

# Digital Literacy Abilities of Students in Distance Learning

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## ABSTRACT

The Covid-19 pandemic has caused the learning system from elementary to tertiary level to change using distance learning. This causes all stakeholders need to master digital devices so they can follow the learning well. The digital abilities of students as learning subjects are on the spotlight because they are considered capable of operating qualified digital devices. This study aims to measure the digital literacy ability of students and then compare the digital literacy ability of students in terms of location. This research used a quantitative approach with a survey method. The study population was elementary school teacher education students in Bandung and Cilacap. Then, the sample from the study was chosen purposively based on their respective affiliations. Data collection techniques used questionnaire through the Google form while the data analysis used descriptive statistics. Furthermore, the results of the study indicate that the digital literacy abilities of students are in the medium category. Students already have decent mastery in digital media but they do not pay attention to aspects related to the writing code of ethics such as including valid references and very rarely access the journal as a source of literature. In terms of hardware usage aspects, students have shown better development because they can use applications that support distance learning activities. Thus, the researcher concludes that in terms of location all prospective teachers have medium category on digital literacy ability.

**Keywords:** *Digital literacy, digital media, survey*

## 1. INTRODUCTION

As the times and science advance, humans will continue to make various innovations. Technology is one of the results of human innovation. The developments that occur cannot be avoided, along with the development of needs that give birth to technological developments (Jamun, 2018). Etymologically, technology is knowledge about making something (Yaumi, 2018). In this era of globalization, technology has become an important aspect to support daily life, be it economic, political, cultural, artistic, and even educational aspects (Jamun, 2018).

In the 21st century, all information and communication can be done easily, quickly, instantaneously, and can be reached by anyone and anywhere (Rakhmawati, 2017). The younger generation, especially students, are expected to master various 21st century skills and use them to improve the quality of civilization. 21st century skills are skills that must be

mastered by everyone in order to succeed in facing the challenges, life problems, and careers of the 21st century (Redhana, 2019). 21st century skills that are integrated in knowledge, skills, and attitudes, as well as mastery of technology can be developed through critical thinking and problem solving, communication, creativity and innovation, and collaboration.

To develop 21st-century skills, the government of the Republic of Indonesia through the Ministry of Education and Culture (MoEC) has issued an effort to activate literacy, namely the National Literacy Movement (GLN). The National Literacy Movement is part of the implementation of Regulation of the Minister of Education and Culture Number 23 of 2015 concerning the Development of Character (MoEC, 2017). There are six literacy developed, namely literacy, numeracy literacy, scientific literacy, digital literacy, financial literacy, cultural literacy, and citizenship.

Digital literacy is the ability to access, organize, understand, use, and disseminate information in various

forms from a very wide variety of sources accessed through computer devices (MoEC 2017). Digital literacy must be understood as basic skills to use computers confidently, safely, and effectively, including the ability to use software such as word processing, presentations, email, the ability to create and edit images, audio, video, and the ability to use search engines (Alagu & Thanuskodi, 2019). More broadly, experts define digital literacy as not just about the ability to use digital tools and information effectively (Ala-Mutka, 2011; Cartelli, 2010; Ferrari, 2012). Experts extend the concept of digital literacy to include the essential abilities of social participation, collaboration and effective communication, critical thinking, and problem solving using digital technology and information (Cartelli, 2010; Martin & Grudziecki, 2006). Bawden (2008) considers digital literacy as an important requirement for living in the digital age. Belshaw (Asari et al., 2019) states that there are eight essential elements for developing digital literacy a) cultural, namely understanding the various contexts of digital users; b) cognitive, namely the power of thought in assessing content; c) constructive, namely the creation of something expert and actual; d) communicative, namely understanding the performance of networks and communications in the digital world; e) responsible self-confidence; f) creative, do new things in new ways; g) critical in addressing digital content and literacy as life skills, and h) socially responsible.

Digital literacy is important for students to have along with the rapid development of the digital world and can lead to two opposing sides in relation to the development of digital literacy. The development of digital equipment and access to digital information presents both challenges and opportunities. The implementation of digital literacy programs that are expected to support Industry 4.0 according to the National Education Association (2010) is critical thinker, communicator, collaborator, and creator. In addition, digital literacy has a significant effect both on students' core competencies and future job performance requiring knowledge and skills that are enhanced by digital technology (Pirzada & Khan, 2013; Vrana, 2016).

