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An Exploratory Study of Indonesian Teachers' Digital Literacy Competences

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Abstract. This study aims to reveal how high school teachers adjust to the demand of utilizing digital literacy skills in two selected areas of the Lombok Island, Indonesia. The study sought to get deep understanding of how high school teachers developed their digital literacy competences and kept up with the demand of online teaching of English during the pandemic time. The study also sought to identify problems pertaining to the utilization of digital literacy in the pandemic time. The study employed a qualitative method with multiple-case design. A purposive Sampling technique was used to determine the key informants for the study. The data were obtained from various sources, which included interviews, observations and document studies. The process of data analysis encompassed data reduction, data presentation, and conclusion drawing. This was done through triangulation of data iteratively. The data were then analyzed thematically. The study yields that teachers in the two selected research areas acquired varying degrees of digital literacy competences due to different goal-setting, interests, knowledge and skills. A number of problems pertaining to teachers' differing competences in digital literacy were identified, i.e. (1) lack of internet access (2) the absence of professional development, (3) and institutional support system. All of these problems were intertwined in nature. The study concludes that a professional development program needs to be devised for the participants to improve their performance and competence in utilizing digital literacy.

Keywords. Digital Literacy, Self-regulated Learning, Competence Achievement

1. Background of the Study

The increasing use of digital technology in various aspects of life has encouraged various countries to develop policies in the field of digital literacy in schools. Responding to the global demands of digital literacy, the Government of Indonesia has budgeted a considerable amount of funds for the construction of internet networks for schools and online professional development projects (Sari, 2012). School teachers are required to adapt to the development of the current information technology so that they are technologically abreast. At present, the majority of schools throughout Indonesia have been equipped with computers and internet devices. Such a rapid provision of internet infrastructure is estimated to have a substantial impact on the development of teachers' knowledge and skills in digital literacy. The issue of digital literacy for education within Indonesian setting was first introduced by Rahmah (2015). She posited that the coming of Free Trade Area of the Asia-Pacific (FTAAP) in 2020 would

force every citizen of Indonesia to learn the digital literacy for their own benefits. Similar account was stated by Prianto, Winardi and Qomariyah (2021).

Such a development of digital literacy technology has taken place so rapidly that its influence has been pervasively unthinkable. Now, teachers in all levels of education are obliged to acquire digital literacy competence in order that they can take advantage of abundant online resources for teaching. The sudden change of schooling system worldwide due to the pandemic has challenged teachers to work under different circumstances. The issue of utilizing the digital literacy for learning became more pivotal when public places, including schools, were forced to close down. This policy has subsequently changed the practice of teaching-learning process in the Indonesian educational system. Teachers are now forced to learn how to utilize digital literacy beyond textbook-based learning materials. This condition requires all stakeholders in schools to adapt to this new challenge. Sooner or later, teachers must familiarize themselves to digital literacy resources to keep up with the demand of the new educational practices. Despite such a great leap of change, however, little is known about how the training of internet technology contributes to the development of teachers' digital literacy (Sari & Yoni, 2021; Muskania & Zulela, 2021). In addition, the potential for digital literacy of teachers in Indonesia has not been clearly known by the wider community. The lack of research results in the field of digital literacy encourages researchers to embark this study. This research is therefore inspired by the phenomenon. It attempts to reveal patterns of teachers' utilization of internet devices for acquiring digital literacy skills in the two selected research areas.

Law et al., (2018) define the term digital literacy competence as one's ability to access, utilize and communicate information from various digital literacy sources to others. This succinct definition entails that a person is said to be digitally literate if he is able to find and collect information from trusted sources in the virtual world, recognize the values contained in it, and communicate it to others using social media networks or online. According to Mercuri & Ramos (2014), digital literacy includes the use of various media and a series of new activities that are different from traditional classroom literacy materials and activities. For this reason, teachers, as digital literacy users, are required to master skills in understanding information on the internet, effectively using search engines such as Google to find information, communicating via email, WhatsApp, Chat, Telegram and the like; and take advantage of various online programs to interact with students via Moodle or Google Classroom. The fundamental impact of this is the change of teachers' role in the classroom, i.e. from owner of learning to facilitator of leaning. This change in role surely demands teachers to be competent in facilitating students or groups of learners to seek and find the information in the digital literacy resources. Thus, the teachers' competence in the field of digital literacy changes not only the way teachers teach but also their mind-sets in treating students in the context of learning.

