errors, ensure time efficiency as well as cost efficiency, and support productivity.

Costagliola et al. (2007) indicate that teachers, lecturers, and other educational practitioners need more sophisticated assessment tools based on technology that can help teachers, lecturers, or other educators to accelerate the process of correcting results of assessment and evaluation of students' learning outcomes on a large scale. A study by Jimoh, Shittu, and Kawu (2012) shows that the use of digitally based tests is more attractive to students than paper-based tests at the time of assessment of students' learning outcomes. It is supported by Barry's statement that civic ecology education will be more effectively carried out by the state or educational institution (Barry 2006). Therefore, building civic ecology can begin with the use of renewable media in the form of digital technology to replace paper media in the process of education at school.

The essence of ecological citizenship is the idea of forming an awareness of environmental preservation in every citizen in order to make them committed to protecting, managing, and preserving the environment (Isin & Turner 2002, p. 29; Szerszynski 2006). According to Dobson (2006), every citizen has the right to enjoy a healthy life and is obliged to participate in realizing this through the concept of ecological citizenship. Data presented by the Central Statistics Agency (BPS) show that numerous forests have been critically affected by the effects of extensive deforestation in Indonesia.

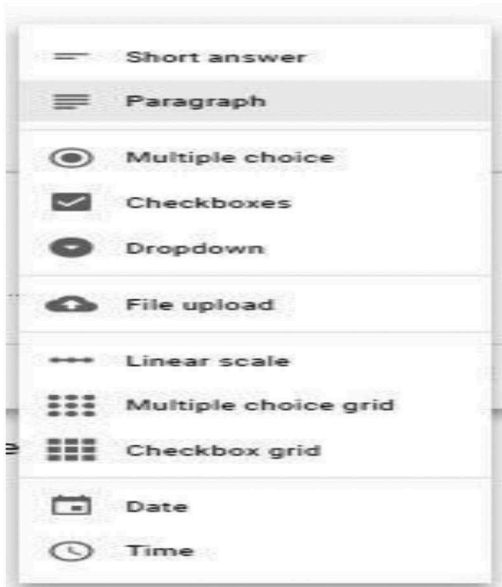


Figure 2. Google Forms.

Based on critical land data for Indonesia in Table 3, it is truly important to use digital technology to reduce paper use in schools. Google Forms is a digital medium that can be chosen by the teacher in the process of evaluating student learning outcomes. It is a free feature from Google that can be used easily in various types of smartphones and computers that have an Internet network connection. For the technical implementation of the examination, the teacher can give the deadline for working on the questions in Google Forms. The form of the questions that can be accommodated by Google Forms for the process of evaluation of students' learning outcomes is still limited to the type of assessment and evaluation through short answer, paragraph, and multiple-choice tests, and some types of answers in the menu display of Google Forms. Therefore, the assessment of the knowledge aspect is the most easily implemented in Google Forms.

Table 3. Critical land data for Indonesia 2005–2013.

Years	Critical (ha)	Very critical (ha)	Total (ha)
2005	23,306,000	6,891,000	30,197,000
2006	23,306,000	6,891,000	30,197,000
2007	23,306,000	6,891,000	30,197,000
2008	23,306,000	6,891,000	30,224,000
2009	23,306,000	6,891,000	30,224,000
2010	24,467,000	5,449,000	29,916,000
2011	22,026,000	5,269,000	27,295,000
2012	22,026,000	5,269,000	27,295,000
2013	19,565,000	4,632,000	24,196,000

Source: The Central Statistics Agency (BPS) Update February 8, 2017.

Environmental degradation is a problem for all humanity. Therefore, every human being has a responsibility to protect the natural environment. Civic ecology education aims at forming citizens who have the knowledge, skills, and attitudes for carrying out actions on the environment and its consequences (Berkowitz, Ford, & Brewer, 2005, p. 228). Therefore, it is important for schools to carry out civic ecology education effectively through theoretical or practical learning processes such as paperless based exams. The aims are to create citizens who care about the environment as a preventive and repressive measure against environmental degradation in Indonesia and the whole world.

4 CONCLUSION

Civic ecology is very important to solve environmental degradation problems. Pollution—air, water, and land—is the impact of human activities on Earth. Therefore, every human has a responsibility to restore and protect nature on Earth. Through using Google Forms for the evaluation of learning outcomes, the teacher has carried out a civic ecology education for his or her students. Even teachers have reduced the use of paper in the education process in schools, which has an effect on reducing deforestation in Indonesia and the whole world. Therefore, assessment through digital media is an important innovation that must be carried out by teachers and schools today. However, based on the findings of this study, schools still use paper as the main medium in the process of evaluating student learning outcomes in the quizzes, mid-terms, and end of semester examinations. The findings of this study can be the basis for further research to solve environmental degradation problems in Indonesia and throughout the world.

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Technology and media in Industry 4.0 education



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Enhancing the students' learning by implementing social interdependence theory and cooperative learning in Education 4.0

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ABSTRACT: Traditional teaching methods are in favour of teacher-centered classes which deter students from improving themselves and cause anxiety and a lack of language practice among them. Cooperative learning is a teaching pedagogy which shifts practice from more traditional teaching methods to a context where students have more control over their learning. Hence, cooperative learning becomes one of the nine trends in Education 4.0. This paper aims to elaborate the barriers of the implementation of cooperative learning and the advantages of implementing cooperative learning for students. A number of articles from reputable journals and studies by Johnson (2003), Page (2017), and Moges (2019) are reviewed. From the review it is found that teachers' understanding of cooperative learning, students' social skills, and time and organization requirements are the main barriers in implementing cooperative learning. Meanwhile, the advantages of cooperative learning include increasing motivation for learning, lowering the level of anxiety, improving language skills, improving social skills and maximizing benefits.

1 INTRODUCTION

Education 4.0 becomes a hot topic to discuss. Education 4.0 is closely related to the emergence of Industrial Revolution 4.0 (IR 4.0). There are many aspects in the society subject to the influence of IR 4.0, and education is one of them. According to Schwab (2016), as cited in Fisk (2017), IR 4.0 is an era where advanced technology takes control in the society so that learning can be engaged anytime anywhere. Thus, Education 4.0 emerges in response to the needs of IR 4.0 where human resources and technology are united. Education 4.0 visualization of learning posits that learners are not only receivers of knowledge but should also be able to identify the sources from which to learn skills and knowledge (Fisk 2017). People should realize that as the world is shifting education is so too.

According to Fisk (2017), cooperative learning provides better opportunities for learners to experience the mentoring and collaborative projects included in the nine trends of Education 4.0. Under this approach, the presence of peers becomes very significant in a learning process as the interaction among peers promotes active learning and provides an opportunity for the learners to gain insights from other learners' experiences. Through cooperative learning, learners are able to learn from each other, while teachers undertake the role of facilitators in the learning process. Johnson and Johnson (1989) state that cooperation typically results in higher group and individual achievements, healthier relationships with peers, more metacognition, and greater psychological health and self-esteem. Moreover, cooperative learning promotes the development of learners' critical-thinking, problem-solving, and decision-making skills in order to prepare them to face the challenges in the 21st century.

Johnson and Johnson (1989) further explain when a group has the same goals, the group's dynamic will be created and each member of the group will influence the state of the others in

the same group. Meanwhile, as pointed out by Herrmann (2013), it has been debated whether it is necessary to let a minor proportion of an individual's grade be dependent on the achievement of others in a common group or if it is sufficient to let students work together toward a shared goal. Hence, this article elaborates on how social interdependence theory and cooperative learning can be used to enhance students' learning in the era of Education 4.0. This issue is significantly helpful for teachers to gain awareness that in Education 4.0, focusing on academic achievement is not enough to fulfill students' needs. Teachers should be aware that students' psychology needs to be considered because it plays a significant role in preparing students to face the future.

2 STUDENTS' LEARNING IN EDUCATION 4.0

According to Fisk (2017), there are nine trends happening in the era of Education 4.0. First, learning can be conducted place-unbound. Internet becomes a great help for learners from remote areas through E-learning. Second, learners have their learning designs customized to cater for their respective needs. Third, learners have the opportunity to determine what learning tools and techniques to be implemented to achieve the learning outcomes preset by the institutions in charge of the curriculum. In this case, learning process allows students to bring their own devices and enables adoption of the blended learning and flipped classroom approaches. Fourth, learners should be able to implement knowledge and skills in project-based and cooperative learning to provide more opportunities for acquiring skills that involve face-to-face interactions. Fifth, learners are exposed to actual learning by experiencing practicums and collaborative projects. Sixth, data interpretation plays significant roles as students need to apply the theory of numbers and interpret particular sets of data based on the logic and trends. The seventh trend is the renewal of assessment techniques as the traditional assessment will be inadequate to measure students' knowledge in real practices. Eighth, students' opinions provide contributions to and considerations in curriculum development. The last trend is promotion of students' autonomous learning because teachers only play a facilitating role during the teaching-learning process. Fisk (2017) argues that those Education 4.0 trends shift the teaching-learning focus from the teachers toward the students.

3 SOCIAL INTERDEPENDENCE THEORY

According to Johnson and Johnson (1989), cooperative learning is embedded in social interdependence theory. Cooperative learning is most effective when students perceive that their group shares similar goals and there is positive social interdependence among the members of the group (Johnson & Johnson 2009). Kurt Lewin (1935, 1948), as cited in Johnson and Johnson (2005), argues that for interdependence to exist, there should be more than one individual present and that the state of one individual affects the states of the others. Deutsch (1962), as cited in Johnson and Johnson (2014), adds further that social interdependence occurs when the individuals share common goals and that each individual's success is affected by the actions of the others. In social interdependence, cooperativeness and competitiveness are likely to appear due to the different characteristics and levels of ability between one student and the other. Cooperativeness occurs when group members recognize that they have the same goal and that their cooperative effort is essential to the joint goal achievement. In positive social interdependence, students perceive that they can attain their goals if the other group members with whom they are cooperatively linked also attain their own goals. Thus, the actions of group members promote the achievement of the joint goals. Meanwhile, in negative social interdependence, students perceive that they can obtain their goals if the other members within the same group fail to obtain their goals. Hence, they take action to obstruct the achievement of other students' goals.

4 ELEMENTS OF COOPERATIVE LEARNING

Johnson, Johnson, and Holubec (2013) define cooperative learning as an instructional strategy which encourages student-centered learning by assigning students into small groups. The purpose of cooperative learning is to enhance students' learning by getting them share knowledge with their group members. In cooperative learning, students are responsible not only for their own learning, but also for the other group members' learning. High-achieving students provide guidance for lower-achieving students to understand the prearranged assignment. For cooperative learning to function well, teachers should state the goal in the beginning of the teaching-learning activity so that students get clear understanding about what they need to achieve. Slavin (1996) states that without any joint goal, group members will not cooperate optimally.

Johnson and Johnson (2009) write there are five elements for achieving effective cooperative learning. The first one is positive interdependence. Deutsch (1949), as cited in Johnson and Johnson (2014), refers to positive interdependence as the attitude in which students view their success interconnected with their group's success as they have mutual goal. A joint goal triggers group members' motivation to strive harder. According to Yassin et al. (2018), positive interdependence puts each member of a group in a dual task. The first task is to make sure that he or she understands the materials properly, and the second is to make sure that other group members understand the materials as well. Cooperative learning will not be effective if a student concentrates on him- or herself only and disregards other members. The second element is individual accountability. Johnson and Johnson (1989) point out that individual accountability can be assessed through each group member's performance and the feedback given. Individual accountability can be seen from a student's attitude in completing his or her own share of task as a group member. Each student has the responsibility to complete his or her own share of assigned task. One important point discussed by Johnson and Johnson (1989), as cited in Yassin et al. (2018), is that the group members should realize who needs assistance, encouragement, and support in order to help him or her to do his or her share for the success of the group. The third element is promotive interaction. Yassin et al. (2018) say that promotive interaction is preferred to be face-to-face since it is more effective that way than otherwise. According to Johnson and Johnson (2009), promotive interaction is characterized by individuals being trustworthy, exchanging resources, providing assistance, being motivated, encouraging efforts, having moderate levels of anxiety, influencing the effort toward achieving the goal, providing feedback, challenging reasoning and conclusions, and considering the perspectives of others. The fourth element is the appropriate use of social skills. Johnson and Johnson (2014) state that this element encourages leadership, decision-making, trust-building, communication, and conflict management skills. Johnson and Johnson (1986) argue that cooperative productivity depends largely on social skills as communicative skills, including requesting, apologizing, and asking for support. According to Yassin et al. (2018), to achieve this element, students should 1) get to know and trust each other, 2) communicate effectively, 3) accept and support each other, and 4) resolve conflict constructively. The last element is group processing. According to Johnson and Johnson (2014), group processing helps students to realize whether their actions are helpful for their group or not by providing peer feedback. This way they may determine which parts of their actions need to be changed for their group to accomplish success.

These are the five significant elements which make cooperative learning successful. Any group work that lacks these elements might not be considered cooperative learning. These elements highlight the role of cooperative learning as an instructional method which has the characteristics of responsibility of each learner for his or her understanding as well as understanding of the whole team (Johnson & Johnson, 2002).

5 ENHANCING STUDENTS' LEARNING BY IMPLEMENTING SOCIAL INTERDEPENDENCE THEORY AND COOPERATIVE LEARNING

5.1 *The advantages of cooperative learning*

In 2019, Moges conducted research at a selected college of Arsi University in order to examine the practices and challenges of cooperative learning as a motivational factor in enhancing students' learning. The participants were taken from 421,330 graduate students, 85 instructors, and 8 deans and vice deans with the use of questionnaire, semi-structured interview, and observation as the research instruments. First of all, Moges (2019) discusses the instructors and students' perceptions of cooperative learning practices. The study indicates that most of the respondents had positive and good perception on cooperative learning. This study found that the advantages of cooperative learning include increasing motivation for learning, lowering the level of anxiety, improving language skills, improving social skills and maximizing benefits.

5.1.1 *Lowering anxiety*

Page (2017) mentions that one of the important advantages is related to the psychological aspects of learning because using cooperative learning techniques inside the classroom helps students to lower the level of anxiety. Working in groups prevents students from getting confused about the materials as they are able to discuss the materials with the other members of the group. According to Dörnyei (1997) and Crandall (1999), as cited in Page (2017), the practice between students will polish the students' skills and make them more self-confident and willing to participate in answering the questions of the teachers, which reduces the communication apprehension. Page (2017) explores further through a study by Golub and Buchs (2014), which investigated the effects of social skills training given prior to a cooperative learning task. Results show that student pairs who had received the intervention were more attentive and supportive of each other, and asked more questions, although no difference in learning outcomes was found. The study confirmed that, with additional social skill support, students can function more effectively in a group setting, resulting in fewer behavioral issues which impede learning and require teacher intervention.

5.1.2 *Self-confidence*

Competitive experiences occurring in cooperative learning tend to be related to conditional self-esteem which is based on whether a student wins or loses. Johnson (2003) explores seven studies directly measuring the relationship between social interdependence and psychological health. The participants involved included such diverse samples as university individuals, older adults, suburban high school seniors, juvenile and adult prisoners, step-couples, and Olympic hockey players. The results indicate that working cooperatively with peers and valuing cooperation result in greater psychological health including self-confidence than does competing with peers or working independently.

5.1.3 *Motivation*

Crandall (1999) and Dörnyei (1997), as cited in Page (2017), highlight that one of the principles of cooperative learning is assisting the other members of a group to understand the materials and achieve the shared goals. The support of the students for one another helps them to get rid of some demotivating aspects such as shyness and insecurity and the increase of motivation. Crandall (1999) elaborates on cooperative learning techniques, such as STAD, by which a winning team is given reward, which can act as an extrinsic motivation for the students to do their best to win.

5.1.4 *Equal participation*

Page (2017) states that the main goal of cooperative learning is to make each individual strong in the objectives being studied, and this cannot be achieved without the participation of all the group members. The students need to master their own task and provide help for the other members of the group. Hence, all group members are required to engage and participate.

Johnson (2003) has compared more than 106 studies to examine the relative impact of cooperative, competitive, and individualistic efforts on social since the 1940s. The social judgments individuals make about each other engender either a process of acceptance, resulting in mutual liking and respect, or a process of rejection, resulting in mutual dislike and lack of respect.

5.1.5 *Improving language skills*

According to Page (2017), when the level of anxiety is low, self-confidence and motivation become high. Also, a low level of anxiety makes the level of participation inside the classroom high, which helps students to improve their language skills. Crandall (1999) and Richards and Rodgers (2014), as cited in Page (2017), add further that cooperative learning depends on interactions, which gives students more opportunities to listen, talk, discuss, and express their opinion, giving a positive effect on the language skills.

5.2 *Challenges and barriers to cooperative learning*

Despite the abundance of advantages, in order to implement effective cooperative learning, there are several challenges which must be handled. Moges (2019) suggests that there are several challenges in the implementation of cooperative learning, namely, the existence of a large number of students in one class, uncomfortable seating arrangement of students, the absence of clear guideline to practise cooperative learning, and problems of group organization/arrangement. In relation to challenges that hinder the implementation of cooperative learning, Moges (2019) finds that instructors' lack of opportunities to get cooperative learning training and their preference for traditional method of teaching become the major problems. Moges (2019) further explains about the supporting factors which affect cooperative learning. These supporting factors are the support received by the college administration and colleagues, students' perception in using cooperative learning, lesson planning and preparation, and incentives given to instructors. The lack of supports from college administration and instructional materials make the implementation of cooperative learning very difficult. Lastly, Moges (2019) writes that the conditions of the classroom, such as unmoveable chairs and tables, will affect the conduciveness of cooperative learning implementation. In addition, Page (2017) mentions the barriers to cooperative learning as follows.

5.2.1 *Teachers' understanding of cooperative learning*

Hennessey and Dionigi (2013), as cited in Page (2017), argue that teachers' knowledge of cooperative learning affects their ability to implement it successfully. Based on the study conducted by Johnson and Johnson (2009), teachers' limited understanding of cooperative learning is a barrier to successful implementation because it means that they do not include the five critical elements necessary for success in their teaching. For example, one teacher believes that she needs to have a high-achieving student leading the group to help less able students achieve, which negates the positive interdependence and individual accountability elements of cooperative learning.

5.2.2 *Students' social skills*

Page (2017) states that some students do not develop essential social skills at home (e.g., cooperation, respect, and listening), posing difficulties to these individuals when relating to others. In Dyson et al. (2016), teachers identify this issue, with one teacher citing that social skills are the top challenge for implementing cooperative learning. These teachers believe social skills are hugely important and, without them, the cooperative learning structures they are trying to implement simply breaks down.

5.2.3 *Time and organization requirements*

According to Page (2017), another challenge that teachers face when implementing cooperative learning in their classes is the time involved. Firstly, time and organization are required by teachers to get cooperative learning structures prepared. The teachers in the study of Gillies

and Boyle (2010) refer to time and work required to find suitable tasks and resources and set up group organization as challenges in implementing cooperative learning structures. Secondly, the time spent on cooperative learning in class is also a challenge.

6 CONCLUSION

The learning preferences of the students in the era of Education 4.0 are different from those of previous generations as current students are more directly involved in teaching-learning process. Kozinski (2017) emphasizes that current students enjoy group discussions and highly interactive learning environments. Students are highly interested in the learning which involves active collaboration with their group members. Cooperative learning provides a lot of benefits for students. The research conducted by Moges (2019) found that cooperative learning provides greater achievement for students than individual learning. Cooperative learning enables students to share and work together to solve a certain task, motivating them to learn by creating a better atmosphere among peer students. From the research, it was found that teachers' understanding of cooperative learning, student' social skills, and time and organization requirements become barriers to implementing cooperative learning. Meanwhile, the advantages of cooperative learning include increasing motivation for learning, lowering the level of anxiety, improving language skills, improving social skills and maximizing benefits. Slavin (1995) states that cooperative learning brings not only academic but also psychological benefits. Students who are engaged in cooperative learning have more positive feelings about their interaction in their groups. Slavin (1995) further adds that students who enjoy the feeling of being in groups have higher cooperativeness and altruism.

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Engaging EFL learners in listening course with MGLab NETLUX

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ABSTRACT: The article reports on preliminary findings based on observations and questionnaires during an ongoing study on the use of MGLab NETLUX as interactive multimedia in a first-year undergraduate listening comprehension course. The findings revealed learners' levels of interest, attention, motivation, and perception. It may be concluded that the software offers the tools that provide teachers and learners with interactive multimedia that has the potential to increase the levels of interest, attention, and motivation in English as a foreign language learning, especially listening.

1 INTRODUCTION

The range of technologies in language teaching and learning has today become diverse in the ways that they are being applied in classrooms all over the world. Technologies have become central to language practice. Today, technologies have been assimilated into many aspects of daily life (Bax, 2011), although not all people are provided with technologies (Warschauer, 2003). However, technologies have long been a feature of the world of education (Dudeney & Hockly, 2012; Gordon, 2017). The technologies are then recognized, established, and developed in the field of computer-assisted language learning (CALL), multimedia interface, computer-mediated communication (CMC), and mobile assisted language learning (MALL) and then increasingly become a core part of English language teaching (ELT) in general. With the advancement of technology and its integration of information and communication technologies (ICT), new media tools have been incorporated in English ELT time after time.

This article reports on the preliminary findings based on observations by the teacher/researcher on students' attitudes and questionnaires on learners' perceptions during an ongoing study on the use of multimedia represented by Mglab Netlux for listening comprehension in a course. These preliminary findings are expected to inform the main study that presents the impact of using multimedia technology for listening comprehension.

1.1 *Learners and listening comprehension*

Listening involves a cognitive process (Goh & Taib 2006), and this brings more challenges to observe and describe the nature of listening. Listening comprehension is described as a "complex problem-solving skill" whereby listeners are required to discriminate between sounds, understand vocabulary and grammatical structures, consider stress and intonation, recognize intention and retain, and interpret all this within the immediate, as well as the larger sociocultural context of the utterance (Ni 2017). Thus, listening is multifaceted, involving an active process of interpretation where acquisition requires matching what is heard with what is already known.

Listening activities are considered as an internal cognitive process, during which the interaction of the processes and the negotiating meaning are investigated. Thus, the content material for listening comprehension courses that was previously structured or specially created in keeping with the authors' perceptions of ease and difficulty now suggests that the tasks themselves be graded, particularly in the context of increasing the use of authentic texts (Son &

Simonian 2016). These have led to the recognition that there are aspects of listening comprehension, in addition to those mentioned, that contribute to learners' difficulty in successfully completing listening comprehension tasks and increasing their proficiency in this area (Jones 2008).

1.2 *Challenges to using technology in language teaching*

The use of technology for language learning remains a challenge for some teachers. This has been supported by a variety of studies and scholars. Concerning technology at the basic levels, some teachers find it frustrating and then are reluctant to use technology in language teaching (Motteram 2012), especially in the early implementation. It is still difficult for some teachers to adopt technology for teaching and learning tasks in schools for a number of reasons, including teachers' inability to keep themselves updated on the new technology, teachers' belief in the lack of benefit of technology in language learning, and their assumptions of inefficiency and boredom in technology use in the classroom (Bax 2011). Examples of problems in using technology include burnt-out projector bulbs, failure to connect to the Internet, time consuming to set digital/virtual class, difficulty in managing tasks in cloud settings, and so on. These issues lead to negative perceptions of technology in language learning. Teachers' anxieties in using technology are increasing without any training sessions. Taken together, it is going to take more time to explain how to use the technology than to complete the classroom tasks themselves (Babiker 2015).

The underuse of technology in the classroom to a certain extent is attributed to factors including students' access to computers, outdated computer hardware, outdated operating systems, and others. In terms of time, teachers find it difficult to manage the time to integrate and use technology into their teaching. They also find it hard to teach in a way they are not familiar with. Other factors such as pedagogical challenges could also be an obstacle in teaching. Proper and well-designed planning and checking the technology (hardware and software) conditions in advance of teaching can serve to overcome the issues (Jones 2008).

1.3 *Learners, listening comprehension, and multimedia (MGLab NETLUX)*

The use of technology resources enhances learning and is viewed as one of the best approaches to help increase learners' competence in their learning process. Multimedia computers, as one of the technological advancements, have been used extensively in ELT in a variety of regions (Selwyn 2013). MGLab NETLUX, a trademark developed by Arion Indonesia Ltd., offers interactive multimedia in high-end features. It is expected to help teachers in language teaching. Teachers have so far made efforts to increase students' motivation, interest, and attention by using pictures, realia, and gestures to convey meaning in what is taught (Christopher 2016). Indeed, in recent years, the computer, along with Internet and hypermedia capabilities, has simultaneously transformed and become a powerful support for ELT/EFL resources. Multimedia offers a variety of means to meet the needs of learners with different learning styles, expectations, and drawbacks.

The use of computer-based multimedia leads to enhanced learning on criteria such as the acquisition of content, development of skills, learning efficiency, and satisfaction with instruction (Motteram 2013). Meskill (1996) elaborates that the success of the use of multimedia for language learning involves two modes of matching representations of information processed via two separate channels, namely the auditory and visual channels. The two modes and the dual channels of auditory and visual involve three theoretical bases: dual-channel, limited capacity, and active processing. The active processing enables the individual to select the most relevant information as input during information processing, followed by the integration of that information with prior knowledge (Al-Shehri & Gitsaki 2010). Within the language learning context, this means that if EFL learners are challenged by the listening content they are exposed to, then it is possible for them to grasp the available visual cues. This combination makes the presented language more easily understood and

more relevant. Thus, both the audio and visual stimuli enhance and enable learners to acquire language proficiency in EFL.

Other studies reveal EFL learners have high levels of anxiety and face difficulties when it comes to listening comprehension. Visuals stand a chance to alleviate the learners' anxiety and then lead to comprehension (Selwyn 2013). This affirms how visual cues via multimedia technology help the learners to achieve comprehension in the listening course. In accordance with the results, Ramirez and Alonso (2007) point out relevant images of EFL can be provided by the use of multimedia in classroom teaching. The use of multimedia has extra benefits for learners, particularly in activities that are more directed toward learner-centered learning that allows them to be more collaborative and interactive in class. To sum up, multimedia technology is ideal for EFL listening comprehension, as it incorporates new technologies and is visually interesting, attractive, interactive, and reiterative (Selwyn 2013).

2 METHOD

This research applied a descriptive method. It aimed to describe the learners' attitudes and perceptions toward the multimedia, MGLab NETLUX, used in the listening comprehension course. The research involved 50 participants randomly selected from 100 students majoring in ELT at a private university in Yogyakarta, Indonesia. All participants are first-year undergraduate students studying to attain a bachelor's degree, none of whom had studied or lived abroad at that point. The participants are native speakers of Bahasa with an age range of 18–20 years. They participated in all sessions of the listening course.

3 FINDINGS AND DISCUSSION

3.1 Findings

The findings of this research deal with the scoring classification of students' questionnaires. The questionnaire in the research consisted of five items containing both positive and negative statements, each of which was provided with alternatives of response categories: strongly agree, agree, disagree, and strongly disagree. The scoring classification of students' questionnaire for each item is as follows:

Item 1. "Using MGLab NETLUX in listening course is interesting."			
No.	Response	Frequency	Percentage (%)
1.	Strongly agree	25	50
2.	Agree	16	32
3.	Disagree	8	16
4.	Strongly disagree	1	2
Total		50	100

This statement is about the students' opinions about their learning interest in the course in which MGLab NETLUX is applied. The result shows that the students have positive beliefs about the learning interest related to the use the multimedia in the course. It is revealed that 25 students (50%) stated "Strongly agree" and 16 students (38%) stated "Agree." On the other hand, 8 students (16%) indicated "Disagree" and the last student (2%) stated "Strongly disagree."

Item 2. "MGLab NETLUX motivates learners in a listening course."

