Digital Literacy and Digital Technology in Post Covid-19 Era: Indonesian Educators' Experiences and Opinions

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Abstrak

Kemajuan teknologi jarang diiringi dengan kemampuan berpikir dan adaptasi yang memadai, terutama di Indonesia, dimana terdapat tren tingkat literasi digital yang rendah di kalangan masyarakat. Oleh karena itu penelitian ini bertujuan untuk menganalisis pendapat para pendidik Indonesia terhadap perkembangan literasi digital dan pengalaman penggunaan teknologi digital untuk memfasilitasi kegiatan belajar mengajar sebelum, selama, dan setelah berakhirnya kebijakan pembelajaran daring pada masa pandemi Covid-19. Penelitian ini merupakan penelitian kualitatif dengan menggunakan desain penelitian fenomenologis. Data dikumpulkan dengan menggunakan wawancara semi terstruktur terhadap 11 responden yang terdiri dari 6 orang dosen perguruan tinggi dan 5 orang guru SMA. Data dianalisis dengan menggunakan analisis tematik. Hasil analisis data menunjukkan bahwa responden secara umum memiliki pandangan positif terhadap perkembangan literasi digital, sudah familiar dengan teknologi digital bahkan sebelum pandemi, dan mampu menghasilkan konten digital untuk proses belajar mengajar. Zoom dan Google Meeting juga ditemukan menjadi aplikasi yang paling banyak digunakan untuk memfasilitasi pembelajaran. Mayoritas responden juga menunjukkan minat untuk lebih memanfaatkan teknologi digital, pembelajaran asinkron, dan pembelajaran jarak jauh setelah pandemi Covid-19 berakhir. Permasalahan yang disebutkan dalam pengembangan literasi digital antara lain adalah kurangnya infrastruktur dan kesenjangan digital di kalangan siswa, serta penyalahgunaan teknologi digital untuk hiburan dibandingkan pembelajaran. Oleh karena itu, penelitian ini menyimpulkan bahwa para pendidik Indonesia memiliki opini positif terhadap perkembangan literasi digital, dan pengalaman positif terhadap teknologi digital.

Kata Kunci: Literasi digital, Teknologi digital, Pascapandemi, Pendidik Indonesia.

Abstract

Advance in technology has rarely been accompanied by adequate thinking skills and adaptation, especially in Indonesia, where there is a trend of low-level digital literacy among the populace. Therefore, this research aims to analyze Indonesian educators' opinions on the development of digital literacy and the experience of using digital technology to facilitate teaching and learning activities before, during, and following the end of the online learning policy during the Covid-19 pandemic. This research is qualitative research using phenomenological research design. Data were gathered by using semi-structured interviews with 11 respondents, consisting of 6 college lecturers and 5 high-school teachers. The data were analyzed by using thematic analysis. The result of the data analysis shows that the respondents have generally positive views on digital literacy development, were familiar with digital technology even before the pandemic, and were able to produce digital content for teaching and learning. Zoom and Google Meeting were also discovered to be the most used applications to facilitate learning. The majority of the respondents have also shown interest in the further use of digital technology, asynchronous learning, and distance learning after the end of The Covid-19 Pandemic. Problems mentioned in developing digital literacy include the lack of infrastructure and digital divide among students, alongside the misuse of digital technology for entertainment over learning. Therefore, this research concluded that Indonesian educators have positive opinions about the development of digital literacy, and positive experiences with digital technology.

Keywords: Digital literacy, digital technology, post-pandemic, Indonesian educators.

