

## **Trend of Digital Literacy Skill Research in Communication Education Journals across Indonesia: from Research Design to Data Analysis**

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### **ABSTRACT**

Empowerment of digital literacy skill intends to acquire. This study employed content analysis on 36 journal articles that had been published in SINTA (Science and Technology Index), an online scientific portal managed by Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia, with articles published in 2017 – 2022 with digital literacy as the main focus of the study. This current study has revealed that over the past three years, there has been a significant increase in the number of publications focusing on research on digital literacy skill. The majority of the 36 publications the researcher reviewed showed that quantitative researches were one point or more superior to qualitative research. Additionally, senior high school students were primarily selected as the research subjects, with the topic of measuring the level of digital literacy skills being the most popular one. In light of the study's findings, some recommendations have been made for additional research. First and foremost, it is essential to improve the research and development method in order to create more educational materials with the goal of raising teachers' and students' low levels of digital literacy. Second, it is advised that when conducting any research, the researchers choose the test that best fits their hypothesis and research design.

**Keyword:** Communication education journals, digital literacy skill, data analysis, digital literacy

### **1. INTRODUCTION**

Education is acknowledged by the United Nations Convention on the Rights of the Child as a fundamental human right that helps lift people out of poverty, level injustices, and promote sustainable development. But for many people, education is still a privilege. UNESCO data in 2019 shows, 258 million kids and teenagers skipped school for the final academic year of 2018 (UNESCO, 2019). More than 129 million of those people were girls, and 58 million of them were children in primary school. In the updated report from UNESCO, an estimated 84 million children and young people will still be out of school by the end of the

decade. COVID-19 aggravated the existing education crisis. By 2030, far too many children are expected to remain out of classrooms (Higher Education Digest, 2022).

Education is the process by which someone gains or transfers fundamental knowledge to another. It is also the place where a person learns life skills, social norms, develops their judgment and reasoning, and learns to discern right from wrong. Though there are many different kinds of education, traditional schooling typically determines how education success is evaluated. Higher educated individuals are viewed as being more employable and more likely to earn more

money. For each additional year of education, a person's future income is expected to increase by 10%, for instance, in low-income, developing nations (World Vision, 2021). By eradicating poverty and hunger, education provides people with the opportunity for better lives. This is one of the main reasons' parents try to keep their children in school for as long as they can. It is also the reason why countries work to promote expanded access to education for both adults and children. On the other hand, more than 617 million children and adolescents among those who are fortunate to have access to education do not meet the minimum proficiency standards in reading and mathematics.

However, numerous changes have taken place in daily life since the COVID-19 pandemic, which started in 2020. Education is inevitably impacted with the changes caused by the corona pandemic. Adaptation the new condition is needed, this includes more approaches are required as solutions when teachers and students are faced with circumstances that prevent face-to-face interaction. One solution that has become a trend since the corona pandemic is the online learning method through a video conference meeting application that can be used via electronic devices such as mobile phones, laptops, and tablets.

The online learning method is an educational experience that is not related to physical boundaries through this experience; students can take part in class, participate in discussions, and interact with one another from any location. As a result, the characteristics of online learning include the use of a multimedia environment, the sharing of information, the institutionalization of e-learning tools that enable collaborative communication, the creation of communities to gain access and dissemination of information, and the integration of systems across various

operating structures and browsers (Oyarzun, Stefaniak, Bol, & Morrison, 2018).

For students who are mature, motivated, organized, and have excellent time management skills, the availability of online learning options can be a very effective alternative educational method. Online learning has benefits such as making it easier for students who can't make it to class to keep up with their schedules, better time management, lower costs, a pleasant and comfortable environment, better technical skills, and accessibility of time and place.

However, this type of learning environment is inappropriate for students who are more dependent and find it difficult to take on the responsibilities required by online courses. The drawbacks of online learning may include things like limited feedback during lectures or during extra working hours, the tendency of online instructors to emphasize theoretical courses, the absence of face-to-face interaction between students and instructors, and occasionally the discovery by students that they are unable to work independently. Additionally, not every subject is appropriate for online learning, such as complex subjects or activities that call for a physical setting.

