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Lecturers in Adopting Digital Literacy towards Innovation Technological Change

Harisa Mardiana
Universitas Buddhi Dharma, Indonesia
harisa.mardiana@ubd.ac.id

Abstract: In adopting digital literacy, lecturers must change teaching from traditional teaching to online teaching. Online teaching uses digital technology where technological changes are accompanied by technological innovations that must develop. Thus, lecturers must master new skills using information technology and the Internet. The problem that occurs is the difficulty of lecturers in changing teaching habits in the classroom to the use of digital technology. Thus the productivity and efficiency of education have problems with there is no balance between student test scores that continue to decline. One of the factors is that lecturers are unable and unskilled in adopting digital technology literacy, such as the ability to analyze, take learning resources that are not credible, and the limited internet network in Indonesia. Lecturers need to adopt digital technology to have the knowledge, abilities, and skills of digital technology.
This research design was a quantitative and qualitative method, giving questionnaires to 87 lecturers in Banten, Indonesia. The result showed that lecturers could teach using digital literacy on the Internet and innovate the new technology in the learning process. The research purpose is to increase the lecturers' qualification for the 21st-century learning process and to deliver the contents and engage students and lecturer's learning process innovatively and disrupt the old technology.

Keywords: Digital literacy, disrupt old technology, innovate technology, technological change, the learning process

Introduction

Online learning applies 24 days and seven days a week to make learners and lecturers comfortable and flexible with learning management systems, online libraries, and digital media to access digital devices and the Internet. Learning can continue to another place and another time (Aldahdouh, Nokelainen, & Korhonen, 2020). However, even though learners do not face difficulties using technology effectively, the problem lies in digital literacy, knowing how to operate technology, having the right information management and critical thinking skills, and the right online (Mardiana, 2017). Literacy is generalized as the ability to understand something by reading and writing something. Reading puts the demands of a unique understanding of the reader, such as reading in the media in classical forms such as newspapers, magazines, books (Heick, 2015). Reading on digital media occurs through meaningful and sustainable consumption, which improves an individual potential to contribute to an authentic community.

Falloon G (2020) revealed that online learning applies 24 days and seven days a week to make learners and lecturers comfortable and flexible. Learning management systems, online libraries, and digital media have access to digital devices and the Internet. However, even though learners do not face difficulties using technology effectively, the problem lies in digital literacy, knowing how to operate technology, having the right information management and critical thinking skills, and the right online behavior (Falloon, 2020). According to Omiunu. O.G. (2019) digital literacy is the understanding of reading on digital media, which occurs through meaningful and sustainable consumption and current patterns that improve an individual potential to contribute to an authentic community.

The problems faced in education are productivity and efficiency. Efficiency means a balance between the resources invested and the results in labor and student equity. It shows that the average expenditure per student increased by 17% (2005-2013), but the results did not significantly increase test scores (OECD, 2016). Therefore, one of the learning factors is that lecturers must be able and skilled in adopting technological digital literacy. It includes the ability to analyze, prioritize, and act upon the countless digital media 21st-century citizens encounter daily (NETP, 2017). Other problems in Indonesia are the still limited Internet network

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throughout Indonesia and ineffective learning. Lecturers must move out of the conventional style, be more innovative in preparing learning materials and mechanisms, and take advantage of all the potential of existing technology to assist learning (Purnamasari & Kompas.com, 2020).

On the other hand, students must be more independent by carrying out online learning and are expected to take advantage of all scientific opportunities and knowledge sources to complement the online learning process. People can study anytime, anywhere, and with more affordable and flexible learning times in an online learning system (Putri & Kompas.com, 2015). In online learning, technology can empower educators to become co-learners with students by building new experiences for a more in-depth exploration of content; also, technology plays an integral role in learning. Moreover, the collaboration between lecturers and students become side-by-side learning designs a learning experience that becomes a catalyst for change (Reeves & Pedulla, 2011). The previous research by Falloon, G. (2020; Mardiana H (2020) indicated that an essential aspect of digital literacy growth is the excellent value of a multimodal literacy form, allowing students to remix various media. The resulting product can resemble the traditional form of academic writing and push the boundaries of the genre. This literacy has disrupted the traditional dichotomy between literacy inside and outside the classroom and between home and school, giving rise to new forms of text, new writing types, and new challenges to nature and the importance of the old forms.