No.	Response	Frequency	Percentage (%)
1.	Strongly agree	8	16
2.	Agree	31	62
3.	Disagree	7	14
4.	Strongly disagree	4	8
Total		50	100

This statement is about the learners' opinions about whether or not they are motivated in the course mediated by MGLab NETLUX. Most of the learners believe that the use of MGLab NETLUX motivates them to attend the learning process, as indicated by 31 learners (62%) stating "Agree" and 8 learners (16%) stating "Strongly agree." There were 14 students (28%) stating "Strongly agree," and 7 learners (14%) stating "Disagree," leaving 4 others (8%) with "Strongly disagree." The learners in these last groups did not find the multimedia motivating.

Item 3. "Learners participate actively in the listening course with MGLab NETLUX."

No.	Response	Frequency	Percentage (%)
1.	Strongly agree	18	36
2.	Agree	14	28
3.	Disagree	12	24
4.	Strongly disagree	6	12
Total		50	100

This statement indicates the students' opinions about the possibility of MGLab NETLUX to encourage their active participation in the learning process. According to the students' statement, MGLab NETLUX has positively encouraged students to participate actively in the learning process. Even though the overall responses do not reach 70% or more, the fact that 64% responded with "Strongly agree" and "Agree" reflect the learners' positive perceptions of the statement. There were 6 (12%) students stating "Strongly disagree" and 12 (24%) stating "disagree."

Item 4. "MGLab NETLUX develops the learners' listening comprehension."

No.	Response	Frequency	Percentage (%)
1.	Strongly agree	31	62
2.	Agree	14	28
3.	Disagree	5	10
4.	Strongly disagree	—	—
Total		50	100

This statement is about the students' opinions about whether the use of MGLab NETLUX in the course develops the learners' listening comprehension. The learners believe that MGLab NETLUX helps them to achieve comprehension. Adding together the 62% of

“Strongly agree” responses to 28% stating “Agree” indicates that 90% of the learners have positive beliefs about the use of multimedia. However, 10% of them disagree with the statement even though no one states “Strongly disagree.”

Item 5. “MGLab NETLUX can be alternative multimedia in a language learning course.”

No.	Response	Frequency	Percentage (%)
1.	Strongly agree	38	76
2.	Agree	8	16
3.	Disagree	3	6
4.	Strongly disagree	1	2
Total		50	100

This statement indicates the students’ opinions about the possibility of MGLab NETLUX to play a role of alternative multimedia in language learning, especially listening comprehension courses. The students’ responses are positive, with 92% in total stating “Strongly agree” and “Agree.” There are, however, some responses of “Disagree” and “Strongly disagree,” with 8% in total.

3.2 Discussion

The findings in this section are based on initial observations and questionnaires on the learners’ perceptions/opinions toward the use of MGLab NETLUX as the learning multimedia. The results of the listening comprehension exercises and the interviews were not discussed further. However, the variables of questionnaire items are described and discussed as follows.

3.2.1 Learners’ attitudes toward the use of MGLab NETLUX

While the learners are viewing or listening to the supplied video or audio, some notes are recorded based on observations. The observations are unstructured; hence, there are no pre-conceived ideas or structures on what is to be observed or noted. Thus, any comments, change of attitude, and others that were observable are recorded and summarized during the observation.

3.2.2 Interest and motivation

In general, learners show positive attitudes and responses to the use of multimedia. They are motivated, stay attentive while listening, and concentrate well on quite a long period. Being attentive means that they focus on listening/viewing. In this sense, they are more active in their listening, despite the fact that the content of the course is not in their mother tongue or even second language. Their attention span level leads to a positive attitude to the course. Listening without visual cues makes listening difficult and decreases students’ concentration, as opposed to listening while watching visual images or cues, which can encourage the listeners to become more active while listening for longer periods of time (Goh & Taib 2006). It also supports previous studies that learners have positive attitudes toward the use of visuals in listening comprehension (Gordon 2017).

3.2.3 Relevance

Relevance deals with the use of technology and learners. ELT instructors or teachers have to be creative in making use of technology while looking for the appropriate materials. It is found that 90% of the learners believe that multimedia technology helps them reach comprehension in the listening course (Babiker 2015). Together these results provide important

insights into the relevance between the MGLab NETLUX as the multimedia and the learners. Nevertheless, the applied multimedia has not been investigated along with teaching methods and the selection of materials so far. Further and in-depth research is required to answer these challenges.

3.2.4 Expectation for success

The multimedia is expected to help learners achieve comprehension. The average result of the learners' perception of the last three items reveals more than 90%, meaning that they believe the MGLab NETLUX has a chance to help learners face the listening task and difficulty in the course. With regard to a listening course related to the use of multimedia, Meskill (1996) describes into three aspects focusing on: (1) visual and text roles as a tool to organize language in aural texts; (2) video motivation aspect as a benefit for language teaching; (3) the fact that those media combinations could reach the language target and then give adequate exposures to the language acquisition process; and (4) comfortable environment to describe chart and discourse strategy for the learners.

4 CONCLUSION

MGLab NETLUX has its main role as a tool of the high-end multimedia interface. Unlike CALL or MALL, which enables learners to adjust their own learning paths through the tasks at their own pace and at their individual points of readiness, MGLab NETLUX offers the tools providing teachers and learners with sophisticated media interaction. Teachers supply the learners information, instruction, feedback, and review with the aid of the technology; thus, they are able to make selections of what or whom the tasks will be given to. By taking account of learners' needs and making provision for learner choice in this way, one other advantage of using multimedia in language learning is that learners can work at their own pace, capacity, and time based on the teachers' consideration. Above all, one needs to consider that the current study of the use of the MGLab NETLUX is still on the surface. Thus, it needs further investigation, in-depth analysis, and a variety of environments to view its strengths and weaknesses in the field of listening comprehension courses.

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Investigating the implementation of e-learning in Indonesia through UT online mobile application

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ABSTRACT: Indonesia Open University (*Universitas Terbuka*) is a higher education institution that is spread out all over Indonesia. It is well known for its online learning method using UT Mobile Learning that contains materials and assessment from the lecturers. In this library study, the characteristics of Open University's e-learning are reviewed and compared to the characteristics of e-learning in general by analyzing the current practices in connection with the theory. The findings showed that the university has been providing proper e-learning based on two main factors: its flexible access and credible sources. On the other hand, some improvements should be made in terms of the selection of materials and ways of establishing communication between the lecturers and students.

1 INTRODUCTION

One of the most well-known institutions that emphasizes e-learning is *Universitas Terbuka Indonesia*, or Indonesia Open University. This university provides UT Online Mobile, an application that contains the materials and assignments from the lecturers and provides learning opportunities for the students. It can be used to transmit information not only from lecturers to students but also from students to students.

To do so, it is important for the members of this institution to possess the ability to design e-learning activities and tasks in order to help the students and lecturers achieve the teaching and learning goals, since managing and planning e-learning is very crucial (Gregg et al. 2018). Also, in improving and developing e-learning activities and tasks, some principles need consideration, including the five pillars proposed by the Online Learning Consortium (OLC): learning effectiveness, cost effectiveness, faculty satisfaction, student satisfaction, and access. Therefore, this article aims to review the e-learning theories and compare the implementation of e-learning from other credible institutions to the e-learning in Indonesia Open University.

2 E-LEARNING STANDARD (ONLINE LEARNING CONSORTIUM)

Online Learning Consortium (OLC) is a community that collaboratively communicates with higher education leaders and innovators in order to develop the quality of digital learning and teaching experiences. OLC is dedicated to inspiring the higher education stakeholders to innovate the quality of an extensive set of resources, benchmarking, best-practice publications, and community-driven conferences.

OLC sets its own online learning standard that is recommended to higher education leaders. The six criteria, shown in Figure 1, are called the OLC Quality Scorecard, which will be used by the OLC members to compare the OLC's rubric with their online learning. One of the criteria is a quality scorecard for online student support, which is the most recent addition to the

OLC Quality Scorecard. This tool is expected to identify gaps in services. In addition, this scorecard facilitates higher education to look at 11 key areas: admissions, financial aid, pre-enrollment advising, veterans' services, career counseling, orientation, post-enrollment services, library, students with disabilities services, technology support, and graduate student support. Each element has its own score range from 4 to 18 points. The two biggest points are post-enrollment services (18 points) and graduate student support (14). The post-enrollment services include student academic advising, academic coaching, and personal development opportunities for students. Meanwhile, graduate student support contains training for students, online guidance, and graduate school orientation for students. In conclusion, this scorecard is effective in identifying what should be developed in online learning conducted in an institution.

3 E-LEARNING

One of the most recent developments in the educational field is the use of e-learning. Nowadays, many institutions use e-learning as way to learn (Siegel 2018). In implementing e-learning, an institution needs to know several factors, including designing e-learning, learning English through e-learning, and the e-learning approach.

3.1 *Designing e-learning*

The first step to implementing e-learning is the design stage. Knowledge of designing e-learning is crucial to determine the students' language learning goals and to ensure correspondence with to existing institutional policies, procedures, infrastructure, and administration. To conduct an appropriate e-learning process, an institution can adopt a system that contains faculty development, student and academic services, academic advisory, finance, learning design, IT, and marketing (Moore & Kearsley 2012). The prime focus on residential online course or extending to a recent distance audience is determined by infrastructure development or extent.

In addition, the implementation of e-learning is related to educational technology and partnerships. By using e-learning, universities can make the use of technologies more efficient (Davidson 2014). Universities can also gain partnerships with many vendors when coping with technological problems.

3.2 *Institution's culture related to e-learning*

Another fundamental component to take into account is understanding the urgency of e-learning implementation. As an example, in Oregon State University, e-learning is established in order to serve adult learners who do not have time to come to the university and to facilitate the students' access to the materials. In this university, e-learning is provided through the e-learning division and to develop an appropriate e-learning division of the institution, understanding the institution's culture related to e-learning is vital. This can be done by knowing the perceptions of e-learning on the campus from various stakeholders, including administrators, faculty, and students. Finally, the goal of e-learning can be achieved by understanding the e-learning culture in the university.

3.3 *E-learning implementation*

The implementation of e-learning can be done in two ways. First, lecturers can transform students' comfort zone pedagogy into an online learning mode that is more student centered, supporting and moderating yet challenging for students by blogging and using wikis. Another way of implementing e-learning is by being aware of the technical constraints and being reflective of the teaching preferences. In implementing e-learning, the lecturers should make sure that the content is already inspiring and interactive, and establish a presence by

4.2 Comparison of UT online mobile with other applications

A case study conducted in Philippines Open University (UPOU). In order to develop the quality of their online learning UPOU used Integrated Virtual Learning Environment (IVLE) as their platform. The platform is equipped with a threaded discussion that can stimulate online classroom interaction, enable synchronous consultation, and provide a workbin for students to submit their assignments. The teacher can also upload additional materials. In UPOU's online learning case, most of the communication and interactions are online. This will affect the students' choice of communication and also their cost and access (Melinda, 2005).

Fajar et al. (2018) proposed an SOA system architecture and SOA system reference in order to connect modern higher education in Indonesia. The purpose of this system is to help teachers and students communicate better. In addition, it also interconnects fund institutions, employers, and financial institutions. The system consists of five different layers: presentation, business processes, application, resources, and governance. This system digitizes the learning content, which will motivate students in online learning.

The case in UPOU is quite similar in Indonesia Open University. As the university is aware that students have been struggling in trying to access the online materials, the application has been rapidly evolving. Through the introduction of new facilities such as online registration, online payment, and online testing/examination, the development of individualized UT Online pages should be implemented in time (Belawati et al. 2005). The SOA system, as mentioned earlier, utilizes more digital content, which is similar to UT Online Mobile, where everything is digital.

4.3 Things that should be improved

Unfortunately, even though e-learning in Indonesia can be categorized as moderate, there are still some things that eventually need to be observed and developed. This is supported by Ali (2015), who affirms that e-learning in Indonesia is still facing major problems, especially in the planning and implementation stages. Also, institutions have to develop and ensure the quality of e-learning. Most importantly, the institutions do not provide a sufficient Internet connection, even though it is very crucial when implementing e-learning (Mudiarti 2018).

5 CONCLUSION

E-learning in the UT Online Mobile application is already appropriate because it has a discussion forum for students and lecturers. It also corresponds with the Online Learning Consortium digital learning criteria. In UT Mobile learning students can easily access the materials and complete the assignments given by the lecturers. It can be concluded that e-learning in UT Online Mobile already supports English language learning for students who learn through online platforms. Unfortunately, despite the fact that UT Online Mobile is an appropriate tool for students to learn English there are still some weaknesses, i.e., the students' Internet connection and its implementation.

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Though some studies have even proven that an increase in vocabulary will positively influence academic performance (Nation & Waring 1997; Nation 2002; Larsen-Freeman 2003), Nation (2002) suggests that an educated native speaker knows approximately 20,000 word families, or 70,000 words, while English foreign language learners know only a fraction of this number (Laufer & Yano 2001).

2 THE IMPORTANCE OF VOCABULARY LEARNING

3 VOCABULARY LEARNING THROUGH MEMRISE

Learning vocabulary at school followed by reviewing the lesson at home regularly is the process that determines the success of language learners. Macaro (2001) argues that students should have more vocabulary practice in order to have good vocabulary acquisition. In relation to this, Memrise provides a solution for English learning by focusing on vocabulary. Because it uses repetition methods that maintain students' memorized data and assesses the knowledge according to the data, it would benefit them to have a long-term memory based on what they have learned.

Memrise has many types of games to enrich students' vocabulary; therefore, it is fun for students to learn while playing the games. It is designed in a way that operating the application system is fun so students are expected to enjoy learning. In addition, students have unlimited

access to learning and they can access Memrise whenever and wherever they want. Besides, in order to maintain and promote their vocabulary retention, students need continuous vocabulary practice. Memrise offers two stages of vocabulary learning, namely learning new words and reviewing long-term memories.

4.1 Stage 1: Students learn new words

When students find new words, the words should be repeated in order to acquire a long-term memory of the words that they are learning. In this case, Memrise provides repeated tests for helping a new memory becomes long-term memory.

4.2 Stage 2: Students review long-term memory

In this stage, students already have their long-term memory so they just need to review it regularly in order to reinforce their retention so they will never forget the list of vocabulary they have learned. Memrise helps by targeting the list of vocabulary that they need to review to keep the words in their long-term memory.

5 DISCUSSION

Some researchers such as Nushi and Egbali (2017), Hooper (2018), and Abarghoui and Taki (2018) have pointed out the most crucial reason why Memrise is the most appropriate application that is designed as a fun learning process for students to possess a rich vocabulary of English as a foreign language. In relation to this, providing fun learning has been proven to build students' enthusiasm for learning. The following are some related previous researches on the use of Memrise. The first study was done by Walker, entitled "The Impact of Using Memrise on Students' Perceptions of Learning Latin Vocabulary and on Long-Term Memory of Words." The result showed that among students of Latin, Memrise is more effective in enriching their vocabulary, even for year 8 and 9 students. The second study was conducted by Abarghoui and Taki (2018), entitled "Measuring the Effectiveness of Using Memrise on High School Students' Perceptions of Learning EFL." The results of this study showed that Memrise is assumed to be highly effective as an instructional resource compared to direct instruction. Those positive results regarding the use of Memrise have categorized Memrise as an appropriate learning mobile application to enrich students' vocabulary through a fun learning experience.

6 CONCLUSION

Memrise has been one of the technological advances in language learning media for which the effectiveness in language learning has been proven. Some of the advantages of Memrise are its quick, easy, and flexible access. To get the best from this application, students have to make sure that they have Internet access all the time in order to access the application through their mobile phones. They also need to use it on a regular basis to practice their vocabulary mastery. Also, teachers need to continuously suggest their students use Memrise after school time to enrich their vocabulary.

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The role of educational technology in preparing learning activities for elementary teachers

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ABSTRACT: Technology in education has a major contribution to improving teachers' methods and performance to create more engaging and meaningful learning experiences for students (Farah & Arnett 2019). This study aimed to discuss the role of educational technology in assisting teachers to prepare learning activities at the elementary level of education. Research documents and other resources were examined to describe several educational resources that provided many kinds of materials for teachers. Results showed that there were three educational resources, namely educational social media resources (Pinterest and Instagram), educational video resources (YouTube), and educational websites (Edutopia and Teacher Pay Teachers). Furthermore, all users/educators can share ways to adopt or adapt learning materials into best practices and also innovations they have made with other users.

1 INTRODUCTION

Recent changes in education and society have made students' needs and society's expectations a bit more challenging for teachers to meet. In the past, teachers' main task was merely to cover the curriculum according to the guides and best teaching practices. However, today, teachers have to differentiate their instructions, use data-driven instructional practices, address students' social and emotional challenges, close achievement gaps, and ensure that all students are prepared for the 21st-century economy (Farah & Arnett 2019).

Ambrose et al. (2010), cited in Mayer (2002), define learning as “a process that leads to change, which occurs as a result of experience and increases the potential for improved performance and future learning.” Based on the preceding definition, learning is considered as a process that involves changes (knowledge, beliefs, behaviors, or attitudes), and is viewed as something in which students themselves do, interpret, and respond to the conscious and unconscious experiences in the past and present. Based on the 2013 curriculum (K13) in Indonesia, learning activities in elementary schools are run using the thematic model.

Thematic instruction is one of the integrated instructional models. It starts from choosing a specific theme as the center of interest for materials integrated into several subjects (Chumdari et al. 2018). It provides meaningful learning experiences because students can acquire knowledge in the coherent whole context related to the real world (Hamalik 1982) and use their knowledge and skills from various subjects simultaneously to answer questions or solve problems (Mutohir et al. 1996/1997; Kovalik in Merickel 1998). There are several components in preparing learning activities using thematic instructional models: (1) identity of subject matters, (2) basic competencies and indicators, (3) subject matter and description, (4) the learning strategy, (5) learning tools and media, and (6) assessment and follow-up (Chumdari et al. 2018).

Furthermore, learning tools and media are considered as other major components for the thematic/integrated learning activities. They help teachers prepare their classes by enhancing their teaching methods and performance to establish more engaging and meaningful learning experiences for students (Farah & Arnett 2019). Slides with audiovisual materials (video, photo, or audio), educational websites, and educational YouTube videos provide more

pedagogically sound and engaging learning materials and activities that can be aligned with the schools' standards and students' needs.

Technology can also expand teachers' capacity and competence to adopt new and valuable teaching practices such as problem-based learning, small-group instruction, relationship-building, mastery-based instruction, and project-based learning. Although it is possible to implement these practices without technology, the utilization of appropriate educational technology resources will ease teachers in adopting these practices in more manageable ways.

2 METHOD

The study was done by examining research documents and other resources to describe several educational resources that could be used by elementary teachers in preparing learning activities. Research documents were related to the utilization of educational resources by elementary teachers in Indonesia and other countries. Several educational websites were also used as secondary resources so that they could support data derived from research documents.

3 RESULTS AND DISCUSSION

Over the past decade, web 2.0 sites and social media have affected the way people communicate and interact with each other. Evidence shows that the utilization of social media in education has increased (Lu 2011; Lee et al. 2012; Ahrenfelt 2013; Carpenter & Krutka 2014), and it should be contextualized to meet students' needs and learning abilities, as well as the set curricula (Kevin & McNergney 1999; Akhiar et al. 2017). In this section, several educational resources (social media, video resources, educational sites, and graphic design sites) are explained. These platforms provide many kinds of materials for teachers that can be used in preparing classroom activities.

3.1 Educational social media

Social media is a communication platform that is based on website and mobile technologies. It comprises several socializing and networking activities through words, pictures, and videos. Social media is popular and user-friendly and contains free and enormous varied content (most of the cases) (Handayani 2016). Therefore, social media can be an alternative resource that matches the social context of learning and students' critical thinking (Mason, 2006; Handayani, 2016). The followings are the two most popular educational social media for teachers as resources in preparing learning activities in the class.

3.1.1 Pinterest

Pinterest (Figure 1) is a website and mobile application founded in 2010 and is considered as a tool used for curating, collecting, and sharing information between users (Buzetto-Hollywood 2018). As one of networking sites, Pinterest has been used by most teachers in all levels to search for educational resources and adapt the resources to suit their classroom needs (Schroeder et al. 2019). According to Rayburn (2014), this site was one of the top five websites used by educators for professional development in 2014. Another study also reported that in Pinterest, the second-most highly searched resources are education-related items (Mittal et al. 2013; Hunter & Hall 2018, p. 634).

Also, Pinterest is considered as an online resource for generating teaching ideas used by elementary teachers before they plan learning activities. This site is predominantly used as a tool to cultivate ideas related to the content, instructional tools, classroom environment, and engagement. Several items are provided such as project-based learning, anchor charts, worksheets, science explorations, workstations, crafts, opportunities for differentiation, and creative ways to save money as a teacher (Schroeder et al. 2019). Moreover, there is one feature in Pinterest that establishes connections among the users, called Repinning. It encourages



Figure 1. Pinterest homepage.

users to simply store online resources (Huber & Bates 2016) and share them with other users (Wilkinson 2013). Therefore, it makes this site a convenient and powerful platform for teachers to connect, share, and enhance professional practices (Grote-Garcia & Vasinda 2014, Carpenter & Green 2017).

3.1.2 Instagram

Instagram (Figure 2) was launched in October 2010 and rapidly gained popularity, with more than 100 million active users as of April 2012 and more than 300 million as of December 2014. A recent survey affirmed that Instagram is still the most popular social media network for teenagers. It is an online mobile photo-sharing, video-sharing, and social networking service, so that it enables its users to take pictures and videos and share them either publicly or privately on the application. It provides users an instantaneous way to capture and share their life moments with friends through a series of (filter manipulated) pictures and videos, captions, locations, hashtags, likes, and comments, as well as to explore the topic and other content collections in their feeds (Ali 2014; Hu 2014; Handayani 2016). Many educators and content creators have been using those features to share a variety of ideas about learning activities. These also can be explored by using the hashtag feature and can be kept in one's personal account.

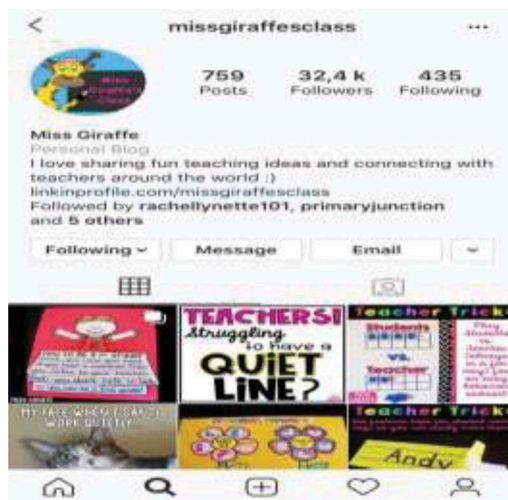


Figure 2. @missgiraffeclass Instagram account.

3.2 Educational video resources

The utilization of videos is considered as effective for learning (Zahn, et al. 2010; Krauskopf et al. 2012; DeWitt et al. 2013). Studies showed that videos are effective in minimizing time spent on lectures (Carlisle 2010), improving students' cognitive and social development in problem-solving (Zahn et al. 2010), and escalating the effectiveness of teaching when they are shown at the appropriate phases in the teaching process (Hsu 2013). Many child-friendly instructional videos (typically under 7 minutes) are available on the Internet and provide topics for students to learn or recall.

There are several online video repositories such as YouTube (Figure 3), TeacherTube, and Vimeo (Alias et al. 2013). These sites have many kinds of film clips, television shows, music, and instructional videos, or video blogs (vlogs), as well as amateur videos with different subjects. According to Alexa (2015), YouTube is the third most visited website in the world after Google and Facebook. As a familiar online learning tool, the use of YouTube in a classroom setting brings a positive impact on students' reception that can enhance their learning experiences (Fleck et al. 2014; Moghavvemi et al. 2018). Alber (2019) identified that there are several purposes for using video as one of learning resources, namely (1) building background knowledge on a topic, (2) enriching a text or text excerpt, and (3) deepening or solidifying students' learning. Students learn effectively through several modalities such as writing, reading, listening to the teacher's oral explanations, drawing, and viewing visual media. They can discuss what they saw, identify new vocabularies in the video, and write sentences using the vocabularies they have encountered. A video can also help them visualize information (an event or a person) that they have read from a text. This occurs when the setting is in a social, historical, emotional, and political context. Alber (2019) proposed several tips for using video as one of the learning resources:

- Be selective. A clip sometimes has several inappropriate parts for students due to lots of intense violence, rants, or adult content. Therefore, it is important to determine the purpose, and then choose what to show and how to frame it for students.
- Provide a mission. Before playing the video, teachers have to ensure that students will actively watch by giving instructions to pay attention to several important details in the video. This makes students more attentive and accountable during the video screening.
- Pause to ponder (and write). During the video screening, students are not allowed to do other activities such as writing notes or answering questions. After a few minutes, teachers can pause the video to give time for students to process what they are viewing. Then, the



Figure 3. YouTube homepage.

teacher can prepare questions related to the content, and ask the students to discuss or to write down reflections.

- Turn on closed captioning. Captioning will help students process the information in the video. If the students are required to apply the information from the video, teachers should consider the transcripts in the form of handouts or digital copies.

3.3 Educational sites

There are two kinds of educational sites that can be learning resources, namely Edutopia (edutopia.org) and Teachers Pay Teachers. Edutopia is one of the intermediary sites that broker research and other knowledge in improving core practice for educational practitioners (Malin et al. 2018). Meanwhile, Teachers Pay Teachers is an educational teaching resource developed from the collaborations of many educators worldwide.

3.3.1 Edutopia

Edutopia (Figure 4) is an educational website resource dedicated to transforming K-12 education and spotting what works in education. This site was founded by George Lucas through the George Lucas Educational Foundation (GLEF) in 1991. It bridges the gaps between research and practice in education (Malin et al. 2018) that are beset by the issues of accessibility, relevance, and timeliness of educational research (Hering 2016). Through their research division, GLEF can provide evidence for “what works in K-12 education” (GLEF 2019). Many experts and educators share ways to adopt or adapt best practices and tell stories of innovation and continuous learning in the real world. In fact, most journals sit behind paywalls (Saunders 2015). K-12 educators do not typically read this kind of work, due to the lack of relevance and actionable information of teaching practices (Lysenko et al. 2014) and the unavailability of actionable information when needed (Sarewitz & Pielke 2007).

Edutopia provides resources to help educators implement six core strategies for innovation and reform in learning: (1) integrated studies, (2) comprehensive assessment, (3) project-based learning, (4) social and emotional learning, (5) teacher development, and (6) technology integration. These core strategies are intended for all students so that they can acquire and effectively apply the knowledge, attitudes, and skills necessary to thrive in their studies, careers, and adult lives (GLEF 2019).

3.3.2 Teachers Pay Teachers

This site (Figure 5) was established by a teacher in New York City named Paul Edelman. He found that his students’ learning was better after he combined ideas from other educators. To date, the Teachers Pay Teachers site has grown into an enormous and global staff room. Teachers Pay Teachers contains a broad range of resources for the pre-K-12 education level. They include (1) whole units, (2) full-year curriculum, (3) assessments, (4) project-based learning, (5) special education, (6) videos, (7) social/emotional learning, and (8) digital. All users, including K-12 classroom teachers, instructional specialists, school administrators, speech

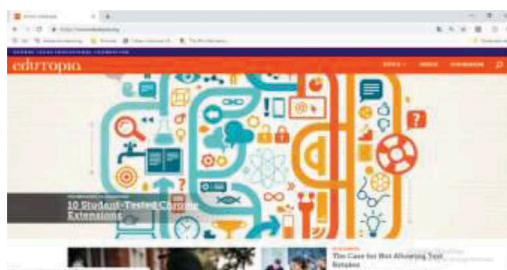


Figure 4. Edutopia.org homepage.