In this Industrial Revolution 4.0 era, learning is carried out not only face-to-face in class but can be carried out by distance learning through several platforms that use the internet. Especially at this time, all countries are experiencing a big disaster, namely Covid-19. The emergence of the coronavirus causes the learning system to change. The phenomenon of limiting distances during the pandemic affects the implementation of learning in higher education. The Circular of the Minister of Education and Culture of the Republic of Indonesia number 3 of 2020 dated 3 March 2020 concerning the prevention of Covid-19 in education units, converting lecture activities into

distance learning. Distance learning is a learning system that does not take place in one room so that there is no physical interaction between teacher and learner (student), and face-to-face is done virtually. In distance learning, students use the software in the form of a learning management system. The types of learning management systems used are Google classroom, Zoom, Google Meet, Visco Webex, and Whatsapp Group. Thus, students need to master digital literacy skills.

Based on the explanation above, the researchers conducted further studies through research to measure students' digital literacy skills and compare students' literacy abilities based on location.

## 2. METHODS

This research used a quantitative approach, which is survey research. The survey method is a technique of collecting information that is carried out by compiling a list of statements submitted to respondents to describe attitudes, opinions, behaviors, or special characteristics (Creswell, 2015; Lestari & Yudhanegara, 2019). The study observed the behavior of respondents so that their digital literacy skills could be found. The study population was students of elementary school teacher education in Bandung City and Cilacap Regency. The sample of the study was selected purposively because the researcher chose research subjects based on their respective affiliations. The data were collected using a questionnaire containing statements with a Likert scale consisting of four answer choices. Researchers used a web-based survey via google form. Furthermore, the data were analyzed to determine the digital literacy abilities of students in each location and to compare the digital literacy abilities of students in both locations. The researcher conducted a descriptive analysis of all statement items by calculating the percentage of each aspect and categorizing them into several criteria. Here are the levels of digital literacy (Table 1).

In addition to using descriptive statistical tests, researchers also conducted inference statistical tests to measure students' digital literacy skills which were reviewed based on location. The following is the hypothesis proposed in this study.

H<sub>0</sub> : There is no difference in digital literacy skills students in the city with students in the suburbs

H<sub>a</sub> : There are differences in the digital literacy skills of students in cities and students in rural areas

## 3. FINDINGS AND DISCUSSION

The data were obtained through a questionnaire distributed with Google Form. Prospective elementary school student teachers filled out a questionnaire according to their situation. The questionnaire contained

25 statements consisting of 4 negative statements and 21 positive statements. The following is a table of the results of the questionnaire distribution that has been filled in by Elementary School Teacher Education students on two campuses.

**Table 1.** Aspects of digital literacy

| Level   | Description  | Scores |
|---------|--|--------|
| Basic   | Has a set of capabilities that allow basic use of media. Users in this level still have limitations in accessing the internet. Users know the basic functions but still have limitations in accessing the use of media to improve critical thinking and communication skills.  | < 70   |
| Medium  | Users are fluent in using media, know functions and are able to carry out certain functions. Users can operate more complex media to obtain and assess information. Users are able to use certain information retrieval strategies such as access to articles in electronic journals.  | 70-130 |
| Advance | Users at this level are very active in the use of digital media, they are aware of and interested in various regulations that affect digital use. Users have in-depth knowledge of techniques and language and can analyze and modify conditions affecting them. Users can carry out communication links and message creation. In the social sphere, users can activate teamwork and can lead to problem-solving.. | >130   |

European Commission (2009)

**Table 2.** Survey result of digital literacy technique aspect

|                    | Digital Literacy |       |
|--------------------|------------------|-------|
|                    | N                | %     |
| Strongly Agree     | 17               | 11,3% |
| Agree              | 78               | 52%   |
| Not Agree          | 40               | 26,7% |
| Strongly Not Agree | 15               | 10%   |
| Total              | 150              | 100%  |

Table 2 showed that 52% of students agree on statements related to technical aspects of digital literacy. This aspect related to students' skills in using electronic devices such as laptops, cell phones, or computers. Students could operate electronic devices and carry out activities such as creating vlogs or content when they have free time. Even though almost half of the participants could operate electronic devices, there were still students who can operate electronic devices only when learning online. They did not have interest in creating content or trying new things related to applications in an electronic device. Students can use features found in laptops or applications on cellphones

such as email, zoom, Google Classroom, or editing videos.

**Table 3.** Survey results of digital literacy cognitive aspect

|                    | Digital Literacy |       |
|--------------------|------------------|-------|
|                    | N                | %     |
| Strongly Agree     | 13               | 8,6%  |
| Agree              | 55               | 36,7% |
| Not Agree          | 64               | 42,7% |
| Strongly Not Agree | 18               | 12%   |
| Total              | 150              | 100%  |

Table 3 was the survey results from the cognitive aspect of digital literacy. The cognitive aspect of digital literacy was related to students' knowledge related to digging important information, paying attention to reference sources, writing years, and about the citation of an information text. The results showed that 42.7% of students paid less attention to reference sources when compiling assignments. Students also have no interest in reading articles even though the information from the articles is newer than the information extracted from books. Also, students did not take advantage of their time by looking for articles or reading the latest information related to the world of education or the spread of the Covid 19 which has an impact on the world of education.