1. INTRODUCTION

One of the most standout changes in today's world is the advance of technology, the availability and accessibility of media, and the inclusion of the internet. The digital age of the 21st century has changed the way people interact and share information (Reddy et al., 2023; Yeşilyurt & Vezne, 2023). At the same time, this advance in technology has rarely been accompanied by adequate thinking skills and adaptation, especially in Indonesia, where there is a trend of low-level digital literacy among the populace (Eryansyah et al., 2019; Wardhani et al., 2019). The meaning of literacy within this context does not simply refer to the ability to read; rather, it refers to someone's competence in accessing, understanding, utilizing, and communicating, information in various forms through digital sources to others (Gilster, 1997; N. Law et al., 2018). Within the context of education, digital literacy most often refers to the utilization of digital media to facilitate the learning process (Nazarova & Nazarov, 2021; Wuyckens et al., 2022; Yeşilyurt & Vezne, 2023). A well-developed digital literacy is a key skill that needed to be mastered by students and educators both, as it confers many benefits, including development of collaborative skill, independent thinking, creativity, critical thinking, media literacy, and other essential skills needed in the 21st century (Pawlicka et al., 2022; Pertiwi, 2022). Conversely, an underdeveloped digital literacy would present risks to educational forces, such as digital exclusion, threats to digital security, threat to educational security, misinformation through inability to process Hoaxes, and susceptibility to cybercrimes. Thus, it is clear that the development of digital literacy is urgently needed in Indonesian education, and that the awareness of its importance is a factor that must be considered going forward.

The outbreak of Covid-19 at the beginning of 2020 has further shown the importance of developing digital literacy among students and teachers, as the effort to reduce the virus' spread caused the majority of the student global population to adopt online learning following the temporary ban on physical classroom (Ratnaningsih & Hidayati, 2022; Widayanti, 2021). In Indonesia, the implementation of *PSBB* (*Pembatasan Sosial Berskala Besar/*Large Scale Social Restriction) beginning in April 2020 have caused Indonesian students to use Online Learning in lieu of face-to-face interaction (Lubis & Dasopang, 2021; Maeng, J. L., & Gonczi, 2019). Recently, schools throughout the world have once again adopted full face-to-face classrooms. In this so-called 'new normal,' students and teachers will once again have the opportunity to engage in a traditional classroom (Yessenova et al., 2023; Yufrinalis & Tiring, 2022). In Indonesia, this officially began the in 12th of May 2022. The shift back into focus on traditional classroom carries an implication of less dependency on digital technology, of which carries potential threat to the further development of digital literacy among students and educators.

The definition of digital literacy varies. First study defined Digital Literacy as ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers (Gilster, 1997). Meanwhile, other study defined Digital Literacy as the 'competence' of accessing, utilizing, and communicating information from digital sources (N. Law et al., 2018). There is also a study stated that digital literacy includes the ability to use technology to obtain, evaluate, produce, and communicate information (Hatlevik & Christophersen, 2013). Meanwhile, other study defined digital literacy as an umbrella term that encompass many different concepts, including computer literacy, internet literacy, media literacy, and information literacy; all of which seeks to help users to function in a digitally rich society (Leaning, 2019). Digital Literacy is an important part of modern learning, as a well-developed digital literacy is beneficial to both students and teachers. Previous study stated that in the 21st century, digital literacy is now considered a requirement for teachers to be able to conform to students' digital inclinations and necessities in the classroom (Turiman et al., 2012). There is also stated that digital literacy is capable of

providing students and participants the necessary ability and awareness of an essential skill for 21st century living, and that the use of digital technology and a developed digital literacy provided learners with collaborative and independent learning, easy, effective, and efficient communication, creativity, as well as critical thinking (Pertiwi, 2022).

Research shows that Digital Literacy has had positive effects on students' performance, with higher level of ability to operate computers and digital media providing a better overall output of students' performance (Yustika & Iswati, 2020). Another research also revealed that that digital literacy skill could affect online risks such as bullying, sexual harassment, hacking, resilience, and addiction to the internet (Purnama et al., 2021). Meanwhile, in regards to problems caused by low-level digital literacy, other research shown that a deficit in digital competence increase the risks to digital security and education (Pawlicka et al., 2022). Furthermore, as shown by researches such as done by previous studies digital literacy increases the risks of influence from misinformation and hoaxes found on the internet (Fauzi & Marhamah, 2021; Fitriarti, 2019). Finally, other study also stated that low digital literacy abilities increase the likelihood of becoming a suspect or victims of cybercrimes among students (Purnama et al., 2021). Thus, we can conclude that Digital Literacy is important, as it provides many benefits and protect students from the more negative aspects of Digital Media. It is also important to note the role Indonesian educators' play in fostering students' interest in the use of Digital Media in a positive way, and understanding their current position on the matter would help in deciding the direction of the development of Digital Literacy, so as to be able to maximize the benefits and minimizing the negatives. Therefore this research aims to analyze Indonesian educators' opinions on the development of digital literacy and the experience of using digital technology to facilitate teaching and learning activities before, during, and following the end of the online learning policy during the Covid-19 pandemic.