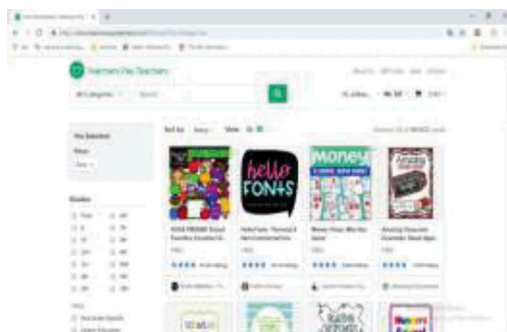


Figure 5. Teachers Pay Teachers (TpT) homepage.

language pathologists, early learning specialists, homeschoolers, tutors, and parents can find resources, establish collaboration, and gain inspiration when preparing materials for their classes (TPT team 2019). On this platform, teachers are treated as experts. They can provide, share, and collaborate to adjust and modify resources for their own classes despite being isolated in their own classrooms (Jones 2018). The teacher can browse teaching ideas based on the categories of (1) grade level, (2) subject, (3) price, and (4) resources type. Grade-level categories provide some levels of education starting from pre K–K, grades 1–2, grades 3–5, grades 6–8, grades 9–12, and others. In the subject categories, there are art and music, English language arts, foreign language, math, science, social studies-history, specialty, and holiday/seasonal. The teacher can also browse teaching materials based on price. In this category, the teacher can choose the free teaching materials or see the paid teaching materials as inspiration in preparing media for the students. The last category is the type of resource. The teaching resources available in this category are worksheets, lesson plans, printables, activities, posters, assessment, math centers, literacy centers ideas, projects, and Google apps.

4 CONCLUSION

Although it is possible for teachers to disconnect technologies in their teaching practice, the proper use of technology can lead to many benefits. It will help teachers to meet the school's standard and students' needs by providing more engaging and pedagogically sound learning activities and materials. Also, it will be very helpful to expand teachers' capacity and competence in adopting new and valuable teaching practices in a more manageable way.

There are several educational resources that can be utilized in preparing learning activities, namely (1) educational social media resources (Pinterest and Instagram), (2) educational video resources (YouTube), and (3) educational websites (Edutopia and Teachers Pay Teachers). These educational resources are based on website and mobile technologies; have user-friendly features; and are equipped with free, frequently updated, and enormous varieties of content. All users/educators can share ways to adopt or adapt learning materials into best practices or innovations they have made with other users.

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2 EDUCATION 4.0

Puncreobutr (2016) states that the goal of Education 4.0 is to create creative and innovative humans. Therefore, Education 4.0 provides life skills and innovation skills, both of which are portrayed in 21st-century skills. Abersek (2017) lists 21st-century skills in Education 4.0 that involve analytical skills, critical thinking, problem-solving, decision making, and research and development. Analytical skills comprise interpersonal skills, reasoning ability, information processing, and changing/learning ability. Critical thinking consists of communication/messaging, initiative and self-regulation, information literacy, and creativity/innovation. Problem solving involves collaboration, productivity and efficiency, media literacy, and adaptability. Decision making covers leadership and responsibility, digital citizenship, and flexibility. In the end, research and development consist of information and communications technology (ICT) procedures and concepts. These 21st-century skills are introduced and taught in Education 4.0. Students not only learn the knowledge they obtain from books or other resources, but they also learn life and innovation skills that enable them to be intelligent individuals who are ready for Industry 4.0 competition and survive in the Industry 4.0 era.

Education 4.0 shows nine trends according to Fisk (2017), as cited in Hussin (2018): (1) the use of e-learning tools to promote anytime and anywhere learning, (2) personalized learning, (3) students' learning choice, (4) project-based learning, (5) hands-on learning, (6) data interpretation, (7) factual and application assessment, (8) students' opinion to the curriculum, and (9) independent learning. These trends indicate that the learning process in Education 4.0 is also based on online learning, authentic materials, intelligent skills, and life skills. Thus, to prepare students to be ready for Industry 4.0, self-regulated learning needs to be fostered in achieving intelligent and life skills. Based on the trends of Education 4.0 above, the possible approach in teaching intelligent and life skills is by applying blended learning.

3 SELF-REGULATED LEARNING

Self-regulation is part of critical thinking, one of the skills promoted in Education 4.0. Zimmerman (2002) states that self-regulated students learn as proactive individuals. They are aware of their limitations and strengths in obtaining preset goals. They also monitor their own behavior in the process of learning. Then, the process of reflection also is conducted to see the improvement of the effectiveness of their learning. Zimmerman believes that self-regulation makes students academically successful and life-long learners with a view toward the future. Thus, according to Schunk and Greene (2017) self-regulation refers to the way students obtain their goal through activating their cognition, behaviors, motivation, and affects.

Zimmerman (1986), cited in Zimmerman and Schunk (1989), states that self-regulated learning happens when learners behaviorally, metacognitively, and motivationally become active participants in their learning. Self-regulated learning is a set of learning in which the students use their self-regulation in their own learning. Bembenuddy et al. (2015) support Zimmerman's (2000) theory by stating that self-regulated learning has a pivotal role in many areas of learning, such as medicine, music, sports, mathematics, science, and other academics.

Self-regulated learning is conducted through three phases. Zimmerman's cyclical phases of self-regulated learning (2002), cited in Bembenuddy et al. (2015), include the forethought phase, the performance phase, and the self-reflection phase. The forethought phase comprises task analysis and self-motivation beliefs. Task analysis includes goal setting and strategic planning. Before conducting the learning session, students have to set their goals. They have to know the goal they need to achieve and plan the best strategy in achieving the goal. Alongside task analysis, students also need to have self-motivation belief, which includes self-efficacy, outcome expectations, task interest/value, and goal orientation. Bandura (1997), along with Usher and Pajares (2008) as cited in Bembenuddy et al. (2015), state that self-efficacy is the belief of the students of their ability in completing the designed task. Through this self-efficacy, students also learn the outcome expectations. Task interest/value is the interest students have in the designed task. They also learn how they complete the task through goal orientation.

The second phase is the performance phase. This phase includes self-control and self-observation. In self-control, students conduct the learning and strategies they have been planned in the previous phase. Task strategies, self-instruction, imagery, time management, environmental structuring, help-seeking, interest incentives, and self-consequences happen during self-control. For example, in vocabulary learning, students could form an image of a certain vocabulary in their mind, look for a comfortable environment to learn, manage their learning time, and look for help in some difficult points as their self-instruction. In self-observation, there are metacognitive monitoring and self-recording. During their learning process, students monitor and record their strategies. They experiment on the strategy to find out if the strategy is effective or not.

The last phase is the self-reflection phase, which comprises self-judgment and self-reaction. Self-judgment includes self-evaluation and causal attribution. Self-evaluation is conducted when the students compare their learning results to a certain standard. Causal attribution is the assumption of particular causes of the failure or success. Then, in self-reaction, there are self-satisfaction/effect and adaptive/defensive. The success of the learning will bring satisfaction and positive effects on students' motivation. However, if the result is not really what the students expected before, there are two possibilities: being defensive or adaptive. A defensive reaction happens when the students try to avoid the result and the possibility to improve the result. On the other hand, students can also have an adaptive reaction when they reflect and try to improve their learning strategies by going back again in the first phase. They set their goals and modify the previous strategy so that they can obtain a better result.

4 BLENDED LEARNING

The implementation of high technology used in industrial practice to increase productivity and quality occurred in Industry 4.0 (Umachandran et al. 2018). As the impact of the Industrial Revolution 4.0, Industry 4.0 Education appears to increase the quality of education (Baygin et al. 2016). The usage of technology integrated in education, including the Internet and sensors, emerges interactive systems and students' practice into the field. The authentic materials given in the lesson and the practice in technology will prepare students to compete in real-world situations.

Teaching and learning online through the Internet could bring advantages both for the teachers and students. Nord (2011) discusses that online learning has a wider audience than traditional learning. However, conducting traditional learning is important. Traditional learning includes face-to-face learning, which allows students to obtain the social skills of sharing, cooperating, and respecting others' opinions (Lalima & Dangwal 2017). One of the ways to teach students integrated technology is by implementing blended learning. Lalima and Dangwal (2017) define blended learning as an innovative concept that enfold both traditional and online learning using ICT tools to support both online and offline learning.

According to Loschert (2018), there are several models of blended learning: station rotation, lab rotation, individual rotation, flipped classroom, flex, a la carte, and enriched virtual. In station rotation, students move from one station of activity to others with a scheduled time. At least one online station is provided in the class. In lab rotation, students move from one station of activity to others. However, here, one of the stations is done online in a computer lab at school. Individual rotation means students, based on individual schedules, move from one station of activity to others. Students come to the station they want and may not come to all stations. A flipped classroom allows students to obtain knowledge through online lectures or courses at home and do practices or projects at school. In flex, students who work at their content in school use online learning as the "backbone" of their fluid schedules based on their needs. A la carte enables students to use online courses conducted by the teacher remotely outside the class as the addition of their face to face learning. In enriched virtual model, students and the teacher conduct the teaching and learning at school. Students complete the task outside the class online. However, these activities do not occur daily.

Szadziewska and Kujawski (2017) conducted blended learning in their study and found some advantages. Teaching and learning materials could be obtained easily, communication with the teacher becomes quick and easy, students are engaged in the teaching and learning sessions, and students are better prepared for examination.

5 FLIPPED CLASSROOM

A flipped classroom is one of the models of blended learning. Bergmann and Sams (2012) define the concept of a flipped classroom as every activity traditionally conducted in class, now conducted at home. Homework that was traditionally done at home now is done in the classroom. Reidsema et Al. (2017) state that students conduct online preliminary learning through video in the flipped classroom. They watch the video to prepare the activity structurally conducted with the teacher and other peers. Thus, the flipped classroom is a model of blended learning where students conduct online preliminary learning at home and activities and practices at school according to the prior knowledge.

Kathleen Furton (2012), cited in Herreid and Schiller (2013), states seven advantages of conducting a flipped classroom. These advantages are that first, students can move based on their own pace; second, conducting practice/homework at school can help teachers easily analyze students' difficulties and learning styles; third, teachers can easily update and customize the curriculum 24/7; fourth, classroom time can be conducted creatively and effectively; fifth, the method report used by the teacher can see the increase of students' interest, achievement, and engagement; sixth, the new approaches are supported by learning theory; and seventh, the technology used is appropriate and flexible for 21st century skills.

Estes et al. (2014) identifies the stages of the flipped classroom: pre-class, in-class, and post-class stages. The pre-class stage comprises modeling and preassessment. Students are given materials online by the teacher before they enter the classroom activity. The teacher may introduce technologies in the learning process. Modeling can be done by using a Learning Managing System (LSM). The teacher can give materials like lecturing, explanation, or demonstration videos through LSM. Then, the teacher conducts preassessment on students' skills, knowledge, and attitude toward the topic of a learning. It makes learning more transparent.

The second, in-class, stage comprises clarifying concepts and solving problems. In this stage, students do practices and activities based on the prior knowledge they received from the first stage. The activities could be done through discussion, observation, and the use of technology. The use of technology here is to identify student weakness in comprehension during the preassessment. The teacher clarifies the confusion between prior comprehension and the result of practices or activities conducting in the classroom.

The third, post-class, stage, comprises assessment, application, and transfer. In this stage, the teacher assesses students' learning. Students will transfer the result of their learning, including the process and the assessment from the teacher, into the other learning. The cycle is still going on. After knowing the strengths and weaknesses of their learning, students will apply what they have successfully learned in an authentic situation and improve and reconstruct the weakness in another cycle of the flipped classroom.

6 FOSTERING SELF-REGULATED LEARNING THROUGH A FLIPPED CLASSROOM

Result on the research conducted by Çakıroğlu and Öztürk (2017) that through a flipped classroom, students gain the ability to set their learning goals, be aware of the content because they have obtained prior information through videos before going to the activities conducted in school, and execute skills of goal planning both at home and school. The aforementioned characteristics also show that the phases of self-regulated learning are applied in the process of flipped classroom learning (Figure 1). Another study conducted by Shih et al. (2018) concluded that through online learning and prior knowledge before the learning session, students

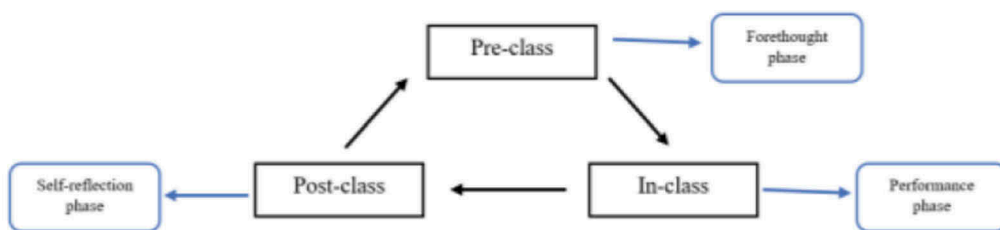


Figure 1. Self-regulated learning in the flipped classroom.

become confident, obtain value from class interaction, and have a higher intention to participate in the classroom.

The results of this research indicate that self-regulated learning is fostered during the learning process of a flipped classroom. In the first stage of the flipped classroom, there are pre-classroom activities in which students set the learning goal and plan the strategy of their learning. Students prepare the activities conducted in a class by watching online videos beforehand at home. This video can be sent by the teacher through some ICT tools. The teacher may send links to YouTube videos or videos directly to an LMS or classroom chat group. In addition, students, with their willingness and curiosity, are able to search for other resources easily through the Internet. They can search, filter, and absorb the knowledge they need in achieving the goals they have set before. The first and third trends in Education 4.0 are portrayed here. Students obtain knowledge anytime and anywhere with the help of the Internet and construct their learning strategy or choice according to their ability and interest. In this stage, the forethought phase of self-regulated learning is fostered.

Students practice and utilize the prior knowledge and strategy planned in the previous stage in the in-class stage. Students in this stage will be given hands-on activities through collaborating, internship, and even monitoring projects. Students could bring their own devices such as smartphones or laptops to support their learning. The collaborating project could be done through discussion, observation, or project-based activities. Here, students learn to interpret data by reasoning their knowledge or theory obtained from pre-class activities with the data obtained from discussion, observation, or project-based activities. These activities might be more complex compared with traditional teaching and learning; however, they create personalized learning. Students will be exposed to more difficult tasks if a certain mastery has been obtained. Teachers' positive reinforcement helps students to pass the challenges and boosts their confidence on their learning ability.

The in-class stage of the flipped classroom also promotes self-control and evaluation. Exposing students with problem-solution activities encourages them to apply the planned learning strategy, self-instruction, imagery, time management, environmental structuring, help-seeking, interest incentives, and self-consequences. Then, students also monitor and record the process of their own learning and get feedback from the teacher. The teacher conducts factual and application assessments. Students are assessed differently according to their learning strategies and interests. The teacher can conduct an assessment during the learning in the field and give feedback after the learning process is finished to clear the understanding students obtained from pre- and in-class learning.

In the last stage of the flipped classroom, the post-class stage, students conduct self-reflection of their learning. Students will compare the goal and learning strategy set in the first stage, and prior knowledge in the pre-class, with the results of the learning through self-monitoring, recording, and teacher feedback. Students notice their weaknesses and strengths at this point. Thus, back again to the first stage of the flipped classroom, students will improve their weaknesses by reconstructing the strategy from the beginning and so on. Students become independent learners so that the teacher role is no longer about spoon-feeding students with knowledge like traditional teaching. Students can learn by themselves anytime and

anywhere with the help of the teacher as the facilitator. Therefore, self-regulated learning can be fostered through a flipped classroom in Industry 4.0 Education.

7 CONCLUSION

It is important to foster self-regulated learning in Education 4.0 to prepare students for Industry 4.0 competition. Self-regulated learning is a type of learning in which students become active participants in their learning. They set the goal, have a plan to achieve the goal, monitor the learning, and even reflect it. Self-regulated learning has a set of phases: forethought, performance, and self-reflection phase.

The flipped classroom is a model of blended learning that can be highly appropriate for Education 4.0. It uses both online and traditional learning. The flipped classroom changes the method of learning from traditional learning in the classroom and home. Students can learn the knowledge from home online with video. On the other hand, they will conduct “home-work” or practice in the school. The stages of pre-class, in-class, and post-class allow them to plan, think, do, and reflect what they learn and move forward. A flipped classroom encourages students to be more active in the learning process. Students know the goal of the learning; know their ability and possible strategy according to their ability; and perform their learning strategy, monitor, and reflect on it. It is an ongoing process of learning so that their self-regulation is fostered through the process. Having self-regulation makes students become independent and long-life learners (Mawas et al. 2017). It helps them to compete well in Industry 4.0. Thus, the flipped classroom meets the need to foster students’ self-regulated learning well in Industry 4.0 Education.

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Exploring teachers' opinions of the use of "Google classroom" to assist learning

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ABSTRACT: The study described in this article aimed to report Google classroom users' opinions about the use of this application in smartphones for learning. This small-scale survey involved 13 junior and senior high school teachers.. The data showed that the majority of the students were reported to have smartphones but some schools banned smartphones at schools. The respondents confirmed that Google Classroom could help the learning process and easy to use. The majority of the teachers need to learn more about the application and nearly half of them are not familiar with it.

1 INTRODUCTION

Industry 4.0 has had a great impact on the field of education and has recently become a well-discussed term among researchers and companies (Paravizo et al. 2018). Industry 4.0 is a combination of cyber-physical systems (CPS), Internet of Things (IoT), and Cognitive Computing (Rajput & Singh 2019). It has inspired some educators to combine education with technological products such as the Internet, cyber-physical systems, databases, and cognitive computing that then generate the new term educational technology. Educational technology is the integration of variables to find and solve problems and manage solutions to the problems involved in all aspects of human learning (Laleye 2015). Cloud-based manufacturing (CBM) is another rising paradigm that will contribute significantly to the success of Industry 4.0 (Thames & Schaefer 2016).

Smartphones, intelligent cell phones having abilities and functions similar to those of computers, are widely used in the industrial era 4.0. In contemporary society, smartphones have become an integral part of everyday life and with their multifunctional capabilities, their presence has transformed and shifted the way people engage in their personal and professional lives (Winkel et al. 2019). Based on the survey of the Indonesian Internet Service Provider Association (APJII), 93.9% of Internet users in Indonesia use smartphones every day (APJII 2018). Their most active users are teenagers, or junior high school (SMP), and high school (SMA) students. The survey reveals that as many as 91% of the users were those of 15–19 years old, which is the highest among all age groups (APJII 2018). Of all Internet users, 93.9% use smartphones every day (APJII 2018). The survey result is also supported by the researchers' survey on 12 junior high school and high school teachers who reported that most of their students use smartphones.

The high percentage of Internet usage through the smartphone in the teenage group has both positive and negative effects. It could be positive because it shows students' familiarity with the Internet, which is seen as a fundamental part of today's life; moreover, smartphones can also be used to accelerate students' comprehension (Machmud 2018). However, smartphones can have negative effects when they cause addiction (Seki et al. 2019) and distract students from studying (Machmud 2018).

Considering the fact that the main users of the Internet and smartphones are the school-age group, the school, especially teachers, should explore the possibility of using the Internet and smartphones to assist the educational process. One of the smartphone applications that can be used for a lesson is Google Classroom. It can help a teaching–learning process inside and outside of the classroom, particularly for giving the learning material and assignments to students. The application can be downloaded through Google Play Store or App Store on Android or iOS-based smartphones. Google Classroom is a kind of a blending learning system that was initiated in 2014 (Al-Marroof & Al-Emran 2018). It is a mixed learning application to find a solution for the difficulty in making, distributing, and classifying every paperless assignment (id.wikipedia.org 2014). It allows teachers to give lessons and assignments, as long as the phones are connected to the Internet system.

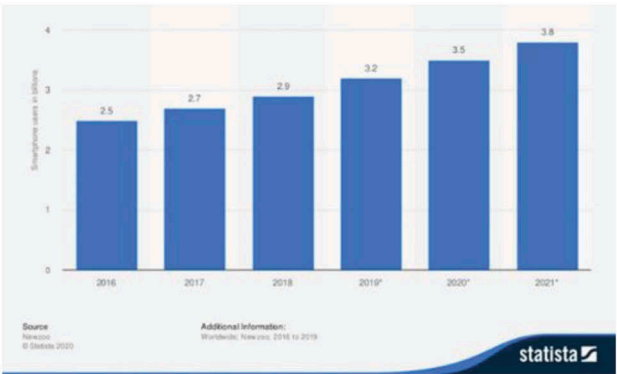
2 THEORETICAL REVIEW

Industry 4.0 accommodates technology as a means to perform a job. The Industry 4.0 concept usually comprises a range of concepts and technologies related to value organizations (Paravizo et al. 2018). A common technology today is a smartphone as a multipurpose tool in people’s day-to-day lives.

The global rate of smartphone usage keeps increasing every year. As described in Figure 1, in 2016–2019, smartphone usage increased by at least 7 billion users and it is predicted to keep increasing to 3.8 billion users in 2021. The increase in smartphone use will have both negative and positive effects on users, particularly students. Sarwar and Soomro state that “almost all walk of human life has impacted by smartphone including in educational area” (Machmud 2018).

Smartphones can be used as learning media for students and teachers. Online learning and the use of technology in higher education is muddled, especially in light of the interchangeability of terms (Heggart & Yoo 2018). Google Classroom is a way to get all students in one place and allows teachers to easily assign work and for students to turn it in (Keeler & Miller 2015).

Generally, Google Classroom operation is separated into teacher user and student user. The teacher can create a classroom and manage it as appropriate. The first step in creating a classroom in Google Classroom is, on the homepage of the application, find “+” on the upper right corner and choose the “create class” menu. The second step is checking the agreement page, then choosing “continue.” The third step is naming the classroom and subject taught by the teacher, then choosing “create.” After completing the third step, an empty classroom page will appear without any conversation or data. The fourth step is adding students into the classroom of Google Classroom by inserting the Google accounts of students who



Source: www.statista.com, n.d.

Figure 1. Number of smartphones worldwide from 2016 to 2021 (in billions).

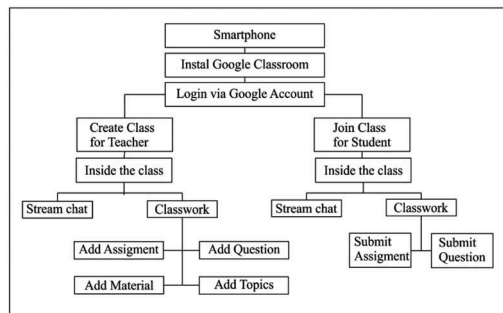


Figure 2. The pattern of application of Google Classroom.

want to join or distributing the classroom code to students. After the classroom is finished, the teacher can give materials or assignments via Google Classroom.

Meanwhile, student users of Google Classroom only have to install the application into their smartphones or open Google Classroom website. Students whose Google account that has been added into a Google Classroom classroom by the teacher can see available classrooms they've joined on the homepage. Otherwise, the student can ask for the classroom code from their teacher. Afterward, the student can insert the code by selecting "+" on the homepage of Google Classroom, then selecting "join class" and inserting the classroom code. Then, the student can stream the materials taught by the teacher and get assignments via the application. More than simply assigning work to students, Google Classroom allows you to build an assignment; include a description; and attach multiple documents, links, and videos, putting the entire lesson in one place (Keeler & Miller 2015).

The application pattern of Google Classroom in a classroom is shown in Figure 2.

3 CONTEXT AND RESEARCH METHOD

Digital-based learning should be encouraged to replace conventional learning. Considering the Industry 4.0 in which everything is performed online and in an integrated manner using a cyber-physical system, education should follow suit. The present study investigated Google Classroom by using a questionnaire distributed to 13 junior high school and high school teachers from various schools. Questionnaires were distributed to get more actual data from the respondents concerning the use of smartphones and Google Classroom in their lessons. Google Classroom that is powered by Google is free of charge. The application can be used by teachers and students, teachers as classroom admins, and students as classroom users. The application supports text chat in a class group. There can be more than one admin, i.e., teacher, in a classroom if required. The application is integrated with Google Drive cloud storage to store documents or data related to lessons. The application can be accessed via smartphone or other computer devices via a browser. The application is entirely online based, so to use it, one has to always be connected to the Internet.

4 FINDINGS AND DISCUSSION

Google Classroom is one of the learning media that was introduced in Google Apps for Education in 2014 (Shaharanee et al. 2016). In summer 2014, Google combined the power of these packages when they announced the launch of Google Classroom (classroom.google.com), a simplified learning management system for users of Google Apps for Education (Izenstark & Leahy 2015). This classroom facilitates the teacher to create and organize assignments quickly, provide feedback efficiently, and communicate with their classes with ease

(Shaharanee et al. 2016). The purpose of the application is to support the integration of technology in the teaching and learning process, which is essential to support the digital natives (Machmud 2018). Smartphone usage and availability should not become obstacles in applying Google Classroom. Smartphones to run smartphone applications will be very effective as the penetration of 15- to 19-year-old smartphone users is 91% (APJII 2018).

The data showed that about 92.3% of teacher respondents stated that most of their students had smartphones. This means that there is an opportunity for them to employ smartphones for learning purposes. It is believed that operating the applications by using smartphones would help to minimize the negative impact of smartphone usage, particularly for students. The use of smartphones for positive things like studying would increase because students would often check their Google Classroom, especially when their teachers regularly updated learning materials on the application. However, the schools' policy might be the biggest challenge. The data from the questionnaire showed that 69.2% of the respondents stated that their schools didn't allow students to bring their smartphones to school.

Banning smartphones is considered unnecessary. The study by Macmud (2018) showed that of 249 respondents only 10.84% didn't use a smartphone at all to help them in the learning process at school (Machmud 2018). It indicates that some students still use smartphones despite the ban. Therefore, the school should change its policy concerning the use of smartphones at schools. Students also should be directed to use smartphones responsibly.

Most of the respondents believed that Google Classroom could be applied to help the learning process and 81.8% of them stated that they could monitor their students' learning activities outside of school. The monitoring is possible because of an Internet connection and cyber-physical system. Teachers can use the Internet-based application as a platform to create an online classroom that can be accessed by students through their smartphone (Machmud 2018). Google Classroom is easy to use, doesn't require a fast Internet connection, and has an easy-to-understand display.

As many as 81.8% of teacher respondents stated that the interface of Google Classroom was easy to understand and 90.1% stated that it could use managing students' assignments. Managing learning materials and assignments was easy because they're integrated with Google drive cloud storage. Respondents also revealed that features in Google Classroom adequately supported learning. Lastly, even with low Internet speed, Google Classroom was still effective to use (Iftakhar 2016).

It is revealed that not all of the respondents were familiar with the application. About 46.2% of teacher respondents didn't know about Google Classroom. Moreover, 90.9% of the same respondents said that there should be more socialization on how to operate Google Classroom. One possible obstacle in applying Google Classroom was it wasn't popular among teachers. This was supported by the study by Iftakhar (2016), who proposed that promotion is required to apply Google Classroom. Teachers' professional development is a key factor in the successful integration of technology (Iftakhar 2016).

5 CONCLUSION

Smartphones and Google Classroom have the potential to be used for learning. Through Google Classroom, the teacher can manage learning materials and assignments for students; conversely, students can have a discussion, access learning materials, and send assignments to their teachers via the application. The use of Google Classroom needs a smartphone, Internet network, and cyber-physical system in its operation. Google Classroom could be applied, but teachers must actively run the application to help lessons. Hence, there should be socialization, especially to teachers, on Google Classroom, so that they could know about the application in detail and promote its use. Moreover, school support was required so that smartphone usage at school wasn't completely banned. Based on the foregoing discussion, Google Classroom could be used in classroom learning as long as the teachers control it, and schools should update the policy on

banning smartphones at school. Therefore it is necessary to provide training for teachers about the use of this application for learning purposes.

