World Journal on Educational Technology: Current Issues

Volume 15, Issue 1, (2023) 59-71

www.wj-et.eu

The level of digital literacy ability of elementary school students

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Suggested Citation:

Sajidan, S., Atmojo, I. R. W., Desstya, A., Parmin, P., Saputri, D. Y. & Salimi, M. (2023). The level of digital literacy ability of elementary school students. *World Journal on Educational Technology: Current Issues*. *15*(1), 59-71 https://doi.org/10.18844/wjet.v15i1.8192

Received from October 23, 2022; revised from November 22, 2022; accepted from January 12, 2023;.
Selection and peer review under the responsibility of Prof. Dr. Servet Bayram, Medipol University, Turkey
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Abstract

Digital literacy skills are mandatory for students to master so that they can process information wisely. The purpose of this research is to determine the level of digital literacy of elementary school students. The research method used in this research is quantitative. The sample of this research is 86 elementary students in Laweyan Sub-district, Surakarta, Indonesia. The data collection technique used is a test that validated by an expert. The data analysis used in this research is descriptive statistical analysis. The result of this study shows that the students' level of ability in digital literacy is good with the fulfillment of five indicators, namely the use of technology reaches 79.75% or students can analyze the functions of hardware and software in technology, the management of information on digital media reaches 70% or the students can search for valid data sources,

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social networking reaches 82.25% or students can design and participate in digital technology, online safety reaches 83.33% or students can protect their personal data, and students can identify impacts of technology with percentage reaches 72%. The result of this research can be used as a reference to measure the level of students' digital literacy.

Keywords: Digital literacy, students, elementary school

1. Introduction

The twenty-first century is considered the age of information technology, globalization, and the Industrial Revolution 4.0 which cause changes in all areas of life including education, economy, technology, communication, information, transportation, and many others (Redhana, 2019). Therefore, humans need skills to deal with those changes. They need to have several skills to deal with the challenges in the 21st century. Some of them are critical thinking and problem-solving skills, literacy skills of information technology, information skills, and media literacy (Salimi et al., 2021; Saputri et al., 2019). Someone's ability to access technology and manage information in digital media is known as digital literacy (Abdul & Riyanti, 2018). This ability is needed in the era of technological disruption, especially in processing information in digital media and responding to the challenges of the times (Janah et al., 2019).

Digital literacy is the ability to understand and use digital devices, find, evaluate, and use information from various sources effectively, efficiently, wisely, and legally to build communication and interaction in everyday life (Bawden, 2008; Gilster, 1997; Hanelahi & Atmaja, 2020; Nahdi & Jatisunda, 2020). Digital literacy skills are needed to face the Industrial Revolution 4.0 with its increased connectivity, interaction, development of digital systems, artificial intelligence, and virtual (Lase, 2019). People need to have the skills to create a community structure with a critical-creative mindset so that they will not easily be fooled by hoaxes, provocative issues, and digital-based fraud (Nasrullah et al., 2017).

Based on the data issued by the Central Statistics Agency (BPS), in Indonesia's urban areas, the average percentage of students aged 5-14 years at the elementary level who have access to cellular phones is 90.94%, access to computers is 23.52%, and access to the internet is 85.13%. While in rural areas, the average percentage of students aged 5-14 years at the elementary level who have access to cellular phones is 81.20%, access to computers is 8.77%, and access to the internet is 66.87%. This shows the problem of the gap in information access and communication technology between cities and villages (Putri & Permata, 2020). Meanwhile, accessing information and communication technology is one indicator of digital literacy skills. Furthermore, another problem of digital literacy is shown by the misuse of internet access to view pornographic and violent content (Adhistian & Muhlisin, 2021; Nawangsari, 2019). Due to inappropriate behavior of internet access, cyberbullying, cybercrime and sexual violence emerge among students (A'yuni, 2015). In 2020, The Indonesian Ministry of Communication and Information Technology conducted a digital literacy survey and reported that Indonesia's digital literacy index has not yet reached a score of 4.00 (good). It only reaches above 3.00 (medium).

During the interview sessions with several elementary school teachers in the Laweyan Sub-district area of Surakarta, it is known that student facilities are insufficient because of the lack of access to technology such as smartphones, computers, or laptops. This makes students unable to understand and evaluate information or content in digital media such as hoaxes, cyberbullying, and others. Based

on the aforementioned information, students in Laweyan Sub-district have not been able to optimize their digital literacy skills.