For all effective changes at the classrooms are important the student, they need to improve their existing knowledge and skills. Nowadays it is necessary to develop their digital literacy in order to successfully develop an understanding of technology that goes beyond a process-focused approach and use digital resources in new and interesting ways in their own work. This shows that students' use of digital media can help them gain knowledge and skills, make significant contributions, and advance their careers (Redmond, 2015). The traditional

concept of literacy is built upon by these abilities, which also help students develop their critical thinking abilities. Paul Gilster (1997) asserts that the internet and identifying digitally literate students who possess a set of skills for searching and evaluating information obtained from the internet in contexts related to formal school-based learning have a fundamental but revolutionary uniqueness in the world of education. In a digital learning environment, it is crucial to raise the level of digital literacy among educators (Tetchataweewan & Prasertsin, 2018).

Schools play a major role in helping students develop their digital literacy. Schools must provide adequate resources, facilities, and infrastructure in the form of information and communication technology. Information and communication technology must be used by teachers effectively to support engaging and effective learning activities. Teachers must therefore be prepared to have strong digital literacy as they are directly involved in the development of students' digital literacy. Teachers in training and currently working need specialized professional assistance and education (Snyder, 2008).

### **Objective**

Using content analysis in several Communication education scientific journals related to Digital Literacy published in Indonesia, from 2017 to 2022, this study aims to collect information on various studies that discuss digital literacy skills in Indonesia. In detail, this research is intended to answer the following questions:

- (1) What is the trend in the number of literacy skills research from year to year?
- (2) How is the diversity of research designs used to investigate digital literacy skills in Indonesia?
- (3) Who is the most frequently used research subject to investigate students' digital literacy skills?

- (4) What are the most frequently used topics to investigate students' digital literacy skills?

- (5) What instruments are used by researchers to measure digital literacy skills?

- (6) What is the description of the series of studies that have been carried out by researchers in assessing digital literacy skills?

In several aspects, this research is different from previous research which focused on digital literacy skills. First, this research focuses on all articles published from 2017 to 2022; all of which are accredited by the Science and Technology Index (SINTA). Second, this study is devoted to investigating a number of articles with digital literacy skills as their main focus. Third, various parameters were used as the basis for content analysis.

## **2. LITERATURE REVIEW**

### **Digital Literacy**

Digital literacy is the awareness, attitude, and capacity of people to use digital devices and facilities appropriately to identify, access, manage, integrate, evaluate, analyze, and synthesize digital resources, create media of expression, and communicate with others, in the context of specific situations, to activate positive social actions and consider pros and cons. High media literacy is characterized by: 1) critical power in receiving and interpreting messages, 2) the ability to search for and verify messages, 3) the ability to analyze messages in a discourse, 4) understanding the logic of the media creating reality, and 5) the capacity to create and distribute positive messages (Juliswara, 2017).

The term "digital literacy" is still used largely in media studies and other academic fields. However, Chetty (2018), asserts that there are at least five dimensions and three perspectives that

make up digital literacy, namely those of information literacy, computer literacy, media alliteration, communication literacy, and literacy technology. Three perspectives—technical, cognitive, and ethical—make up each dimension. The capacity to find, retrieve, manipulate, create, synthesize, evaluate, and use appropriate digital content is known as information literacy. Computer literacy is the skill of being able to comprehend, use, evaluate, and respect the privacy of other tool users while using hardware and software (Kusumastuti & Nuryani, 2019).

The phenomenon of globalization and the fourth industrial revolution (or "4.0") makes people from all over the world need to be empowered one of them through the internet and other technological advances. The economic structure, for instance, has started to be filled by new start-up businesses since the invention of the internet. This demonstrated how technology, the internet, and other digital devices have the ability to give everyone in this field the potential to develop various spheres of life (economic, social, and political), and it is possible to start shifting the roles of big businesses (Kusumastuti & Nuryani, 2019).

In the United States, there is a definite digital divide. When it comes to digital competency, the Pew Research Center found in 2016 that there are currently two camps: one that is relatively hesitant and one that is relatively prepared. The study found that 52% of American adults are generally hesitant to access information using digital tools (Pew Research Center, 2016). These results point to a serious issue as well as a major opportunity: if more people are prepared to use technology effectively as they grow older, they will be better able to solve issues, exercise critical thinking, and explore new virtual worlds (Kusumastuti & Nuryani, 2019). A new foundation for a generation of learners is created when educators and

school librarians emphasize the importance of digital literacy in education for students of all ages.