Moreover, the research by Tang & Chaw (2016) informed that digital literacy could use in traditional classrooms, such as asking students to greet a wider audience or think about plagiarism in different ways. Moreover, digital stories can be shared in the classroom or posted to YouTube for the world to see. Hence, teachers can curate appropriate information for their students. Another researcher Rahmah, A. (2015), stated that on the other hand, teachers are overwhelmed by the number of literacy tools and spaces available, such as chat, electronic lists, Twitter, Facebook, blogs, digital storytelling, and online portfolios that have been designed for teaching and must be continuously adapted and modified for learning. Therefore, teachers may be afraid to use technology because of their potential to encourage plagiarism and use inappropriate learning resources.

This study investigates lecturers in adopting digital literacy and finding out lecturers' difficulties in adapting to disruption technological changes and entering technological innovations.

Literature Review

Digital literacy is a new key to today's modern education using the Internet. Changes in learning that include technology after infiltrating the classroom include finding, evaluating, utilizing, sharing, and creating content using information technology (C. Hoadley & Favaro, 2015). Furthermore, digital literacy is no longer limited to books held by students and teachers but goes beyond that, namely in e-books that include websites, social media, videos, and collaborating with other people worldwide (Cole, 2019). C. Hoadley & Favaro (2015) supported that in general, lecturers must understand technology, have planning, monitoring, and control skills concerning information management and critical thinking skills. De Smet et al. (2012) and Eshet, Y (2004) supported that lecturers must understand the technology and plan, monitor, and control skills concerning information management and critical thinking skills.

Teachers and lecturers must be digitally literate, know how to find information from the web, and understand and collect information from various print or digital sources. Hence, digital literacy involves mastering ideas and not just about using technology itself. Widuri et al. (2017) indicated that Indonesia's digital literacy framework is designed based on the experience of information communication technology that runs the Internet Safety pillar, which refers to cognitive and technical skills and refers to each user's internet safety. Ng (2012) explained that digital literacy consists of three main dimensions: technical, cognitive, and socio-emotional: (1). The technical dimension concerns the skills required to use IT proficiently, (2). The cognitive dimension concerns the skills required to seek, evaluate, and synthesize digital information critically, and at the same time, to be aware of ethical, moral, and legal issues (3). The socio-emotional dimension concerns the skills required to socialize online in an appropriate manner.

According to Bawden (2008), the concept of digital literacy is comprehensive and includes specific skills and competencies for general awareness and perspective. Moreover, Tang & Chaw (2016) informed that four components differentiate digital literacy: (1) foundation - the ability to read and write and use software and computer packages; (2) background knowledge - understanding of how digital and non-digital information

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is made from various forms of resources and communicated; (3) main competencies - the ability to gather knowledge from various sources; (4) attitudes and perspectives - the ability to learn independently and show good behavior in a digital environment.

The development of digital literacy needs an update with the development of digital technology. The digital literacy level for each learner, especially lecturers, is different, assuming all lecturers have a specific digital level that can cause problems in online teaching, which adjusts to the online curriculum's expectations (OECD, 2016). Technology is rapidly changing the educational environment, exploring information strategies to support learning activities, and require new organizational structures. Moreover, information systems strategy responded to technological disruptions and applied in education (McIntyre, 2014).

Paul Gilster (1997) first defined digital literacy as the ability to understand and use information in various formats from various sources when presented via computers, mainly through the Internet. Also, Pool (1997), in the conversation with Gilster, explained that the emphasis is on the difference between digital information media and conventional print media.

Digital literacy involves adapting one's skills to evocative new media, and experiences on the Internet will be determined by how the core competencies of mastering digital literacy are. The conversation also described that the competency is operational or technical competencies and the principal digital literacy competencies in assembling knowledge, evaluating information content, searching the Internet, and navigating hypertext (Gilster, 1997; Pool, 1997). Standard operationalization refers to efforts to operationalize those involved in digital literacy to become digitally literate in tasks, performance, demonstration of skills. Hence, the standard device for general applications is more than codifying a specific operations series employing a button press (Lankshear & Knobel, 2016).