6 PREFERENCES, SYMBOLS, AND UNITS

Questionnaire of smartphone usage during the lesson:

- Smartphone ownership
- The intensity of smartphone usage
- Smartphone ownership among students
- Regulation of bringing the smartphone to school
- Smartphone usage for lessons
- Knowledge of Google Classroom

Questionnaire of Google Classroom assessment:

- Application of Google Classroom for learning
- Monitoring learning activity outside of school
- Requirement for the socialization of Google Classroom
- Adequacy of features of Google Classroom to help lessons
- Interface display of Google Classroom
- Student readiness to use Google Classroom
- Management of student assignments using Google Classroom

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Using Memrise to promote students' listening and speaking abilities

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ABSTRACT: Recently, a considerable literature has grown up around the theme of mobile-assisted language learning (MALL). It has been claimed to play an important role in enhancing students' listening and speaking skills. Memrise is one of the most widely used platforms in MALL. Several attempts have been made to use Memrise as a way of learning a foreign language that can support the learning process in a classroom. The study described in this article aimed to investigate the impact of using Memrise to promote students' speaking and listening skills. It was done by combining information from relevant journals. Finally, the article proposes suggestions for both applications and users in using Memrise to maximize the mastery of language skills.

1 INTRODUCTION

The main goal of learning a new language, whether it is as a second or a foreign language, is to be able to use it in real communication. Language without real communication is as useless as Saint Valentine's Day without lovers or Children's Day without kids (Foppoli 2019). Traditionally, a language teaching and learning process focuses on grammar and passive memorization (Kam & Wong 2004). Research has shown that knowing grammar rules does not necessarily result in good speaking or writing (The Balance Careers 2020). A student who has memorized the rules of the language may be able to succeed on a standardized language test but may not be able to speak or write correctly (Lodola 2018). However, there have been shifting perspectives on how learning a language should proceed. The main goal of language teaching is to give learners the ability to use the language effectively and correctly in communication (Davies & Pearse 2000). Among the language tools for learners are listening and speaking (Brown 1994), and therefore it is important to establish these skills to maximize students' learning.

In light of recent developments in language learning, it is becoming extremely difficult to ignore the advances of technology. Recently, researchers have shown an increased interest in the use of technology to facilitate English language learning. This dramatic change is in some ways due to several benefits that technology, especially the Internet, offers such as ease of access, unlimited time and space, and abundant learning materials available online. These benefits have also been instrumental in our understanding of the increasing number of mobile phone users in Indonesia (Statista Research Department 2019). Looking at this phenomenon, it is crucial to investigate the use of mobile phones in assisting language learning.

Among hundreds or thousands of mobile-assisted language learning applications, Memrise is one of the powerful platforms commonly used by teachers of English to facilitate their students' learning. Memrise is a language learning application that can be accessed through a computer or mobile phone. It is a company founded by Ed Cooke, a Grand Master of

Memory; Greg Detre, a neuroscientist specializing in the science of memory and forgetting; and Ben Whately, a trained psychologist.

Memrise offers official courses for the following languages: English, French, Spanish, Korean, Japanese, Chinese, Italian, German, Portuguese, Russian, Danish, Swedish, Polish, Norwegian, Turkish, Indonesian, and Arabic. Other than language learning, people can also use it to learn almost anything, such as historical dates and country capitals, just to name a few (Kent 2017). Also, it is designed to build up a long-term memory of vocabulary through systematic and frequent testing of vocabulary items without the help of a teacher. Furthermore, it stimulates listening and also speaking skills, as the users become accustomed to listening to many different accents and try to follow how the speakers pronounce words.

Besides making language learning as fun as playing games, Memrise also provides a preview, tutorial, exercises, and test in every lesson. By using this application, users are not only learning vocabulary by reading, but also pictures, audio, and video maximize the users' experience in promoting their language skills. More importantly, the users are exposed to different accents of different native speakers (age, gender, accents).

When the users first try this application, Memrise will give them options, such as what language they speak, what language they want to learn, and what topic they want to pursue. It provides specific topics such as education, career, travel, culture, and others. Therefore, it will be tailored to what the user needs, as it will be an effective and efficient way of learning.

This article discusses the use of Memrise in promoting students' listening and speaking abilities. This article will also try to provide some suggestions on its weakness, i.e., limited access in the Memrise Pro version, which requires users to pay.

2 DISCUSSION

A considerable amount of literature has been published on the importance of listening and speaking in language learning. Seferoglu and Uzakgöre (2004) claim that "listening is usually an interactive process." When communicating, one should be able to understand what the other speakers say by listening and then try to react or ask for some clarification. Learning a language is exactly the same as how children learn to communicate for the first time as they mimic their parents by listening.

Speaking, on the other hand, is communicating and expressing ideas and emotion orally. Efrizal (2012) suggested that speaking is of great significance for interaction between people where they speak English almost everywhere and every day. Teachers can encourage students to communicate using the language that they are learning. In the same vein, Richards and Rodgers (2001) state that, in traditional methods, speaking skill was ignored in the classrooms where the emphasis was on reading and writing skills. For example, in the grammar-translation method, reading and writing were the important skills and speaking and listening skills were not of great significance. According to Ur (2000), of all the four language skills of listening, speaking, reading, and writing, speaking is the most important one and is essential for effective communication. Speaking skill helps learners develop their vocabulary and grammar skills, which then eventually promote their writing skills.

In fact, teaching a language using visually stimulating texts, audios, and video features makes multimedia an effective medium for language instruction (Ayres 2002). The advance of technology has significantly improved the ability to provide quality language learning experiences to learners (Ayres 2002; Green 2005; Wang & Heffernan 2010). Green (2005) indicated that the greater interactivity of technology could have a positive effect on mastery of language skills. Green has also noted that children who have access to high-quality smartphones with features such as authentic audio, sound effects, text that highlights itself as it is read, and vocabulary instruction score much higher on standardized tests. Furthermore, it has prompted a marketable business in developing MALL applications. MALL applications are designed to appeal to visual, auditory, and kinesthetic learners through interactive protocols, which thus promotes internalization of the language. Educators have acknowledged both advantages and disadvantages of MALL applications.

As an example of MALL, Memrise can be a tool to promote students' listening and speaking abilities. Memrise uses a systematic and guided curriculum with audio, graphics, video, and speech recognition software (Heil et al. 2016). It was created to develop long-term memory of vocabulary by frequent, systematic testing of vocabulary items, and it benefits the users because of its portability and accessibility via computers and apps on smartphones or tablets (Walker 2015).

Overall, previous studies highlighted a positive association with students' performance ever since they began using Memrise to support their language learning (Walker 2015). Students are also gaining more confidence to communicate using the language they are learning. Abarghoui and Taki (2018) also stated that students' exposure to Memrise as MALL interactive software over a 6-week intervention period aided in developing a positive attitude toward MALL software application. The study indicated that when combined with direct instruction and direct exercises, Memrise was highly effective in promoting language learning skills.

In integrating Memrise with class activities, teachers have to be able to use it and to cope with the possible difficulties that might occur along the way. Using Memrise is moderately easy, as users just have to sign up, choose the language desired, and follow the instructions. As students will most likely be occupied with staring at their mobile phones when using Memrise, it will be best to use Memrise as a support activity outside the classroom but teachers should keep track of it to measure the language skills that the students are acquiring.

In addition, in its Pro version, Memrise has additional features such as speed review, difficult words, listening skills, meet the natives, grammabot & chatbot, and offline mode. Those features are supposed to be helpful and beneficial for the users. However, many Pro users (see community.memrise.com) claimed that the features were not good enough compared to the price they have paid. Grammar structures were not learned methodically and practiced. Therefore, users were expected to develop an intuitive understanding of grammar rules during the course.

3 CONCLUSION

There is evidence that Memrise plays a crucial role in promoting students' language skills such as listening and speaking. Despite the benefits that Memrise offers, students should not rely too much on it for language learning. In the same way, teachers should not neglect the responsibility to guide the students in achieving the goals of language learning, since Memrise does not provide structured grammar lessons. Still, teachers are very much needed. Memrise should only be a supporting supplement, as it enhances vocabulary, provides different accents, and increases students' confidence to encourage them to actually use the language to communicate.

In conclusion, teachers should remember that MALL, in this case Memrise, is only a medium to support learning language. The main source of knowledge is still and always be the teachers themselves. As for the students, using Memrise is a very effective way to promote their listening and speaking abilities. For the application itself, it would be better if structured grammar structured was included as well because not everyone has the time or ability to develop the understanding by themselves. It can also help the students to remember what they have already learned at school. That way, Memrise can really support the learning activity at school.

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How can teachers use social media to teach speaking skills? A literature review

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ABSTRACT: The rapid advance of social media platforms has changed the way people interact and communicate with others around the world. In some ways, this advance in technology has resulted in more and more students devoting their time to access various kinds of social media for different purposes, one of which is practicing writing and speaking in English. This article provides a literature review of how social media are widely used to enhance students' English speaking skills. Different perspectives on how these platforms are used are provided in this article. The most obvious conclusion from the literature is that social media have many advantages in enhancing students' English speaking skills. Several factors and activities of social media that influence students' speaking skills are also discussed.

1 INTRODUCTION

Evidence suggests that speaking is among the most important language skills, with an essential role in the abilities of students to express their ideas and experiences (Nazara 2011; Gan 2012; Michaels & O'Connor 2015). These skills have been considered one of the benchmarks of someone who is successful in learning a language, especially English. Pawlak et al. (2011) suggest that speaking skills are not easy things for students to master. One of the reasons is that speech ability is strongly influenced by other language subsystems that students have to master first before they can speak spontaneously and automatically. This productive skill also becomes a concern especially for students of English as a foreign language when they have fewer opportunities to practice and apply what they have learned in class outside of school. Since this skill helps students to build self-confidence and their understanding of foreign languages, teachers are expected to provide opportunities for students to practice English in an authentic situation to express their opinions, share experiences, and ask questions in an accurate and accepted manner.

Though traditionally teaching speaking has taken place in a formal classroom environment, Smith and Barber (in Correa 2015) suggested that technology can empower teachers and improve their teaching practice. Recently, with the rapid growth of information and communications technology (ICT), computers and Internet-based technology have played an important role in the teaching of English speaking skills in general. One example is the integration of speaking activities in social media, as more English teachers learned that social media can facilitate their teaching and they finally decided to incorporate emerging technologies into their daily teaching practices as learning media that can improve students' ability to communicate (Nasri et al. 2018; Namaziandost & Nasri 2019). In this article social media refers to Internet-based technology that is used to share information online to facilitate independent learning and collaboration (Evans 2014).

Recently, advances in social media have afforded the potential to be used to support the learning process well and to motivate and facilitate students' learning. They provide features

that allow students to communicate indirectly in far-off locations. They also offer a variety of interesting features to facilitate students' communication through platforms such as video conference, chats, and emoticon (Sponcil & Gitimu 2013; Othman et al. 2016). Anakulladetch (2017) suggested that the use of social media in the learning process can connect students with peers, teachers, as well as with other media that can increase broader material exposure for students. Further, social media provide opportunities for students to expand their learning environment, explore new resources, and apply them as tools to facilitate the learning community by encouraging collaboration and communication.

Combining online social networking in the learning process can create a different learning environment for students and provide them with an opportunity to discuss topics with each other directly or indirectly. Students with low participation in traditional face-to-face discussions may find it more comfortable to express themselves and share their thoughts indirectly (McBrien et al. 2009; Martin & Parker 2014; Hsieh & Tseng 2017). They are expected to show interest in becoming active when learning to use social media. Students can discuss the same content, build conversations, and exchange ideas in online study groups. Specifically, they can build their learning through comments given by peers and teachers who can encourage them to learn better. Incorporating the use of social media effectively by maintaining integrity and good standards can have a positive effect on student involvement to improve students' speaking skills.

2 CONCEPT OF SOCIAL MEDIA AS AN ONLINE LEARNING PLATFORM MEDIA

In recent years, there has been an increasing amount of literature highlighting the flexibility that online learning provides for students to choose materials and media that suit their own needs (Song & Hill 2007). Online learning features with facilities available anytime and anywhere provide students the ability to plan their activities at the time and place that is most comfortable for them. In learning that integrates social media, students have flexibility to choose the most comfortable way of learning to participate. Unlike in traditional classes where there are limited time, place, and schedule of activities arranged for classes that require the physical presence of students and students as a group to follow the same schedule, online learning provides students much control in creating their own learning space and decide their own pace and sequence of learning (Jaggars 2011; Bergmann & Sams 2012; Chen et al. 2014).

Rodrigues and Vethamani (2015) pointed out that learning using online methods fulfills several concepts to facilitate the learning process, that is, learning anytime and anywhere. This concept allows students to be able to participate fully or not in an online learning environment with the aim of creating an independent learning approach. Communication mediated online through social media provides the possibility for students to communicate with peers, teachers, or experts, which can improve their listening and speaking skills. In addition, online speaking communication enables shy students to express themselves more freely because students experience less pressure compared to the learning process in the classroom. Egbert (in Rodrigues & Vethami 2015) showed that online communication provides opportunities for students to communicate verbally with others in a conducive and effective environment for learning. Conducive learning conditions provide students the confidence to express themselves to teachers, peers, or native speakers of English.

Modern technology offers powerful learning and teaching tools that demand new skills and understanding from both students and teachers. It can produce better results of teaching effectiveness compared to traditional teaching methods. The Internet has created a new context of effective teaching through collaboration-based teaching that promotes classroom interaction, thereby increasing opportunities for students to offer authentic English use and to create a student-centered learning environment (Mustafa 2018). Many social networks and facilities such as Facebook, YouTube, and many others are now used for various purposes. Of course the tools are also used by teachers as a platform for teacher-student communication and students inside and outside the classroom. They live in a digital era. These tools and many others are means to improve oral communication skills in English in particular.

This article provides an overview of the concept of social media as a learning medium and its advantages as a modern technology to improve student' speaking skills. This topic was raised because of the emergence of the need to use modern technology in improving the education system. The concept of social media, which as a flexible technology that is easily accessed anytime and anywhere, provides opportunities in the world of education to be utilized as a learning medium in the learning process. There are traces of previous research that show social media can help improve students' speaking abilities and increase student confidence and student involvement in the learning process. Finally, the authors offer social media applications that can be used in the English learning process

3 BENEFITS OF SOCIAL MEDIA FOR SPEAKING SKILLS

Bakar et al. (2013) stated that there are several benefits of implementing social media in improving students' speaking skills. Integrating online media allows students to correct their pronunciation, practice speaking, learn independently, be aware of good English when speaking, and to be able to practice and self-correct. Social media can provide space for students with low skills to practice their speaking skills in second and foreign languages. Utilizing social media as a learning medium can help students improve their proficiency in speaking skills, increase their self-confidence in learning with fun and accessible lessons, and improve their learning engagement (Correa 2015; Rodrigues & Vethamami 2015; Maulida 2017; Mustafa 2018). The site of the learning environment is operated and controlled by the students themselves. Hence, there will be more space for the students to improve their English communication skills.

Students are provided the opportunity to learn independently to be able to foster and encourage the desire and awareness to learn. Thus, they will be able to develop independent or collaborative learning utilizing problem-solving skills. Furthermore, when EFL students with low skills are provided the opportunity to use language in a more flexible learning environment, they will gradually overcome their fears, thus, increasing their confidence in speaking English. Students are given enough time to think and practice what must be said without pressure from the teacher or their peers. If the practice of speaking is continuous, learning will take place more quickly. Furthermore, when students with low abilities are given more time to build and develop their ideas or thoughts, they can develop and express more complex perspectives on specific topics rather than discussing them directly.

Students have the opportunity to learn through material or discussion indirectly by utilizing online social media and adjusting the massing ability of each individual to channel ideas or respond to the provided learning (Bakar et al. 2013). Another benefit of integrating social media in language learning is that it helps increase one's motivation and understanding of a particular language culture. Ridrigues and Vethamami (2015) claimed that through social media, students also have the opportunity to communicate directly with native English speakers who can help improve students' speaking skills.

4 APPLICATION OF SOCIAL MEDIA IN THE LEARNING PROCESS

4.1 *YouTube*

YouTube is one of the largest social media platforms in the world with a high number of visitors. YouTube is a social networking media that facilitates the distribution of videos. Many types of channels can be found, including those for the advancement of education. This application has been widely used by people around the world to share educational videos by teachers, students, and experts around the world. YouTube also has a special site for videos related to education, YouTube EDU, which can add insights and help develop verbal communication skills.

Mustafa (2018) noted that there is evidence in education that YouTube has been used for the following purposes:

- Using videos as resources
- Using videos as visual aids to help students to improve their oral communication skill
- Using class videos to provide flexible learning
- Producing videos for projects (e.g., vlogging)

Vlogging, or video blogging, is production of a video to share in a YouTube application. It can be used by the teacher to enhance students' communication in the class through group projects. Students will divide into groups to plan their own topics for the video project.

According to Maulidah (2017) there are several recommended steps in vlogging activities that students have to follow to make sure their vlog is wellprepared before it is uploaded to YouTube:

- **Conceptualizing.** This stage allows students to plan the topic of their vlog. Students can prepare what to say and how to say it by making a note. By conceptualizing the topic students would like to raise in their video, they can prepare the material well to explain it in their video. These activities help students to be more active and creative in preparing the materials in a team.
- **Brainstorming.** Students must describe the main ideas and supporters. In the process of brainstorming, students will write back if in the designed text, an error occurred. Students record, then check again until the process is considered good enough. During this process, students will work independently, under the supervision of the teacher as facilitator.
- **Articulation.** In this stage students should practice before recording to check that the sound quality is clear enough to be uploaded. Students can check their pronunciation, fluency, and grammar. Students can also consult with the teacher if they find difficulties during the articulation check process.
- **Monitoring.** Students and teacher monitor the vlog entries in terms of content, organization, and language use.
- **Evaluating.** The teacher will evaluate the vlog content, organization, and language use of students before the vlog is uploaded in YouTube.

4.2 *Skype and WhatsApp*

Skype™ and WhatsApp are free computer and mobile applications that can be used to make telephone calls over the Internet, to make conference calls and video calls, to chat, and to transfer files (Sheppard 2015; Mustafa 2018). These applications helps greatly in improving students' speaking skills with direct communication either through voice calls or video calls that can be made by students outside school hours. Students can take advantage of this application to communicate well with peers, teachers, and native speakers of foreign languages. As explained by Chen and Cordier (in Mustafa, 2018), Skype offers one of the most popular voice and video call platforms to communicate with foreign language speakers, and students can connect with and call each other anytime and anywhere. With Skype, students can call the contacts and talk to someone from any country, using a headset and microphone connected to one's computer or smartphone. The other application used to communicate via chat or video call that is popular in Indonesia today is WhatsApp. WhatsApp is similar Skype, where users can chat and make video calls to anyone, both in Indonesia and abroad, as long as they have the contact information of the person. This application can also be used either via a smartphone or computer.

Through Skype and WhatsApp, students can also make voice calls and video conferences with peers to discuss the lessons they were assigned in the school. They can also be means for students to make it easier to do assignments or projects without having to meet in person.

Social media platforms, in particular Skype, WhatsApp, and YouTube have the capacity to improve students' English speaking skills. Moreover, social media network learning can

facilitate oral communication skill and encourage oral discussion. Furthermore, learning to speak by utilizing networking can be an alternative medium that can inspire students and is effective in teaching English as a foreign language.

5 CONCLUSION

Social media have an important role in improving students' communication skills through providing a fun and enjoyable learning process. They also enable students to train and practice speaking by providing opportunities to learn and use the language in an authentic situation. Furthermore, they allow students to get a chance to build up flexibility in study and offer autonomous learning, which in turn motivates students to improve their speaking skills.

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Students can begin by reading some kinds of creative writing, as reading can add insight. Wattpad can be used as a medium because it provides writing features and various types of creative writing used for reference. Some researchers also state that the use of Wattpad has a positive effect on students' writing skills. For example, Isti Rokha (2019), showed that using Wattpad aimed to improve recount text writing skills. This clearly shows that Wattpad can be used as a medium to help the students improve their writing skills.

Rokha focused only on how to improve students' writing skills through recount text on Wattpad. She did not mention how reading stories could also improve students' critical thinking skills. Therefore, in this article, the authors will discuss how reading skills can affect thinking processes because the more we read the more we acquire a wide knowledge and become more critical in our thinking. Critical thinking is needed for critical writing. In short, on the basis of this article, students are expected to be able to use Wattpad as media to improve their writing and critical thinking skills.

2 WHAT IS CREATIVE WRITING?

Creative writing is the process of conveying our ideas, opinions, and feelings indirectly in written language. In contrast with academic writing that is based on research and compiled systematically, creative writing is usually based on the writer's imagination, thoughts, and feelings. Nettle (2009) defines creative writing as fictional narratives or representations. Meanwhile, Cook (2000) states that creative writing fosters "playfulness," which encourages learners to use language creatively, explore language, and discover things about themselves based on language. In addition, according to Harmer (2004), creative writing tasks encourage both L1 and L2 students.

Creative writing requires creativity and imagination. Creativity means the ability to come up with new ideas that are surprising yet intelligible, and also valuable in some way (Boden 2001, p. 95). IT has the power to create imaginative, original literary compositions (Ramet 2007).

According to Morley (2007), the following are needed to be able to write creatively: (1) Open space (wide open insight); it means that the writer can get ideas to write anywhere without restriction. (2) Learning to write; promoted through approaches, feelings, and efforts to learn writing skills continuously on an ongoing basis accompanied by the consequences. (3) Creative writing on time; it means disciplinary writing by a predetermined time. (4) The school of wildness; that is related to the theoretical approach acquired while studying in the school or college. (5) Reading and the individual writer; it means understanding that writing is a necessity not only for themselves but also for others.

3 CRITICAL READING LEADS TO CRITICAL THINKING AND CRITICAL WRITING

Critical reading means reacting critically to what is being read. It helps the reader to figure out the writer's purpose and to stimulate the reader's mind to think critically. Thus, when students start writing, they can write critically, even though it is only imaginative writing.

Critical thinking is defined differently from various perspectives. It means thinking logically about what to do and what to believe. As one of the most commonly accepted and widely quoted definitions states, critical thinking refers to the ability of individuals to take charge of their thinking and develop appropriate criteria and standards for analyzing their thinking (Elder & Paul 1994). Paul (1990, p. 9), for instance, considers critical thinking as a disciplined, self-directed thinking that exemplifies the perfections of thinking that is appropriate to a particular mode or domain of thought, while Sternberg (1987, p. 3) regards critical thinking as the mental processes, strategies, and representations people use to solve problems, make decisions, and learn new concepts.

According to Paul and Elder (1999), critical thinking is composed of three dimensions: the elements of thought (reasoning), the intellectual standards, and the intellectual traits. Paul and Elder suggest that people need to master two essential dimensions of thinking (elements of thinking and intellectual standards) to learn how to upgrade their thinking. Specifically, people need to be able to identify the “parts” (elements) of their thinking, and they need to be able to assess their use of these parts of thinking using intellectual standards. Gradually, the intellectual traits can be developed.

4 SOCIAL MEDIA AND SOCIAL MEDIA-BASED LEARNING

Social media is a form of electronic communication in which people create virtual communities to share information, ideas, personal messages, etc. at the same time, whenever and wherever around the world.

Kaplan and Haenlein (2010) explain that social media is a group of Internet-based applications that are built on ideological and technological foundations of Web 2.0 and that allow the creation and exchange of user-generated content. Every individual above 13 years of age will have his or her account on some popular social media networks. In other words, most students in the world might have social media. Social media allows students to connect and collaborate beyond the physical classroom. It means that students can start to experience the globally connected world.

Social media-based learning is a method that uses social media as a medium in the teaching-learning process. In this setting, social media might afford multiple opportunities to improve learning methods and promote self-directed learning. If reinforced in a classroom setting, these social media skills can be guided and refined to produce better learning outcomes and critical awareness. Social media also allows students more freedom to connect and collaborate beyond the physical classroom, which means the students can start to experience global connections anywhere. Ferdig (2007) suggests that social networking promotes interaction between learners and potentially improves active learning in a student-centered constructivists’ environment. Meanwhile, Conole and Alevizou (2010) state that Twitter, blogs, and other Web 2.0 technologies are catalysts of scholarly practice and the sharing of designs and good practice. This enables students to participate in a distributed network of educators and researchers and to co-create knowledge and develop a skill in critiquing content (Conole & Alevizou 2010).

4.1 Wattpad

One of the various types of social media is Wattpad, founded in 2006 by Allen Lau and Ivan Yuen in Toronto, Canada. Wattpad provides thousands of books from various genres written by famous writers, professionals, and even amateur writers. Reid (2016) states that Wattpad is an application developed for online reading and writing.

Nowadays, Wattpad claims that they have more than 80 million users, and it provides books in more than 50 languages. Nevertheless, most of the content in Wattpad is written in English. Furthermore, they also claimed that in 2016, there were 45 million people in a month who accessed Wattpad. In addition, Wattpad had more than 300 million stories that could easily be read through computers, handphones, and tablets but most of the users access the application by smartphone whenever and wherever.

Like social media in general, Wattpad allows the user to interact with other users by exchanging comments. In other words, Wattpad can also be referred to as social media for writers. Thus, users can add friends and build friendship networking, so they can share anything related to the stories written or read by users around the world.

Wattpad has various features, such as Home, Library, Create a Story, Notification, and Profile. The home panel consists of two main menus, Browse (which contains a list of the genre of stories) and Recommended (it usually contains collections of popular stories). The Library menu contains three features: Current read, Archive, and Reading list. When we put stories in the Library menu, we can read them even when we are offline. The Create a Story menu is a place to write a work

and publish it, and thus it can be read by other users. The Notification panel consists of three features: News Feed (usually contains updates from friends such as new story recommendations, interesting stories, and others), Notification (contains lists of notifications that are more personal or related to our story, readings, or writing posted), and Message (which has a function similar to that of message in handphone or Inbox in Facebook, in which you can exchange messages with contacts on Wattpad). Profile has 2 menus, About (which contains personal data) and Conversation (which is similar to Wall on Facebook).

There are other features, such as Vote (as a form of appreciation for the stories), Comment (to give input, critiques, advice, or suggestions about the story to the author), Share (to share the stories through other applications, such as Facebook, WhatsApp, Twitter, etc), Invite friend (to invite friends who have similar interest in trying to use Wattpad), and Community (contains various communities of reading and writing to join).

5 USING WATTPAD TO IMPROVE STUDENTS' CREATIVE WRITING AND CRITICAL THINKING SKILLS

Nowadays, the use of Wattpad is popular among young people. Wattpad can attract students' interest in reading through online media. As mentioned before, Wattpad is a form of social media for those who have an interest in reading and writing. By using Wattpad, people can read and write anytime and anywhere they want, and it is more flexible than carrying a physical book to read. Therefore, the use of Wattpad has become an interesting phenomenon that has changed reading and writing habits.

By comparing with the previous research, there are some ways to improve writing and critical thinking skills for students through Wattpad, starting with reading, because reading and writing are interrelated. As mentioned previously, the more students read the more knowledge they gain, find new information that they did not know before. In addition, reading can stimulate the imagination and motivate students to write their own stories. Since most of the stories in Wattpad are fiction, it can be an alternative or a reference for creative writing.

Students should be strongly advised to write continuously, with the teacher giving feedback and assessments of their writing. An effective strategy for extending students' conceptual understanding and improving their writing skills is to provide multiple opportunities for them to receive feedback. Hattie (1992) concludes that the most powerful single modification that enhances achievement is feedback. Teachers often believe that giving feedback to students in terms of specific levels of knowledge and skill is better than simply giving students a percentage score (Marzano 2001).