According to research by Kusumastuti & Nuryani (2019), Singapore had the highest average score for digital literacy among the Association of Southeast Asian Nations (ASEAN), while Cambodia had the lowest score. From highest to lowest, we rank these as follows: Singapore (24.6), Thailand (24.0), Indonesia (20.5), Vietnam (20.4), Myanmar (19.9), Philippines (19.80), Malaysia (19.20), and Cambodia (15.6). Between ASEAN nations, there are not many differences in terms of digital literacy levels. This demonstrates that the level of digital literacy across ASEAN nations is surprisingly similar. Nearly all members of the ASEAN community are capable of finding digital content, producing it appropriately, utilizing it, judging its validity, controlling the flow of media information, and adapting technology to specific situations.

Singapore has a higher level of digital literacy than the average country because each individual subscribes to multiple cellular service providers, uses the Internet to read news, learn about finances, and access health and educational resources. Out of every 100 Singaporeans, 25 to 26 have a fixed-line broadband subscription. Singaporeans feel secure storing their personal information online because there is legislation to protect their data. Fixed-line broadband refers to the fixed subscription to high-speed access. Singaporeans have 65.4% confidence in the websites and applications that the government offers. The government also started offering free Wi-Fi hotspots. Furthermore, the state has plans or strategies that address teacher and student digital literacy training through ICT (information and communication technology) courses.

In the research conducted by Kusumastuti & Nuryani (2019) found that there are a number of reasons why Cambodia has the lowest level of digital literacy when compared to the average. The percentage of Cambodians who use the internet to access financial information is low, and the country has few fixed-line broadband subscribers (0.61, which is low when compared to other nations). Additionally, there are still no data protection laws in place, and those who violate them are not punished. In addition, although there are private Wi-Fi hotspots available where Cambodians must pay for them, the government has not made them accessible to the general public, including in urban areas. However, Cambodia has set up a strategy that addresses teacher training as well as student digital literacy. The 2G network is frequently used by many people to access the internet for entertainment purposes.

The ability to use digital resources creatively, knowledge of how to ensure security in digital environments, and knowledge to accommodate the understanding of the social society are all requirements for being considered digitally literate. According to Savage and Barnett (Savage & Barnett, 2015), possessing the skills, knowledge, understanding, values, and attitudes necessary for both roles as a consumer and a writer (producer) of digital content constitutes digital literacy. The concept of digital citizenship has emerged as a result of all citizens of the world having access to digital platforms in the shrinking world brought about by the effects of globalization, and the idea of being a good citizen is quickly changing to include being a good digital citizen (Çubukcu & Bayzan, 2013).

In Indonesia, numerous studies on digital literacy skill are also found. The 36 studies that have been published over the period of 2017–2022 cover a variety of

topics related to digital literacy skills, ranging from the development of digital literacy framework, digital literacy skill as way to enhance students' and teachers' capabilities in the digital era, capacity building or methods to improve digital literacy skill, evaluation of the digital literacy skill level, and the case studies of digital literacy skills applied in different subjects of research.

### 3. METHOD

#### Research Design

The study adhered to the principle of content analysis, which was focused on findings from 36 previous studies that had been published in scientific journals in Indonesia. The research method used was similar to those used by Eko Susetyarini (2020).

#### Data Source

The data were collected from the results of content analysis on Communication education articles. The whole articles were taken from Communication education journals registered at Science and Technology Index (SINTA) on August 2022. SINTA (<http://sinta2.ristekdikti.go.id/>) is a platform to measure science and technology development which was designed and developed by Ministry of Research, Technology and Higher Education of Indonesia. Henceforth, all of the articles that reviewed critical thinking skill were collected from each of those journals. The articles under analysis in this study had been published on-line before August 2022. Of the hundreds of articles collected, there are 36 articles that examine critical thinking. All of the articles were analyzed in this study.

#### Research Instrument

The instrument used for this current study was a guideline of content analysis that contained related aspects under

observation (Table 1.). There were as many as seven main aspects to review for content analysis in this study. Those aspects included (1) the number of publications per year; (2) types of research; (3) research subjects; (4) Communication topics chosen for the studies; (5) treatments; (6) data collection instruments; and (7) data analysis methods. Exceptionally, categories on aspect (1), (4), and (5) were not decided in the beginning due to the absence of previous studies that might be referred to determine what should be included in the categories and the possibility of overgeneralized categories that might appear when content analysis on some articles was performed. Besides, categories on aspect (2), (3), (6), and (7) were defined before data collection. The categories are shown in Table 2, which were adapted from (Fauzi & Pradipta, 2018). In addition, aspect (2) was divided into two sub-aspects, including (2a) general types of research and (2b) quantitative research design.