The problem with digital literacy in technological change is the lack of skills, understanding, and practices needed for lecturers and teachers to navigate the ever-changing digital landscape successfully (Meyers, Erickson, & Small, 2013). The development of Instructional information technology, accompanied by developing potential, has created new communications and digital tools. Besides, it is the school's responsibility to prepare lecturers, teachers, and students, and members of universities for digital literacy, both formally and informally (Chase & Laufenberg, 2011). The skills that differentiate sophisticated searches' measures by specific behaviors rather than conceptual structures and literacy training can account for rapid digital technology changes (Bawden, 2008). The low level of digital literacy in education is due to a lack of motivation, lack of information skills, and a lack of encouragement to achieve or properly use digital literacy (Small, Arnone, Stripling, & Berger, 2012). The self-taught approach to digital literacy provides a reasonably good solution in learning. Information context provides an alternative place for skills instruction, coping with motivational challenges with contextualizing skills providing different incentives to practice and achieve mastery (Cole, 2019).

Methodology

Research Method

The research method is to conduct quantitative research, which is to determine the lecturers' performances based on digital literacy adoption (Creswell & Creswell, 2017).

The sample selection was 87 lecturers in the Banten area, Indonesia, spread out through Google Form. Data collection techniques regarding qualitative were collected from lecturers to have an interview with eight lecturers for 2-3 hours in October-November 2020. A series of work carried out to collect data for research related to literature study and questionnaires.

Variables and Hypothesis

This section is a brief explanation before the research and extensive exploratory phase to accomplish the hypothesis—the importance of research issues to check five dimensions.

The hypothesis of the research:

1. There is a statistically significant relationship – independent between a frequency-independent variable of lecturers' technical skills for adopting digital literacy.

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2. There is a statistically significant relationship – independent between a frequency-independent variable of lecturers' cognitive skills in ethical, moral, and legal issues in digital information.
3. There is a statistically significant relationship – independent between the frequency-independent variable of lecturers' socio-emotional skills for socializing appropriately.
4. There is a statistically significant relationship – independent between the frequency-independent variable of lecturers' background knowledge in digital and non-digital information to form the source and communication.
5. The independent variable frequency of lecturers' principal competencies for ability shows good behavior in a digital environment.

Data Analysis

The research used five questions of each dimension and analyzed using frequency to find the most using the dimensions for independence in the testing of statistical significance of the relationship between lecturers in adopting digital lecturers towards Innovation Technological change. First, to find the reliability and the correlation of data to obtain the next step procedure. In analyzing the data, this research needs to find the reliability of data and correlation between them. Table 1 showed the reliability and correlation between lecturers' in adopting digital literacy towards innovations technological change.

Result

The research measurement used questionnaires to show the reliability and correlation of the questionnaires and percent value of lecturers in adopting digital literacy toward technological innovation change and the impact on the online teaching process. The describing statistical of correlation and reliability showed in the table. 1.

Table 1. Indicators of Correlation and Reliability for each variable

Indicator	**Correlation**					**Reliability**
Indicator 1 Technical Skills	Training	Use LMS	Tech. Internet	Find Sources	Have a computer & Internet	α
	0.833	**0.436**	**0.911**	**0.771**	**-0.085**	**0.687**
Indicator 2 Cognitive Skills	Competency in teaching	Understand ICT	Know to use the Internet	Online Pedagogical	Online Teaching	α
	0.661	**0.625**	**0.472**	**0.592**	**0.598**	**0.685**
Indicator 3 Socio-emotional Skills	Change in Learning	Passion	Collaboration	Teach Patiently	Appropriate Teach online	α
	0.768	**0.577**	**0.764**	**0.683**	**0.465**	**0.751**
Indicator 4 Background Knowledge	Ability to teach	Enable digital learning	Teaching Competencies	Skill in teaching online	Capable of reading online and offline	α
	0.698	**0.576**	**0.687**	**0.552**	**0.471**	**0.687**
Indicator 5 Principal Competency	Have certificate	Enable to show the capability	Enable to use of digital literacy	Understand that students need	Know to use assessment	α
	0.497	**0.506**	**0.578**	**0.521**	**0.455**	**0.667**

Source: Research Process

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Indicators of correlation and reliability for each variable' showed that the correlation for each variable of technical skills for lecturers in adopting digital literacy impacts technological change innovation, and reliability is acceptable.