In Wattpad, the students can get feedback from all users. They can ask other users to offer some comments, suggestions, or even criticism to make their writing better. Like social media in general, Wattpad offers a free digital environment, feedback, and an experimental environment for new and even experienced writers (Ramdarshan 2018). It means that through Wattpad, users not only read and write, but they also interact with other users to get and share information or new knowledge related to the stories written. They can also build friendships and create their own communities of writers and readers.

Reading can also develop students' critical thinking skills. Critical thinking will lead to critical writing, which focuses on how to present an effective argument. It is a process that involves using a range of writing skills as well as personal qualities. For most students, learning to write and becoming a competent writer requires deliberate instruction (Raban & Scull 2013), which typically occurs in school. Today, many students are interacting in social cyber networks and using multimedia and digital tools to communicate in their daily lives—particularly those students from higher socio economic classes (Coiro et al. 2008)—and their school writing experiences are often quite different. Therefore, social media as a medium in the learning process might be effective in improving students' writing skills as long as it is used wisely.

6 CONCLUSION

Based on the foregoing explanation, it can be concluded that Wattpad is a social media application that provides various stories from different genres. Since most of the stories in Wattpad are fiction, can be used as a reference in creative, usually imaginative, writing. In addition, as with social media in general, Wattpad users can interact directly with other users to share knowledge or information related to their work by exchanging comments with each other.

Furthermore, reading can also stimulate the mind to think critically, which can lead to enhanced critical writing skills. As students are expected to be able to write critically, their writing skills can thereby improve automatically.

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ICT-based teaching resources for education: Implementation of TPACK in ELT in Indonesia

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ABSTRACT: There are many information and communication technology (ICT) resources that can support English learning but most of them have not been utilized in classrooms, and some teachers have problems employing the technology in their classrooms. The TPACK framework provides insight for English teachers to optimize three aspects for education: technology, pedagogy, and content knowledge. This article reviews the implementation of the TPACK in Indonesia, especially in ELT. The knowledge and skills of technology, pedagogy, and content should be possessed and mastered by EFL teachers if they plan to incorporate ICT resources and use them relevant to the conditions in Indonesia. One of the ways to introduce the framework is by conducting courses or workshops to allow teachers to have competencies to integrate TPACK component and enhance classroom teaching and learning activities.

1 INTRODUCTION

Technology continues to grow in importance as a tool to help teachers facilitate their students in language learning. Especially in Industry 4.0, there are so many information and communication technology (ICT) resources that can support learning, such as computers, software, cameras, and a range of ICT devices that can all make teaching more effective and more fun for the pupils. The use of technology or ICT devices in education requires knowledge and understanding of English teachers in ELT. The fact is that most of the technology is not utilized in classrooms because some teachers have a problem with its use.

There are some reasons for the problems. Teachers only know the technology, but they do not know how to implement it into the teaching and learning process (Koehler & Mishra 2006). The other reasons are inadequate facility support and limited time. The use of technology in teaching in the classroom should be emphasized (Koehler & Mishra 2006, 2009).

This article provides an overview of ICT resources for education and combines it with the implementation of the TPACK framework in classroom teaching, followed by a review about how to integrate that framework into ELT with the example of its activity. Finally, the framework was integrated with the understanding of teachers' knowledge, and the course or workshop as a way to make teachers understand the TPACK framework. Besides holding courses and workshops as the implementation of TPACK, comparison with the education situation in Indonesia is also needed because it still has problems in some aspects.

2 ICT EDUCATIONAL RESOURCES FOR INFORMATION, COLLABORATION, AND LEARNING

ICT educational resources can be analyzed based on their use for information, collaboration, and learning (González 2011).

2.1 *ICT information resources*

ICT information resources are ICT that offers basic to high-level additional information and offer the availability of data sources and access to web resources directly, for example Web 2.0 tools (e.g., social bookmarks, YouTube, and Slideshare), online databases, and visual search engines based on Web 3.0.

2.2 *ICT collaboration resources*

ICT collaboration resources offer users and professional networks the opportunity to participate and co-create in the resources. ICT collaboration resources help them to be more creative in using ICT in the context of collaborative learning. Some collaborative ICT resources are mailing lists, collaborative Web 2.0 tools such as wikis and blogs, and collaborative group and webinars.

2.3 *ICT learning resources*

ICT learning resources offer content and activities in various forms of work, and also offer the possibility of acquiring knowledge, attitudes, and procedures during the teaching process. In learning resources, integrated design is an important part of the instructional process. Some ICT learning resources are interactive tutorials, repositories of educational resources, Web 2.0 tools (e.g., eBooks, podcasts), online quizzes and questionnaires, and open online courses.

3 TPACK FRAMEWORK

The TPACK framework is a model that represents a full understanding about how to integrate technology in the classroom, and how to operate several ICTs in both software or hardware, or ICT resources, as mentioned earlier. In Figure 1, this framework focuses on the three main components of teachers' knowledge: content, pedagogy, and technology. Content knowledge (CK) is knowledge about the subject matter, such as theory, concept, and organizational framework, which in this context, is knowledge about English subjects. Pedagogical knowledge (PK) is knowledge about students' learning, instructional methods, different educational theories, and learning assessment to teach a subject matter without references toward content, for example, knowledge about how to use problem-based learning (PBL) or content-based instruction (CBI) in teaching. Technological knowledge (TK) is knowledge about how to use ICT, both hardware and software, for example, knowledge about how to use Web 2.0 tools (e.g., Wiki, blogs, etc.).

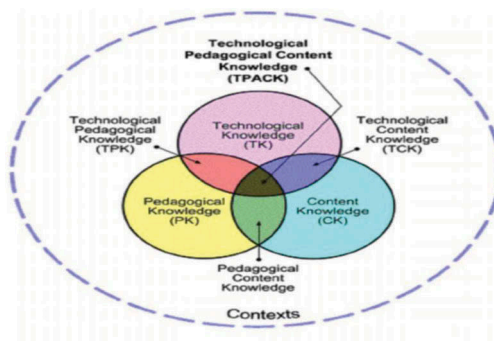


Figure 1. The TPACK framework (Koehler and Mishra 2009).

4 INTEGRATING TPACK IN ELT IN CLASSROOM

The following are examples of the instructional decisions: (a) objective: students will be able to compare and explain the narrative text and recount text; (b) method: presentation; (c) activity type: comparing, creating, and discussion; (d) assessment: students present in front of the class and upload their creating; (e) tools and resources: students can use some ICT resources to support their creativity as explained in instructional activities in the next paragraph.

The diagram illustrates the interconnectedness of various factors in language education. At the center is a large circle divided into four quadrants by two perpendicular arrows forming a cross. The top quadrant is labeled 'TK' (Use of standard and new technology). The bottom quadrant is labeled 'PK' (TEFL methodologies, Classroom management, Curriculum and instruction; Assessment). The left quadrant is labeled 'CK' (SLA Theories; Linguistics; Language proficiency skills; Cross-cultural understanding; Learning theories; Professionalism). The right quadrant is labeled 'PCK' (TPACK). Surrounding this central circle are five rectangular boxes: 'Design' (top-left), 'Ethics' (bottom-left), 'Proficiency' (bottom-right), 'Exertion' (top-right), and 'TCK' (top-center). Arrows connect these outer boxes to the central circle and to each other, indicating a dynamic system.

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5 TPACK TRAINING AND WORKSHOP

One of the ways to make the teachers understand the TPACK framework is by conducting courses or workshops. Research on TPACK training in the field of English learning in Indonesia has not been conducted to any great extent, so the implementation of TPACK has not yet been maximized. However, with various kinds of problems that are still felt by teachers, various studies on TPACK workshops has shown an increase in teachers' knowledge and perceptions, for example, the research of Tai (2013), Ersanli (2016), Cahyono et al. (2016), and Doering et al. (2009). In research by Ersanli (2016), pre-service teachers before training could mention 23 types of software and applications with some functions of the applications, and after training, the teachers were able to mention at least 46 types of software and applications and all their functions.

Another example is research conducted by Cahyono (2016), who showed that the teachers responded positively to the introduction of the new instructional design. They knew that these new activities were beneficial and could enhance their knowledge and ability in materials and methodology. They also realized that they needed knowledge and the ability to use the recent trend of technology in their teaching practice. Doering et al. (2009) reported that the development of TPACK provided an opportunity for teachers' professional development.

Implementation of TPACK starts from the content knowledge, which means having the ability to provide teaching and learning activity that fills the demand of curriculum and the design of appropriate instruction. If EFL teachers' content knowledge is already sufficient, then the concerns are to ensure that the content is delivered using appropriate pedagogy and technology. Cahyono et al. (2016) suggested a model for developing teachers' TPACK through courses.

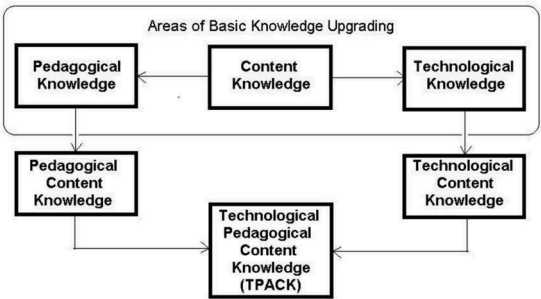


Figure 3. A model for developing teachers' TPACK through courses.

6 CONDITION OF EDUCATIONAL ON IMPLEMENTATION OF TPACK IN INDONESIA

The use of ICT tools has not been well implemented in Indonesia. In applying technology in learning, teachers still focus only on technology, even though understanding content and pedagogy must be the basis for applying technology. Therefore, in the five basic instructional decisions by Harris and Hofer, the selection of tools becomes the final step after understanding and selecting learning goals, practical pedagogical decisions, activity types, and assessment and selecting tools and resources. Content knowledge in the TPACK framework is a basic element that must be possessed by teachers according to their scientific discipline. The average score of the teacher competency test, which is quite low in some areas in Indonesia, illustrates a quite alarming condition of education. Based on teacher competency test data from Regional Education Balance, the Ministry of Education and Culture, from 2015 to 2019, the

average score of the teacher competency test was still below 70, from the maximum score of 100. In Sumatra, Kalimantan, and Sulawesi dan Papua, the average score was still below 60; only in Java was the average score below 70.

Additionally, there are many (certified) professional teachers who are actually mismatched with the subject they teach, for example, a teacher with a biology degree who teaches the Indonesian language, a teacher with an agriculture degree who teaches physics, and so on. This situation needs to be handled seriously by the government.

Not only content knowledge but also the technology, such as the facilities, needs to be considered. The technological tools in Indonesia are only complements and not involved in the learning process. For example, there are still many schools, not to mention schools in remote areas, whose laboratories are used only at certain times such as during national examinations. Laboratories are not used in the learning process to help students. There are also regulations in schools about the use of mobile phones.

Indeed, the implementation of TPACK courses can improve the knowledge and ability of teachers, but in their application, given education in Indonesia still needs to be improved, there are aspects that must be considered by several parties, that is, human resources, curriculum, hardware, software, funds, and facilities.

Another aspect that must be added in TPACK is a requirement for the teacher to have a good personality. Delinquency, promiscuity, and criminal cases committed by students have increased significantly. Moreover, the 2013 curriculum (K13) articulated a strong mandate to shape the attitudes and character of students to become noble human beings. Based on the Standard of Teacher's Academic Qualification and Competence, in developing learning materials as stated in the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 16 of 2007, one of the competencies required of teachers is personality (Wulandari 2019).

Additional aspects of personality in the framework of TPACK (technological, pedagogical, content knowledge), which eventually became TPACK-P (personality), is a systematic and integrated effort to educate future teachers.

7 CONCLUSION

In the current era of the 4.0 industrial revolution, information and instructional technologies have been developing rapidly, including those used in English language teaching and learning. For example, new applications and software are easily found in paid or free packages. However, many teachers have not been able to integrate these into teaching and the learning process. They still face several problems, such as lack of background knowledge about the content, pedagogical potential, and technology, as well as skills in how to integrate those three elements. They may understand technology, but do not know how to integrate it into their practice so that the teachers' technological framework is still not well exploited in Indonesia. Moreover, the condition of education in Indonesia still needs to be improved in terms of facilities and connectivity. TPACK can be introduced to teachers through relevant professional development such as courses and workshops. Such supportive activities may provide teachers with a positive perception about relevant and appropriate technologies to be applied in teaching-learning activities to facilitate learners in language mastery. Thus, integrating knowledge and skills in technology, content language, and pedagogy accordingly may help teachers to make the right decisions to support their practice effectively. However, such knowledge and skills must be accompanied by improvement of education quality, such as improvement of curriculum understanding and educational facilities.

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Effectiveness of Android-based and computer-based learning media to enhance children's cooking skills

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ABSTRACT: This article analyzes the effectiveness of Android-based and computer-based learning media to enhance the cooking skills of 5- to 6-year-old students. The research used a quasi-experimental (before–after) approach and two-group pretest–posttest design and employed qualitative analysis for qualitative data and quantitative inference (*t*-test) for quantitative data. The result of a paired sample test generated $p = 0.000 > \alpha (0.05)$, signifying that H_0 is rejected and H_1 is accepted. This is to say, a significant difference in the average score of 5- to 6-year-old children's cooking skills resulted from Android-based and computer-based learning media. In value range and criteria, the implementation of Android-based media resulted in a 3.6 average score, while the implementation of computer-based learning media resulted in a 3.4 average score. Both were categorized into “Very Well Developed” criteria. Therefore, the implementation of Android-based or computer-based learning media is similarly effective to improve children's cooking skills.

1 INTRODUCTION

Early childhood is the period during which children spend much time playing, as they consider it an entertaining activity. According to Beichler and Snowman (in Yulianti 2010, p. 7), early childhood is categorized as the period between 3 and 6 years old. Essentially, the period of early childhood (Augusta 2012) is unique in nature and an individual undergoes growth and development in specific aspects, i.e., physical, cognitive, socio-emotional, creative, language, and communication aspects. Within this period, children's health and nutrition are essential to support subsequent cognitive development, as what the child eats can affect the pattern of growth, body size, and immune system. Provision of adequate nutrition is considered one of the main concerns in terms of providing optimal growth and development for a child (Waluyo 2010).

A daily breakfast routine is one of the efforts to maintain a child's health. According to Bellock and Breslow in Santoso (2004, p 18), some parents do not want to be bothered in preparing a homemade meal for children, leaving the children with an instant and less nutritious breakfast. Solving these problems requires appropriate methods so that the children can also

participate in preparing healthy food. This study aimed to provide a fun cooking activity for children as well as to educate them on cooking of nutritious food. Fun cooking refers to the activity that intends to provide information to the children about cooking skills, food ingredients, proportions, and color, as well as to train their gross motor skills by introducing names of objects in the kitchen. The implementation of fun cooking can improve the children's skills in creating simple dishes from available food ingredients.

In applying the concept of fun cooking into a game, for example, one should take into account the children's age and other factors in order to provide the right stimulus and positive impact on children's growth and development. Some games possess content and elements that are dangerous and harmful to children. Some of them are even disguised as the children's favorite characters. Hence, it is important to be strictly selective in choosing games for children that will provide only positive results. According to Costikyan (2004 in Martono 2015), games are an interactive form of art in which players are required to make decisions in managing their resources or objects in the game to achieve goals. The implementation of games in learning activity emphasizes the achievements of the players (Crawford 2003 in Martono 2015). To support that theory, Islam et al. (2014) provide a sample of multimedia learning on orbit and planetary material that can increase children's motivation and enthusiasm for learning.

Games are often stigmatized as having a negative influence on children. Essentially, however, games have various positive functions for children, e.g., providing information on computer technology; training children to follow directions and rules, solve problems, and develop logic as well as their motor and spatial skills; building parent-child communication; and providing entertainment. In fact, for certain patients, gameplay can be used as a healing therapy (Samuel 2010). The implementation of games in early childhood learning subjects, such as reading, writing, and arithmetic, or commonly acronymized locally as *Calistung*, can increase 3- to 8-year-old children's motivation in learning by 78.33%, signifying a remarkable result (Irsa et al. 2015). Implementation of a 3D animation video titled "Healthy and Balanced Food and Beverage" as learning media for on cooking activities is proven to increase the knowledge and skills of children aged 5–6 years up to "Capable" criteria (Nur Riska et al. 2017). Assessment feasibility of an operational field test on kindergarten students' result generated 95% or "Eligible" criteria. The use of the Android-based educational game "Let's Cook Together" has increased the effectiveness of early childhood cognitive procedures by 88.4%, falling into "High Product Effectiveness" criteria (Annis et al. 2018).

Based on the previous description, the present study compares the effectiveness of Android-based and computer-based learning media to increase the cooking skill of students aged 5–6 years. In the present digital era, Android-based and computer-based games are proven to enhance children's creativity and skill in cooking. Supported by the rapid development in IT, the implementation of digital games can be used as learning media in early childhood, with content that is informative but still enjoyable.

2 RESEARCH METHODOLOGY

2.1 Method

The research was a quasi-experimental study, i.e., research that can be conducted with or without a control group (Notoatmodjo 2012). The research used two-group pretest–posttest designs to identify any improvements from the initial observation and pretest up to the end of research duration. The present study employed a control group in applying image and recipe-based learning media. The population in this study were kindergarten students in Tangerang, East Jakarta, and Bogor. The research samples, i.e., students in RA Amanah Kindergarten in Tangerang, Kreativa Tanah Sareal Kindergarten in Bogor, An-Nashihin Kindergarten in Bogor, and Al Azhar Kindergarten in East Jakarta, were selected by a random sampling technique.

2.2 Research instrument

This research used an observation sheet to measure cooking skill levels. Instrument aspects consisted of (1) method measurement: questionnaire, (2) instrument measurement: questionnaire, (3) result measurement: respondents' skill score, and (4) score 4, 3, 2, 1 for positive value and 1, 2, 3, 4 for negative value.

Table 1. Score and criteria of measuring skills.

Value range	Criteria	
3.4–4	BSB	= Very Well Developed (<i>Berkembang Sangat Baik</i>)
2.6–3.3	BSH	= Developed as Expected (<i>Berkembang Sesuai Harapan</i>)
1.8–2.5	MB	= Developed Initially (<i>Mulai Berkembang</i>)
1–1.7	BB	= Not Developed Yet (<i>Belum Berkembang</i>)

Prior to the sample test, the instrument was tested on 10 children aged 5–6 years to measure the validity of the pretest and posttest items. Instrument reliability was carried out by internal reliability with the Cronbach alpha formula and SPSS 16 software. The reliability test results on the knowledge instrument obtained $r = 0.82$, indicating a high category of correlation coefficient in the range of 0.800–1.000 (Arikunto 2010).

2.3 Data analysis technique

2.3.1 Analysis of influence of media implementation

The data normality test was measured with the Kolmogorov–Smirnov statistical test. The results indicated that data were normally distributed so that measurement could be carried out further by a paired sample test statistic to determine a 95% confidence; if the p -value in the treatment group reaches <0.05 , the implementation of computer-based learning media in fun cooking activities is considered significant to improve the students' cooking skills.

2.3.2 Measuring improvement and effectiveness of media implementation

Table 2 displays guidelines for product effectiveness criteria.

Table 2. Guidelines for product effectiveness criteria.

No.	Interval	Criteria
1	76%–100%	High product effectiveness
2	25%–50%	Medium product effectiveness
3	50%–75%	Low product effectiveness

Source: Arikunto (2010, p. 28).

2.3.3 Comparative analysis

Within this phase, the study employed the Liliefors normality test and F formula homogeneity test. If $F_{\text{count}} \leq F_{\text{table}}$, or, H_0 is accepted, it signifies that the data are homogeneous. If $F_{\text{count}} \geq F_{\text{table}}$, or, H_0 is rejected, it means that the data are not homogeneous (Sudjana 2005, p. 250). Further, a test was employed for two average differences prior to applying a one-tailed right-sided t -test. The hypothesis was tested by comparing the experimental and control classes using a one-party test or correlated sample t -test (Sugiyono 2007, p. 119).

3 RESULTS

3.1 Comparison of effectiveness of Android-based and computer-based learning media in 5- to 6-year-old students' cooking skills

Table 3 illustrates a comparison between Android-based and computer-based learning media toward students' cooking skills.

The paired sample test result of Android-based learning media generates a $p = 0.001 < \alpha$ (0.05). Therefore, there is a significant influence of the media on the students' cooking skills. In addition, the influence analysis result of computer-based obtained sig. value of 0.000, or < 0.05 , signifying that H_0 is rejected and H_1 is accepted. Therefore, there is a significant influence of computer-based media on students' cooking skills.

The quasi-experimental result indicates that the image-based learning media (control) generated 43.6%, categorized as "Low Product Effectiveness," while the Android-based learning media (experiment) resulted in 88.4% or "High Product Effectiveness" criteria. In brief, the use of Android-based learning media is proven to enhance the students' cooking skills. Moreover, the incorporation of computer-based learning media resulted in 85%, or "High Product Effectiveness" criteria, while the image and recipe-based learning media only resulted in 58%, or "Low Product Effectiveness" criteria. The numbers signify that computer-based learning media is more effective than image and recipe-based learning media to enhance students' cooking skills.

Table 3. Influence and effectiveness analysis result.

No.	Learning media	Influence normality (Kolomogorov)	Criteria	Paired sample test	Effectiveness	
					Control (%)	Experiment (%)
1	Android-based	0.732 > 0.05	Normal	0.001	43.6	88.4
2	Computer-based	0.055 > 0.05	Normal	0.000	58	85

3.2 Comparative analysis result

The comparative analysis employed a correlated one-tailed right-sided t -test because H_1 is "Better" (Sugiyono 2016, p. 309); the result indicated a df value of $10 - 2 = 8$ with significance level of $5\% = 0.05$ with $t_{table} = 1.86$ and $t_{count} = -15.155$. The H_1 reception area is illustrated in Figure 1.

The figure indicates that there is a significant difference in implementation of image and Android-based learning media toward students' cooking skills. In simpler terms, this signifies that the implementation of Android-based learning media is more effective than image-based learning media in improving students' cooking skills.

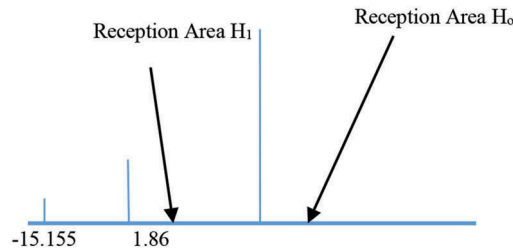


Figure 1. Right-sided hypothesis test. t_{count} of -15.155 falls in the area of acceptance of H_1 , so that H_1 is accepted.

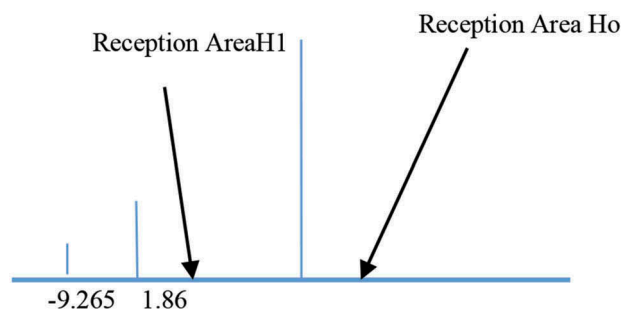


Figure 2. Right-sided hypothesis test. t_{count} of -9.265 falls in the area of acceptance of H_1 , so that H_1 is accepted.

Further, the comparative analysis of computer-based learning media resulted in a df value of $10 - 2 = 8$, with $t_{\text{table}} = 1.86$ and $t_{\text{count}} = -9.265$. The reception area is displayed in Figure 2.

Figure 2 indicates that computer-based learning media is more effective than image-based learning media in improving students' cooking skills.

3.3 Comparative analysis result in cooking skill of students aged 5–6 years by using Android and computer-based learning media

Within this step, the data were tested by using the paired t -test sig. with a value of $0.000 < 0.05$, signifying that H_0 is rejected and H_1 is accepted. The result indicates that there is a significant difference between computer-based and Android-based learning media toward students' cooking skills. In value range and criteria, Android-based media resulted in a 3.6 average score while computer-based learning media resulted in a 3.4 average score, categorized into "Very Well Developed" criteria. Therefore, the incorporation of Android-based media is similarly effective when compared to computer-based learning media toward students' cooking skills.

Table 4. Comparative data of Android-based and computer-based learning media.

No.	Learning media	Normality	Criteria	Homogeneity	Criteria
1	Android-based	of 0.520 > 0.05	Normally	0.917 > 0.05	Homogeneous
2	Computer-based	0.622 > 0.05	Normally		

4 DISCUSSION

Paired- t sample test results showed $p = 0.001 < \alpha (0.05)$, indicating a significant difference between computer and Android-based learning media. Moreover, the sig. value of $0.000 < 0.05$ also emphasizes that H_0 is rejected and H_1 is accepted. In conclusion, there is a significant influence on cooking skill in children aged 5–6 years before and after implementing Android- and computer-based learning media. One of the main advantages of the educational game is the visualization of real problems. The Massachusetts Institute of Technology (MIT) succeeded in proving that games are beneficial for improving the logical competence and understanding of players about a given problem through a game project called Scratch. Based on the results of previous studies, there is no doubt that educational games can support the educational process (Clark et al. 2005; Clark 2006). Educational games excel in several aspects when compared to conventional learning methods. One significant advantage is the presence of animation that can improve students' visual memory, so that children are able to

memorize learning content for a longer time than through conventional teaching methods (Donald 2006).

Simulation-based educational games are designed to simulate existing problems in order to obtain the essence or knowledge that can be used to solve these problems. Simulation games can be used as educational media by incorporating certain sets of contents into the game pattern, allowing the players to learn certain patterns to solve existing problems. Game status, instructions, and tools provided by the game will actively guide players to explore information so that they can enrich their knowledge and strategies while playing. According to Randi Car-tono (2013, p. 1), educational games are creative activities related to the creation, production, and distribution of computer and video games that are entertaining and educational in nature.

Educational games are increasingly used as a means of learning optimization, both formally and informally. An educational game is a computer game that contains educational material to help children learn in fun ways. It has been proven that provision of interventions in the form of educational games is effective in increasing the addition ability for DII class at MIN Koto Luar, Pauh District (Yeni et al. 2013). According to Felicia (2011, p. 2), compared to traditional methods, a learning process that employs educational games not only provides motivation but also makes children learn by playing and can extend skills that are difficult to develop by traditional methods.

The significance of incorporating games into education only grows higher. A survey has reported that 91% of children aged 2–17 years play video games and computer games as a hobby (Granic et al. 2014, p. 66). Therefore, the use of educational games as a learning medium for the introduction of regional culture is regarded as suitable because it can take advantage of technological developments. According to Griffiths (2002, p. 48), games can provide innovative ways of learning. Students are more intrigued to participate in learning. Busran and Fitriyah conducted a study on the effect of application software on learning to read in preschool by using Android smartphone software supporting Java Development Kit (JDK), IDE Eclipse, Android Software Development Kit (SDK), and Android Development Tool (ADT) made using the Java programming language. The study argues that application software is beneficial as a learning media in mobile learning technology (Busran & Fitriyah 2015).

This study found that the use of computer-based learning media in teaching cooking skills resulted in 85% or “High Product Effectiveness” criteria, while that of image and recipe-based learning media resulted in only 58% or “Low Product Effectiveness” criteria. This signifies that computer-based learning media is more effective than image and recipe-based learning media to enhance students’ cooking skills.

Based on research by Putra et al (2016) on educational games for early childhood, children are more exposed to smartphones, iPad, and tablet PCs for practical reasons. The development of games production gave rise to games that not only entertain, but also educate and are capable of extending one’s mental capacity. It is widely regarded that the early childhood period between 3 and 6 years is the golden period of an individual’s brain development. During this age, a child undergoes rapid growth physically and mentally. For this reason, Android-based educational games possess a high potential to stimulate children’s brains and provide enjoyable learning experiences (Putra et al., 2016).