quantitative research	C.2 Comparative C.3 Correlation C.4 Survey	C.6 Explanative C.7 Explorative
Research subject	D.1 Elementary School Students D.2 Junior High School Students D.3 Senior High School Students D.4 Higher education Students	D.5 Teachers/Lecturers D.6 General Public D.7 Previous Related Studies
Data collection instruments	E.1 Interview E.2 Observation E.3 Questionnaire	E.4 Documentation E.5 Survey E.6 Focus Group Discussion

Table 1. The Aspects and Categories used for Content Analysis in the Study

Aspects	Categories	
Types of research	A.1 Qualitative Research A.2 Quantitative Research	A.3 Research and Development
Types of qualitative research	B.1 Case Study B.2 Grounded Theory B.3 Ethnographic Studies	B.4 Phenomenological Studies B.5 Action Research Studies
Types of	C.1 Descriptive	C.5 Experimental

### Data Analysis

Each of articles was classified into specific category based on certain aspect that met the defined category. The decision was based on information that was shared by the authors in abstract, method, and discussion parts. Further, the data that had been collected were presented in a form of bar chart.

## 4. FINDINGS

### Number of Publications

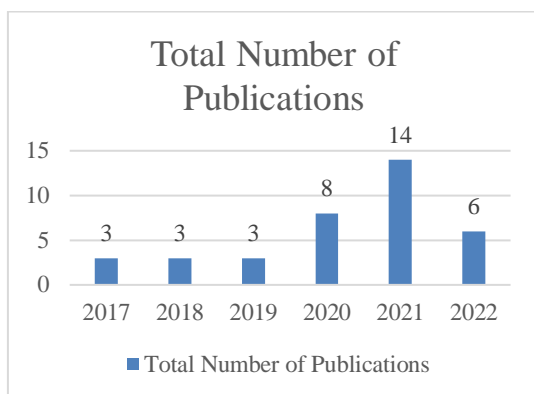


Figure 1. The Improvement Trend of the Number of Educational Researches with Digital Literacy Skill as the Main Concern in Indonesia in 6 (six) Years

The number of article publications indicated how frequent the research was conducted in certain period. Alluding to the graph shown in Figure 1, the articles that review digital literacy skill could be found since 2017 and had increased higher than those in the previous years. As for the highest of now is in 2021 with 14 publications in a year. The improvement trend on the number of the publications about digital literacy skill indicated that there was a significant increase in the number of researchers who were keen to investigate more deeper regarding the digital literacy skill.

Most researches were generated from the researchers' sensitivity on common issues that frequently occurred around them. One of them is in the regards to Indonesian students' digital literacy skill level that is still needs to be improve. For that reason, conducting research was believed as the most effective way for the purpose of dealing with and overcoming the issue, as one of the ways to alert the academics of the importance of digital literacy in the current era. By research, the researchers could identify the most effective instructional design or media that might be able to optimally accommodate students' digital literacy skill.

This is also reinforced by the premise presented by Coburn and Penuel (2016), the approach of Research-Practice Partnerships (RPP) to ensure that research plays a stronger role in educational improvement, developing new resources for practitioners to increase access to research findings, introducing new funding streams that encourage researchers to focus on problems of practice, and pioneering new ways for researchers and practitioners to work together. RPPs are long-term collaborations between practitioners and researchers that are organized to investigate problems of practice and solutions for improving schools and school districts (Coburn, Penuel, & Geil, 2013). Advocates argue that RPPs can enable greater use of research in decision making (Chen & Tseng, 2012), address persistent problems of practice, and improve educational outcomes (Donovan, 2013; Fishman & Penuel, 2018). Therefore, the higher the number of Indonesian researches investigating digital literacy skill, the more positive influence on Indonesian educational development will be.