Indicator 1.

Variable of technical skills for lecturer in adopting digital literacy

Form Indicator 1, technical skills for adopting digital literacy to the technological change, lectures showed that they could have technical skills. The lecturers have trained in technical skills (0.833), the use of learning management systems (0.436), understand the technology internet (0.911), find the sources from the Internet (0.771), and have computer & the Internet (-0.085). The reliability is 0.687. In adopting digital literacy to technological change, lecturers must have technical skills so that they can use a learning management system, training, lecturers, understand the use of internet technology, and can search for learning resources on the Internet and have their laptops or computers, as well as the Internet so that lecturers can work and study independently (Tang & Chaw, 2016). The lecturers have trained, which indicated substantial value (0.833), but the learning management systems are not strong enough (0.436). Some of the lecturers have difficulty understanding the LMS, which is the software application. This application is for teaching administration, save, retrieve, submit, and send the documents to report the teaching process and delivery of the learning process (Turnbull, Chugh, & Luck, 2019; Mtebe, 2015). Another variable is technical skills (0.911) is the lecturers must understand the technology Internet, which is vital since online learning is using the Internet. Lecturers need technical assistance to use and maintain technology, especially in learning. When Internet technology does not function well, learning opportunities are lost, and learner frustration. Lecturers must have the training to use and maintain Internet technology to solve learning problems (Khvilon & Patru, 2002; Mardiana, 2020; NETP, 2017). The next point is that lecturers need to understand to find the sources of learning from the Internet (0.771). Most of the learning sources can take from the Internet, and the lecturers must know to find the source of learning. In obtaining learning resources, lecturers can get them from the Internet, which is an open-source of information and can be accessed and accelerates and helps students and lecturers learn (Alshahrani, Ahmed, & Ward, 2017). The impact of faster learning changes in finding learning sources is a challenge for lecturers because the learning sources taken must be the correct source (Turnbull, Chugh, & Luck, 2019). The last point from technical skills in adopting digital literacy is lecturers should have a computer and an Internet connection (-0.085). The value of this point is negative -0.085. An interview with the lecturers indicated that most lecturers have computers or laptops for teaching and learning, but some lecturers do not have the Internet independently. They use the Internet when they are on campus or in places where there is the Internet.

The impact of online learning is the unpreparedness of lecturers and institutions in providing computers or laptops and Internet technology. The main context in online learning is computers and laptops, and the availability of technology Internet connections (Bulman & Fairlie, 2016). Today, the main problem is that there are still many lecturers who do not have computers or laptops along with Internet technology. The implication of the availability of a computer or laptop and Internet technology is the maximum learning achievement. Hence, the institution's policy provides relief for lecturers to own a computer or laptop by buying installments or employing installers (Kraushaar & Novak, 2010). Thus, online learning can run smoothly and optimally.

Indicator 2

Cognitive skills in ethical, moral, and legal issue in digital information

A vital factor in using technology utilizing human cohesion can help students and lecturers positively and minimize negative potential. This level of interaction with technology allows users to live in tune with technology. The teaching competency showed that the correlation is strong enough (0.661), and the reliability is 0.685. The teaching using technology (the correlation of 0.625) must understand and have the ability and technological skills with ethical and moral awareness decisions and the institution's functional academics (Cahill et al., 2020). In the interview to the lecturers stated that the institution requires the lecturers to have teaching competency online or offline and use the information communication technology.