2. METHOD

This research used qualitative-descriptive research using phenomenological research design. Qualitative research is an approach that is used to explore and understand the meaning a group or an individual ascribes to social or human problems (Creswell, 2013). Phenomenological design, meanwhile, is a research design that inquired into the lived experience of a group or an individual about a certain phenomenon.
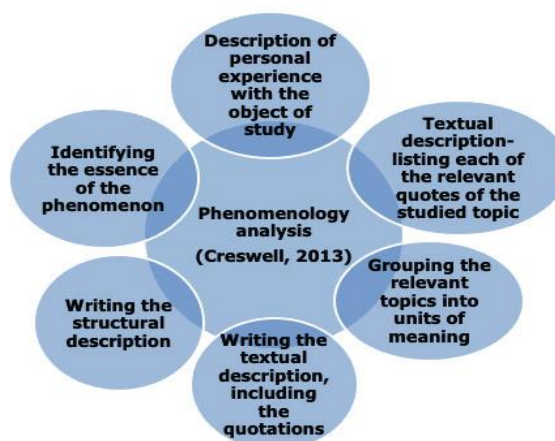

Figure 1. Cresswell Phenomenological Research Design

This research was conducted by using semi-structured interview sessions, with research subject consisting of 11 educators including high school teachers (5) and college

lecturers (6). The research objective is the educators' opinion about digital literacy, their experience in using digital media for learning, and their view about the development of digital literacy. The sample size for qualitative research is dependent on the type of research being conducted; for phenomenological research, in particular, usually ranges from 3 to 10 participants. Therefore, this research used 11 respondents in order to obtain enough data while still being able to avoid data saturation and finish within a manageable time constraint. The instruments of the interview included an interview guide, the researcher, mobile phones, notes, and voice recording if permitted by the participants. Data collection was conducted from 9th October to 2nd November 2022. The interview was conducted either directly through face to face, or through WhatsApp chatting service, if the respondents were not available for face-to-face meeting.

Table 1. WhatsApp Chatting Service

No.	Method	Instrument
1.	Semi-Structured Interview	Interview Guide, Recorder, Smartphone, Notebook.

The qualitative data that have been gathered was analyzed by using thematic analysis. According to thematic analysis is a method of qualitative data analysis to identify, analyze, describe, and report themes found within a dataset (Nowell et al., 2017). The procedure for using thematic analysis from start to finish, are: 1.) Familiarizing the data, which involves the step of reading and re-reading the data that have been gathered until the researcher is familiar with all aspects of the data. 2.) Generating initial codes, in which the researcher moves to simplify and focus on the specific characteristics of the data, and to identify and categorize data into labels based on theme or issue present in the data. 3.) Searching for themes, which involves the sorting of coded data into relevant themes. The themes for this particular research were generated deductively; i.e., it arose from theoretical and analytical interest of the researcher before the data had been gathered. 4.) Reviewing themes, where the researcher reviewed the codes contained in a theme in order to see if they form any coherent and meaningful pattern. 5.) Defining and naming themes, where the researcher determine which aspect of the data that a theme captured and how it explains and relates to the research question. 6.) Producing the report, which is the final step of the analysis that involve the write-up of the analyzed data through themes and codes.

3. RESULTS AND DISCUSSION

Results

Based on the result of the thematic data analysis, the following themes and codes has been discovered through the transcription:

Teachers' Usage and Exposure to Digital Literacy

Opinion on digital literacy and general experience in using digital technology is show in Table 1.

