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## **Digital literacy and online course design: Study of Indonesian educators**

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### **ABSTRACT**

This paper explores the role of the digital literacy of Indonesian educators in their competence regarding online course design, in a Distance Education context, at tertiary level. It focuses on the competence of lecturers regarding digital literacy, and self-perceived ability in designing online courses. Lecturers (n = 275) at both public and private universities in Indonesia participated in this study. The developed instrument was adopted from that of Brown and Voltz (2005). It measures seven elements of digital literacy competence in a teaching and pedagogical framework (Payton and Hague 2010) and six components of effective course design aimed at achieving desired learning outcomes for students. The result of Pearson's correlation testing indicated a strong relationship between two variables  $r(275) = .765, p < .001$ . The findings also showed that the digital literacy competence of educators had an influence of 58.6% on the quality of online course design, with a significant impact ( $F(1)=386.358; p=.000$ ). It may therefore be concluded that it is important to improve the digital literacy competence of lecturers to the end of promoting the quality of online course design, leading to the achievement of desired learning outcomes. Further studies should particularly consider measuring the impact of online course design on the quality assurance of the course

**Keywords:** digital literacy, educators, self-perceived ability, online course design, distance education, higher education

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### **INTRODUCTION**

The distance education program in Indonesia was started in 1984, known then as the Open University (*Universitas Terbuka - UT*). The *UT* was designed to widen access to higher education. From 1984 to 2000, the *UT* was the only university providing distance education in Indonesia. Later, in 2001, the Ministry of Education issued a decree allowing other private and public universities in Indonesia to offer distance-learning programmes. The online programme was trialled in a small teaching and learning unit, called the Massive Open Online Course - MOOC) (Kementrian Pendidikan Nasional, 2001).

In accordance with that decision, the ministry launched the national *Sistem Pembelajaran Daring* (Online Learning System - *SPADA*); which offered massive grants to educators and institutions to establish distance learning study programmes, and to develop online courses (Spada Indonesia, 2018). Since then, many higher education institutions in Indonesia have offered distance education for both undergraduate and postgraduate study programmes through open online courses. The study programmes consist of several courses to be completed by a learner in order to graduate.

For the institutions doing this, the establishment of distance education facilities has benefitted many parties; businesses have opportunities for expansion, owing to their ability to recruit students from larger demographic areas, and thus achieve significant cost savings (Zhang &

Worthington, 2017); students from remote areas have access to higher education opportunities (Vivolo, 2016), and; opportunities for knowledge sharing between institutions arise, ensuring inclusivity and equality of access to higher education in accord with the SDG 2020 indicator 4.3 (ristekdikti, 2019). Other than that, the initiative to open online courses in the national online learning system of Indonesia was a starting point to the development of the Massive Open Online Courses - MOOC. The term MOOC refers to open access, global, free, video-based instructional content, problem sets and *fora*, released through an online platform to a large number of participants aiming to take a course or to obtain a degree (Baturay, 2015).

Despite the tremendous increase in online courses and distance education programmes offered within the nation, there were only a few educators in Indonesia ready to shift from face-to-face classes. This new online education system and environment required a robust and new strategy. For example, without appropriate training, most online teachers tended merely to transfer their face-to-face teaching methods to the online environment (Davis & Rose, 2007).

In ensuring that the quality of online education achieves the desired learning outcomes, it is important to understand that the delivery of a course using the traditional means (face-to-face) and online approaches is significantly different (Moore et al., 2014; Jensen et al., 2020; Xu & Morris, 2007). The competence of educators to design an online course plays a significant role in engaging students with minimal direct (face-to-face) interaction between educators and learners (Bingimlas, 2009; Lopes & Soares, 2016; Jensen et al., 2020). To be able to design an online course, educators need to be able to evaluate, use, and disseminate digital information effectively to deliver such a course in an online environment. These competencies are called digital literacy, or DL (Gilster, 1997). In the Indonesian context, despite the robust push to move to online education, currently only 10.14% of Indonesian educators have participated in digital literacy activities and training (Kurnia & Astuti, 2017). This might be one explanation for the ongoing problem, that educators tend to merely transfer their face-to-face teaching methods to the online environment (Davis & Rose, 2007). For this reason, the role of the digital literacy of an educator in online course design is worth investigating. This has led to several research questions, which this research project has sought to answer: Is there any correlation between the digital literacy competence of educators and their self-perceived abilities, in the designing of an online course? How significant is the impact of the digital literacy competence towards the educators' self-perceived ability in the designing of an online course? And is there any significant difference in educators' self-perceived ability in digital literacy between those who prefer asynchronous vs synchronous online course delivery?