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Moreover, the lecturers must understand to use the Internet (correlation 0.472), whether the Internet is on or off. Besides, the lecturers must understand the online pedagogical, and the lecturers will teach online well. Everyone should have privacy and view normal privacy behavior. Using technology, lecturers can rely on technology and contribute to other lecturers, employees at universities, or students (Khvilon & Patru, 2002). By having reasonable control, lecturers can control themselves so that electronic devices are not excessive.

To understand the online pedagogical, lecturers must help students become knowledgeable and specialized in the discipline and create and apply knowledge to develop it for global competitiveness (correlation 0.592). This qualification is relevant to online pedagogical standards in creating and developing a knowledge-based society. Furthermore, institutions must change their teaching methods to respond to these qualifications (Songkram, Khlaisang, Puthaseranee, & Likhitdamrongkiat, 2015).

In online teaching (correlation 0.598), the application of online teaching can help deliver content, activities, measurement, and evaluation of learning by complying with online teaching regulations. Online learning in higher education is flexible for lecturers to integrate educational technology in teaching. Besides, lecturers can offer more effective teaching by applying student-centered methods, and students can access and study content anywhere and anytime. Students can also participate and exchange ideas in forums provided in e-learning or on social media. Therefore, lecturers can improve students' cognitive skills and learning attitudes needed in the online class period.

Indicator 3

Socio-emotional skills for socializing in an appropriate manner

Change in learning may give lecturers awareness to improve online teaching skills and comprehend the meaning of online learning. Besides, it helps teachers and lecturers to avoid burnout and increase well-being by identifying the internal drivers and emotional intelligence. (Martinez, 2015; Mardiana, 2017). In the interview to the lectures, they explained that online learning and emotional are the process of students and professors understanding and managing their emotions, setting and achieving goals, showing empathy for others, building healthy and rewarding relationships, and making responsible decisions. With reliability (0.751), the learning changes (0.768), from offline learning to online learning, help lecturers and students build a connectivity digital learning framework that focuses on collaborative, interactive synchronous teaching and learning (Delahunty, Verenikina, & Jones, 2014). By understanding the importance of feeling connected to online learning, lecturers and students can benefit from a deeper connection to develop direct interaction between learners (Hesse, 2020).

Lecturers who have passion show qualified lecturers (0.577) and qualified lecturers who have characteristics that differentiate them from others. Reflections of efforts to determine teaching excellence and identify strategies that enhance teaching are indicated by a taxonomy that identifies personal traits and pedagogical skills that contribute to effective teaching. Having pedagogical skills can attract students' enthusiasm and enthusiasm (Delahunty, Verenikina, & Jones, 2014; Benekos, 2016). Online learning environments make lecturers and students less socially and emotionally real than face-to-face interactions. Therefore, appropriate online pedagogical practices cannot be neatly transferred from traditional learning approaches. Because students need a sociocultural approach to face-to-face learning, lecturer passion can be part of new development as an intrinsic inseparable learning context (Hesse, 2020; Fabelico & Afalla, 2020).

By collaborating, lecturers can share content with students, other lecturers, and other educators (0.764). Collaboration development in socio-emotional must be safe, caring, supportive, participatory, and well-managed (Benekos, 2016; Hesse, 2020; Martinez, 2015). Support student development and practice the skills they learn. The learning context includes communication styles, performance expectations, structures, and rules for collaborating in online learning. The organizational climate created by faculty and students is committed to academic success for all learners and their communities (Schonert-Reichl, 2017).

Emotional abilities and self-efficacy, and empathy among lecturers believe that lecturers who have patience in teaching have social-emotional competence (0.683) and directly and indirectly affect students by demonstrating performance that can set the speech's tone for a healthy and supportive relationship between lecturers and students (Hen, Goroshit, & Boylan, 2016). This relationship is essential for healthy student development in learning and is positively related to academic performance, achievement, social functioning, institutional involvement, and student motivation (Benekos, 2016; Delahunty, Verenikina, & Jones, 2014).