Table 1. Respondents' Opinion and Experience of Digital Literacy

No.	Indicators	Positive	Negative
1.	Have produced Digital Content for educational purpose	7	4
2.	Have asked students to produce digital Content for educational purpose	11	0
3.	Have ever felt left behind by students Digital Literacy	10	1

No.	Indicators	Positive	Negative
	development		
4.	Have used digital technology and the internet to conduct teaching and learning activity before the pandemic	11	0
5.	Willing to use Digital Technology learned during the pandemic in post-pandemic era.	8	3
6.	Views on the development of Digital Literacy for both educators and students	11	0

Based on Table 1, it can be inferred that all of the respondents valued the development of digital literacy for both educators and students. Base on interview in respondent, the position of DL is important for the future, so whether we like it or not all educators must learn about it, because in the future there's going to be a lot of aspects of educations which will use digital literacy. Then respondent state even though we're back to using online learning, it is still important that we develop digital literacy. Through digital, we could increase our knowledge and learn about new things. Further, it also shows that the respondents were already familiar with the use of digital technology to facilitate learning even before the pandemic, such as using Youtube and Search Engine for the purpose of using it as learning materials. All of the respondents also mentioned having to learn and apply new applications and tools in order to facilitate online learning during the pandemic. Then other respondent state yes, I have. Usually, I use media such as google to access journal article, websites about materials, and Youtube. I often use Quizzez to give quiz to my students. For content applications, I usually use Canva. Before, we only used social media and teaching sources from the internet, we only began to use online learning application such as Zoom and Gmeet during the pandemic and after the pandemic. Maybe before the pandemic I've used Quizzez, but that's it. At the same time, a number of the respondents have stated that they have no interest in using online learning / asynchronous learning following the end of the pandemic, and instead will focus on using internet and digital technology to develop materials. In terms of production, 7 out of 11 respondents (63.64%) have stated that they have experience in the production of digital content for the purpose of teaching and learning. The majority of the materials produced are in the form of videos and documents, as listed in Table 2.

Table 2. Production of Digital Content

No.	Digital Content Production	Educator	Students
1.	Videos	6	7
2.	Documents (Powerpoint, Infographic, Quizziz, etc.)	4	3
3.	Other (Animation, Game, etc.)	1	1

Meanwhile, all of the respondents have stated that they have asked their students or planned to ask their students to produce digital content as tasks. Finally, all of the respondents have acknowledged that they view their students to be more adept at using digital technology. At least one respondent mentioned that many of the students were more adept at using technology for the purpose of entertainment, such as gaming and social media, and were actually still lacking in the usage of technology for academic purposes. Base on interview respondent state that they are pretty good because they have to use it more often. It's just that, when we look at it from the academic perspective, their aim for using that (Digital Technology) lean more towards having fun and for personal entertainment, not for any academical context. When we involve academic context, they're relatively incapable, for

example if I asked them to find scientific journal or to create an infographic they are were still lacking. The application popularity is show in Table 3.

Table 3. Application Popularity

No.	Applications	Frequency	Pre-Pandemic Use	During-Pandemic Use	Post-Pandemic Use
1.	Zoom	10	2	10	7
2.	Google Meets	9	1	9	8
3.	Youtube	6	6	6	6
4.	Google Classroom	6	1	6	4
5.	WhatsApp	5	2	5	2
6.	Google Forms	4	1	4	3
7.	Quizziz	4	4	4	4
8.	Instagram	2	2	2	2
9.	Microsoft Teams	1	1	1	1
10.	Skype	1	1	1	1
11.	Hot Potato	1	1	1	1
12.	Canva	1	1	1	1
13.	Photoshop	1	1	1	1