A number of researchers, such as Galvis, 2012, Shifflet & Weilbacher (2015), Ha & Lee (2019) and Nikian et al. (2013) reveal teachers' acceptance or refutation to the presence of digital literacy for teaching and learning is heavily influenced by their previous experiences. Teachers will develop a negative attitude towards digital literacy when previously they had distasteful experiences that lower their self-confidence. Such experiences can lead to feelings of uncertainty and a fear of wrongdoing. Teachers' lack of knowledge and skills in using such technological products also can induce anxiety and lack of confidence (Buabeng-Andoh, 2012). As a result, teachers refused the presence of digital literacy in their workplace. Consequently, they become demotivated and insist on maintaining what they have practiced for years. For teachers who do not have the habit of accessing digital literacy resources, changing learning

modes can become a big challenge and bring about a problem too. At this point, it can be inferred that the problem of teacher difficulties in using online learning media is strongly influenced by a number of factors, such as the level of digital literacy competence, motivation to learn, and the ease of access to the internet (Hutchison and Reinking, 2011).

Conversely, teachers who have positive views usually develop positive attitudes towards the presence of digital literacy. These teachers are highly motivated to apply the digital literacy in the workplace because they understand the benefits of what they learn. Teachers with this positive view are usually active to learn to utilize digital literacy resources for their own learning (Johannesen, Øgrim and Giæver, 2014). Through the utilization of digital literacy, teachers can teach students how to seek and find reading sources that can support the field of science they are interested in. Also, teachers can help students develop critical thinking through analysis of textual reading sources widely available on various internet sites (Moradi, 2019). In short, through digital literacy-based learning, teachers can train students to be skilful and proficient in accessing, understanding, communicating, and evaluating information through digital technology devices. In a study in the United States, Honan (2008) found that changes in teacher mind-sets can occur if structural institutions, such as schools, support and facilitate these changes. The education system in schools and local education authorities must be able to respond to these changes in a more productive and creative way in utilizing this digital literacy learning resource.

To account for how high school teachers perceived and responded to the demand of acquiring digital literacy competences, the present study employed the theory of Self-Regulated Learning (Zimmerman and Kitsantas, 2005) as the theoretical stance. Briefly, the theory of Self-Regulated Learning explains that the learning process experienced by a learner occurs through 3 main phases, namely (1) thinking ahead (forethought), (2) performance achievement and (3) self-reflection. . In the first phase, digital literacy learners usually analyse new tasks, set goals, plan ways to achieve them and drive motivation that influences how they activate their learning strategies. In the second phase, the learners implement what is planned, monitor his learning progress, and use self-control strategies that encourage him to accomplish the task completely. In the last phase, namely self-reflection, students will assess the results of task completion, analysing the attributive link between performance and their success or failure. These attributive links generate self-reactions that can elicit either a positive or negative view of what they have learned. In essence, the theory of Self-Regulated Learning emphasizes that teachers' change in response to the phenomenon of digital literacy is highly dependent on their cognitive and affective conditions. In order for them to be able to mobilize their ability to reach the level of digital literacy competence effectively, they are required to change their perspectives and attitudes towards the existence of digital technology. This study tries explore the phases that teachers go through when dealing with the demand of digital literacy.

Previous studies have showed that ease of access and geographical factors contribute to one's perceptions about his/her experiences in digital literacy. Dube (2020), for example, informs that compared to those who work in the rural areas, teachers in urban places tend to be more active and innovative in using online resources for learning because of adequate learning facilities and high support from parents and the community. The same is true with students. For students in the rural areas, provision of digital literacy for independent learning is problematic in some ways. They have difficulty to adjust themselves to the new learning model because previously they never have any experience. With unstable network conditions and lack of learning facilities at school, students in rural areas tend to be passive and not enthusiastic about

learning using online modes. This of course further widens the inequality in learning between urban and rural students.