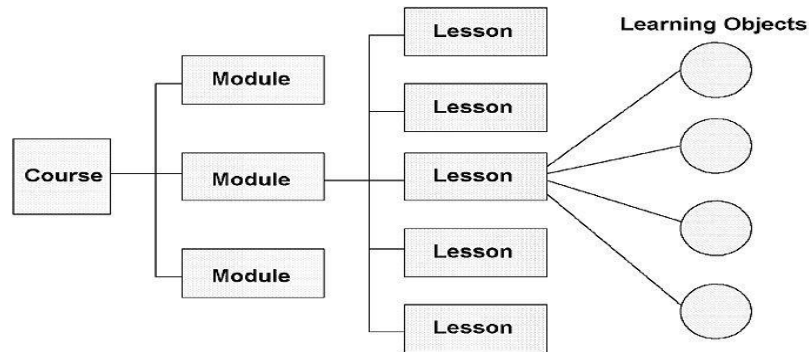
Digital literacy has been defined as the use of a computer and the internet to gather, organize, understand and use information in various formats (Gilster, 1997). An individual should be able not only to search and organize, but also to integrate digital information from many sources to find accurate, factual information, before disseminating it to more people (Greene et al., 2014). Digital literacy also includes the ability of individuals to correctly choose the right communication platform to communicate effectively with their fellows (Lanham, 1995). Thus, digital literacy can be understood as the ability of an individual to understand and optimise the use of digital tools and facilities, to identify, organize, use, analyse, manage and synthesise digital information, as well as to present and create new knowledge and information (Laksani 2019). In the educational field, digital literacy is defined not simply as the ability to use digital tools to select and synthesise information. Instead, Baruah (2012) spoke further about the term covering the ability to use digital tools in communicative ways, which enables users to connect globally with others. Tang and Chaw (2015) stated that digital literacy is the most important prerequisite in the online environment of teaching and learning activities. By having digital literacy skills, educators will be able to provide learning materials, to support with updated references from the correct sources, to disseminate those to students in a way which is attractive and interactive, and to boost the supportive learning environment with the aim of achieving the desired learning outcomes. Payton and Hague (2010) suggested that the components to measure digital literacy, in a teaching and pedagogical framework, consist of seven elements: functional skills (the ability to master basic intercommunications technology, known as ICT competence), creativity (the way students create and distribute knowledge, building their own digital literacy through activities

offered by the teacher), collaboration and communication (creating dialogues, discussing and exchanging ideas), the ability to find and select information (to find information digitally, evaluate the information and use it), critical thinking and evaluation (the analysis and transformation of information to create new knowledge), cultural and social understanding skills (which promote comprehension using digital literacy, while creating meaning), and e-safety (protection in the digital world, when individuals create and share digital content).