Based on Table 3, it can be inferred that both Zoom Meeting and Google Meet were the two most used applications. However, their use only spiked during the period of the pandemic, with many of the respondents mentioning that they only learned to use it during the pandemic. Further, not all of the respondents were interested in using asynchronous/blended learning in the post-Covid world, which reduced their total use in post-pandemic world. Meanwhile, the application that was used the most before the pandemic was Youtube, followed by Quizziz. The majority of the respondents have stated that they use Youtube primarily to update videos or to look for videos to be used as learning materials. Quizziz was mainly used to create easy-to-share materials and questions among other educators and students. Base on interview before the pandemic I already have used digital technology such as Youtube, Whatsapp Group, Google Classroom, Google Form, Google Meet (For extracurricular activity), quizziz, Hotpotatoes (to make test. Other popular applications which were used during the pandemic were Google Classroom and Google Form. Both of them were used to streamline task giving and paperless tasks submission. Finally, Social Media such as WhatsApp and Instagram were also mentioned to have been used in order to facilitate learning. WhatsApp was used to facilitate communication between educators and their students, while Instagram was mentioned to be used for video editing. Other applications used by educators to facilitate teaching and learning or creating learning materials include Microsoft Teams, Skype, Hot Potato, Canva, and Photoshop. Problem face is show in Table 4.

Table 4. Problems Faced

No.	Problems	Educators	Students
1.	Internet Connection and Accessibility	3	7
2.	Digital Divide	0	3
3.	Lack of Experience in using Digital Technology for teaching and learning	4	2

As Table 4 shown, problems relating to the use of digital technology and digital literacy include infrastructure problem, digital divide, and lack of experience in using digital technology. Issues with infrastructure such as the lack of stable internet is the most common problem faced by educators and students, while the lack of experience is mostly felt by the teachers. The problem is time constraint and the availability of supporting facilities. It often resulted in unstable signal. Problems faced by the students, is that even though they were already familiar with digital applications that can be accessed through phones, some of them were limited by economic factor that they do not own a laptop. That becomes a problem, because there's a difference between using smartphone and laptop. The features are differences, especially for academic needs, of which the applications are most often found in laptop.

Discussion

Based on the result of the interview, it can be inferred that the lecturers and teachers generally have a positive opinion regarding the development of digital literacy, both among educators and students. The respondents were shown to be already familiar with the use of digital technology for teaching and learning even before the pandemic. The majority of the respondents (7) have even stated proficiency in the production of digital content, mainly in the form of videos (6) and documents (4) for use in teaching. This means that the majority of the respondents have good skill of digital literacy as stated by previous study which include obtaining, evaluating, producing, and communicating information using digital technology (Hatlevik & Christophersen, 2013). Although, only a small number of the respondents (2) were familiar with the use of digital technology to facilitate blended and distance learning in the pre-pandemic era. This is best shown by the significant increase in the usage of online meeting applications such as Zoom and Google Meet, and blended learning platforms such as Google Classroom, when the pandemic started. Overall, this finding shows that before the pandemic, while the respondents were not wholly digitally illiterate, they were not quite adept in the utilization of technology for the benefit of teaching in the 21st century (Elshami et al., 2021; Kaufmann, 2018). At the same time, the respondents have also expressed interest in learning and to continue using digital technology to facilitate blended and asynchronous learning. They have also shown positive views towards the development of digital literacy among their students, with the majority of the respondents (10) have admitted that they viewed their students to be more capable in using digital technology compared to them (Bhurekeni, 2020; Virvou et al., 2005).

This implies the possibility that while students might be able to use digital technology much better than their teachers/lecturers, it does not necessarily mean they're interested in using it for academic purposes. This statement, coupled with other findings, also gives way to the topic of gamification; 4 of the respondents have mentioned the use of Quizziz, while 1 respondent has also mentioned using Hot Potato, both of which are considered to be gamification applications, to facilitate learning even before the pandemic (Azizah et al., 2020; Roediger et al., 2011). This means that, while low, there is a level of awareness among educators regarding the use of digital applications for gamification of learning, in order to bridge the gap between academics and entertainment (Astafiria & Bayu, 2021; Handoko et al., 2021). Regarding problems of digital literacy and its development, the majority is related to the problems with infrastructure, such as poor internet connection, lack of access to available internet hotspots, and lack of experience in using new digital applications. A number of respondents have also pointed toward the existence of a digital divide among the student population. Digital divide, here, refers to the inequality of access and level of skills between different individuals, in which the more optimized pattern of usage and skill level increase the benefits of deploying ICT; resulting in widening of inequalities in an increasingly