Although there are many opinion articles that describe how increasing digital literacy can improve the quality of teaching and learning in Indonesia, the results of research on digital literacy are still very limited. In a qualitative study of high school teachers in the city of Surabaya, Kharisma (2017) reports that teachers in the city of Surabaya have relatively high levels of digital literacy in implementing digital literacy-based learning. This finding is in contrast to the findings of (Asari et al. (2019). These researchers found that teachers in Malang Regency, Indonesia, have a relatively low level of digital literacy competence. Many of them still have difficulty accessing digital literacy due to lack of online training. They found that their knowledge of digital literacy applications was still limited. The survey of English teachers in Indonesia by (Jeong-bae, Robb and Indra, 2011) show a similar result, i.e. many teachers do not have adequate digital literacy competencies as reported by Kharisma (2017).

In a qualitative study conducted in Luwu, Palopo, East Indonesia, Mastura & Santaria (2020) found that there were two main obstacles faced by teachers in applying digital literacy for learning during the pandemic time. First, teachers underused digital technology in designing and conducting the learning process. Many of these teachers were found not to have adequate understanding of digital literacy. Second, a number of teachers still have not mastered digital literacy for online teaching. Many of them were not familiar with models, styles and strategies implemented for learning digital literacy. The study indicates that in general teachers had difficulty in changing their mind-sets and teaching methods. For example, they still applied a deductive teaching pattern, one way communication and teacher-centeredness. This finding suggests that changing the mind-sets and teaching habits seem to be difficult for teachers as these habits have been deeply entrenched in the teacher's way of thinking and acting.

Along the explanation above, the objectives of the present research are formulated as follows: (1) To reveal English teachers' forethoughts regarding the presence of digital literacy in their schools (2) To uncover teachers' perceived performance in using digital literacy in schools and (3) To assess teachers' self-evaluation on their present competence in digital literacy.

2. Research Method

This study used a qualitative approach with a multiple-case design. This choice of this research paradigm helped the researchers to yield detailed and comprehensive data that were used to achieve the research objectives and answer the research questions. To account for the identified postulates of Self-Regulated Learning mentioned previously, the qualitative research approach was employed. In order to be able to explore in depth the qualitative data, the researcher employed interviews and document studies in collecting qualitative data from the participants. Previously, the researchers planned to involve school observations. However, due to the lock-down policy, the observation was dropped as teachers and students worked from home.

This case study was conducted in two different schools in the urban and rural areas of Lombok Island, Indonesia The focus of the present study was high school teachers' efforts in developing their digital literacy competencies for teaching English. For that purpose, the researchers administered semi-structured interviews with a total of 6 English teachers from both schools. The interview instruments were arranged in the form of a list of themes for semi-structured interviews. It took approximately 30 to 50 minutes to interview each of the participants. The interview guide and informed consent were read and given to the participants

prior to the interview. This interview was intended to explore the general perspectives of the participants on the perceptions, responses and problems pertaining to the implementation of digital literacy To ensure participants, the researchers explained that the interview was not intended for evaluating their performance bur rather it was merely for research purposes. The participants of the study were greatly cooperative and open in providing the information required by the researchers.

The in-depth interview instruments were arranged in the form of a list of themes for semi-structured interviews. This interview aimed to explore the general perspectives of the participants on the perceptions, responses and problems pertaining to the implementation of digital literacy. The data were analysed descriptively. The researcher used the qualitative analysis procedure suggested by Miles and Huberman (1994). The data obtained from observations were grouped and sorted according to the emerging themes and checked for consistency with other types of data. In essence, the data relevant to the theme was grouped into sub-themes until they are saturated.

To analyse the data obtained from interviews, the researchers used thematic analysis techniques. As the name implies, thematic analysis, according to Teddlie & Tashakkori (2009), involves a whole series of narrative data analysis processes using various inductive and iterative techniques, including categorical strategies and contextualization. The researcher intends to use this technique because the focus of his research is on the teacher's experience and views on changing teaching strategies. The data obtained from interviews were transcribed, grouped and sorted according to emerging themes and checked for consistency with other types of data. In essence, the data relevant to the theme was grouped into sub-themes until they are saturated. Through this analysis steps, the researchers obtained a clear and detailed picture of a situation or phenomenon under the study.