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Lecturers' confidence in their emotional and teaching abilities will contribute to their empathy for students. Hence, lecturers who care more about students support increasing lecturer empathy and positive motivation in students (Hen, Goroshit, & Boylan, 2016; Martinez, 2015; Hesse, 2020)

Indicator 4

Lecturers' background knowledge

In the lecturers' background knowledge with reliability (0.687) becomes a benchmark for the student's quality. In the interview with the lecturers, most of them stated that background knowledge of teaching is important. It is a role to be a lecturer, and it will obtain the lecturer to the higher level and, the lecturers give the easier way to adopt digital literacy.

The factors of knowledge, abilities, and lecturers' skills become content complexity for recruiting lecturers to teach (0.698). The strongest indicator of how well they learn new information is related to the lecturer's content. Hence, confirmation of the relationship between lecturer quality and student learning outcomes becomes a reference in lecturer assessment (Ibrahim, Mohamad, Rom, & Shahrom, 2013). In teaching, lecturers face many challenges related to themselves: roles and responsibilities. Lecturers who are capable and knowledgeable in-depth and knowledge will quickly adopt digital literacy in online learning. Many lecturers use other strategies to complement the skills needed in teaching to cope with the demands of their roles and responsibilities as lecturers (Bawden, 2008; Mardiana, 2020).

Digital learning is a resource used to support learning. The lecturers use digital learning (0.576) to teach online learning. The concept of online education is to provide smaller, independent, and accessible to users. The lecturer chooses a series of digital learning, and it gives to students, and the lecturer presents some digital knowledge, and students can choose those that support their learning needs (Eshet, 2004; Bawden, 2008; C. Hoadley & Favaro, 2015). The use of digital learning makes learning more manageable, especially for millennials students who understand digital technology and provide flexibility in student learning. The combination of the Internet and multimedia allows digital classrooms to adapt to online learning forms (Tang & Chaw, 2016; Chase & Laufenberg, 2011). By using online learning spaces as a platform, learning can reach anywhere, anytime. Students can study independently and involve all community learning partners such as lecturers, students, parents, business partners, and education experts (Cole, 2019; Chase & Laufenberg, 2011). This learning is learning in the 21st century synchronously with student-centered teaching methods, and lecturers facilitate and share information beyond the boundaries of time and place between networks (Lankshear & Knobel, 2016; Mardiana, 2020).

In achieving teaching competencies (0.687), the expansion and renewal of abilities, skills, and knowledge must continuously sharpen. Therefore, teachers and lecturers need to increase their knowledge and skills to improve and explore teaching practices. The professional development of lecturers must be sustainable to change times that rapidly require more abilities, skills, and knowledge (Selvi, 2010). Teaching competencies offer strategies, practices, and thumb rules to guide lecturers in improving teaching, improving student performance, and the quality of work experience (Pantić & Wubbels, 2010). In the beginning, lecturers manage online classes, convey instructions, and constructively assess students. Thus the institution can develop lecturer competence (Schonert-Reichl, 2017; Selvi, 2010).

The ability to read offline is different from reading online (0.471). As respondents, lecturers explained that the lecturers had to read a lot offline and online. The ability to read will provide knowledge and thinking skills.

The findings showed that many teachers and lecturers prefer to download and print learning materials for physical and academic reasons. Meanwhile, most teachers and lecturers prefer reading online to access study materials and prefer printing copies to read journal articles for more detail (Son, 2015). Reading comprehension showed that online reading accounts for many unique differences in performance compared to offline reading. For knowledge in a particular topic, offline reading provides more interaction with critical thinking skills, synthesizing, and communicating information in discussions (Coiro, 2011).

By teaching in digital learning and online teaching skills, lecturers can compete in their teaching, and lecturers can read offline and online so that lecturers can increase their competence.

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Indicator 5

Principal Competency for ability and show good behavior in a digital environment.

In the interview with the lecturers, most lecturers revealed that they must have the principles of principal competence so that in carrying out their duties, it can be more comfortable, effective, and efficient in learning, relationships with institutions and other peers. Lecturer orientation to students, institutions, peers related to teaching certificates can show ethical and behavioral skills and show qualified leadership.