Online courses differ from classroom learning in several significant ways. These differences may not easily be observable, as familiarity with traditional teaching methods can blind people to what is entailed when meeting face-to-face, where a connection is formed between learners even if the teacher takes no steps to establish it. A face-to-face scenario allows for the nonverbal communication by the teacher to be conveyed to the student. The lecture format makes use of, at least, visual and auditory information. As online courses are missing certain learning-promotional elements present in classroom-based courses, there are structural differences between the two. Firstly, online courses do not automatically benefit from social interaction, or a sense of community, which helps students commit to learning and boosts their motivation. Moreover, as concentration on online content is more challenging compared to that in face-to-face teaching, it must be divided into manageable blocks and structured with the help of activities (Huhtanen, 2019). Online courses are delivered entirely over the internet and usually take advantage of a learning platform or environment (Learning Management System, LMS). The course structure, materials, exercises, and guidelines are distributed via the platform, which can also serve as a channel for synchronous (real-time) or asynchronous teaching-learning. Students can be required either to participate at certain set times (synchronous) or at times of their choosing (asynchronous). However flexible, asynchronous courses often have certain weekly deadlines. Figure 2 illustrates the granularity of online courses, which consist of modules typically with a duration of one week, but shorter or longer modules are also possible. A module focuses on a single topic, and includes one or more lessons, to achieve the required learning outcomes related to that topic. Each lesson consists of several learning objects as content (lectures, videos, text etc.), activating exercises, and possibly an interactive component and assessed work. There are many definitions which describe learning objects, and even several different terms used in describing them, though eventually these have identical meanings. Merrill (2000) described learning objects as “knowledge objects”, consisting of a collection of “containers” which combine various sources of knowledge as needed, but which require instructional strategies. Gibbons (2002) described learning objects as “*instructional objects*” referring to elements which can be independently drawn into a momentary assembly in order to create an instructional event. The most relevant definition to show the relationship between learning objects and distance learning (both study programmes and online courses), was developed by Wiley (2002), *i.e.* “any digital resource (digital images, video feeds, animations, or perhaps web applications) which can be used and reused to support learning” Using this definition, it is easier to trace the use of learning objects to incorporate an e-learning strategy, since the learning objects themselves are digital in nature and accessible over the internet.

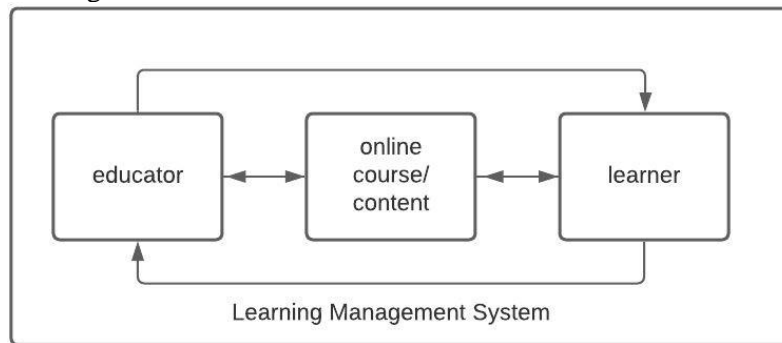
Brown and Voltz (2008) stated that, to design an effective online course, every educator has to evaluate six components to ensure that students are able to achieve the desired learning outcomes. Those elements are activities, referring to creating effective e-learning relying on having tasks for students to undertake, which provide the experiences likely to lead them to the desired new understandings; scenarios, referring to contexts or scenarios which can assist the activity to have meaning; usually provided by a story, role play, or simulation, within which the activity plays a pivotal role in helping students to contextualize the content; feedback, including provisions for feedback, which amplifies the learning from the experience and enables students to increase their levels of skill and knowledge; delivery, being appropriate delivery to reach the full potential of the lesson, which aims to maximize the engagement of the student with the activity, enables the communication of stimulating contexts, and maximizes opportunities for feedback and reflection; context, being the institutional objectives of the e-learning programme, the role and skills of an instructor, the longevity of the resources, and to include any cultural sensitivities, and; influence, being a number of perspectives, including the way the lesson will

affect the learner, the ramifications it will have for the learning (and broader) community into which it will be implemented, and the environmental influence of its development and use.



**Figure 1.** Granularity of an online course

Many previous studies have discussed the idea that developing an online course in distance learning requires content-knowledge and an understanding of interactivity, multimedia, technological requirements, and possibilities, in both the synchronous and asynchronous environment (Xu & Morris, 2007; Bonk & Reynolds, 1997; Buarki, 2016; Hamdi & Hamtini, 2016; Aviram, 2009). It seems that technology tends to shape education whilst people forget about pedagogy, which is crucial in education. There is a serious mismatch between the sophisticated features in the Learning Management System and the lack of explanations regarding pedagogy (Govindasamy, 2001). The befitting statement made by Firdyiwek (1999) suggests that the rapid development of technology in education often creates confusion for educators on how to use it, brought about by the lack of integration of pedagogy, as seen when these educators start designing online courses. E-pedagogy is defined as the approaches to teaching which utilize the facilities of digital information and communication technologies which cater for the learning preferences of the digital generation (Fisher 2011), to develop teaching and learning strategies specifically for an online environment as captured in Figure 2 (Salmons, Wilson, and Klinger 2010). Online pedagogies and methods are different to those utilised in face-to-face classroom situations. In addition, the delivery of courses in an online environment requires the use of robust technologies and the ability to design an online course for an online environment.