From these problems, solutions for optimizing digital literacy skills need to be done. Testing students' digital literacy skills can be an alternative solution to finding out how serious the problem is. Previously, several researchers have researched the topic of digital literacy skills. One research focuses on the digital literacy level of high school students in terms of the use of information technology as mobile learning in biology learning (Oktavia & Hardinata, 2021). The result of the research reveals that students' digital literacy level belongs to the low category of 35.5%. While the students' literacy level is in the moderate category of 51.7%. Another research focuses on the digital literacy of students majoring in library science and the use of E-resources (Sugawara & Nikaido, 2014). The result of the study shows that the level of digital literacy skills in the use of E-resources by library science students is high. Next, the research analyzes the level of digital literacy and collaboration skills of seventh graders in online science learning. The result of the study indicates that the level of digital literacy of the students is 69% and belongs to the high category, 18% to the medium category, and 13% to the low category.

Digital literacy services contain more information and have easy access to reach (Restianty, 2018). This is in line with the research result on digital literacy which is utilized to provide a direct reading experience in which students can read information, books, news, or other texts by utilizing technology (Fauziyah & Kurniawan, 2020). However, this research is different from the aforementioned research. This research analyzes the skills needed in the 21st century. The topic is chosen because it is relevant to the current situation, that is, digital literacy skills. Students need to have an interest in reading and digital literacy skills to be able to understand the information in digital media and avoid hoaxes, etc. The researcher chooses students' interest in learning as variable X because it is in line with the national literacy movement that has been mandated by the Ministry of Education and Culture since 2016 and matches the Regulation of the Minister of Education and Culture No. 23 of 2015.

Digital literacy refers to a variety of literacy related to the use of digital technology. Digital technology is part of electronic technology that includes hardware and software used by individuals for educational, social and/or entertainment purposes at school and at home (Ng, 2015). In 2012, Ng Wang developed the concept of digital literacy into 3 intersecting dimensions, namely (i) technical (ii) cognitive and (iii) social-emotional dimensions of digital literacy (Ng, 2012).

This research is important to carry out to determine students' level of digital literacy skills. This is because, in the digital era, information needs to be processed not only by reading it but also by critically thought so that students can identify hoaxes and cybercrime. Besides, they can prepare themselves to deal with the positive and negative impacts of the use of technology (Ariyana et al., 2018). Furthermore, the ability of digital literacy enables students to obtain more extensive and in-depth information so that their ability to find valid information from online sources increases (D. R. Wulandari & Sholeh, 2021).

Based on those reasons, this research aims to determine the level of digital literacy of elementary school students. While, the focus of this research is seeking to answer the problem formulation of this research, that is, how is the digital literacy level of elementary school students?

2. Methods and Materials:

2.1 Research Design

This research uses a quantitative method. A quantitative research method is a way to gain knowledge or solve problems carefully and systematically. While the data collected is in the form of a network or group of numbers (Ridzuan et al., 2018). The reason for using the quantitative method is to obtain information concerning the level of digital literacy in the form of numbers by giving tests to students.

2.2 Participants

The population of this research is the fifth graders of elementary schools in Laweyan Sub-district, Surakarta Regency, Central Java Province. The sample used is the fifth graders of State Elementary School of Pajang IV, State Elementary School of Tegal Rejo, State Elementary School of Setono, and State Elementary School of Jajar. The total number of respondents is 86. The fifth graders are selected as the research subjects because Piaget's cognitive theory states that students aged 7 to 11 years old can function their minds to think logically, rationally, and objectively on an empirical and abstract object (Bujuri, 2018). The fifth graders are socio-emotionally able to interact with their friends, understand, and cultivate their abilities (Kharisma et al., 2020). In terms of language development, fifth graders can differentiate between good and bad words, can use words, and manage sentences (Julrissani, 2020; D. R. Wulandari & Sholeh, 2021). Therefore, the researcher chooses the fifth graders as the research subjects.

2.3 Data Collection

The data collection technique used in this research is a test. The test instrument, which consists of 15 questions, is used to measure students' digital literacy skills. The research procedures in this research are making research instruments, testing research instruments, taking research data, analyzing the data, and drawing conclusions. The digital literacy indicators used in this research are a modification of Asari et al. (Asari et al., 2019) and Febliza and Oktariani (Febliza & Oktariani, 2020). The indicators include the use of technology, information management on digital media, social networks, online safety, and the positive impact of technology. The blueprint of the instruments used in this research is presented in more detail in table 1 below:

Table 1. The Grid of Digital Literacy Skills

No.	LD indicator	Sub-indicator	Question number	Level Cognitive	Question Indicator
1.	Use of technology	The physical use of digital technology devices	1.2	C4	Students can analyze the function of the hardware when they see some pictures of digital hardware.
				C4	Students can interpret the functions of digital devices when they see some digital devices.
		Digital technology software	3.4	C5	Students can analyze the type of software when they see the functions of certain digital technology software.
					Students can identify the type of software when they see the functions of certain digital

					technology software.
2.	Information management on digital media	Understanding data, information, and digital content	5	C5	Students can search for valid data sources when a statement regarding certain information in digital media is presented.
		Managing data, information, and digital content	6	C4	Students can analyze the function of certain symbols when they see pictures of data-processing symbols.
3.	Social networking	Interaction with others through digital technology	7	C6	Students can design solutions by using technology when they have to interact with illustrations of certain cases.
		Sharing via digital technology	8	C5	Students can show how to share information or digital content using certain applications when they see a certain illustration.
		Engagement in citizenship through digital technology	9	C4	Students can analyze citizenship participation through digital technology when they have to deal with a certain case.
		Collaboration through digital technology	10	C6	Students can design collaborations in creating digital content that is beneficial to the community when an illustration is presented.
4.	Online Safety	Protection against digital devices	11	C4	Students can analyze ways that can protect digital devices to avoid damage or viruses and online hacking an illustration is presented.
		Protection of personal data	12	C4	Students can analyze ways to protect personal data on digital devices when an illustration is presented.
		Protection of personal mental health	13	C4	Students can analyze how to overcome posts or comments on digital media that can be mentally disturbing when an illustration of a case is presented.
5.	The positive impacts of technology	Identifying the benefits of digital technology for	14	C5	Students can identify digital applications that cannot be used to help the learning process

students' learning			when illustrations or learning cases are presented.
Utilizing digital technology for self-development	15	C5	Students can identify digital applications that can develop video editing skills when an illustration is presented.

2.4 Data Validity

The test instrument is tested for its content validity before being distributed to students. Proving the content validity of the instrument is an important first step in the instrument development process. Content validity concerns the extent to which the scale items represent the latent construction measured or whether the ability of the specified scale has been properly structured to measure (Lamm et al., 2020). The content validity testing of this research is carried out by asking for an assessment from some experts: one lecturer in literacy or language, one lecturer in measurement expert, and one elementary school teacher. After those experts' finish testing the validation process, the researcher begins to collect data using the test instrument.

2.4 Data Analysis

The data analysis used is statistical data analysis with descriptive quantitative. Descriptive statistics is statistics used to analyze data by describing the data that has been collected as it is without any attempt to draw general conclusions (Du Sert et al., 2020).

3. Results /Findings

Digital literacy data is obtained from the distribution of test instruments to students and analyzing the digital literacy indicators. The table and histogram of the frequency distribution of the digital literacy data of the research sample can be seen in Figure 1.

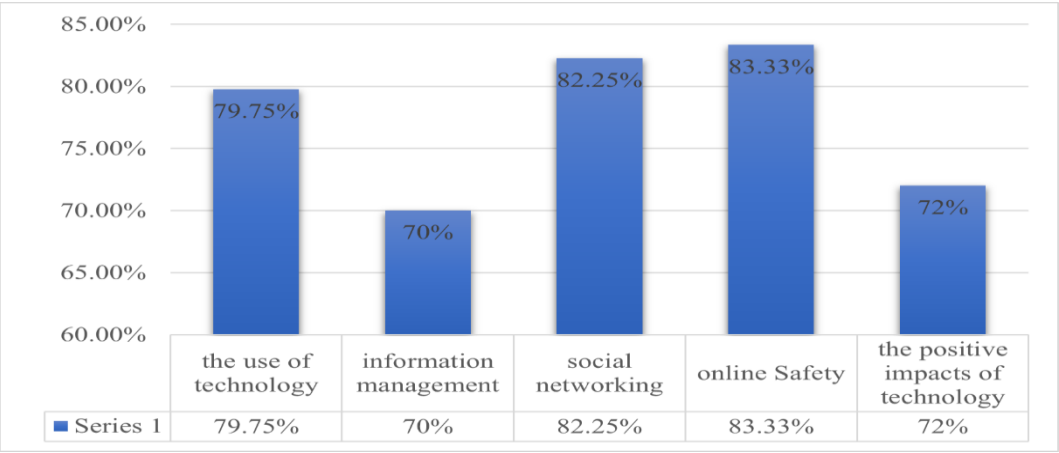

Figure 1. Histogram of the Average Percentage of Digital Literacy for Each Indicator