Lecturers must have a certificate of teaching (0.497). In Indonesia, teachers and lecturers must have teaching certificates, and there is Law no. 14/2005 on teaching certificates for testing, evaluating, and teaching. There is remuneration in teaching certificates, and unfortunately, certification of teachers and lecturers from the government is a different target because teachers and lecturers are only pursuing remuneration (KEMENDIKBUD, 2020). Therefore, to get the certification, teachers and lecturers must be reviewed to be right on target. An essential factor contributing to improving cognition is the professional competence of lecturers who must have extensive and in-depth knowledge of their subjects. Professional competence is manifested in a competency certificate shown how to teach, teaching methods, and teaching experience (Prasetio, Azis, Dindi, & Fauziah, 2017). Hence, the lecturers must have a teaching competency certificate related to performance. Having a teaching certificate is evidence of professional competence, which is closely related to lecturer performance. Al-Twaijry, A. (2010) argued that lecturers' professional competence is characterized by having a certificate and the ability to give lectures, the willingness and the capacity to use their potential functionally in adult teaching, and take responsibility in the educational process.

Lecturers enable to show capability (0.506) is to form capable lecturers and standard operations. In the interview to the lecturers found out that the problems revealed in teaching through monitoring classroom teaching or assignments related to assessments, assigning homework and examining exam results, disclosing poor performance, and students' complaints. Moreover, the institution must be able to identify problems with the ability of lecturers in relation to existing problems and lecturers' performance and attitudes. Earnshaw et al. (2002) revealed that lecturers must carry out their duties professionally and have a good work record. In capabilities, not all attention is centered on the quality of teaching and the efficiency of carrying out professional duties, and some lecturers have poor attendance records that the study program authorities are unsure about handling through proficiency procedures. Falloon (2020) explained that lecturers must show physical and mental health and good behavior and work as a lecturer after receiving a psychological test. Lecturers who ignore mental health boundaries and are unsure classify the resulting behavior as errors or disabilities. Mulford (2003) stated that even though lecturers with low performance have a relatively short working period, it found out that the proportion of performance has decreased, especially those with physical illnesses so that they tire easily and are unable to adapt to existing conditions. Another thing is that lecturers prove unsatisfactory but have less than good references that can be appointed as learning coordinators due to a lack of qualified candidates. Therefore, a lecturer's capability is not only based on the ability and teaching skills but also attitude and physically and mentally and spiritually.

Besides having certificates and showing the capability, lecturers must use digital literacy (0.578) in digital technology. In interviews with lecturers who said that currently, lecturers must demonstrate digital literacy abilities and skills on a platform that makes it possible to connect and collaborate with students, other lecturers, and other educators. Moreover, lecturers have the opportunity to learn about new and important issues and empower innovation in ways never before imagined. C. Hoadley & Favaro (2015) and Cahill et al. (2020) stated that in digital literacy, apart from giving great value to learning, students also have inherent risks. Even though students are digital natives, digital platforms make students vulnerable to crime and oppression, especially during lockdowns and social isolation, such as currently COVID-19. Coiro (2011) informed that lecturers must deal with this problem, which can trigger feelings of inadequacy, isolation, and mental health development. Lecturers must teach openness to information and choose correct information and avoid manipulation and fake news. This research concluded that the lecturers must continue to teach students to stay safe in online learning and not provide personal data as part of e-safety education.

Another point in indicator 5 of principal competency is the lecturer understand the students need in online learning (0.521). As the interview with the lecturers described that student needs should be a significant factor in online learning by promoting a flexible and responsive approach and maintaining students' technological skills. Also, the lecturers teach meaningful and independent learning environment navigation.

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Physical infrastructure and opportunities for face-to-face interaction in an online environment emphasize alternative forms of communication and support. Al-Twaijry (2010) stated that lecturers could provide different learning for each student in providing online learning. Hence, students can understand and show maximum learning. Also, lecturers must motivate students to focus and be serious in learning. Mardiana & Daniels (2019) stated that lecturers might increase learning flexibility and make it easier for students to access learning materials and tell them how to find the correct learning resources. Gilster (1997) indicated that lecturers could also overcome learning barriers geographically. Synchronous learning methods make it easier for students to access the material. For the asynchronous method, it can be done twice per semester. The most important thing is that lecturers can provide the understanding needed in online learning.