The research by Petrovska, Sivevska, and Cackov (2013) from the University of Goce Delcev reveals that games could meet the biological and psychological needs of children and contribute to their mental, emotional, social, and moral development. As a familiar and essential form of entertainment for children, educational games enable an individual to organize the objectives independently and associate special meaning for education in general. They are powerful tools for education because, through games, children can gain knowledge, enrich their experiences, and develop skills or positive habits. Despite the difference in both research studies’ dependent variable, it is generally agreed that educational games are highly beneficial. The hypothesis used in this study can be accepted, that mobile educational games increase students’ motivation in early childhood education; this is based on the research conducted in kindergarten children in group B in Aisiyiah Nusukan 1 and three kindergartens in Surakarta during the academic year 2015–2016.

In general, the educational games applied in this study have positive values on children's learning interests. Children are eager to learn and understand better the learning materials. This only justifies the notion that the stage of playing is central to early childhood; therefore, implementing an approach that makes students learn and play simultaneously can result in positive outcomes.

5 CONCLUSION

Based on the study described in this article, it is concluded that the implementation of Android-based and computer-based learning media is more effective than images and recipes in developing 5- to 6-years old students' cooking skills. The comparative analysis of Android-based and computer-based media generates that both media are similarly effective in increasing the students' cooking skills.

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The use of online dictionaries in teaching collocations

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ABSTRACT: Collocation marks the richness of languages in terms of vocabulary. However, it is one of the main challenges encountered by EFL vocabulary learners. In this article, the literature review finds it difficult to provide an easy and exact definition of collocation because it is a very polemical term. Despite the general role of a dictionary in teaching and learning vocabulary, apparently; students today prefer online dictionaries to the printed ones but its use remains problematic. This article aims to study the way EFL teachers can use online dictionaries in teaching English collocations. To teach effectively, the learner-centered approach with collocation-technology oriented tasks should be applied to overcome the aforementioned problem. This article includes both teachers and students as the ones who deal with English vocabulary in their daily lives.

1 INTRODUCTION

Collocation is one of the most challenging issues in vocabulary learning for language learners (Laufer & Waldman 2011). In fact, it is widely recognized that collocation and other standard units with multiple words are essential for idiomatic and common language use for EFL students. Unfortunately, the use of correct and appropriate collocation is a major challenge, and even advanced students have problems with it. Student dictionaries are helpful in learning English collocation, especially in terms of production. Dictionaries assist them with identifying the most frequent collocation and providing appropriate examples to illustrate various combinations of collocation from the dependent word to the independent one.

Lexicographers have strived to recognize the benefits of learning collocation and have highlighted an interest in a diversity of shared, theoretical, or practical location questions related to compilation of instructional dictionaries, such as collocation categorization (Cowie 1981). Students' textbooks and pocket dictionaries may be their only source of collocations; but with the development of the digital era, it is apparent that the activities implemented with online tools represent a more efficient approach to collocation teaching than the traditional activities. With the increase of technological availability and capabilities, the integration of IT in learning and teaching collocations is now practicable. Thus, it is believed that online tools such as online dictionaries, data mining, search engines, and other popular tools and features can be useful in the process of teaching collocations (Basal 2017).

Therefore, an online dictionary seems to be a reliable tool to learn English collocation effectively, as it provides adequate information about each vocabulary, while the printed ones possess limited information, sometimes with single words. Despite the efforts of dictionary compilers to identify and illustrate collocation to help students, the use of a dictionary in teaching and learning collocation is still unrealized. In spite of the fact that collocation knowledge is important, the best way to gain collocation skills has not yet been fixed (Zaabalawi & Gould 2017).

Considering the importance of the transition in EFL education and the importance of online dictionaries for EFL students, this article intends to identify the best way of teaching collocation through an online dictionary to help students during the teaching and learning process. One of the best techniques to teach collocation, according to Laufer and Waldman (2011), is to share information to understand the difference between the L2 and L1 methods of articulating similar words. Additionally, collocation teaching provides classroom-based activities with practical tips for adopting and using them (Lewis 2000). Hence, this article provides an example of relevant academic activities that enhance collocation mastery. However, these practical activities should engage students in learning collocations by themselves. It is argued that a higher exposure and determined awareness of acquiring collocation allow learners to use an online language dictionary more frequently to learn collocation. However, questions remain regarding which resources provide collocation materials and the best time to teach.

2 DEFINITIONS OF KEY TERMS

This section defines the main key words of the article: collocation, dictionary, and online dictionary.

2.1 *Definition of collocation*

It seems very difficult to define the term “collocation” easily and accurately. However, it is normally defined in accordance with areas of research or practical reasons for which it seems relevant (Yuzhen 2016). Basically, there are two approaches to collocation: phraseology, which defines collocation as a kind of finite combination of words based on semantic features, and a collocation-frequency-based approach that matches it to the well-ordered co-occurrence of words in word space. According to Basal (2017), collocations are a combination of words that is crucial for fluency in a particular language. Hence, considerable emphasis should be given to teach collocation as part of vocabulary instruction in any language teaching process. Nevertheless, there is no current accordance on how best to learn collocations, and some researchers have mentioned this matter. Linguistically, a collocation is a series of words or terms that co-occur more frequently than expected. There are two or more words that often go together.

Thornbury (2002) explained that collocations, which are a form of complex words, should be considered as special issues for teachers and learners. In fact, he highlights the importance, which encourages us to learn collocations with significant enthusiasm but Thornbury (2002) does not suggest the best ways to learn them.

2.1.1 *Types of collocation*

Collocations are often described as those words that come together in foreseeable patterns both in speaking and writing. Ayto (2015) classified collocations into two major categories consisting of eight grammatical collocations (e.g., exception to) and seven lexical collocations (e.g., valuable asset). The categorization of these two classes represents two different aspects of collocations, but they are also related because they are lexical and grammatical.

For Ayto (2015), a grammatical sentence comprises a group of the most powerful words (verb, noun, adjective) and a grammatical word (e.g., preposition) like make-up (verb and preposition), relative (adjective and preposition), and the choice between (noun and preposition). The grammar collocations are composed of eight types of collocations as presented in Table 1.

Unlike grammatical collocations, the lexical collocations do not include functional words, i.e., prepositions and infinitives, but consist of words that contain the action or action words such as adjectives, nouns, verbs, and adverbs. Ayto (2015) asserted that lexical collocations can be divided into six types, as illustrated in Table 2.

Table 1. Grammatical collocations.

Collocation	Example
Noun + preposition	Exception to
Noun + to-infinitive	A decision to do that
Noun + that clause	He made a promise that he would do his best
Preposition + noun	By chance
Adjective + preposition	Keen on movies
Adjective + to-infinitive	It's essential to type the letter
Adjective + that-clause	It was necessary that all of us attend
Verb + to infinitive	They started to work

Reprinted from Talakoob & Koosha (2017).

Table 2. Lexical collocations.

Collocation	Example
Verb + noun	Kick the ball, make a sandwich
Verb + adverb	Recommend highly, move slowly
Verb + adverb	Recommend highly, move slowly
Noun + verb	Cars crash, bee stings
Noun + noun	A school of fish
Adverb + adjective	Dramatically changed, closely related
Adjective + noun	Thick fog, terrible mistake

Reprinted from Talakoob & Koosha (2017).

Generally, the lexical and grammatical traditions associated with collocations seem to have advantages, instead of creating problems. Compared to grammar-oriented traditions, lexical-oriented traditions emphasize the need to learn and master many collocations. We are aware of the complex nature of collocations and the potential difficulties for EFL learners to learn collocations.

2.2 Dictionary

2.2.1 What is a dictionary?

The term “dictionary” refers to a wide variety of helpful references for students of all disciplines. It is often thought to apply primarily to works that provide linguistic information on words, such as spelling, pronunciation, grammar class, meanings, phrase and collocation combinations, related words, and variation restrictions.

In his authoritative text on lexicography, Zgusta (1971:197) proposed an extensive definition of a dictionary:

“A dictionary is a systematically arranged list of socialized language forms, developed based on the habits of a particular language community and commented on so that qualified readers understand the importance of each separate form and are informed of important facts about this function in a given community.”

It is a book or another electronic resource that contains words in any language (usually alphabetically) and provides equivalent meanings or words in other languages, giving information about pronunciation, origin, and usage. An online dictionary will be included among the electronic resources. To improve someone’s L2, a dictionary is a faithful helper (Mokhtar & Rawian 2013). It means that whoever is keen to learn collocations needs a dictionary, as it is a means of learning vocabulary also.

El-sayed (2013) indicated the role of dictionary by considering it as a tool that can help in language learning. Indeed, a dictionary can be used to effectively build a significant instructional world. Not only does it aim to find the word's meaning but also outlines another important part of linguistic skills that teachers and students need.

2.3 *Online dictionary*

2.3.1 *Definition of online dictionary*

An online dictionary is any dictionary or other meaning resource that is available online or on the World Wide Web (WWW) and is accessed from a computer or mobile device by using a web browser. It is mostly easy to look for, but sometimes not complementary (Iain et al. 2016).

2.3.2 *Examples of online collocation dictionaries*

- Dictionary.com
- Free Online Collocations Dictionary
- The English Collocations Dictionary-Pro-Writing-Aid
- Longman dictionary
- Online Oxford Collocation Dictionary
- <http://www.studycollocations.com>
- World Wide Web
- Macmillan Collocation Dictionary, etc.

3 DISCUSSION

3.1 *Dictionaries and vocabulary searching*

Reading information online consists of specific reading steps: reading for problem identification, reading to understand the problem presented in the tasks, finding relevant task information, evaluating results, mixing details found in different sources, and then conveying the findings or information to others. The first two steps seem problematic: if students are not able to understand the task and do not find the necessary information, the next steps will be impossible. They will just delay the upcoming task. Another feature of online reading is that several students use their own individual search knowledge to solve the problem.

The entries in the dictionary represent an extraordinary textual form archive where the dictionary is the tool helping in productive reading. Reading entries in a dictionary is different from reading on web pages. First, there are websites with multifaceted information that can facilitate understanding. Second, even though the text running on the site is low and contextualized, concise, and consistent, some dictionary entries contain short definitions. There is no significant context on the use of examples and it may not be familiar to students to find the targeted word meanings they are looking for. Third, dictionary entries are read primarily for quick access to the meaning of the word. Consequently, the word search using the dictionary is incidental. Despite the variety of supports and approaches, previous studies report several similar results about the behavior of the L2 learners' use of a dictionary.

Actually, several studies prove that learners' skills in using a dictionary seem to be insufficient. This also applies to using an online dictionary, especially when they are learning collocation as a complex part of vocabulary. In fact, the limited skills in using the dictionary and short information in printed dictionaries hinder learners in searching for the words. As a result, they just sweep the genesis of a list and take the simple definitions without looking at the different senses. As a result, the teacher's strategy and approach need to motivate the students' abilities and autonomy in using a dictionary in general.

In addition, the behavior of using a dictionary in terms of academic language appears to be in relation to language proficiency. Advanced students prefer to respond without any concentration on word consultation, but sometimes they become successful in finding the intended words they were looking for. On the other hand, the lower achievers need to know more words, but they do not use the dictionaries because of their inadequate lexical abilities. Therefore, the number of searching inquiries does not depend on the number of correct answers.

Furthermore, many students struggle to use the word they know in an unknown sense because of their belief that there is no other meaning beyond the single meaning of a word they already know. Some learners feel bored when the consulting process is too slow, especially when their dictionary skills are poor. The others consider it a waste of time if they have more tasks to accomplish, while others find it hard to use the dictionary when reading long texts for general understanding. In addition, the purpose of reading has a great impact on dictionary use, through challenging tasks like translation and synthesis. They can make students engage in searching dictionaries in order to gain general and necessary meaning of the complex vocabulary like collocations, phrasal verbs, etc. Furthermore, the students' decisions on the tool for reference depends on their capability to learn the language and use the dictionary to find the word.

3.2 *Online dictionary to enhance the learner's collocation*

The applications of new technologies aim to improve vocabulary capabilities, such as portable electronic dictionaries and nonlinear dictionaries or electronic glosses. They have an impact on the effectiveness of vocabulary use. For readers, the reduction in time and distraction is a part of the positive effects in tackling unfamiliar language via electronic links and websites. Nonetheless, there is no relation between the lengths of time required in accomplishing the task of reading and the number of words to use the electronic vocabulary.

In this study, it was found that the users of the electronic dictionary see more words in a short time than those using pocket or printed dictionaries. Moreover, the concentration of students is interesting because they will learn more collocation through different available dictionaries on the Internet. Collocations, which are a type of assembled block, are very interesting for teachers and learners. Thus, they should be taken into account in language learning (Thornbury, 2002). In this case, the dictionary provides students with important language information, especially in the absence of teachers where students take responsibilities for language learning.

With the net generation, students show good practice in using digital tools, but they rarely use them. However, teachers should design tasks that students can carry out tasks independently by searching the words in online dictionaries. Apparently they can increase their understanding of lexical words, but sometimes they know the words and their meanings, which makes them overconfident. Looking for a word in online dictionaries involves some steps in making a decision: deciding a word to be searched, deciding where (the dictionary as a source) to search, deciding what items to choose, and which sources to choose from and deciding if it is necessary to look for additional information.

With a browser, navigating between tasks and information sources helps students to keep relevant information for the task in their working memory. This process is complicated, especially when the users of online dictionaries are working because collocations need attention on the dictionaries due to their complex combination, though most dictionaries contain the meaning for single words. In this way, many researchers share the view that learning collocation through online dictionaries needs the learners' autonomy on the given collocation tasks. It is achieved within enough time to search more dictionaries in order to ensure the quality of collocation information gained.

Some illustrations of online dictionaries in teaching-learning collocations are shown in Figures 1 and 2.

However, it does not imply that learners ignore the teacher's responsibility as a class facilitator. The teacher's role in learners' use of online dictionaries appears in designing the tasks

4 CONCLUSION

Users need to be more involved, to pay attention on collocation learning techniques, to include factual information, and to be thoughtful to different styles and oppositions in using the dictionary. This article also shows the need for providing students with guidance on how to use online dictionaries. Based on the foregoing information, it has been confirmed that collocation seems to be an enormous challenge in vocabulary learning. It is essential for students to understand the possibility of a large number of easily understood combinations causing the production problems, since the items cannot be joined arbitrarily (Nesselhauf 2003).

However, mastering vocabulary does not need the full intervention of a teacher. Instead, it needs the learners' self-concentration with good dictionaries to search more information about collocation. In this case, the small printed dictionaries seem to be replaced by online accessible dictionaries for effective collocation learning. To solve this challenge, teachers must first increase awareness about the collocation to their students by applying a learner-centered approach. Most importantly, it must be noted that teaching collocation should be an integral part of the language teaching and learning process, especially in vocabulary learning. One of the best ways to teach collocation, according to Laufer and Waldman (2011), is to share information and to identify the difference between one's additional language and L1 methods of articulating the synonymous words. It means that the full domain in language teaching jobs is practicing the language itself, thus emphasizing the role of mediation of two languages.

Apart from what is proposed by Laufer and Waldman (2011), this article found online dictionaries as a quick, easy and effective way to teach collocations. Learners need to do their best to master collocations, as it seems to take a prolonged period. Hence, their involvement in using an online dictionary will determine their process of teaching and learning of English collocation. In short, to encourage learners to use the online dictionary as a guide of learning collocation, teachers should apply a learner-centered approach by providing the collocated-challenging online tasks to increase their awareness of the online collocation dictionary.

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Developing autonomous learning and Industry 4.0 skills for non-native learners through a self-access learning center

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ABSTRACT: Self-access learning centers (SALCs) assist teachers to develop students' autonomous learning. SALCs provide students with self-access facilities including materials that can help students in the learning process. The existence of SALCs helps students to develop their self-directed and self-regulated learning, which is part of autonomous learning. This study used library research as the methodology to explore the supporting theories and statements concerning the issue. This article reviews SALCs in relation to autonomous learning that is very well known and Industry 4.0 skills that are demanded in this era. Based on some reviews, the SALC emphasizes autonomous learning in which the students are responsible for their achievement in the learning process. It also helps the students to develop their Industry 4.0 skills such as knowledge of information and communications technology (ICT) and the know-how of ICT, since SALC supports the technology that helps the quality of the teaching and learning process.

1 INTRODUCTION

The Fourth Industrial Revolution (IR 4.0) has been a significant development that has been changing human life. It started with the invention of cyber-physical systems for industry that integrated networking, computation, and physical processes. The physical element performs the process and the computer monitors or controls the physical process. This term is popular not only in industry but also in government and academia because of the significant influence of society, economy, and environment. One of the influences in academia is the use of e-learning, which has already been implemented in some institutions. E-learning is technology-based learning in which the students do not use printed texts to study; in other words, it is online (Goyal 2012). E-learning can be defined as modern education since it does not need paper and it can be done online but it still needs an interaction between the students and the teacher. From this activity, information and communications technology (ICT) can be used in the academic situation. It is also considered the mechanism that enables students to rethink and redesign the educational process and system, which is related to the quality of education (Sangrà & González-Sanmamed 2010)

Since ICT can be a partner for the teacher in the teaching process, many institutions apply this media in the teaching process. A self-access learning center (SALC) can be a platform in integrating ICT as a tool in the learning process. The institution can provide computers and other facilities such as printed or online resources for the learners. In addition, SALC helps students to develop autonomous learning and the teachers to give materials or assessments via computer, so they can learn independently (Benavides 2000). Besides developing students' autonomous learning, SALC can train students' Industry 4.0 skills.

SALC can be a medium for students to develop their autonomous learning, as students to develop communication, collaboration, critical thinking, creativity, problem-solving, decision-making, etc. (Kin & Kareem 2019) are personal skills needed for Industry 4.0. Besides

Table 1. Range of references.

No.	Sources	Period	Number
1	Journal	2000	1
		2008	1
		2009	1
		2010	2
		2011	2
		2013	2
		2014	1
		2015	4
		2017	8
		2018	2
		2019	3
2	E-resources	2016	1
		2017	1
3	A proceeding	2017	1

personal skills, SALC also helps students to gain knowledge about ICT, to use ICT technically, and to work with big data. This study used library research as the research method. This article reviews autonomous learning and Industry 4.0 skills for non-native learners through SALC with some related references. The references consist of journals, e-resources, and a conference proceeding. The range of the references can be seen in Table 1.

Finally, this article relates some resources concerning the issue and then reviews and filters some statements to align the theories and the statements with the issue in this article. In addition, this article also explains some theories and statements to support the issue and then discusses some theories and statements related to the issue by connecting each theory and statement to strengthen and support the issue itself.

2 INDUSTRY 4.0

IR 4.0 influences the whole society, especially advances of technology, which changes the way people work. As in industry, advances of technology also influence education. Many institutions or schools use technology in the teaching and learning process. To fulfill the demands of IR 4.0, teachers need to develop some principles in order to keep aligned with the IR 4.0. The first principle is engineering knowledge and skills, which oblige the teachers and the students to develop their knowledge about the cyber-physical system, Internet of Things (IoT) that is connected with the Internet of People (IoP), and cloud computing. The second principle is Digital Literacy 4.0, in which the teachers and the students become able to communicate through the IoT and or IoP. The third principle is skills through which teachers and students are able to decide and solve the problem in a short time. The last principle concerns a decentralized decision in which the teachers and students are required to work on particular cases and interventions that are assigned to the higher level. Thus, to upgrade the effectiveness of the teaching and learning process in this era, teachers should include the philosophy of individualization in the classroom, which possibly can be done through the use of technology with innovative pedagogy in which the students can in particular have their own tutor (online education platform) (Aberšek & Flogie 2017).

Some of the aforementioned principles are part of Industry 4.0 skills that either the teachers or the students need to develop to fulfill the requirements of IR 4.0. Industry 4.0 skills can be grouped into four main categories including knowledge about ICT, ability to work with data, technical know-how, and personal skills. With regard to the aforementioned principles, the first and second principle involve knowledge about ICT, since it is about the ability to use and interact with computers. The third and fourth principles involve personal skills because they

are about the ability of people to communicate, to make decisions, to adapt, and to work in a team. Furthermore, the ability to work with data means that someone can process and analyze the data obtained from the computer. This ability also demands teachers and students to understand the visual data output and to decide on it. Technical know-how means that someone masters anything concerning manufacturing activities. This ability also requires teachers and students to have technical know-how of the machine to accomplish the maintenance of related activities (Berger 2016).

3 AUTONOMOUS LEARNING

Autonomous learning has become a strategy implemented in the teaching process to make students learn independently. Numerous terms are used to describe autonomous learning such as “self-direction,” “independent learning,” and “learner independence.” Autonomy is a social process translated as a redistribution of power that constructs the participant’s knowledge and roles in the learning process. Autonomous learning is not learning without a teacher or teacher-less learning but the teacher can help students to be aware and identify strategies that they have already used or potentially can use (Jooneghani & Bahraminezhad 2012).

According to Sakulprasertsri (2017), as cited in Holec (1981), autonomous learning is the capability of the learner taking charge of his or her own learning. Holec further states that autonomous learning is not arise on its own, but needs to be obtained through formal learning in a systematic and deliberate way. In addition, it indicates that the teacher instructs students to be responsible for decisions regarding the learning.

Autonomous learning means learners can use the knowledge that they have already obtained and develop their cognitive level; determine their learning goals; choose their suitable learning methods; monitor their learning process and evaluate its result; and train their self-design, self-management, self-control, self-judgment, and some other aspects of a learning process (Zhifeng 2017). He also states that autonomous learning is a wide platform for teachers to give their students free time and to permit students to attain their learning goals by means of their own decisions.

Zulaihah and Haridah (2017) define autonomous learning as a way of learning in which the individual of students try to find out their own learning needs, organize their own learning goals, arrange a suitable way to learn the material, and evaluate their learning progress. Although the students learn independently, they still need a lecturer, teacher, or instructor to help and support their autonomous learning and they still need to learn as a group within the classroom. Wang (2010) defines autonomous learning as a modern learning theory built upon the theory of constructivism. Autonomous learning is a student-focused learning model that stresses the learning environment and also cooperative learning.

Besides the students’ intention in doing autonomous learning, some strategies are also involved to support autonomous learning. Wang (2010) as cited in O’Malley and Chamot (1990) discuss the strategies of autonomous learning including meta-cognitive strategies, cognitive strategies, and social meditation. Meta-cognitive strategies can be applied through activities of data collecting, personal file-making, study-planning, learning-reflecting, self-evaluating, and self-supervising. Cognitive strategies are more likely the activities of reading, memorizing, note-taking, and questioning. The last strategy is social meditation in which the students are relaxed in doing the activities such as making group roles, building cooperativeness with their partners, communicating with their peers, and evaluating their peers’ work (Wang 2010).

From some of the preceding definitions, autonomous learning is a modern way of learning in which the students are responsible for their own learning including finding out their own learning needs, setting their own learning goals, implementing the appropriate method of learning of by themselves, and monitoring their own learning progress independently.

4 SELF-ACCESS LEARNING CENTER

4.1 *The use of SALC*

SALC has become common in some universities or institutions around the world. This program is facilitated by the institution or the university by providing the students with some self-access materials, so the students can access the materials by themselves easily because of the trend of developing autonomous learning and the revolution of information technology in the teaching process (Balla 2017). SALC provides students with the scaffolding and assistance to develop their strategies, so the students can set their own needs, learning goals, and decisions about what and how they learn (Hobbs & Dofs 2017).

The SALC can be implemented in EFL learning. Learning a foreign language is interactive and appropriate for social purposes. It also can be a suitable way for students to learn language independently. Najeeb (2013) finds that independent language learning is indicated by expanding learner choice, focusing on students' needs and interests rather than on the teacher or institution, and leaving decision-making to learners.

4.2 *The implementation of SALC for non-native learners*

In a non-native speaking country, SALC provides space in which students can actively interact by using the foreign language like in Japan (Birdsell 2015). In Japan, foreign exchange students are hired as part-time teaching assistants in a SALC to help and to interact with Japanese students to foster their language skills. Another non-native speaking country that applies SALC is Thailand. Even though the implementation of SALC in Thailand is popular, it has raised a problem in the Thai context caused by some statements (Ferguson 2015). The implementation of SALC in Thailand might be a difficult task because it is a change from teacher-centered to student-centered (Noom-ura 2009).

In Indonesia, some institutions or universities have already applied SALC to train students' language needs and skills. According to Priyatmojo and Rohani (2017), the implementation of SALC is very crucial, especially for higher education students because of the change of learning methodologies that affect students' English learning from teacher-centered learning to student-centered learning that can encourage or promote students' autonomous learning. SALC gives students the freedom to decide their activities and learning materials for their own learning experience (Sulindra & Dasuki, 2018). Sulindra and Dasuki (2018) also state that the implementation of SALC changes the students' learning habits, in which the students become more autonomous in their learning style. In addition, the students are more independent in looking for resources. They also try to solve problems by themselves. Besides improving students' autonomous learning, SALC also fosters students' confidence and motivation in learning (Balla 2017). SALC can be a positive atmosphere to develop students' autonomous learning because by implementing SALC, students learn and work on their own to develop their study skills and also language skills. As students work independently, they become responsible and motivated to achieve success.

4.3 *The technology offered by SALC*

SALC offers many facilities to make the students feel comfortable in learning including technology. Computer-Assisted Language Learning (CALL) is one of the technologies that can be used in SALC. According to Tafazoli and Golshan (2014) as cited in Levy (1997), CALL is defined as the media to search and to learn computer applications, especially in the language teaching and learning process. Through this activity, the teachers can build the appropriate framework on how the learners learn independently as well as how the learners are responsible for their learning (Mutlu & Eroz-Tuga 2013).

The use of CALL is mostly used in language learning programs because this ICT involves many applications regarding language learning such as podcasts and weblogs (Liew et al. 2008). This statement is also supported by Derakhshan et al. (2015), who state that the use of

CALL is helpful especially in language learning and teaching either inside or outside the classroom. CALL also trains students from teacher-centered learning into student-centered learning, as demanded in Education 4.0 to foster students' 21st century skills. In addition, CALL also promotes autonomous learning because students are free to access the sources of knowledge, especially language knowledge (Farivar & Rahimi 2015). However, the use of CALL has a disadvantage, which is that some users, either teachers or the students, are not familiar enough with the technology, especially in using the software (Derakhshan et al. 2015). Moreover, lack of experimentation in using CALL can delay the learning process (Tafazoli & Golshan 2014). Although the students learn independently, the teachers should monitor students' learning process by providing useful guidance regarding students' self-directed learning, helping students to develop self-directed learning strategies, and training them to be real autonomous learners (Farivar & Rahimi 2015).

Another facility is using the web (e-learning) in the learning process. E-learning is a learning process through a technology service, especially the web, to provide the presentation facilities and information distribution. E-learning can be developed on television or radio but since the technology is advanced, it can be done not only through television or radio but also through Internet-based learning or web-based learning (Sabar & Rahman 2011). Here, the students can access the Internet including searching, noticing, getting, understanding, and using many kinds of information to build their knowledge. They can also assimilate their previous knowledge with the new one that they can get through the web. Furthermore, e-learning plays an effective role in language learning because it provides activities for each language skill in an advanced and motivating way (Saeheng 2017). Saeheng (2017) also states that e-learning can be an effective method to motivate students to learn, especially in language, and develop their autonomous learning.