In Figure 1, it can be seen that the percentage of digital literacy in each indicator has reached more or equal to 70%. According to the data, it is known that there are five indicators: the use of technology, information management, social networking, online safety, and the positive impacts of technology. The elaboration of the data is as follows:

In the first indicator concerning the use of technology, there are at least two sub-indicators. They are the physical use of digital technology devices and digital technology software. These two things describe the results that are relevant to the percentage obtained. The percentage of 79.75% is a number that is neither small nor too much. These results can be interpreted that the students have met the criteria for physically using digital technology devices. This is characterized by their ability to analyze hardware functions and can interpret the functions of these digital devices. Meanwhile, regarding the second sub-indicator in the form of digital technology software, it provides information that students have been able to identify the types of software.

In the second indicator concerning information management on digital media, it can be seen that its percentage is 70%. This means that students have sufficient ability to manage information on digital media. Their ability is shown by students' ability to search for valid data sources. This is suitable for the first sub-indicator, that is, understanding data, information, and digital content. Furthermore, students have also been quite able to analyze the symbol function of digital content. This capability is in line with the second sub-indicator, that is, managing data, information, and digital content.

The percentage of the third indicator regarding social networking is 82.25%. It can be interpreted that students have met the criteria of mastering social networks well. Another finding of the indicator is also in line with its sub-indicators. It means students who have met the sub-indicators can interact with others through digital technology. This is marked by the students' correct answers concerning their ability to design solutions by using technology to interact with others. Next, the second sub-indicator is students' ability to share information through digital technology. This is indicated by the students' ability to share information or digital content by using certain applications. Besides, students can analyze citizenship participation through digital technology. This ability is in line with the third sub-indicator, that is, being involved in citizenship through digital technology. Furthermore, students have also been able to design collaborations in creating beneficial digital content for the community. This ability is balanced with the sub-indicator of collaboration through digital technology.

In the fourth indicator, students have met three sub-indicators on online safety. The indicators are protection against digital devices, personal data, and personal mental health. It can be concluded from the students' answers concerning the way the students demonstrate their ability to protect their digital devices to avoid damage or viruses and online hacking, to protect personal data on digital devices, and to analyze how to deal with posts or comments on digital media that can be mentally disturbing. This is in line with the percentage of the fourth indicator which reaches 83.33%.

Students reach a percentage of 72% in the fifth indicator. It means that they have known the positive impacts of technology well. Besides, they have also been able to fulfill two other sub-indicators. The two sub-indicators are identifying the benefits of digital technology in the students' learning process and utilizing digital technology for self-development. This is indicated by the students' ability to identify the digital applications that are not useful to help their learning process and those which can help them develop their video editing skills.

From the explanation, it can be concluded that the students' level of ability has met five indicators. The first is the use of technology as indicated by the students' ability to analyze and interpret the functions of hardware and software used in digital technology. The second is the management of information on digital media as shown by the students' ability to search valid data sources and analyze the functions of digital media symbols. The third is social networking which is demonstrated by the students' ability to design solutions by using technology to interact with others, conclude ways

to share information or digital content using certain applications, analyze citizenship participation through digital technology, and design collaborations in creating beneficial digital content for the community. The fourth indicator is online safety demonstrated by the students' ability to protect digital devices from damage or viruses and online hacking, analyze ways to protect personal data on digital devices, and analyze how to deal with posts or comments on digital media that can be mentally disturbing. The fifth indicator is the students' knowledge of the positive impacts of technology demonstrated by their ability to identify digital applications that cannot be used to help the learning process and those that can develop their video editing skills.

4. Discussion

Based on the results of the research above, the majority of the fifth graders of elementary schools in Laweyan Sub-district have good digital literacy skills, including using digital technology, managing information in digital media, engaging in social networking, understanding online safety, and utilizing positive impacts of technology.

The use of technology, as the first indicator, means access to competence related to technical skills in using media (Asari et al., 2019). Learners can operate a computer or smartphones before uploading or downloading information from online media. In addition, the students' ability to search for information in cyberspace is to understand the keywords of the information to be searched and understand the use of applications or software such as YouTube, Google, and others. Educators and teachers take advantage of digital media as learning media for remote learning during the pandemic time. The practice is quite good to prepare the 21st-century generation who have digital competence (Sutisna, 2020).

The results of the research show that the students are quite capable of identifying the type of software. A good ability to use and access technology will have a positive impact on students' learning process. As a result, when schools are carrying out online learning, students' good digital literacy can have a positive influence to help students during the remote learning process. Digital literacy ability plays a role in supporting interaction and communication among teachers and students during the learning process. For example, students need to have the ability to use the camera and microphone features on the device to be able to be present and connect virtually. Furthermore, the ability to use software to present supporting texts and images (graphics, illustrations, etc.) plays a role in optimizing collaboration and communication in online learning (Dewi et al., 2021).