**Figure 2.** Teaching and Learning in Online Environment

The design of online courses, including engagement, instruction, and assessment online will significantly impact student engagement (Ashour, 2019; Newlands & McLean, 1996) which is significantly related to learning outcomes (Pike et al., 2012). Finally, “learning outcomes” is identified as one of indicators to measure the quality of higher education (Gabdrakhmanova et al., 2019). For centuries, faculty members have designed their own instruction and assessments or sometimes done this in collaboration with other faculty members for use in face-to-face classroom settings (Fredericksen et al., 2000). Currently, educators have to be able to deal with the system (as opposed to with human beings) to move into the online environment. This involves not only

knowing how to operate the technology, but also having the right information management and critical thinking skills, as well as proper online behaviours as the key prerequisites to being effective in online teaching and learning activities. To date, previous research has put more focus on the importance of digital literacy competence for learners in distance education (Greene et al., 2014; Lankshear & Knobel, 2006; McGraw, 2017; Son et al., 2011; Tang & Chaw, 2015). Even though numerous distance education scholars have noted the importance of the digital and technical literacy of students, there is a dearth of research in the area of the digital skills of instructors. The success of teaching and learning activities is determined by both learners and educators (Meiers 2007). Therefore, to understand and measure digital literacy from the educators' perspective is equally, if not more, important.

## **METHOD**

### ***Research Design***

This study aimed to answer the research questions which led to the use of the quantitative survey research method to explain how different variables affect each other (Cresswell, 1991) or to establish the relationship between the variables (Fraenkel et al., 2012). This research was non-experimental quantitative, using a survey technique involving the administration of a set of questionnaires for data collection. The survey is the most widely used data gathering method in the social sciences and is deemed relevant to the gathering of data to answer research questions. It provides the researcher with an appropriate way to obtain sound data. A survey can provide accurate, reliable, and valid data (Neuman 2000). Survey research grows within a positivist approach, producing information which is inherently statistical in nature, asks a large number of people about their beliefs, opinions, characteristics, and past or present behaviours. Therefore, it is considered to be an appropriate way to learn about self-reported beliefs or behaviours (Groves, 1996).

### ***Population***

The targeted population in this study consisted of registered lecturers in both private and public higher education institutions in Indonesia. There were, at the time of the research, 294,820 lecturers located in Java, Sumatera, Kalimantan, Sulawesi and the western half of New Guinea or East Indonesia. The minimum number of respondents at the  $E = .06$  and the significance level of  $p = .05$  was 267 lecturers. Sample selection for this study was conducted by utilising a purposive sampling procedure. Purposive sampling is a non-random sampling method, using a wide range of methods to locate all possible cases of a specific, yet difficult-to-reach, population (Neuman, 2000). The criteria for selecting those suitable for the sample were for the respondents to: have at least one year of teaching experience, in either a public or a private university, have a *Nomor Induk Dosen Nasional* (Registered Number as a National Lecturer - *NIDN*), be living in Indonesia, and (4) have a minimum educational level of achievement of a Masters' degree. To gather the respondents, an online training series was conducted in support of lecturers who have been obliged to shift to the online environment, owing to the COVID-19 pandemic situation. The registered participants were 300 lecturers from leading colleges and universities of the five largest portions of Indonesia as advised above. The heads of the largest public and private schools and universities in Sumatera, Java, Kalimantan, Sulawesi, and Papua, were amongst the invitees. In the registration process, the participants confirmed their willingness to participate in the survey, before the online training took place. Of those 300 invitees, 275 participants completed the questionnaire. The participants had the option of choosing either an Indonesian or an English version of the questionnaire for their convenience.

### ***Instrument***

A questionnaire was developed to obtain the information needed to measure the correlation between both variables. The instrument comprised the demographic profile of the respondent, his or her digital literacy competence, and the quality of the design of the online course.