**Table 4.** Survey results of digital literacy social aspect

|                    | Digital Literacy |       |
|--------------------|------------------|-------|
|                    | N                | %     |
| Strongly Agree     | 42               | 28%   |
| Agree              | 60               | 40%   |
| Not Agree          | 28               | 18,7% |
| Strongly Not Agree | 20               | 13,3% |
| Total              | 150              | 100%  |

Meanwhile, in table 4, the survey results showed that as many as 40% of students could use digital media as a means of social interaction. The social interactions carried out by students are exchanging ideas about lecture assignments, attending seminars, and joining discussion forums. The digital literacy score between student groups is shown in Table 5.

**Table 5.** Digital literacy scores of students

| Aspects          | Group 1 | Group 2 |
|------------------|---------|---------|
| Technique Aspect | 96      | 88      |
| Cognitive Aspect | 75      | 56      |
| Social Aspect    | 88      | 80      |
| Average          | 88      | 74,7    |

Based on the students' digital literacy scores, it can be concluded that group 1 has a higher digital literacy score than group 2 (Table 5). In terms of digital literacy technical aspects, groups 1 and 2 were in the medium category. Therefore, student groups 1 and 2 can operate digital media by well. Students could use features found in laptops or applications on cellphones such as email, zoom, Google Classroom, or editing videos. This indicated that college students located in the city center and college students located in suburban areas have the same digital literacy technical skills. Then, in the cognitive aspect of digital literacy, group 1 was in the medium category while group 2 was in the basic category. The digital literacy scores showed that first group of digital literacy skills were higher than second group. In the cognitive aspect of digital literacy, group 1 students used articles in electronic journals as references for papers or final assignments and pay attention to the spelling in each writing. Meanwhile, group 2 students rarely used articles as a reference source, rarely access electronic journals, and still often used blogs or Wikipedia as references in writing papers. Furthermore, in the social aspect of digital literacy, the two groups were in the medium category. This explained that both groups used social media to interact with other people to add information and knowledge, such as group discussions, participating in forums, and attending seminars.

In this study, the results of the survey showed that students' digital literacy skills scored 88 and 74.7 so the students' digital literacy was in the medium category. The value for the medium category is in the range 71-130. The medium category means that students' ability to operate digital media was quite high, the ability to analyze and evaluate media content was quite good, and it was good enough to use media as a form of social interaction. In addition, researchers also compared students' digital literacy skills reviewed based on location. Group one consisted of college students located in the city center, while group two consisted of college students located in the suburbs. Researchers also conducted statistical tests to measured students' digital literacy skills in terms of different locations. The following are the results of the statistical tests listed in table 6.

**Table 6.** Hypothesis tests result

|                  | Sig   | Informations            |
|------------------|-------|-------------------------|
| Normality Test   | 0,490 | Normal distributed      |
| Homogeinity Test | 0,419 | Homogein                |
| T test           | 0,000 | H <sub>0</sub> Rejected |

Table 6 showed the results of statistical tests on students' digital literacy skills. The results of the t-test showed that the hypothesis was rejected, so it means that there is no difference in students' digital literacy skills reviewed based on location. Referring to the

research results, it can be seen that from a technical aspect student already can operate and install various features to carry out distance learning. However, only a few students took advantage of this situation to learn new things so that they came up with creative ideas such as making vlogs or creating interesting content. Students only used various features when they were learning or when there is a task that requires them to operate the feature. This was as explained by Blummer (2008) that the younger generation is reliable in operating technology but they are not careful in controlling technology. The younger generation tends to operate technology just for fun. Therefore, not many young people have digital literacy skills in the medium category.

Furthermore, in the cognitive aspect, the ability of students to find and process information is still low. Not many students pay attention to reference sources for assignments. Students tend to be less interested in writing, such as paying attention to spelling, paying attention to templates, or choosing references that are recent and come from reputable journals. Similar to the technical aspect, in the cognitive aspect, students also never take the time to access and access science unless there is an assignment that requires them to access articles. However, the existence of distance learning caused students to seek referrals independently because usually students only rely on learning materials from lecturers. Based on the survey results, students prefer face-to-face lectures rather than distance learning. This was similar to the results of Tang & Chaw's (2016) study that students in Singapore prefer face-to-face learning to distance learning. However, what distinguishes Tang & Chaw's (2016) research results was that students in Singapore prefer reference sources from electronic journals rather than references from books. They like material that can be stored on their cell phones so that it is easier for them to read at any time.