The second indicator is the management of information in digital media. It is a skill concerning the capability of selecting and analyzing information content by sorting out correct and valid information. Technological literacy includes all knowledge and skills in utilizing technology, starting from knowing the device, operating it, processing it, and communicating the information. Technological literacy has an important role in the implementation of remote learning and triggers the improvement of technological literacy that yields new habits in the teaching-learning process in the future (Zam, 2021). The results of this research show that there are two abilities in using media literacy. The first is the consuming skills which concern the students' ability to consume information from online media by analysing, evaluating, criticizing, and synthesizing data or information on certain websites. The second is the presuming skill which shows how individuals can produce and distribute their writing correctly so that it will not mislead others (Sari, 2018).

The third indicator, social networking, is the ability to interact with others, share information, and collaborate with others on digital media. Social networks can increase the meaningful

involvement of learners in the learning process, enhance collaborative learning, and assist in bridging the gap between knowledge and individual or teamwork competencies. In addition, social networks can provide motivation and flexibility for learners' questions and responses respectively. Social networks or social media applications also support continuous learning, as they align with learners' preferences and learning cultures. In addition to the benefits identified in using social networks for educational practice (Cavus et al., 2021), social media have also created a communication platform that can change the way people interact with each other significantly.

Opportunities to engage in instant messaging, photo sharing, video sharing, and document transfer have enabled millions of users to utilize this platform for various purposes. Social networks or social media can provide a platform where students can share ideas, post documents, provide links to educational websites, and interact with their teachers or friends to improve learning. Learners will be ready to evaluate news sources only when they have received appropriate instructions, directions, and training. Although digital media literacy is recognized as an important tool for increasing awareness of online fraud, the curriculum can be redesigned to integrate activities that encourage learners to increase their interest and motivation in learning.

This finding also provides information that students are quite capable of analyzing citizenship participation through digital technology. One way to overcome various circulating information, whether it is true or false, is to teach students to discuss and exchange ideas in viewing information from social networks. Educators and instructional designers should join in the effort and direct their focus to design content directed towards raising awareness among learners of their own personal opinions, along with hidden opinions in the news and information they encounter online (Mrah, 2022).

The fourth indicator, online safety is the students' ability to protect their personal data, mental health, and protection of digital devices. Learners can show resistance to digital learning, which directly affects their success. Learners can see the advantages and disadvantages of digital learning in relation to academic activities and digital technologies. However, students seem not to be able to analyze ways to protect digital devices from damage or viruses and online hacking properly. This is because they have not yet acquired a deeper knowledge of what an ideal learning experience entails for learners in a technology-supported setting. These results are in line with the previous findings that the ability to protect personal data is influenced by knowledge and experience, both from the teaching-learning process at school through subjects or outside schools (Scheel et al., 2022).

The students' ability to protect themselves (personal data, mental health, and protection of digital devices) is also influenced by the supervision and guidance from their parents which is known as parenting. Effective parenting in the digital age is democratic parenting. This parenting style seeks to strengthen children to be critical of the positive and negative influences of the digital era (M. Yemmardotillah, 2021).

The fifth indicator, the positive impacts of technology is the ability to know the benefits of digital technology and utilize digital technology to improve self- development. The results of the research show that students are quite able to differentiate between digital applications that can develop video editing skills well and those that cannot be used to help the learning process. This is also influenced by the development of information that they can access on the internet.

The growth of the internet and various emerging technologies (e.g., mobile technology, AR/VR, and 3D) provides learners with opportunities for personalized learning support in their education. These results are in line with the expert's opinion that the effectiveness of digital learning in primary

schools significantly outperforms that in secondary and higher education. (Wang et al., 2022). The use of digital technology helps students to get new information related to the content of teaching materials more easily rather than teachers. Different technologies can improve the quality of the learning process by adding and connecting learning activities with learning activities that occur in other classes or other schools or environments (Hidayat & Khotimah, 2019). The use of E-learning in learning activities is one model to improve digital literacy. The existence of E-learning causes students and teachers to master new media so that they can improve digital literacy skills indirectly (Apriliyanti et al., 2022).