digitized world (Jubaerudin et al., 2021; E. L.-C. Law et al., 2022). In this research, the most common form of digital divide is the availability of hardware, with some students lacking access to vital equipment such as laptops and thus being disadvantaged compared to their more well-off peers. The educators themselves did not face such problems and instead were more troubled by the lack of infrastructure and inexperience in using new applications.In general, the result has shown that among the interviewed teachers, there's awareness and positive attitude towards digital literacy, its importance, and its development, before, during, and after the end of Covid-19 Pandemic. Comparative result with previous findings from other researches also supported the finding of this study. For example, the result of teachers' attitude and their awareness of the importance of digital media is similar to the result of study conducted by previous study which discovered that Malaysian EFL teachers and students have positive attitude and experience in using digital technology during the pandemic, in large part due to the shift caused by Covid-19 (Alakrash & Abdul Razak, 2021). Other research conducted in Kazakhstan, also discovered similar result, in which it was discovered that the majority of students and teachers showed positive attitude towards online learning, and medium level of competency in using online learning for the purpose of language learning after Covid-19 crisis (Yessenova et al., 2023). Meanwhile, the findings regarding the use of gamification and students' well-developed Digital Literacy, and their preference of digital entertainment over digital learning, is similar to the result of the research conducted by previous study who discovered that there was a positive correlation between students' smartphone addiction and their digital literacy level, with students' use of applications such as Youtube, TikTok, Instagram, Facebook, and games present in their smartphone boosting their critical literacy level (Okela, 2023). However, other study did not mention any negative impact of smartphone addiction, unlike the response of respondent 4, who implied the presence of negative influence when students prefer to use digital media for personal reasons over academic (Haryanto et al., 2021; Lampropoulos et al., 2019). Problems faced by Indonesian educators for the development of digital literacy are the lack of supporting infrastructure to facilitate online learning, lack of experience in using new applications, and the existence of digital divide among students (Choudhary & Bansal, 2022; Mu'awanah et al., 2021; Zainal et al., 2022). Lack of infrastructure often resulted in unstable connection that hinders the process of teaching and learning, while digital divide among the students means that there is an unequal opportunity for learning due to the lack of available hardware for students, such as laptops, which might negatively affect their learning process due to the differences between laptops and smartphone when it comes to accessing and utilizing applications for learning. To conclude, it can be said that it is paramount that digital literacy development is supported for both educators and students, considering that in the future, the use of digital technology would only increase. The research would also like to acknowledge limitations in this study, such as time constraints and the number of respondents. For future research, the researcher hopes that this research can be used as a material, of which to give deeper insight into the experiences and opinions of educators in Indonesia regarding the growth of digital literacy and the technology to support it so that in the future, both students and teachers could fully enjoy the benefits offered by digital technology.

4. CONCLUSION

This study aims to discover Indonesian educators' opinion of digital literacy and their experience of using digital technology, before, during, and after Covid-19 Pandemic. Based on the result of the discussion, it can be inferred that Indonesian educators were aware, and in support of the development of digital literacy, and its importance for the future of education. Before the pandemic, Indonesian educators have shown familiarity with the usage of digital

technology to conduct teaching and learning, although not many were experienced in using blended/online learning. Following the pandemic, it was shown that there is a positive development of digital literacy among educators, as the majority of the respondents have acknowledged that there were many applications and technology that they were obliged to learn during the online learning period, mostly online meeting applications such Zoom and Google Meet, and LMS such as Google Classroom. Indonesian educators have also positively responded to the possibility of the continued usage of applications that they have learned to use during the pandemic. The respondents have also shown interest in using blended learning, distance learning, and asynchronous learning in the future.

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