**Table 1. Respondent Profile**

Respondent Profile (N=275)		Frequency	Percentage
Age	18-24	25	9%
	25-39	138	50%
	40-55	103	37%
	56-74	9	3%
Gender	Male	76	28%
	Female	199	72%
Location	Java	180	65%
	Kalimantan	15	5%
	Sumatera	17	6%
	Sulawesi	28	10%
	East Indonesia	35	13%
Preference teaching mode	Synchronous (Video Conference)	191	69%
	Asynchronous (LMS)	84	31%

Determination of digital literacy competence, measured across seven elements, was based on digital literacy in teaching and the pedagogical framework. These elements comprised those developed by Payton & Hague (2010). They were: functional skills (the term 'functional skills' refers to the ability regarding basic ICT competence); creativity (meaning how students were encouraged to create and distribute knowledge, building their own digital literacy through activities given by the teacher); collaboration and communication (involving creation of dialogues, discussion, and exchange of ideas); the ability to seek and select information (covering the ability to find information digitally, evaluate that information, and then use it); critical thinking and evaluation (the analysis and transformation of information to create new knowledge); cultural and social understanding skills (the promotion of comprehension using digital literacy, while creating meaning), and; e-safety (protection in the digital world when individuals create and share digital contents).

The quality of the design of online courses with the aim of achieving the desired learning outcomes for students was measured on six components as developed by Brown and Voltz (2008). These were: activities, referring to creating effective e-learning that relies on having the tasks for students to undertake, providing experiences likely to lead them to the desired new understandings; scenario, being the contexts or scenarios which could assist the activity to have meaning, usually provided by a story, role play, or simulation, within which the activity plays a pivotal role in helping students to contextualize content; feedback, including provision for the feedback amplifying the learning from experience and enabling students to increase their levels of skill and knowledge; delivery, meaning appropriate delivery to reach the full potential on offer, aiming to maximize the engagement of students with the activities, enabling the communication of stimulating contexts, and maximizing opportunities for feedback and reflection; context, meaning institutional objectives of the e-learning programme, the role and skills of the instructor, the longevity of the resources, and cultural sensitivities, and; influence, covering a number of perspectives, including the way in which material will affect the learner, the ramifications it may have for the learning (and broader) community in which it will be implemented, and the environmental influence of its development and use.

The quality of the instrument used in the research was very important. It was expected to be valid (truthful), to be definable as appropriate, meaningful, correct, useful, and reliable (consistency), referring to the consistency of scores from one administration of the instrument to another (Fraenkel et al., 2012). To measure the validity of the instrument, criterion-related evidence was chosen by relating to another measurement of the same variable. The internal-consistency method was chosen to measure the reliability of the instrument by dividing it into halves and scoring each or using the *Cronbach alpha* coefficient approach. The developed instrument was pilot tested, involving 30 lecturers in Jakarta. The data was analysed by using the Statistical Package for Social Sciences - SPSS. The minimum score for the recommended validity

of the question items was .20, while the minimum score for the reliability of the dimensions or the recommended measuring instrument was .70 (McCrae et al. 2011). The results showed that  $\alpha = .943$ , with the item – total correlation ranging between .409 and .677. The scores indicated that the instrument returned good consistency (reliability) and validity.

**Data Analysis**

Both descriptive and inferential statistical methods were used to analyse the data to answer the research questions. It was expected that this study would not only describe, but also test the hypothesis and find out whether the sample results would hold true in a population, to decide whether the results were large enough to indicate that a relationship truly existed and were not owed to chance alone. Since there is shortage of previous studies about the correlation between the two variables, bivariate statistical analysis was first conducted to show a statistical relationship between the variables which tend to appear together. Descriptive statistical testing was used to ascertain the profiles of respondents. A Kolmogorov Smirnov (K-S) test indicated that the data followed a normal distribution  $D(275) = .04, p = .20$ . To answer the first research question, a Spearman correlation statistical test was used to measure the relationship between the variables. To answer the second research question, a t-test was chosen to compare those two groups. Finally, when the results of the correlation test ( $R \geq .40$ ;  $R\text{-square} \geq .50$ ) showed a strong relationship between variables, a linear regression test was expected to answer the third research question.