Learning Management System (LMS) is also part of SALC. LMS consists of applications that can be used for teachers to develop students' autonomous learning. This kind of activity is associated with blended learning because it uses applications to learn. According to Saeheng (2017), blended learning is a kind of learning through applications combined with technology and traditional classroom teaching. Saeheng also states that blended learning can be a significant element in creating an appropriate balance between traditional teaching methods and technology use. In addition, according to Ardi (2017) as cited in Benson (2011), LMS provides students with self-access, gives them an opportunity to develop their self-direction, allows teachers to monitor students' language learning, and creates independent and collaborative self-directed learning which are demanded in IR 4.0. LSM can be a space for students to train their autonomous learning because the students can reflect and share their learning experience, which is a critical step in developing autonomous learning. Jamal and Shanaah (2011) add that learning through online discussion and interaction helps students to construct and build new meaningful activities to support their learning process.

5 DEVELOPING AUTONOMOUS LEARNING AND INDUSTRY 4.0 SKILLS THROUGH A SALC

IR 4.0 brings changes to human life because it is about the involvement of technology, which demands that people do things autonomously. Some education media such as video and multimedia help students to learn in a multimodal style in which the students are the center of learning and the teacher is the organizer accommodated by the service providers with the use of multimedia network environment resources (Umachandran et al. 2019). With the advance of technology, especially multimedia, students can easily access knowledge across the country from around the world. SALC is part of Education 4.0, in which it is the employee competency of Industry 4.0 (Hariharasudan & Kot 2018) that integrates mobile technology, high-speed Internet, and social media platforms to facilitate personalized learning anywhere and anytime, and to alter the role of teachers to one of mentors and facilitators (Saxena & Bhat 2017).

With the advance of technology, SALC offers students the opportunity to build their knowledge autonomously. Students can also develop their ICT knowledge and personal skills (Berger 2016) through SALC. To ensure that students can develop their autonomous learning and Industry 4.0 skills, teachers can give students a mini group project that contains problem-solving that can be done through some particular technologies such as mobile apps and social media, so students can use SALC as the space for their class activity because it facilitates students' learning process. This kind of mode links and integrates classroom-based learning with SALC, so students are attracted to use of SALC as the space to learn (Birdsell 2015).

6 CONCLUSION

A self-access learning center (SALC) is a facility given by the school or institution to fulfill the demand of IR 4.0. This facility gives students free access to access learning facilities such as online resources to foster their learning process. Since it is free access, the students can build their new knowledge and assimilate it with the previous knowledge independently. Thus, this facility can be a medium for teachers to train their students to learn independently and to move from teacher-centered learning to student-centered learning. This facility also integrates with the technology to support students' learning process and to accustom the students with technology and the skills required in IR 4.0 such as critical thinking, collaborative learning, and ICT knowledge. The technology offered by SALC can be Computer Assisted Language Learning (CALL), e-learning, and Learning Management System (LMS). Those kinds of ICT can foster students' autonomous learning because these different platforms support the students to seek the materials independently. Moreover, those ICTs train the students to reflect and to evaluate their learning process. In addition, students can also develop their technical knowledge and skills in ICT gradually. Although the teacher uses the technology in the teaching and learning process, his or her role cannot be replaced by the technology. The teacher needs to control and monitor his or her students' learning process as the supervisor and facilitator.

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The use of the *Hello English* application to improve junior high school students' vocabulary and grammar mastery

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ABSTRACT: Junior high school students are beginners in learning vocabulary and grammar for meaningful purposes. They need to understand the relationships among forms, meanings, and their uses to communicate either in spoken or written form. However, most junior high school students still do not understand how to construct a meaningful purpose. They just focus on remembering words and patterns. It is perhaps caused by their teachers' teaching styles, which still use conventional methods. This can actually be improved by using a number of mobile applications. One of the applications that can be used in learning vocabulary and grammar in meaningful purposes is *Hello English*. It consists of learning materials, tests, and games. This article reviews previous studies on improving junior high school students' vocabulary and grammar using *Hello English*. It aims to describe how *Hello English* can improve junior high school students' vocabulary and grammar mastery.

1 INTRODUCTION

English is one of the compulsory subjects taught in Indonesian schools, with listening, speaking, reading, and writing skills as its four basic skills. To support the development of these skills, students should be able to use grammar and vocabulary in meaningful texts, either written or spoken. Sadeghi and Nobakht (2014) state that vocabulary is one of the fundamental and essential elements of learning foreign languages. Vocabulary mastery is defined as the proficiency to know words and meaning in a meaningful context; thus students not only know the words but also their meanings used in a meaningful context, such as conversation and text (Lestari, 2017). If students have a great deal of vocabulary knowledge, they will be able to access their knowledge, express ideas, communicate, and create new concepts (Astika 2015). Without vocabulary mastery, there is no meaning that can be transferred to meaningful context in a communication. Therefore, students must have vocabulary mastery to help them to understand the message and share their thoughts through communication. This is supported by Hatch and Brown (2001), who stated that vocabulary is a list of particular words individual speakers use in communicating.

To arrange meaningful context, either spoken or written, students must understand and be able to use grammar rules. Benati (2017) explains that grammar rules are used to combine, arrange, or organize words into meaningful communication with other people. Mart (2013) says that grammatical rules are one of the important elements to master the English language. Unfortunately, some researchers studying English mastery among junior high school students found that most students still had problems in learning vocabulary and grammar in context. In vocabulary, they only memorize word by word although sometimes they do not remember at all. They were confused in organizing the vocabulary (Puspitaloka et al. 2017). They do not understand how words extend their use, how words are combined, and how grammar works. For grammar, they also

memorize the patterns but they cannot use it in context; for instance, they cannot arrange or organize the relationship between structure, function, and meaning (Jalali & Dousti 2012). They have less practice in their vocabulary and grammar in a meaningful context. The problem is found not only among students, but also among teachers who still apply traditional methods to teach vocabulary and grammar.

The authors of this article believe that the aforementioned problems will be a challenge for teachers. They must be creative in designing their teaching-learning classroom. As known at this time, Indonesia has entered Industry 4.0, which involves the progress of information and communications technology (Suherdi 2019). Technology in teaching and learning can help organize and provide materials to students, teachers, and even parents. Van der Linden (in Suwanto 2009, 2010, 2017) says that the use of information technology is believed to penetrate testing in the field of education. In the past, mostly computer-based learning was used by educators. However, today almost all educators use mobile phones supported by Internet connectivity, such as Wi-Fi and data packages. Mobile phones can be used to learn English anytime and anywhere. This shows that computer-based learning has shifted to mobile-assisted learning. It is supported by Meeker (2012) and *The Economist* (2012) as cited in Jati (2018) saying that the number of mobile phones exceeds the number of computers. The mobile phone market has also changed drastically, with smartphones supported by the Android system, and the number of users is growing at a fast rate, especially young people (Liu & He 2014) who not only prefer mobile phones but also use them as primary computing devices (Heil et al. 2016). Moreover, many students have mobile phones, which are now affordable and have very high quality. Even children under 5 years old have already been given a mobile phone by their parents.

Although students sometimes use mobile phones to play games or access social media, they can use them as an alternative media to support the process of teaching and learning to make it more interesting. In this case teachers should be able to use them to design the syllabus and lesson plan. Such a design can attract students to learn more about English and enhance their motivation (Hashemi & Ghasemi 2011; Ababneh 2017; Teoh & Sai 2017; Aziz et al. 2018; Ibrahim & Kadiri 2018). By using mobile phones for learning English, students can be independent learners and effectively learn English anytime and anywhere (Godwin-Jones 2011; Kusmaryani et al., 2019).

Mobile phones provide many applications to learn English, such as TOEFL, Reading, Listening, Irregular Verb, Hello English, Duolingo, etc. All of them can improve students' English skills as proven by Liu and He (2014). The research described in this article chose *Hello English* as a specific English learning application. *Hello English* can be used to learn all the English language basics and its elements, such as speaking, pronunciation, vocabulary, grammar, reading, and listening skills through interesting scenes. It provides various games, tests, and dictionaries. However, this study just focused on grammar and vocabulary. The application instructs learners to use it in daily self-learning outside the classroom (Hidayati & Diana 2019). However, it can be used inside the classroom to support the teaching-learning process. The application can design material as additional interesting media since the application is a great deal of fun and effective for learning English, especially for grammar and vocabulary. It will be suitable for young learners, such as junior high school students and even senior high school students. This is proven by Sivakumar (2015) in teaching English Grammar for VII Standard Students. The application makes junior high school students enjoy learning grammar and vocabulary with enthusiasm, interest, and fun (Puspitaloka et al. 2017). Thus, this study chose junior high school students as the target. It is not only for the students but also for teachers in that it can be an interesting media to support their teaching-learning process. Therefore, *Hello English* as English learning media can improve the students' vocabulary and grammar in meaningful purposes and help the teacher in teaching vocabulary and grammar easily, efficiently, and effectively.

2 HOW TO TEACH VOCABULARY AND GRAMMAR

Grammar and vocabulary are two important subskills for a teacher to stress in teaching. They work together to create meaningful context, either written or spoken. Vocabulary consists of

words; meanwhile, grammar provides methods and rules to combine these words into a sentence in a meaningful context. All vocabulary words can be divided into verbs, nouns, pronouns, adverbs, adjectives, prepositions, conjunctions, and interjection, collectively known as eight parts of speech. The words can be combined into the right arrangement because of the unity between grammar and vocabulary. If the teacher can teach both well, students will be able to express their ideas in a meaningful context. The teacher must pay attention to approach, method, and technique in the teaching-learning classroom.

2.1 Grammar

The two approaches to teaching grammar are the inductive approach and the deductive approach (Thornbury 1999). A deductive approach starts by showing the rule followed by examples of the rule, while the inductive approach begins with giving some examples of the rule and explaining the rule later on. In the deductive approach, the teacher, for instance, provides students with grammatical rules and explanations, who are then they are asked to make sentences, either spoken or written. In the inductive approach, the teacher asks students to read a text in which their new grammar material is practiced or introduced, but the activity focuses on the text rather than on the grammatical rule. Teachers will help students to acquire and to practice the language, but they do not focus on any grammatical rules. These approaches are easy for teaching rule-driven learning and discovery learning respectively. There are some methods to teach grammar. They are a grammar-translation method, direct method, audio-lingual, and communicative language teaching (Faridi 2012). Moreover, Thornbury (1999) states that the other techniques of teaching grammar are EGRA (explanation-generalization-reinforcement-application), PGR (practice-generalization-reinforcement) and TPR (total-physical-respond).

The deductive approach, for example, is traditionally associated with the grammar-translation method. A grammar translation starts with an explanation by using the learner's mother tongue among teachers and students, and then the practice activities consist of translating sentences from the source language into the target language. The method provides a way to learn writing and reading skills rather than speaking and listening skills. The main problem is the students learn by using their mother tongue; thus they have little opportunity to practice the source language in communication. It is useful to learn reading and writing but not speaking skill, such as pronunciation. Another example is the drilling technique of the audiolingual method. It is a technique for teaching language through dialogues that emphasize students' habit formation by repetition, memorizing grammatical structures, and tense transformation (Setiyadi 2006). For example, the teacher says a simple present-tense sentence and the student must repeat the sentence exactly. Then, the teacher asks the meaning of each vocabulary term in the sentence that he or she said before until students know the meaning of each vocabulary and the grammatical structure of it.

2.2 Vocabulary

There are some techniques for learning vocabulary, such as using objects, drawings, pictures, reading aloud, and flashcards. In addition, there are the grammar-translation method, direct method, audiolingual method, and activity (Thornbury 2002; Faridi 2012). This study took one of them as an example, such as reading aloud, using pictures, and drawings, which are direct methods. First, a teacher explains and demonstrates a new vocabulary by using the picture. Then, the teacher explains that students have to read aloud the topic of the passage. After each sentence is read, the teacher points to each part of the map. The students will ask a question if they have difficulties in the vocabulary. Then, the teacher answers it by drawing on the board and giving an example based on the topic. He or she asks a question about the map for students. They have to reply in a complete sentence in the target language. Finally, the teacher pronounces a new vocabulary, and corrects the students' pronunciation of vocabulary and errors in grammar.

Vocabulary and grammar learning are not interesting for students in the digital era or industry 4.0. Also, it cannot train for meaningful purposes (Liu & He 2014). The students' learning needs a media that inspires them to learn vocabulary and grammar for meaningful purposes. Thus it becomes a consideration for a teacher to be creative in selecting media that is interactive and joyful to interest students' learning in vocabulary and grammar. This article suggests the *Hello English* application, which is suitable for junior high school students to learn vocabulary and grammar.

3 HELLO ENGLISH APPLICATION

3.1 Definition of the Hello English application

Hello English is an English learning application that can be downloaded in the play store. It can be used anytime and everywhere through a mobile phone. Casalena (n.d.) says that it is created by Culture Alley and includes a tutor, online course, and video game mixed into one application. It covers all basic English language skills, such as writing, reading, listening, and speaking and its elements, such as vocabulary and grammar with interesting scenes. Lieungnapar (2019), Puspitaloka et al. (2017), and Sivakumar (2015) explored *Hello English* and found it could help and improve students' English language learning. It is used from the beginner until the advanced levels, so that junior high school students can use it. The application provides 22 different languages in language settings. The users, therefore, can choose appropriately with their native language first and do a test given by the application to assess their English proficiency. Then, the application will recommend a lesson at their English proficiency level. It uses interactive lessons through games, conversations, and some kinds of tests to teach different English lessons.

3.2 Features of Hello English

3.2.1 Modules or lessons

The application provides many modules ranging from easy to advanced levels. Each module contains a topic based on the level. It contains conversational English with audio from a native English speaker, vocabulary, and grammar explanation that is followed by tests, such as multiple-choice and sequence tests. Every user's answer will receive feedback from the application. The correct answer will get five points and is marked with a green color and the incorrect answer will get an explanation and is marked with a red color. Users will be asked to answer the question again until they get a right answer. The application not only offers tests, but also provides games. The users can play the vocabulary and grammar games against users around the world. The winners will get coins. All of the coins earned will contribute to users' ranks within their city, or even around the world (Hidayati & Diana 2019). The users can see their ranks, so it will motivate them to learn and compete more. The coins will not only increase their rankings, but also enable them to go up to or unlock the next level.

3.2.2 Private live teacher classes

Some English teachers can teach the users through a video call or email. The teachers will give the students feedback, either in written or spoken form based on the users' questions. The users can ask for their grammar, vocabulary, TOEFL, or IELTS scores. Unfortunately, it is a Pro benefit; thus the users must pay for the private live classes.

3.2.3 Exercises or practices

Users can practice with challenges, news, conversations, articles, games, videos, audios, and books. First, the challenge is a battle with another user who chooses him or her or vice versa, the user can choose his or her friend's account. The battle is vocabulary and grammar mastery between them. The winner will get coins. The challenge will provide high motivation to learn more vocabulary and grammar. Second, the news is recent news at moderate and difficult

levels. It focuses on reading skills, vocabulary, and grammar. Each news item provides three questions that immediately provide feedback. The correct answer will be green, and the incorrect answer will be red. Then, the student is given a coin. If the user finds an unfamiliar word, he or she can just click the unfamiliar word and the meaning in the user's native language will immediately appear at the bottom. The user must not open a dictionary. The exercise shows saving time and speed of understanding, especially for vocabulary mastery. It is useful not only for vocabulary but also the user can learn grammar through the text and thus can use it in a meaningful context in written form. Third, the conversations focus on pronunciation exercises, but the user can also learn vocabulary and grammar in a meaningful context through daily conversation. Fourth, the articles have many various topics at easy, moderate, and difficulty levels. The topics contain tips, steps, or specific kinds of words such as 10 slang words, 15 baby words, 11 temperature vocabulary words, 2 ways to write a date, and the 12 verb tenses. The user will get more knowledge related to vocabulary mastery in different contexts. The user will also get tips about the use of English in various ways. When there are unfamiliar words, the user can immediately click the words and get the meanings. Fifth, games provide spelling, vocabulary, reading, synonyms, pronunciation, and activities in interesting visualization with easy and difficult levels. Unfortunately, some of the features must be paid, especially for difficult levels. Sixth, videos focus on pronunciation and listening skills through the script based on the titles of videos in the easy and moderate levels. Then, when there are difficult words, the user can directly click them to know the meanings in her or his native language. Seventh, audios with various topics have easy, moderate, and difficult levels. They also provide the scripts and three questions to improve students' listening skills. The concept of audios is the same as the concept of news. Eighth, the book provides some stories from various authors at the moderate and difficult levels. It focuses on the reading skills, but the user can learn and improve grammar and vocabulary mastery in the meaningful context of the story.

3.2.4 *Dictionary*

There is a dictionary to help students who have difficulties with unfamiliar words. It provides memory notes in the text, pictures, and description of each word. It is easy for the user to remember and understand the word. The character makes words easy to remember.

3.2.5 *Memory map*

There are three memory terms consisting of long, medium, and short terms. The memory map shows how well the user has learned words. Unfortunately, it is not free for users.

3.2.6 *Word of the day*

The word of the day is given every day as homework. It will be remembered in a notification. The application will send the users a short text with one question that is about the synonymous words. It helps the user to remember the word better in a meaningful context; thus it helps students to remember words in meaningful contexts.

3.2.7 *Tips of the day*

Tips of the day given daily in a notification with various topics, especially for vocabulary, for example, 15-word types of doctors (terminology), 15 misspelled words in English, and hair-style words.

3.3 *Advantages of the Hello English application*

There are some advantages of this application (Sivakumar 2015; Yuanita 2019):

- This application is available in Android, iOS, and Windows.
- Some features can be used offline, such as lessons, exercises, and a dictionary.
- This application is easy for students to learn English step by step from the beginning to the advanced level.

This application is easy for students to look for unfamiliar words in the dictionary by directly clicking on them.

3.4 *Disadvantages of the Hello English application*

There are some disadvantages of this application:

- Some features provided by the application are not free, such as private live teacher classes, memory maps, and some games.
- There are some advertisements that can distract from student learning.
- Some games and videos need an Internet connection, so the signal becomes an important thing to be pay attention to. When there is a problem with a signal, it will disturb student learning.

4 IMPLEMENTATION OF THE HELLO ENGLIS APPLICATION IN VOCABULARY AND GRAMMAR LEARNING

This article gives some basic competences and the materials from the syllabus of seventh grade junior high school that can be applied using *Hello English*. The basic competences and materials are shown in Table 1.

This article discusses two of the basic competencies, i.e., 3.2 and 4.2: self-introduction and its responses. To do so, students can click *ambil pelajaran ini* in the application. Then, they can select lesson 1. They will listen to a native English speaker, who says “My name is Putri” with the meaning in Bahasa and one grammar rule explanation for “is.” From this section, the students can learn vocabulary and grammar rules directly with native English speakers. Next, the students will see a grammar explanation in introducing “My name is Putri.” Next, they will do some tests based on the previous lesson. The students’ answers will be immediately given feedback; for example, the correct answer will be praised and given five coins for each question with its explanation. An incorrect answer, on the other hand, will be given an explanation. Next, a different sentence is “I am Putri” with a native English speaker on audio, and the next follows the same concept as the first sentence. The next sentence is “What is your name?”

The next section is the grammar explanation that discusses the differences between *you*, *yours*, and *yours*. Students are asked to do a test based on the previously learned lesson. After doing the test, the students will see and listen to the conversation between Putri and Aulia with the native English speaker. The meaning is given in Bahasa. The following is a sample conversation in this section.

Putri : What is your name?

Aulia: My name is Aulia

Putri : I am Putri

Aulia: Nice to meet you.

Putri : Same here.

In the next section of the application, the students are required to do some translation tests. It trains students to understand vocabulary and grammar in a meaningful context.

In addition, students can choose a practice, exercise, or *latihan* in the menu for an extra activity. This article gives two examples of practices in the forms of a game and an article. With the game, the students can choose the *Tea Game* with time limitations. It trains students to memorize vocabulary with interesting visuals such as glass, tea, and bread with music background. When the student answers incorrectly, the bread will crumble. It is very joyful and funny, so students feel happy when they learn and do a test of English vocabulary. This activity can improve students’ memorization of a new vocabulary. The second example is an article. The students can choose one of the topics in the article that is “Ways to introduce yourself.” In this activity, the student reads the

Table 1. Basic competences and materials implemented using the *Hello English* application.

Basic competences	Main learning materials	The lesson in <i>Hello English</i>
Understanding social functions, text structures, and linguistic elements in greetings, sayings, thanks, and apologies, and their responses according to the context of their use. Compile simple oral texts to say and respond to greetings, sayings, thanks, and apologies by paying attention to social functions, text structures, and linguistic elements that are correct and in context.	(a) Greetings (b) Farewells (c) Thanks (d) Apologies (e) Responses	8: Learn how to apologize, give thanks, and congratulate someone 7: Learn to welcome someone: good morning, good night, etc. 2: Hello, how are you, I'm fine, etc. in English 16: Practice to-be-verb (verb): is, am, are
Understanding social functions, text structures, and linguistic elements in self-introduction expressions, and their responses according to the context of their use. Compile simple oral and written texts to state, ask questions, and respond to self-introduction, in a very short and simple manner, by paying attention to social functions, text structures, and correct linguistic elements in context.	Self-introduction and response	1: How to ask and tell names 3: How to ask about someone's origin 4: Simple present tense: to-be verb; talk about one's nationality
Understanding the social functions, text structures, and linguistic elements of the text to express and ask the name of the day, month, name of the time, time in the form of numbers, dates, and years. Compile oral and written texts to state and ask for names of days, months, names of days in days, times in the form of numbers, dates, and years, with correct linguistic elements and in context.	state and ask: (a) Name of day (b) Month (c) Name of the time of day (d) Time of numeric form (e) Date (f) Year	20: Numbers in English 62: Names of the months and their letters 55: Ask and mention time

topic. They can learn vocabulary and grammar in a meaningful contextual topic. Furthermore, if the student finds an unfamiliar word, he or she can click on it. The application will directly give its meaning at the bottom. Students also gain a wide knowledge of “how to introduce yourself” to others in various ways.

5 CONCLUSION

Hello English can be an alternative media to support and help teachers to teach vocabulary and grammar in meaningful context. The application can be downloaded on a mobile phone and can be used anywhere and anytime. Thus, it can be self-learning method for junior high school students. By using the application, the students will learn more vocabulary and grammar than when using the conventional method their teacher used in the teaching–learning process because the application is an interactive one that contains interesting visual aids, such as lessons, games, tests, exercises, and a dictionary. Students will improve their vocabulary and grammar mastery. They not only improve their memorization of grammar rules and the meanings of words but are also able to use the comprehension of both to construct meaningful purposes.

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Teaching and learning writing using mobile phone in 4.0 era

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ABSTRACT: The utilization of mobile phone in industry 4.0 era to transfer, download, and deliver multimedia may offer a new exciting tool for pedagogy, especially for teaching writing. This (1) makes both teachers and learners able to find unlimited information, (2) enhances students' autonomy, and (3) helps the teacher face digital era in English language teaching. This article explores, describes and analyzes the use of mobile phone in context of teaching and learning, especially for the writing skill. The literature shows that some features in mobile phones, including applications and social media can be used by teachers and students to enhance the students' writing skill.

1 INTRODUCTION

In the 21st century, “communicative language teaching” (CLT) has become the focus in language teaching methodology (Dörnyei 2009). The type of classroom activities proposed in CLT implies new roles where students now have to participate in classroom activities by listening to their peers in group work or pair work tasks, rather than relying on the teacher for a model. They are expected to take on a greater degree of responsibility for their own learning (Richards 2006). The essence of CLT itself is the engagement of students in communication in order to allow them to develop their communicative competence (Savignon 2007). To better understand that, Dörnyei (2009) adds that CLT methodology is centered around the students' participatory experiences in meaningful L2 interaction in (often simulated) communicative situations, which underscore the significance of less structured and more creative language tasks. A key aspect of CLT then is highlighted on the students' autonomy to decide their own learning and to communicate with other students in order to develop their communicative competence in a communicative situation.

Therefore, it is important to find out the best way to support students both inside and outside the classroom. One way to accommodate students' needs is through mobile devices. Mobile devices such as mobile phones can provide a larger opportunity to support students in learning autonomously because it can be used anywhere and anytime by adopting and adapting the information inside (Reinders 2010, Reinders & White 2011). Extensive research has shown that mobile phones with advanced features and Internet access inside are able to change the landscape of technology for supporting communicative language learning, especially in accessing authentic materials and completing the tasks (Chinnery 2006, Dudeney & Hockly 2012, Hashemi et al. 2011). Besides, in the educational context, mobile phones become new alternative as an m-learning because they are powerful and affordable (Chinnery 2006, Halder et al. 2015, Kukulska-Hulme & Traxler 2005, Muyinda et al. 2007, Reinders 2010). Finally, it is vital to investigate the (1) types of texts that can be learned through specific features in mobile phones, and (2) ways to make use of mobile phones in learning the genres.

The article discusses the use of mobile phones, especially for writing class. First, the literature on the use of mobile phone in teaching and learning writing is reviewed. Then, the teacher and

student's roles in the 4.0 era in the writing class using mobile phones are examined. After that, the use of mobile phone features, applications, and social media in teaching writing is presented.

2 DISCUSSION

2.1 *Teaching and learning writing using mobile phones*

Writing is considered an important skill, although it is a difficult and complex skill to learn especially for nonnative speakers (Harmer 2004, Siddique & Nair 2015, Peha 2002, Myles 2002). Several studies examined suggest that students face many challenges in mastering the skill because they need to employ accurate vocabulary, grammar and coherence in a sentence and paragraph (Sultana & Zaki 2015, Creme & Lea 2008). Therefore, it is crucial to find new strategies to make learning writing become more attractive and fun. One of them is by using a mobile phone. The use of mobile phones in writing skills offers cooperation, collaboration, face to face interaction, fun learning and creates a conducive learning environment in the classroom (Siddiq & Nair 2015). In addition, such a technique helps students (1) overcome their anxiety in writing, particularly at the initial stage, (2) use English both inside and outside the classroom, and (3) enhance the linguistic features by using Short Message Service (SMS) (Shalbag 2013). Therefore, mobile phones in English language learning may offer great innovation and may give the opportunity to the students in learning writing skill autonomously.

2.2 *Teacher roles*

Nowadays, teachers have a major role in the teaching and learning process. They are responsible to provide information and show their students how to make use of the information. Although they are still considered to be a kind of leader in the class, they can be regarded as facilitators in the learning process. They are supporters rather than educators, and also advisors to students (Szűcs 2009).

In the writing class, teachers have more specific roles, including as a facilitator, assessor, organizer, and student (Archambault et al. 2010). First, as a facilitator (resource) where students have taken a more active role in their learning, the teacher facilitates the students in using appropriate features, applications or social media to learn texts. Teachers should be able to organize different types of E-learning and E-learning programs. They have to change the classes from a static mood to a student-centered environment with a dynamic method.

Second, as an assessor, a teacher provides feedback for students and this can be done by using social networking tools such as applications or social media inside and outside the classroom. The teacher can also function as an organizer who extends students' knowledge beyond what was learnt before going through the process of redesigning and teaching the updated unit. He/she may ask students to acquire as many sources as possible to improve their writing.

Third, as a student (participant), a teacher becomes more student-like, acquiring new skills and knowledge through the curriculum redesign process. Here, the teacher can enliven in writing class by standing back and not becoming the center of attention. It can be a good way to interact with students without being too overpowering.

Lastly, the teacher requires additional preparation to effectively integrate the use of technology in the teaching/redesign of the curriculum. This role also allows a teacher to get involved and engaged with students to design the curriculum altogether in writing class. Therefore, the teacher's role in 4.0 era in the writing class is to facilitate and create productive classroom environments, in which student engagement becomes the most important aspect in the teaching and learning process.

2.3 *Student roles*

In this era, students have good digital literacy and therefore, are able to learn using technology by themselves. Using appropriate learning strategies, students can monitor their learning process and

maximize their learning potential (Kumaravadivelu 2012). Students can exploit some of these opportunities by (1) identifying their learning strategies and styles in order to know their strengths and weaknesses as language learners; (2) stretching their strategies and styles by incorporating some strategies employed by successful language students; (3) reaching out for opportunities for additional language reception or production beyond what they get in the classroom, for example, through library resources, learning centers and electronic media such as the Internet; (4) collaborating with other students to pool information on a specific project that they are working on; and (5) taking advantages of opportunities to communicate with competent speakers of the language.