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3. Results and Discussion

3.1. Results

Results of data analysis show that there was a striking difference of forethoughts among teachers in the rural and urban areas in responding to the demand of digital literacy. Participants from rural areas were in the state of "wait and see" and did not assert a clear future plan to deal with the digital literacy. They considered that they were not ready yet to employ digital literacy for learning. Thus, they still relied heavily on school libraries for literacy resources. Teacher 01 stated, "*I'm not very good at digital technology. I only use the available books here because it is easy to use*" He further explained that he felt reluctant to learn using Google Engine to look for teaching materials. "I *am just looking for an easy and less consuming way of accessing resources for teaching*" He added that he preferred a simple technology for classroom use. Two other participants from the rural area stated in the same vein. These teachers preferred to use hard-copy books rather than internet platform. In this relation, teacher 03 asserted, "*Even in pandemic time, many of us don't teach using online. Usually we only provide quizzes and exercises for students to pick up at school. They picked them up, did them at home and sent them back to teachers' desks*" Because they never received any training in digital literacy, they considered that the digital literacy was not quite urgent and appealing to learn. Thus, they did not plan ahead how to prepare themselves to deal with the new technology-based literacy resources.

In contrast to their colleagues in the countryside, teachers in the urban area showed their readiness and enthusiasm to welcome the coming of digital literacy in their workplace. Teacher 06, for example, admitted that she and her colleagues got used to using digital literacy for both teaching and learning. She stated that she liked the digital literacy resources because they were handy and provided her with a variety of choices. In the same vein, Teacher 04 expressed, "*I have attended 2 training activities regarding digital literacy. I think the training activities were awesome. The skills we got from the training make it easy for us to handle our job*" In general, participants from urban area developed a positive forethought to respond to the demand of digital literacy. Most of them considered that they had to learn to utilize digital literacy because "*its existence was certain and undeniable*" (Teacher 05). In this relation, Teacher 05 remarked, "*At my school the teachers are mostly young. They are enthusiastic and responsive to using digital literacy in their teaching*" Regardless of such positive attitudes toward the presence of digital literacy in their schools, some of the teachers was still difficult to change their mindsets. Similar to their counterparts in the rural area, some teachers in urban schools also showed reluctance to plan ahead to utilize digital literacy resources for teaching and learning. They experienced the same problem pertaining to the use of technology-based literacy resources.

As regards the performance achievement, participants from rural area admitted that they had not used digital literacy resources for teaching and learning because of their limited ability to use digital literacy resources. In general they relied on smartphones only for interacting with

students. "*Generally, we use mobile phones to interact with students. We used WhatsApp Group to send assignments to students*" said teacher 04. Other participants concurred. Due to the limited internet access in schools, they did not have an opportunity to explore other types of digital literacy resources for learning. Statement made by Teacher 02 probably represented the rural participants' voices regarding their low performance achievement in utilizing digital literacy resources, "*In my school the main problem is that we are not adequately trained to access online information and our school internet facilities are very limited*" Results of observations and document studies in two different rural schools complement the interviews. All participants consistently carried out the conventional learning process as they explained in the interviews. They also showed how they utilized limited literacy resources available in the school libraries. These teachers therefore suggested that local education authority provide them with special training in information and technology.

Different from their colleagues in the rural areas, participants from urban regions showed steady performance achievement in digital literacy. Three participants asserted that they were able to share their own work to other teachers and students through a variety of social media, such as E-mail, WhatsApp, Facebook and Instagram. These participants claimed that their schools had already had websites and online classrooms. Teacher 05 stated she and her colleagues were able to create video for learning. Similarly, teacher 04 said, "*We know the basic digital literacy but we did not yet have knowledge and skills to create a personal webpage. We do expect to get such training in the future*" All participants concurred that they and their colleagues had been familiar to access various e-books, online articles and journals, and online teaching resources. The majority of teachers in urban areas acknowledged that they were able to achieve good performance in employing digital resources due to the availability of adequate learning facilities provided by their school management. Results of the interview English teachers from urban areas show that they had a strong confidence in their current digital literacy skills. They concurred that their colleagues played an important role in sharing and improving their digital literacy skills. Results of observation in the field were congruent with the interviews. Participants provided evidence that they had developed creativity to utilize online learning resources for the teaching of English in their respective schools. Together with other teachers in the same school, participants took an initiative to create online literacy resources shared collectively. Overall they showed their readiness to take advantage of the digital literacy resources for the teaching and learning of English.