The results of this research are also in line with the findings of Ayun (Ayun, 2021) who states that the majority of students' digital literacy levels are good in terms of indicators of knowledge about hardware and software, software or applications, understanding of security in using the internet, and online communication etiquette. Students who have high digital literacy skills mean that they can operate digital devices, think critically, and evaluate information in digital media (Gilster, 1997). The results of this research are useful for teachers who will measure the ability of students' digital literacy levels. It is also supported by other findings which state that digital literacy has a positive influence on students' learning rates. This is proven by the use of digital technology in an audio-visual animation in which students have good learning outcomes (M. Wulandari & Aslam, 2022).

5. Conclusion

Based on the discussion above, it can be concluded that students have reached a good level with the fulfillment of five digital literacy indicators such as the use of technology that is maximized by the ability to analyze hardware and software functions of digital technology; management of information on digital media indicated by the students' ability to search for valid data sources and analyze the functions of symbol in digital media; social networking demonstrated by the students' ability to design content, methods, solutions, and participation in maximizing digital technology in society; online safety indicated by the students' ability to protect personal data on digital devices and overcome negative comments on digital media; as well as the students' ability to identify the positive impacts of technology through their development of video editing capabilities.

This research has several limitations because the researcher only focuses on digital literacy at the elementary school level. Therefore, future researchers can carry out the same focus, but at higher levels such as in high schools and colleges. Another limitation is that it only observes at the students' level of digital literacy so that the data cannot be generalized in depth regarding the relationship of students' digital literacy with their acquisition of learning achievements and critical thinking skills. Therefore, future researchers can conduct quantitative research to examine the relationship between students' digital literacy and students' critical thinking skills at the elementary or higher levels.

Funding Information: This research received no external funding.

Author Contributions: All authors contributed equally to the conception and design of the study.

Conflict of Interest: The authors declare that there is no conflict of interest.

Acknowledgments : The authors would like to thank Universitas Sebelas Maret for permitting the conduct of research under the auspices of the university and granting ethical clearance.

References

A'yuni, Q. Q. (2015). *Literasi Digital Remaja Di Kota Surabaya: Studi Deskriptif tentang Tingkat Kompetensi Literasi Digital pada Remaja SMP, SMA dan Mahasiswa di Kota Surabaya*. Universitas Airlangga.

Abdul, H., & Riyanti, A. (2018). Pembelajaran Mandiri Melalui Literasi Digital. *Seminar Tahunan Linguistik*, 1–6.

Adhistian, P., & Muhlisin, I. (2021). Penyuluhan Membentuk Kesadaran Orang Tua Terhadap Penyalahgunaan Gadget Anak Dalam Menangkal Akses Pornografi Di Internet Desa Cijengkol Kecamatan Caringin Kabupaten Sukabumi. *Jurnal Adibrata*, *2*(1), 37–47.

Apriliyanti, M., Setiawan, H. C. B., & ... (2022). Digital Literacy and Increased Utilization of Higher Education E-Learning in Indonesia: A Literature Review. *Library Philosophy and …*, 1–4.

Ariyana, Y., Pudjiastuti, A., Bestary, R., & Zamromi, Z. (2018). Buku Pegangan Pembelajaran Keterampilan Berpikir Tingkat Tinggi Berbasis Zonasi. *Direktorat Jendral Guru Dan Tenaga Kependidikan*, 1–87.

Asari, A., Kurniawan, T., Ansor, S., Bagus, A., & Rahma, N. (2019). Kompetensi Literasi Digital Bagi Guru dan Pelajar di Lingkungan Sekolah Kabupaten Malang. *BIBLIOTIKA: Jurnal Kajian Perpustakaan Dan Informasi*, *3*(2), 98–104.

Ayun, Q. (2021). Analisis Tingkat Literasi Digital dan Keterampilan Kolaborasi Siswa dalam Pembelajaran IPA Kelas VII Secara Daring. *Jurnal Didaktika Pendidikan Dasar*, *5*(1), 271–290. https://doi.org/10.26811/didaktika.v5i1.286

Bawden, D. (2008). *Origins and Concepts of Digital Literacy*. Peter Lang Publishing.