He also states that those activities may help students gain a sense of responsibility for aiding their own learning and this is called liberatory autonomy. There are some points in this student's autonomy. It includes providing opportunities for them to explore the unlimited possibilities offered by online services on the World Wide Web, and bringing back to the class their own topics and materials for discussion, and their own perspectives on those topics.

Clearly, the development of technology, such as the mobile phone can assist language teaching and give more opportunities toward the student to have learning autonomy. They may design a learning style based on their own strengths and weaknesses. This learning autonomy makes the students learn anywhere and anytime.

2.4 How to use mobile phones to learn writing

Students may use some features on the mobile phone which are already available or using some applications to learn writing.

2.4.1 Learning writing through mobile phone features

Most mobile phones have many features which allow users to take any actions. Reinders (2010) identifies some features in the mobile phone to facilitate students in learning writing, although the features may be different from one device to another.

2.4.1.1 NOTES

The most common feature in the mobile device is Notes. The teacher may ask students take notes to write any information that they need. For example, when learning idioms, they may find idioms from online resources, and then take a note in this feature. The student who collects the largest number of samples may win. It can be an alternative to replace paper-based daily homework.

2.4.1.2 TEXT MESSAGING

Most students find writing difficult and it becomes a boring task. By using text messaging feature, students may create their own story using *circular writing* stages. A student may write the first sentence, and then send it in a group. After that, another student continues to write a sentence, followed by other students until the story completes. They may create descriptive texts, procedures, news report, etc.

2.4.1.3 CAMERA

Students may use a camera to capture English texts. Next, they transfer them into the personal computer and upload them in some shared account such as Flickr account (www.flickr.com).

2.4.1.4 BLOG

A blog is a feature that is integrated with Internet connection. The students are able to save texts and pictures through this feature. They can share their experience, make a written report, collect some texts, make summaries, and many more. Teachers can read their work, provide some feedback or comments, and ask questions through this feature.

2.4.2 Teaching and learning writing using online applications

Many online applications have been found to make learning writing become easier. Some of them can be used for college students. They are Whatsapp and Google Classroom.

2.4.2.1 TEACHING AND LEARNING WRITING USING WHATSAPP APPLICATION

There are some text types which can be taught using this application such as recount texts, hortatory expositions, analytical expositions, and spoofs. The following is the example of a step by step teaching writing using Whatsapp application.

- *Pre-writing stage.* In the pre-writing stage, the teacher guides the student to make an outline or mind map by giving questions to generate ideas. The teacher may send and provide a topic through the application, send it in the classroom group, and then ask students to expand the topic sentence to a phrase.
- *Writing Stage.* The writing stage is when the students turn their ideas into sentences. In this stage, the students put a phrase into a topic sentence, and a topic sentence into a paragraph. First of all, the teacher asks the students to write a topic sentence and develop the topic sentence into a paragraph in ten minutes. Students are given additional two minutes to self-edit. If they have questions, they may ask the teacher. Finally, the students start reading their classmates' messages. This activity is adapted from Shalbag (2013).
- *Editing Stage.* The last stage is about editing. The teacher can manage to check the students' work by individual checking, peer-reviewing or even group working. In this stage, they have to check some items such as grammar, punctuation, style, organization and many more using the Whatsapp group.

2.4.2.2 TEACHING AND LEARNING WRITING USING GOOGLE CLASSROOM APPLICATION

Teaching and learning through this application is the same as teaching using mobile phone features. The students may do the assignments anywhere and anytime. There are some advantages in using this application in teaching and learning writing. First, the teacher can design the materials in their limited time and track the student's writing progress. The students can add some pictures or videos in submitting their work and do a bit complicated project using this application. This application can be used in higher education with various text types such as discussion, report text, and explanation. The following is a step by step example of teaching and learning writing using Google Classroom.

- *Building knowledge.* In this stage, the students are given the situation as the background knowledge to know the text they are going to study. The teacher can start the activity by giving some stimuli, providing pictures or videos related to the topic, and asking the students to respond to them. Finally, the teacher may ask them what they will possibly learn in today's class.
- *Modeling.* In this stage, the students are given information in depth about the text type and learn about the social purpose of the text and the audience of the text. The students are also introduced to the generic structure and language features of the text.
- *Brainstorming.* At this stage students focus on the topic. They can brainstorm, make a mind map, and/or read related materials for ideas. Similar to pre-writing activities, there are some activities that can be given to guide students to find ideas.
- *Planning.* Based on the ideas generated in the previous stage, the students make an outline of their composition. The teacher can give feedback to the students before they start drafting.
- *Drafting.* In this step every student develops his/her outline into his/her first draft. The student may ask the teacher or classmates for help when he/she needs some. Having finished drafting, he/she may seek feedback from the teacher and peers.
- *Revising.* This is the step when the students produce their final draft. They revise their first draft based on the teacher's feedback and consider peer's comments.

2.4.3 Teaching and learning writing using social media

Another brilliant idea of using a mobile phone for writing class is by using social networking tools such as Twitter, Facebook, and Instagram. They are the most popular social media that allow the users to post messages, share pictures, and interact online by making a group or direct interactions. Most of the interactions are in writing, and the teacher may ask students to use English to practice their writing skill. The teacher can keep in touch with the students and organize online activities.

3 CONCLUSION

This paper has discussed how mobile phones can be used in teaching writing. First, the teacher and learner roles in a writing class using mobile phones are presented. Second, learning writing can be done by the students autonomously anywhere and anytime using (1) their mobile device's features like notes, text messaging, camera, and blog; (2) some applications such as Whatsapp and Google Classroom; and (3) their social media like Twitter, Facebook, and Instagram.

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English teachers are strongly advised to use social media as useful tools in teaching and learning process to promote their students' 21st century skills.

2 SOCIAL MEDIA

Social media is a phenomenon that has transformed the interaction and communication of individuals throughout the world. However, social media is not a new concept—it has been evolving since the dawn of human interaction. The word “social” refers to connecting people by sharing and receiving information, while the word “media” refers to what people use to make a connection with other people. When the two parts are combined, “social media” refers to interaction among people in which they create, share, and exchange information in virtual communities and networks (Nations 2019). The term social media also refers to technology-mediated media that enable its users to create and share information through virtual networks (Jonathan & Steve 2015). According to Zourou (2012), social media can be defined as online media that enable users to interact with each other through various web applications that allow users to create; share; and exchange a variety of contents including videos, pictures, texts, and other modes. Actually, there are many types of social media, but in this article, the authors discuss only three: Facebook, WhatsApp, and YouTube. The authors consider that these three types of social media are the most widely used platforms for learning.

2.1 *Facebook*

Facebook is one of the social media platforms that teachers can use in the classroom. Teachers can gain many benefits from using Facebook. One of the main benefits from Facebook is that it enables its users to share sources, knowledge, and information (Kabilan et al. 2010). With respect to this benefit, English teachers can provide more information about issues and trends in EFL education and gain ideas for classroom practices. Facebook also offers many benefits not only for teachers but also for students. It offers students valuable learning experiences that provide them the chance to practice their language skills both in formal and in informal contexts (Grgurovic 2010). Therefore, Facebook has positive effects on students because it allows more practical, interactive, and enjoyable English language teaching and learning.

2.2 *WhatsApp*

One of the messaging services provided by 21st century technological innovation is WhatsApp. WhatsApp is one of the tools in education that has been considered to have the potential to promote learning (Smith 2012). Since communication is one of the purposes of WhatsApp, it can be used as an effective tool of interaction and learning between students and teachers in the school setting. Nguyen and Fussel (2016) suggest that WhatsApp could be a useful tool in the field of learning anywhere and anytime, and it could also be used for collaborative learning.

2.3 *YouTube*

YouTube is another platform that can be used in teaching and learning activities. There is a growing body of literature that recognizes the importance of the use of YouTube as an educational information source (Lee & Lee 2015). Further, Alimemaj (2010) recommends that YouTube has many benefits to support the teaching and learning processes. It is very useful for learning languages in and outside of the classroom. Numerous videos in YouTube are believed to enhance students learning about the target language, which is English, and promote their learning autonomy, as it allows them to watch videos and find their learning material.

3 PROMOTING STUDENTS' 21st CENTURY SKILLS USING SOCIAL MEDIA

Technology training is a good choice to ease the transition to 21st century teaching (McCoog 2008). Technological advances have empowered several methods of doing something very differently from conventional methods. Social networks/media are the consequences of this developmental step. Social interactivity has never been as developed as experienced in the 21st century. Seaman and Tinti-Kane (2013) and Person (2010) prove that social media is one of the technologies that appears in education in or outside the classroom. Teachers must help their students to develop specific work and life skills, and 21st century skills are essential for everyday living. These skills will help students become successful later on in their lives. The 21st century skills are the core competencies for learning that can help students to evolve in this global and digitally connected world (Partnership for 21st Century Skills 2016). Improvement of the teaching and learning processes will be determined by the strategies that the teachers use. Teachers should be able to motivate their students. Teachers can use various techniques or strategies combined with the use of information and communications technology. Technology, especially social media, will help teachers to promote their students' 21st century skills. The skills explored in this article are critical thinking, creative thinking, collaborating, and communicating.

3.1 *Critical thinking*

Critical thinking skill is a fundamental skill in solving problems. It is important for students to possess this skill to find the source of a problem and then the right solution for it. According to Ennis (2013), critical thinking is a form of reflective thinking that makes sense or is based on reason that is focused on determining what should be believed and done. Critical thinking skill can be embedded in various disciplines. The teacher plays an important role in designing and developing learning programs that are more focused on empowering this skill.

Critical thinking skill is the dominant skill that must be taught explicitly (Zubaidah 2016). Through critical thinking skill students are expected to be able to use systems of thinking to make effective analyses, solve problems, calculate possibilities, draw conclusions, and make decisions. Critical thinking skill is one of the higher order thinking skills. With high-level thinking skills, students can absorb knowledge and demonstrate their performance; students will become effective communicators, critical and dynamic thinkers, competent problem solvers, and experts in their careers (Živković 2016).

To promote the students' critical thinking, teachers can use social media such as YouTube videos in the classroom. YouTube videos are fun and interesting and increases students' participation and engagement and enhance their critical thinking skill (Sethela et al. 2014). According to Kivunja (2014), some abilities related to creativity can be developed in learning, such as solving problems in everyday life; being open and having curiosity; being able to utilize abilities and skills in analyzing, evaluating, elaborating, and creating; and being able to use various creative thinking strategies to find and express new ideas.

3.2 *Creative thinking*

Creativity has been considered as one of the important skills that must be mastered and the key for effective learning in the 21st century. Creative thinking is about how to think outside the box. It is the ability to produce new, diverse, and unique ideas. Creative thinking is synonymous with the ability to generate new ideas (Piaw 2010). Creative thinking skill can be fostered by teachers and learning environments that encourage questions, openness to new ideas, and learning from mistakes and failures. Like other skills, creativity and innovation skills can be developed through practice and over time (Pacific Policy Research Center 2010). Creative thinking will produce a creative generation that has the potential to solve complex social and environmental problems. To build effective creative thinking, students must learn to use various techniques to discover new and useful ideas (e.g., brainstorming) and perfect, analyze, and evaluate their own ideas to enhance and maximize creative efforts, and so forth.

Using social media such as Facebook can enhance students' creative thinking. It is in line with Yunus (2012), who states that existing research shows that Facebook plays a significant role in promoting students' creative thinking skills. Therefore, teachers can use Facebook in teaching and learning processes. Coffman (2013) stated that several methods can be used to train students' creative thinking skill, including posing questions and inviting students to actively participate in learning, exploring topics and material with primary or real data that can be found in social media (Facebook, YouTube, etc.), and thinking of new ways to inform new findings. Therefore, the more interesting the media presented, the higher the incentive of students to pay attention to the material presented.

3.3 *Collaborating*

Collaboration is a 21st century learning trend that shifts teacher-centered learning into collaborative learning. The collaborative learning environment challenges students to express and maintain their positions and produce their own ideas based on reflection. They can discuss conveying ideas to their peers, exchanging different points of view, seeking clarification, and participating with high-level thinking such as managing, organizing, analyzing critically, solving problems, and creating new learning and deeper understanding. Collaboration is a skill that aims to develop collective intelligence in terms of helping, suggesting, accepting, and negotiating through interactions with others mediated by technology (Brown 2015).

Collaboration in the learning process is a form of collaboration between students who help one another and complement each other to do certain tasks in order to achieve a predetermined goal. Collaborative learning also leads to the development of metacognition, improvement in formulating ideas, and discussing or debating with higher levels of thinking. This gives students the opportunity to learn to monitor each other, detect errors, and learn how to correct their mistakes. Therefore, students can develop knowledge content and learn 21st century skills such as the ability to work in teams, solve complex problems, and apply acquired knowledge to other situations (Barron & Darling-Hammond 2008).

Social media such as WhatsApp and Facebook can enhance students' collaboration skills. Novak et al. (2012) state that tools of social media play a positive role in enhancing the performance of learners and encourage active collaborative learning in education. Therefore, teachers can use them in classroom activities. There are certain strategies that can be used by the teacher in developing collaborative skills in learning. First, teach students to work respectfully with different teams, not only physically but also psychologically. Second, teach flexibility and a desire to compromise so that goals that benefit all collaborating parties can be achieved. Third, emphasize five principles of cooperative learning, namely positive dependence, individual accountability, equal participation, group processing, and simultaneous interaction in the development of collaborative skills.

3.4 *Communicating*

Communicating is related to the ability of students to communicate and express their opinions in the learning process. Communication skills include understanding the information provided and the ability to express ideas or concepts effectively (Partnership for 21st Century Learning 2015). Communication skills refer to the ability of individuals to communicate clearly, use spoken or written language, verbal and nonverbal, and collaborate effectively (Pacific Policy Research Center 2010). Verbal communication is related to the content of the information conveyed, while nonverbal communication is related to the way information is delivered.

Learning is a social activity that can fundamentally occur in schools, workplaces, and other environments. Therefore, communication skills must be built from the beginning. Some communication skills that can be developed in learning are as follows (Arsad & Soh 2011; Osman et al. 2013). These are the ability to convey information and ensure recipients of information understand the message conveyed, ability to communicate verbally and in writing through various media, ability to choose the media and the most appropriate way of communicating related to the

character of the recipient of the message and the purpose of the message, ability to manage and use technology and other digital resources in expressing ideas and opinions, and ability to interact cooperatively in a group work.

Social media such as Facebook can enhance students' communication skills, as a teacher can communicate with students or students can communicate with students through Facebook by sending and discussing learning material, giving comments or feedback, or exchanging information. It is in line with Walsh (2012), who maintains that a Facebook group is a great way to distribute content and create a central place for communication for a course or class. Trilling & Fadel (2009) suggest a number of strategies teachers must carry out in order to effectively build 21st century communication skills in students. Some of these include communicate using digital media and the environment to support personal and group learning; teach students how to articulate thoughts and ideas verbally and use written and nonverbal communication skills in various forms and contexts; and teach students how to listen actively and effectively. The strategies also will help students interpret and understand meaning in communication, taking into account cultural background, values, attitudes, and intentions.

4 CONCLUSION

In the world of adolescent education today, the learning process is no longer focused on the delivery of information that is limited by classroom walls. Advances in science and technology have made social networking very popular in the current development of communication. Social media create a new culture where teachers and students not only engage in the learning process in the context of the physical space, but also allow the educational process to be carried out in other spaces online. The use of social media formally can be interpreted as a combination of learning in analog and online. A well-integrated social media communication breeds a new learning environment. The role of the teacher is slowly changing due to the development of media technology. The role of the teacher who was originally a giver of knowledge has now turned into a party that facilitates the sharing of knowledge because the information and knowledge obtained by students is no longer obtained only from the teacher. The traditional teaching methodology, especially traditional classroom instruction, has been changed by social media. Students can now use such media to post, share, and make comments on the related topics. More importantly, teaching English using social media can promote students' 21st century skills because these can make studying more collaborative and efficient. Students can create, store, and manage their study; make the best of their study time; and find new resources to help them learn and retain knowledge.

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A tablet application design to teach sexuality to children with autism

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ABSTRACT: Sex education is necessary in early ages to overcome bad sexual behavior in children with autism. Luckily, the development of information and communication technology (ICT) opens a possibility of development and use of learning media appropriate to the characteristics of children with autism, especially the high-functioning autism. This study, therefore, aimed to explore a design of ICT-based learning media of sex education for children with high-functioning autism. The study employed a qualitative descriptive method, consisting of literature review and focus group discussion which involved teachers, doctors, psychologists, and experts relevant to autism. The results show four parts of the learning media development planning, namely: 1) materials for girls, 2) materials for boys, 3) materials on relationship with others, and 4) concepts of privacy. All the teaching materials are in visual and audio forms, delivered through an application on an Android-based tablet.

1 INTRODUCTION

Children with autism are basically no different from those without autism in terms of emotional, physical, and social changes like hunger, thirst, and need for love, as well as hormonal and sexual changes. Into puberty, those children will also experience such physical changes as hair growth in several parts like the face, armpit, and genital areas as well as vocal chord changes (for boys) and menstruation (for girls); however, the process of sexual changes seems to be more difficult for children with autism since they have difficulties in understanding social norms (Sullivan & Caterino 2008). This “challenge” usually leads to issues in dealing with changes in expressing feelings or causes improper sexual behavior (Helleman et al. 2006, Sullivan & Caterino 2008, Chamidah & Sukinah 2015). Boys with autism, for instance, often express their sexual desire by masturbating (Helleman et al. 2006), and some of them not even ashamed of showing their genitals or doing masturbation in public (Chamidah & Sukinah 2015). Besides, children with autism express their sexual desire are by holding somebody else’s genital, hugging, and kissing their fellows or even their teachers. Moreover, as proven by a study conducted in seven special education schools in Yogyakarta, some children with autism sometimes express their sexual desire by playing with their own genitals, i.e. by rubbing them to the wall and floor (Chamidah & Sukinah 2015).

A study by Helleman et al. (2007), which examined boys with autism, proved that it is important for children with autism, especially those with high-functioning autism, to have sex education in early ages since most of them come up with sexual deviation. It has also been proven by the study that to cope with it, sex education or reproduction education in early ages is one of the good solutions. Actually, since 2009, UNESCO has issued International Technical Guides on the implementation of sex education and reproduction education which aim to decrease sexual problems in teenagers (Goldman & Collier Harris 2012). Concerns with the importance of sex education for children with special needs are actually increasing, yet only in a few cases has focus been placed on autistic persons who face obstacles in social interactions (Sullivan & Caterino 2008, Travers & Tincani 2010, Hartman 2014). These make it difficult for both teachers and parents to have adequate information on sex education for children

with autism (Sullivan & Caterino 2008; Chamidah & Sukinah 2015). In Indonesia, particularly Yogyakarta, sex education is not conducted as a specific subject, but it is integrated into subjects such as sciences and religion. Thus, it is not taught in a structured way (Chamidah & Sukinah 2015).

Sex education can actually be given to children with autism with the aid of learning media that fit their characteristics and learning styles. It is believed that most children with autism are visual learners, so that they find it easier to absorb learning materials in the form of pictures rather than sound. Considering this fact, an application on a tablet is quite accommodative. Some teachers agree that ICT-based media can help them give sex education to children with autism since the media are interesting for these children (Chamidah & Sakinah 2015). For the aforementioned reasons, this study aimed to explore a design of ICT-based learning media of sex education for children with high-functioning autism.

2 METHOD

This study employed a qualitative descriptive method through five phases: 1) literature review, 2) focus group discussion, 3) visual and audio selection, 3) picture making and audio recording, and 4) the making of the application. Figure 1 illustrates the research steps.

Figure 1 shows that the first step of the application development was literature review on a sex education curriculum for children with autism as well as choosing a learning application appropriate to the characteristics and needs of children with autism both in school and at home. The next step of the development was choosing contents or materials through a focus group discussion which involved teachers, doctors, psychologists, and experts relevant to autism. The teachers involved in this study were teachers of students with high-functioning autism in grades 7 to 9 (13 to 15 years old). After that, pictures and sounds for the materials were selected. After the selection of the pictures and the sounds, all the pictures were then made using the Adobe Photoshop CS 6 software and all the sounds were recorded. Finally, the application was created based on the Android operating system. Some types of software were used in making this application, such as Adobe Flash Professional CS 6, Adobe Photoshop CS 6, Corel Draw X7, Audacity, Illustrator, and Adobe Air.

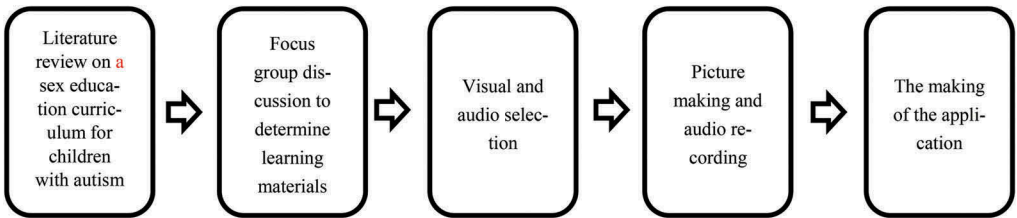


Figure 1. Steps of the application development.

3 RESULTS

3.1 Sex education materials

There are few resources discussing the sex education curricula especially designed for children with autism. Table 1 explains some sex education curricula for children with autism.

Table 1 shows that sexuality education curricula for children with autism vary widely in terms of both the number of topics that are taught and the coverage of learning materials. Tarnai and Wolve (2007) described learning topics of sexuality to consist only of three major topics, while the other authors recommended that the number of topics taught be increased.

Table 1. Conclusion on Literature Analysis of Sex Education Curricula.

Writer	Topic
Tarnai & Wolve (2007)	Health & cleanliness Opposite sex relationship Early protection and advocacy
Sullivan & Caterino (2008)	Body parts and their functions Physical development Personal health and treatment Appropriate social and sexual behaviors Privacy issues Understanding emotions Self-image Sexual harassment prevention
Hatton (2010)	Interpersonal relationship Cleanliness Safe touches Public and privacy Health Masturbation Menstruation Opposite sex relationship Sexual relationship

Table 2. Sex Education Materials for Children with Autism on Application.

Topic	Component	Sub-component
Girls	Organs in female bodies	Mouth, breasts, stomach, vagina, thigh, and bottom.
	Physical changes in female bodies	Physical changes from infancy up to old ages.
	Menstruation	Introduction to menstruation How to use a tampon
Boys	Organs in male bodies	Mouth, chest, stomach, penis, and bottom.
	Physical changes in male bodies	Physical changes in male bodies from infancy to old ages.
	Nocturnal orgasm	Explanation about nocturnal orgasm.
	Masturbation	Explanation about masturbation. How to do masturbation properly.
Relationship with others	Proper physical contacts	Core family (father, mother, and siblings) can touch, kiss, and hug.
		Doctors are allowed to touch body parts when examining.
		Handshaking with other people is allowed.
The concept of public-privacy	Improper physical contacts	Touching other people's genitals.
	Knowing public places	Schools, markets, and playgrounds,
	Covering personal body parts	Personal body parts cannot be shown to other people.

Based on the information presented in Table 1, a discussion between teachers of children with autism, doctors, psychologists, and special education experts was held to formulate sexuality learning materials that would be included in the learning application. The focus group discussion (FGD) by the team of this study decided that the materials to be taught to children with

high-functioning autism also need to be adjusted to the Indonesian context. The FGD then agreed that the materials were to be categorized into four parts: 1) materials for girls, 2) materials for boys, 3) materials on relationship with others, and 4) concepts of public privacy. Below is the explanation of the categories.

3.2 *Sex education application*

The application, as mentioned before, is filled with pictures and sounds matching the characteristics and needs of children with autism. Pictures are used to visualize the materials needed such as when showing genitals of both girls and boys, when talking about forbidden parts to touch, and so on. Besides, sounds are used so that children with low literacy can still understand the materials delivered. The learning medium, which appears in the form of an application, can be used on smartphones and tablets with certain specifications. Here are the required specifications to run this application: 1) at least Jelly Bean Android operating system, 2) at least 1 GB RAM memory, and 3) at least 14 GB free space of memory. It is suggested that teachers and parents guide their children or students so that they can give assistance when their children or students find difficulties.

4 DISCUSSION

The curriculum of sex education as a part of reproduction health education for children needs to be developed individually and in accordance with the needs of children (Sullivan & Caterino 2008). The unique characteristics of children with autism make it difficult for them to adjust their sexual expression based on informal socialization like children with no autism. Thus, sex education has to be given in early ages before they develop sexual deviation, such as, doing masturbation in public; however, the exact age to start sex education might vary from one child to another.

The development of an application for promoting sex education for children with autism, especially of the high-functioning type, is an attempt to meet their needs. This application was developed for children in grades 7 to 9 or aged 13 to 15 years. One of the materials discusses the genital organs or male and female bodies. This part is very important for them since they tend to have barriers in communication. By using the application, they can identify those parts and their functions through an interesting, easy-to-use application (Travers & Tincani 2010). In addition, the introduction of masturbation, nocturnal orgasm (ejaculation), and menstruation also plays an important role in sex education for children with autism since masturbation in public, for instance, is often a case found in sexual issues for children with autism (Helleman et al. 2007).

The concept of keeping their body parts from improper touches is also an important issue in sex education for children with autism. This is due to their lack of understanding of which touches are allowed and which are not (Brown-Lavoie et al. 2014). Information of public places and privacy is also useful for them so that they can know when and where they can and cannot show their body parts and avoid the risk of sexual harassment. Sexual harassment surprisingly happens frequently to children with autism. According to a study by Brown-Lavoie et al. (2014), 78% of adults with autism used to have sexual harassment when they were kids.

It has been proven that ICT-based sex education media are useful for children with autism (Ramdos et al. 2011). The development of ICT now allows the use of multi-touch tablet which is more user-friendly for children with autism (Hourcade et al. 2011, Price 2011, Tseng & Do 2011, Autism Spectrum Australia 2013, O'Malley et al. 2013, Doenayas et al. 2014). There are actually plenty of applications whose usage is adjusted to individual needs and situations (Price 2014). A research study by the Autism Spectrum Australia (ASPEC) in 2013 shows that children with autism who learn using Android-based tablet or iPad perform better in learning than those who take the traditional way of learning.

Communication is actually one of the common concerns in studies using tablets or iPad for children with autism (Ramdos et al. 2011), even though some other factors such as social skills are also proven to improve with the use of the devices (Hourcade et al. 2011, Doenyas et al. 2014). Burton et al. (2013) did a study on autistic children 13–15 years of age who appear to have better mathematical skills when learning using iPad. Milman et al. (2012) also supported this idea through their study, proving that younger children with autism performed better in writing, drawing, and mathematical skills when using iPad. Recently, Price (2011) compared the skills of comprehensive writing of children with autism who used printed books and interactive e-books. Unsurprisingly, children who used interactive e-books performed better in reading and writing than those using printed ones. Therefore, the application developed in this study is expected to be able to accommodate the needs of children with autism since the application promotes multiple sensory abilities important for them. Figures and sounds are also expected to make them more interested in learning and understand the materials better.

5 CONCLUSIONS

This application is an attempt to provide sexuality education for children with autism, especially the high-functioning autism. By this learning application, children with high-functioning autism study materials about the private parts of the body, relationship with others, and sexual behavior. Learning materials are presented with a variety of colorful images and are equipped with voices that run on smartphones/tablets with the Android operating system. Learning media are expected to increase children's interest in learning the materials and provide a clearer understanding because they can see visually the materials being taught.

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