**FINDINGS AND DISCUSSION**

**Findings**

The respondents’ descriptions are presented below in Table 1. Among the 275 participants, a total of 199 (72.4%) were women and 76 (27.6%) were men. The mean age was 36.7 years ( $M = 36.7, SD = 9.89$ ) with the ages ranging from 18 to 74 years. Some 2.5% ( $n = 9$ ) were older than 56 years and 9.1% ( $n = 25$ ) were younger than 24 years. The distribution of the locations of respondents showed the greater number were in Java (65.5%), then East Indonesia (12.7%), Sulawesi (10.2%), Sumatera (6.2%) and Kalimantan (5.5%).

A significant result was found, with the value of the Pearson correlation test being  $r(275) = .765, p < .00$ , which indicated a strong positive relationship between actual digital literacy and self-perceived ability in the design of online courses, which provides an answer to Research Question 1.

As can be seen in Table 3, below, a linear regression test resulted in the value of  $R^2 = .586$ . This result indicated that digital literacy competence had an impact of 58.6% in increasing the self-perceived ability of educators in designing online courses, answering the Research Question 2.

**Table 2. Pearson Correlation Results**

CORRELATION		DL	ODC
DL	Pearson Correlation	1	.765**
	Sig. (2-tailed)		.000
	N	275	275
ODC	Pearson Correlation	.765**	1
	Sig. (2-tailed)	.000	
	N	275	275

\*\* . Correlation was significant at the 0.01 level (2-tailed).

**Table 3. Linear Regression Result**

Model	R	Model Summary <sup>b</sup>		
		R Square	Adjusted R Square	Std. Error of Estimate
1	.759 <sup>a</sup>	.586	.584	7.339.983

Note:

- a. Predictors: (Constant), DL
- b. Dependent Variable: ODC

To answer Research Question 3, during the COVID pandemic era, some 191 participants (69.5%) preferred to use video conferencing and 84 participants (30.5%) claimed to be using LMS to conduct online courses. Table 4 below shows the results, demonstrating that both the group which preferred to conduct synchronous instruction (M = 977.12, SD = 1.84) and those preferring asynchronous instruction (M = 993.81, SD = 2.41) for online courses did not, interestingly, have any significant differences in their self-perceived digital literacy competence.

**Table 4. T-Test Result**

Group Statistics					
	Teaching Mode	N	Mean	Std. Deviation	Std. Error Mean
	DL	Video Conference	191	977.12	1.835.027
LMS		84	993.81	2410.814	263.041

**Discussion**

In general, the study indicated that digital literacy competence had a strong relationship with the self-perceived ability of educators in designing online courses,  $r(275) = .765, p < .001$ . A prior research study by Ferrari (2013) stated that “being digitally literate today involves the knowledge, attitudes, and skills needed for operating technologies, using the internet, understanding the media and managing information. The convergence of literacies into the digital sphere is, however, more than the sum of its single elements” (p.16). It is obvious that digital literacy competence is related to the use of technology and the internet as digital infrastructure.

The Jakarta Post (2020) reported the internet penetration rate in Indonesia is at over 88%, with the highest media utility rankings being of YouTube, Instagram, and WhatsApp (Eloksari, 2020), in contrast to the use of technology in the education field. It has been found that the low levels of adoption of technology amongst educational institutions and professionals in Indonesia means that 60% of educators do not have any experience using technology-based teaching tools (Innovation Factory, 2020). Early in 2020, the COVID 19 pandemic struck Indonesia. The government issued a work-from-home policy, in order to control the spread of the virus. Along with this, the Minister of Education ordered home-based learning for all educational sectors when they conducted teaching and learning activities. The crisis has evidently forced the acceleration of the use of technological utilities for teaching and learning purposes. Face-to-face classes had to be changed to online classes to establish their continuation. In the current situation, where online classes seem to be the only solution to ensure the continuation of teaching and learning activities, the results showed that there was a number of the respondents (N=275) who rarely used the basic software to support online course design. For instance, 13.8% rarely used Microsoft Office, 35.5% rarely used LMS, and 17.5% rarely used the available video conferencing platform. For a huge developing country, it is challenging to pursue the equality of the availability of technology infrastructure across the nation. This indicates that access to quality education is still unfortunately exclusive, for both educators and student learners.