Bujuri, D. A. (2018). Analisis Perkembangan Kognitif Anak Usia Dasar dan Implikasinya dalam Kegiatan Belajar Mengajar. *LITERASI (Jurnal Ilmu Pendidikan)*, *9*(1), 37. https://doi.org/10.21927/literasi.2018.9(1).37-50

Cavus, N., Sani, A. S., Haruna, Y., & Lawan, A. A. (2021). Efficacy of Social Networking Sites for Sustainable Education in the Era of COVID-19: A Systematic Review. *Sustainability (Switzerland)*, *13*(2), 1–18. https://doi.org/10.3390/su13020808

Dewi, D. A., Hamid, S. I., Annisa, F., Oktafianti, M., & Genika, P. R. (2021). Menumbuhkan Karakter Siswa melalui Pemanfaatan Literasi Digital. *Jurnal Basicedu*, *5*(6), 5249–5257. https://doi.org/10.31004/basicedu.v5i6.1609

Du Sert, N. P., Ahluwalia, A., Alam, S., Avey, M. T., Baker, M., Browne, W. J., & Würbel, H. (2020). Reporting animal research: Explanation and elaboration for the ARRIVE guidelines 2.0. *PLoS Biology*, *18*(7), e3000411. https://doi.org/10.1371/journal.pbio.3000411

Fauziyah, R., & Kurniawan, K. (2020). Meningkatkan Minat Baca Siswa Melalui Literasi Digital Sebagai Upaya Memaksimalkan Pembelajaran Daring. *Seminar Internasional Riksa Bahasa XIV*, 439–442.

Febliza, A., & Oktariani. (2020). Pengembangan Instrumen Literasi Digital Sekolah Siswa dan Guru. *Jurnal Pendiidikan Kimia*, *5*(1), 1–9. https://doi.org/10.33578/jpk-unri.v5i1.7776

Gilster, P. (1997). *Digital Literacy*. Wiley.

Hanelahi, D., & Atmaja, K. (2020). Literasi Digital dalam Peningkatan Kompetensi Peserta Didik

Distance Learning di Homeschooling. *Jurnal Pendidikan*, *4*(4), 112–129.

Hidayat, N., & Khotimah, H. (2019). Pemanfaatan Teknologi Digital Dalam Kegiatan Pembelajaran. *JPPGuseda | Jurnal Pendidikan & Pengajaran Guru Sekolah Dasar*, *2*(1), 10–15. https://doi.org/10.33751/jppguseda.v2i1.988

Janah, S. R., Suyitno, H., & Rosyida, I. (2019). Pentingnya Literasi Matematika dan Berpikir Kritis Matematis dalam Menghadapi Abad ke-21. *PRISMA, Prosiding Seminar Nasional Matematika*, *2*, 905–910.

Julrissani. (2020). Karakteristik Perkembangan Bahasa dalam Berkomunikasi Siswa Sekolah Dasar di SD Muhammadiyah Karangbendo Yogyakarta. *Jurnal Pendidikan*, *4*(1), 72–87. https://doi.org/10.33487/edumaspul.v4i1.296

Kharisma, N. D., Komalia, N. I., Laili, N. A., Murni, S. A., & Laksana, J. . (2020). Perkembangan Kognitif, Bahasa, Sosial Emosional, Peserta Didik Kelas 5 dan 6 SD Negeri Banyuajuh 7 Kamal. *Prosiding Nasional Pendidikan: LPPM IKIP PGRI Bojonegoro*, *1*(1), 460–466.

Lamm, K., Lamm, A., & Edgar, D. (2020). Scale Development and Validation: Methodology and Recommendations. *Journal of International Agricultural and Extension Education*, *27*(2), 24–35. https://doi.org/10.5191/jiaee.2020.27224

Lase, D. (2019). Jurnal sundermann. *Jurnal Sundermann*.

M. Yemmardotillah, R. I. (2021). Literasi Digital Bagi Keluarga Milenial Dalam Mendidik Anak Di Era Digital. *Continuous Education: Journal of Science and Research*, *2*(2), 1–13. https://doi.org/10.51178/ce.v2i2.223

Mrah, I. (2022). Digital Media Literacy in the Age of Mis/Disinformation: The Case of Moroccan University Students. *Digital Education Review*, *41*, 176–194. https://doi.org/10.1344/DER.2022.41.176-194

Nahdi, D. S., & Jatisunda, M. G. (2020). Analisis Literasi Digital Calon Guru SD dalam Pembelajaran Berbasis Virtual Classroom di Masa Pandemi Covid-19. *Jurnal Cakrawala Pendas*, *6*(2), 116–123. https://doi.org/10.31949/jcp.v6i1.2133

Nasrullah, R., Aditya, W., Satya, T. I., Nento, M. N., Hanifah, N., Miftahussururi, & Akbari, Q. S. (2017). Materi Pendukung Literasi Digital. In *Kementerian Pendidikan dan Kebudayaan*. Kemdikbud.

Nawangsari, D. (2019). Pola-Pola Sophistikasi dalam Penyalahgunaan Gadget di Kalangan Anak. *An-Nisa': Jurnal Kajian Perempuan Dan Keislaman*, *12*(1), 113–136.