The last point in indicator five principal lecturers' competency are able to use assessment method in online learning (0.455). When the interview to the lecturers described that assessment techniques that are effective in online teaching are seen from the system to evaluate student academic achievement. Lecturers' knowledge of online assessment is essential when there is a demand for accountability from institutions. According to Gaytan (2004), assessment techniques are designed to immediately provide feedback to students to help them understand the material given. An assessment rubric must be given to students so that students understand the assessment. Fabelico & Afalla (2020) also explored that prerequisites for developing effective assessment techniques must be adapted to the institution's online curriculum and aligned with online learning. In giving the assessment must be transparent.

Furthermore, this research result provides knowledge and planning in adopting digital literacy to innovate technological change, implementing it for lecturers to continue developing and improving knowledge, abilities, and skills in the learning process.

Discussion

Educational institution policies underwent a fundamental revolution after the COVID-19 outbreak exposed the world by emphasizing online learning. The policy of innovation and technological change lies in a large domain that aims to improve learning efficiency and effectiveness (Teräs, Suoranta, Teräs, & Curcher, 2020). Educational institutions and teaching determine the process of learning innovation and its impact on technological change. The long journey of innovation and technological change in learning must understand each learner's innovative active role, especially the teacher. Teachers play a crucial role in generating innovation in particular institutions (UNESCO, 2020).

Lecturers who master digital literacy on technological change reflect and instill educational principles for sustainable education development into education. Mastery of innovative digital literacy as an integral part of quality education and encourages sustainable educational competencies. Lecturer competencies focus on knowledge, abilities, and skills that refer to technical skills, cognitive skills, emotional management skills, communication skills, and competency principles as leaders by showing good behavior. Testing and validating the evaluation process for lecturer competence can develop conceptual models focused on higher education subjects.

Lecturers' weakness in adopting digital literacy provides essential lessons for lecturers and institutions to provide coaching and digital literacy development training immediately.

Lecturers who find it challenging to adopt digital literacy will be left behind, and students will continue to use digital literacy while there is no supervision in technological innovations. Institutions that provide coaching and training provide meaningful competency certificates because lecturers can use these certificates wherever they teach. Also, lecturers' attitudes and behavior in digital literacy are an essential part of teaching competence principles. However, lecturers who are still struggling with digital literacy must continue to strive to achieve the competencies needed to evaluate the development of lecturers' competencies.

The implementation and evaluation of innovative pedagogical approaches and curriculum development can also foster competencies in educational contexts that have a growing interest. Competent lecturers can develop learning, teaching methods, and facilitate the relationship between lecturers and students, lecturers and lecturers, lecturers and stakeholders, lecturers, and institutions. The application of learning with an integrated approach of knowledge, procedures, abilities, skills, attitudes, behavior can promote institutions and lecturers to be sustainable in the future.

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Finally, the lecturers' competence who adopt digital literacy towards technological change innovation regarding innovative digital pedagogy is the current online learning application. Researcher suggests that further researchers to do the sustainably research operational competence and develop tools to measure and evaluate the development of lecturers' competencies for learning in the 21st century.

Conclusion

Since the COVID-19 outbreak hit the world, learning in the classroom has been transferred to online learning. Therefore, institutional policies to use Internet technology changes the learning pattern in the classroom to online. However, lecturers must master Internet technology and digital technology so that the learning process is achieved. Technological change innovations make lecturers' competencies change from teaching competencies in the classroom to online teaching. Many lecturers are weak and ignore their abilities and skills in online teaching. Thus the institution must provide lecturer training for online learning. In addition, the lecturers' behavior and attitudes can be reflected in social-emotion so that they continue to focus, have confidence, and understand learning. Finally, mastering innovative digital literacy as an integral part of quality education can encourage sustainable educational competence. The competence of lecturers who adopt digital literacy to innovate technological changes related to digital pedagogy innovation is the teaching competence of the 21st century.

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