In response to the question related to participants' self-evaluation on their present competence in digital literacy, all participants from rural areas viewed that they did not acquire adequate knowledge and skills in digital literacy due to unavailability of computer facilities at schools and unstable internet access in their areas. This is in contrast to conditions in urban areas. Almost all respondents from urban areas stated that they did not experience problems with access to digital literacy resources because of the stable internet network and the availability of sufficient number of computer facilities in schools. These teachers showed high enthusiasm to explore digital literacy resources to develop learning materials for their students. Despite such a progress, one participant admitted that he needed more training to utilize a variety of advanced digital literacy resources in the internet. He found that students lost their interests to explore digital resources he suggested because they got bored with monotonous tasks. He said, "*Actually they are bored with the same online learning materials (that I provide)*" This finding indicates that teachers should improve their competence in the field of digital literacy in order to create interesting and fun online learning materials. This lack of teachers' competence in digital literacy had an effect on students' interest in virtual learning. This finding

supports the results of previous studies (Jeong-bae et al., 2011, Mercuri & Ramos, 2014, Asari et al., 2019, Mastura & Santaria, 2020)

3.2. Discussion

By using the theory of Self-Regulated Learning from (Zimmerman and Kitsantas, 2005), the study has identified different participants' forethoughts concerning the coming of digital literacy in their daily practice. Participants from urban areas consider that digital literacy resources are not their priority goals regardless of the force of work from home policy whereas teachers from urban areas view that the policy of work from home can yield great potentials to improve their digital literacy so that they can have an alternative to run online classes. These potentials include positive support from the school leadership, colleagues' assistance in utilizing digital literacy resources and professional development initiatives from the local authorities. Thus, they set up clearly plans of how to keep up with the new challenges.

The study concurs that due to different goal setting in dealing with the presence of digital literacy, the performance achievement among participants from rural area and urban area differ significantly. Participants from rural area underperform in utilizing digital literacy resources as they did not have adequate access to digital learning facilities. This is in contrast with their colleagues in the urban area. Results of this study indicate that there was striking difference in the mastery of digital literacy among participants in urban and rural areas. A number of problems pertaining to teachers' differing competences in digital literacy were identified, i.e. (1) lack of internet access (2) absence of professional development, (3) and no institutional support system. This finding is in line with the previous research study conducted by Dube (2020), i.e. teachers in urban areas have wider access and higher interest/motivation than those in rural areas and thus consequently they develop different digital literacy competence.

Regarding self-evaluation, the participants reflected details of the problems they faced in utilizing digital literacy in schools. There are three major problems faced by teachers in rural areas related to their lack of optimal use of digital literacy resources, namely (1) short of training in digital literacy (2) lack of access to digital literacy resources and (3) low motivation and interest. In the urban area participants claim that these problems did not appear in their workplace. Almost all participants consider that they are ready to deal with the demand of using digital literacy in their schools. Despite differences, the findings show that the participants from both areas are aware of the importance of improving their digital literacy for teaching. From their reflection, it can be seen that in the future a professional development program needs to be provided for them in order that they can improve their competence in the digital literacy.

Conclusion

Results of the study show that teachers in the two research sites have developed uneven competencies due to their differences in responding to the demand of using digital literacy in schools. The majority of participants from rural area did not have clear immediate plan to deal with the presence of digital literacy in their daily work. They are in the state of "*wait and see*" In contrast, most participants from urban area show that they have good knowledge of digital literacy because of their responsive attitudes toward the presence of digital literacy. They have adequate knowledge and skills to deal with the demand of using digital literacy at work. Due to different goals, interests, levels of knowledge and skills in digital literacy, participants from both sites show divergent performance achievement. The study suggests that the three problems faced by teachers rural areas, namely (1) lack of training in digital literacy (2) low ability to access and utilize digital literacy resources and (3) low student motivation, need to be addressed

accordingly. The study also reveals that problems pertaining to teachers' differing competence achievement in digital literacy were due to (1) lack of internet access (2) the absence of professional development, (3) and institutional support system. The study concludes a professional development program needs to be devised for the participants to improve their performance and competence in utilizing digital literacy.

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