Then on the social aspect, students who previously rarely used applications for discussion now really need discussions to do assignments. Students were quite enthusiastic about participating in webinars organized by various agencies to increased their knowledge for free. In addition, students also needed interaction via social media to discuss assignments. However, most of the students only discussed when there was an assignment, not in their spare time discussing things outside the assignment. This is reinforced by Ng's (2012) opinion that students usually took advantage of technology in learning when they are required to use technology. For most students learning using technology was not important.

In contrast to the results of research conducted by Irhandayaningsih (2020). Irhandayaningsih's research (2020) showed that respondents have a high level of digital literacy when measured using the Bawden

Concept. In the aspect of basic digital literacy skills, all respondents were able to connect to the platform to take part in online learning, and were able to use worksheet technology to write assignment articles according to the provisions.

As for the results of the survey in Nahdi & Jatisunda's research (2020) that overall students have digital literacy skills at the basic level in using the internet, they were able to find and retrieve information from the internet, and used it effectively. Furthermore, Nahdi & Jatisunda's (2020) research results indicated that nearly half of respondents said they had difficulty using the Internet for various activities, including helping their learning process. They realize that the information they got was not enough to get good grades from lecturers. More than half of the respondents admitted that they had difficulty finding information effectively and using more specific sources of information.

Furthermore, referring to the results of this study, it was found that the majority of students did not have the skills to take advantage of the digital library. They have difficulties and did not know how to use this information source. In addition, almost half of the respondents realized that they were less critical and creative about the information they obtained and how to use information ethically and responsibly. Many students did not know how to interpret references to papers or journals, how to search databases effectively, or assess the quality of websites. Students usually rely heavily on one search engine, such as google and yahoo, to find information on the Web. Along with this, many of them copy information directly from the website without citing the source and still lack awareness of the ethics of writing related to copying and quoting when they use various sources (Nahdi & Jatisunda's, 2020).

Meanwhile, the results of this study were relevant to the results of previous research conducted by Amelia & Ulumu (2019) that prospective teachers already have digital media literacy skills, it is proven that students can filter out good and bad news. Then, students doing digital media literacy are more and more used as a place to build relationships. There were 60 respondents or 33.15% in the Basic category in critical understanding skills. 114 respondents or 62.98% were in the medium category in critical understanding ability.

The existence of distance learning requires students to use technology more often. Indirectly, students were required to be more competent in operating technology. Therefore, students need to have better digital literacy skills. Digital literacy was very important in education in the 21st century because digital literacy was not just adding technology to the learning process, but utilizing it for various purposes to improve the quality of learning. Digital literacy was very important for prospective teachers, to be used during learning and to

be applied when carrying out learning in elementary schools (Cam & Kiyici, 2017). It was a fact that prospective teachers are deficient in the use of the application in a certain curriculum; therefore, they have to attend a specific training to accelerate their skills. Teachers have a significant role in industrial revolution 4.0 to make students develop their potential through the use of the latest technology (Rahman et al., 2018). High digital literacy skills can make it easier for students to follow any distance learning process during a pandemic. At least students can connect the device to an adequate internet network and install various software for distance learning. Both of these are fundamental abilities to be able to participate in distance learning effectively.

On the other hand, digital literacy plays a role in streamlining interaction and communication during the learning process. For example, the ability to use the camera and microphone features on the device to be able to be present and connected virtually. Nevertheless, the ability to use the software to present supporting text and images (graphics, illustrations, etc.) plays a role in optimizing collaboration and communication in online learning, which is bridged by e-mail, online worksheet and spreadsheet features, as well as the existing 'attach file' feature. on various software (Irhandayaningsih, 2020).

In the end, digital literacy competencies play a role in the ability to access various quality learning sources. During the pandemic period, students have limitations in accessing information sources on campus, so the information sources that may be accessed are online-based. Information-rich online sources of information require students to be able to access quality information, as a supplement to information for online learning that is followed. This is in line with research (McLoughlin, 2011) which suggests that in online learning, technological literacy is related to skills in utilizing a digital environment that is rich in learning resources.

#### **4. CONCLUSION**

Improving digital literacy and students' skills in using information technology is something that is important to do, especially in distance learning. This is so that students achieve better results in the learning process even in the midst of the Covid-19 pandemic. Based on the survey results, it was found that overall students have digital literacy skills in the medium category. Then, based on the results of a survey on the digital literacy skills of students in cities, they have a higher score than students in suburban areas. Even though they have different scores, the results of statistical tests show that there is no difference in students' digital literacy abilities that are reviewed based on location. Then seen from the technical aspect, students already have the ability to operate and install

various features to carry out distance learning. Furthermore, in the cognitive aspect, the ability of students to find and process information is still low. Then, in the social aspect, students have good digital literacy skills. In terms of all aspects, students already have good digital literacy skills, but students only use technology in learning when they are required to do so. Students still see little chance that distance learning will hone their creativity and train them to use technology wisely.

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