A large gap between the use of technology as a communication media in social life and as a teaching and learning platform was also found. It was shown that 69% of participants (N=275) preferred to use video conferencing in making a shift to online classes. They literally moved their lecturing in onsite classes to lecturing through video conferencing. Educators treated the online courses through video conferencing as they would social media communication to connect them



to students without considering the different learning environment. Only 31% of respondents preferred using LMS which requires more preparation in designing the online courses.

The results of the study specifically indicate that digital literacy competence contributed 58.6% to the self-perceived ability of educators in designing online courses. Prior to this, in previous studies many researchers examined the digital literacy of the educator through their acceptance of technology which consisted of their perception of the usefulness and ease of use, their attitudes towards using e-learning, and their behavioural intention regarding online learning. The findings of Feriady *et al.* (2020) showed that digital literacy had a significant influence regarding perceived usefulness and perceived ease of use.

This paper examined further the significant contributions made to educational providers, whether educators had a positive self-perceived ability regarding designing online courses. Digital literacy and self-perceived ability in designing online courses had a significant, positive effect on self-efficacy. This played a role as a positive predictor of at least some domains of actual teaching behaviour. Teachers' improved teaching behaviour is obviously related to improved teaching quality (Prior *et al.*, 2016; Irnidayanti *et al.*, 2020; Walters *et al.*, 2017). Some theories have explored the relationships between the perceived ability of personal competence, human behaviour, and psychological well-being (White, 1959; McClelland *et al.*, 1953; Rotter, 1966; Abramson *et al.*, 1978), but the article by Bandura (1977) formalized the notion of perceived competence as "self-efficacy," defined and embedded in a theory of how it develops and influences human behaviour.

It may be concluded that the design of online courses in both synchronous and asynchronous modes suffered from the lack of preparation by educators, educational providers (institutions), and students. Particularly for the educators, Scherer *et al.* (2021) found that only one of three readiness dimensions showed the readiness of educators to enter online teaching and learning. The three are: the self-efficacy of teachers; their perceptions regarding the online presence they create during online teaching and learning, and their perceptions of the institutional support provided. This is in line with the finding of Bao (2020), who found that institutional support in the form of provision of online materials, technology, and pedagogical support is very limited for both students and educators in online teaching and learning at the time of the COVID-19 pandemic. In the end, the quality of these online courses will be questioned since there is no national quality framework for online courses existing as yet. Developed countries began their online teaching and learning at higher educational levels nearly two decades ago (Singh and Thurman 2019). Indonesia, as a developing country, began the initiation of the online learning process only in 2018.

Self-efficacy is not a perceived skill. It is what individuals believe that they can do with their skills under certain conditions not concerned with what they believe that they will do, but with what they believe they can do. Decades ago, Prosser and Trigwell (1997) found that how teachers perceive the teaching context can influence their intentions and their approach to teaching, which in turn plays a significant role in determining the learning of students. The approach to teaching and learning must obviously change with the transition to an online environment. This condition forces educators to take part, as individual learners, to improve their skills in preparing teaching and learning activities through online course design. Research by Baldinš (2016) reminds educators that pedagogy, connected with the precise formulation of an issue, the recognition of interconnections, the choice of appropriate resources and their consecutive application in practice following a developed pattern, should be a first concern when designing an online course. To conclude, digital literacy plays a significant role cognitively in promoting the self-perceived ability of educators in designing online courses by collaboratively managing human resources, systems, and course-content. The self-perceived ability of an educator is expected to be able to accelerate the adoption of technology in the educational field. On the other hand, the more digitally literate, the more confident an educator in designing online course, the greater should be the improvement in the quality of distance education.

## CONCLUSION

Education providers need to think seriously about options in optimizing technology penetration in higher education. Digital literacy should be promoted not only for students, but also among educators. There is a huge opportunity to promote the quality of online course design which expectedly will have an impact on inclusive education within the nation. Further studies should particularly consider measuring the impact of online course design on the quality assurance of the course. Once the national quality framework in the scope of learning objectives, courses, block or study programmes is released, further research is expected to be undertaken to compare self-perceived ability and actual competence in designing online courses based on the national Quality Assurance (QA) Framework.

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