Ng, W. (2012). Can we teach digital natives digital literacy? *Computers & Education*, *59*(3), 1065–1078.

Ng, W. (2015). New digital technology in education. *Switzerland: Springer*.

Oktavia, R., & Hardinata, A. (2021). Tingkat Literasi Digital Siswa Ditinjau dari Penggunaan Teknologi Informasi sebagai Mobile Learning dalam Pembelajaran Biologi pada Siswa Mengengah Atas (SMA) Kecamatan Kuala Nagan Raya. *Bionatural*, *8*(1), 26–34.

Putri, R. P., & Permata, R. I. (2020). Transformasi Perpustakaan Desa Bandung Kidul Sebagai Sarana Mengatasi Kesenjangan Akses Informasi. *Jurnal Ilmu Perpustakaan*, *8*(2), 178–188.

Redhana, I. W. (2019). Mengembangkan Keterampilan Abad Ke-21 Dalam Pembelajaran Kimia. *Jurnal Inovasi Pendidikan Kimia*, *13*(1), 2239–2253.

Restianty, A. (2018). Literasi Digital, Sebuah Tantangan Baru Dalam Literasi Media. *Jurnal Gunahumas*, *1*(1), 72–87. https://doi.org/10.17509/ghm.v1i1.28380

Ridzuan, A. R., Ridzuan, A. R., & Ridzuan, M. (2018). Research methods in communication research. *E Journal of Media and Society*, *1*, 1–7.

Salimi, M., Dardiri, A., & Sujarwo. (2021). The Profile of Students' Social Skills of Bengawan Solo Elementary Nature School. *European Journal of Educational Research*, *10*(1), 211–226. https://doi.org/https://doi.org/10.12973/eu-jer.10.1.211

Saputri, A. C., Sajidan, Rinanto, Y., Afandi, & Prasetyanti, N. M. (2019). Improving students' critical thinking skills in cell-metabolism learning using Stimulating Higher Order Thinking Skills model. *International Journal of Instruction*, *12*(1), 327–342. https://doi.org/10.29333/iji.2019.12122a

Sari, W. (2018). Literasi Digital pada Masalah Pencarian Informasi Dengan Google. *Jurnal Penelitian Pers Dan Komunikasi Pembangunan*, *22*(2), 135–147. https://doi.org/10.46426/jp2kp.v22i2.96

Scheel, L., Vladova, G., & Ullrich, A. (2022). The influence of digital competences, self-organization, and independent learning abilities on students' acceptance of digital learning. In *International Journal of Educational Technology in Higher Education* (Vol. 19, Issue 1). Springer International Publishing. https://doi.org/10.1186/s41239-022-00350-w

Sugawara, E., & Nikaido, H. (2014). Properties of AdeABC and AdeIJK efflux systems of Acinetobacter baumannii compared with those of the AcrAB-TolC system of Escherichia coli. *Antimicrobial Agents and Chemotherapy*, *58*(12), 7250–7257. https://doi.org/10.1128/AAC.03728-14

Sutisna, I. P. G. (2020). Gerakan Literasi Digital Pada Masa Pandemi Covid-19. *STILISTIKA: Jurnal Pendidikan Bahasa Dan Seni*, *8*(2), 268–283. https://doi.org/10.5281/zenodo.3884420

Wang, L. H., Chen, B., Hwang, G. J., Guan, J. Q., & Wang, Y. Q. (2022). Effects of digital game-based STEM education on students' learning achievement: a meta-analysis. *International Journal of STEM Education*, *9*(1). https://doi.org/10.1186/s40594-022-00344-0

Wulandari, D. R., & Sholeh, M. (2021). Efektivitas Layanan Literasi Digital Untuk Meningkatkan Minat Baca Siswa Di Masa Pandemi Covid-19. *Jurnal Inspirasi Manajemen Pendidikan*, *9*(2), 327–335.

Wulandari, M., & Aslam, A. (2022). Hubungan Antara Literasi Digital dengan Hasil Belajar Siswa Kelas Sekolah Dasar. *Jurnal Basicedu*, *6*(4), 5890–5897. https://doi.org/10.31004/basicedu.v6i4.3152

Zam, E. M. (2021). Peran Literasi Teknologi Informasi Dan Komunikasi Pada Pembelajaran Jarak Jauh Di Masa Pandemi Covid-19. *EDUTECH : Jurnal Inovasi Pendidikan Berbantuan Teknologi*, *1*(1), 11–20. https://doi.org/10.51878/edutech.v1i1.176