### Types of Research



Figure 2. The Distribution of Researches with Digital Literacy Skill as the Main Concern based on Types of Research

Types and designs of research determine the focus of a study. Based on Figure 2, quantitative research constituted is the most chosen by the researchers employed to investigate on the digital literacy skill. Quantitative research is chosen to help find relationships between variables in a population. The higher number of quantitative researches than

other types of research is in line with some previous studies reporting that the researches preferred quantitative research design to conduct research in education, instead of qualitative research design (Uzunboylu & Aşıksoy, 2014; Goktas, et al., 2012). However, based on Figure 2, the trend of qualitative research design has shown increasing as it holds as the second of most research design used in digital literacy skill research. This condition is closely interlinked with the advantage of qualitative research design approach that intends to explain a phenomenon in depth by means of data collection as deep as possible, which shows the importance of depth and detail of the data being studied. Nevertheless, the finding revealing the rarity of mixed method research about digital literacy skill.

### Research Subjects

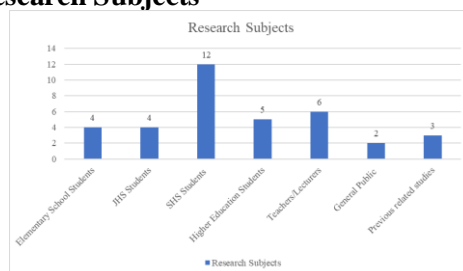


Figure 3. The Distribution of Research Subjects in Educational Researches with Digital Literacy Skill as the Main Concern in Indonesia

The empowerment of digital literacy skill was aimed for students. Based on the information regarding the types of research, quantitative research design as the most widely used research design, although qualitative research design is also almost as widely used by researchers considering the difference between the two is only one point apart. It indicated that, in general, the researches attempted to compare some finest instructional designs in empowering students' digital literacy skill. In conducting research, the researchers needed research subjects to examine their hypothesis. Based on Figure

3, the most selected research subjects were students of senior high school (SHS), consecutively followed by teachers/lecturers and higher education students in university.

The dominance of students of senior high school level was also shown in a study conducted by Susetyarini (2020) and Lin, Lin, & Tsai (2014). Based on Susetyarini (2020), study, the higher the level of a class in certain educational level, the less frequent the class would be selected as research subject. As for study conducted by Lin, Lin, & Tsai (2014), showed that students learning process and conceptual understanding constituted two out of three topics that were frequently selected as the focus of study in 15 recent years. The finding is also similar to Choi, Seo, & Kim (2016) study that found keyword "students" as the most third most searched keyword used for educational related researches.

Beside showing information about the comparison of SHS students, teachers/lecturers, and higher education students, Figure 3 shows that SHS students is the most frequently selected as the research subject of digital literacy skill research. This is due to the the majority of Indonesian high school students are familiar with and regularly use ICT. Furthermore, at least one ICT tool or skill is something they can use. SHS students can be counted on to serve as the subjects of studies on digital literacy skills because they already have a foundational understanding of ICT and can easily be taught about these skills.

### Topics Selected when Conducting Digital Literacy Studies



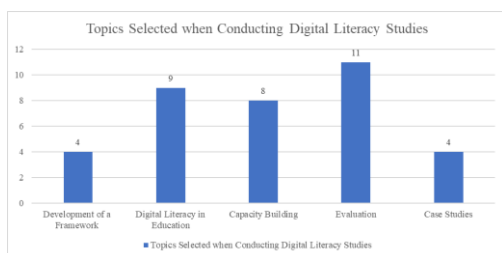


Figure 4. Topics Most Selected in Educational Researches with Digital Literacy Skill as the Main Concern in Indonesia

Based on the Figure 4 shown above, the most popular subject for research is the evaluation of the degree of digital literacy skills. Given that Indonesia's level of digital literacy has remained below average for the past two years, this topic has become the most popular choice. This is similar to the research conducted by Kusumatuti and Nuryani (2019) that shows Indonesia's digital literacy level can be ranked by mean rank from 1 to 8 that sequence is Singapore (24.6), Thailand (24.0), and Indonesia ranked number 3 with 20,5 score.

This also evident from the most recent index rankings, which demonstrate that technology adoption in various industries has accelerated due to the COVID-19 pandemic. The Communication and Information Ministry and research firm Katadata Insight Center (2022), released a report on January 2022 that found that the digital literacy index, which was based on a survey of 10,000 respondents across the nation, increased slightly to 3.49 in 2021 from 3.46 in 2020, with the subindices of digital skills and culture improving but digital ethics and safety declining. According to the most recent data, Indonesia is classified as having "medium" digital literacy. One being "very bad" and five being "very good" on the scale of one to five.

As for the second topic that is most widely used by other researchers, it is the topic of digital literacy in the field of education, which is related to the method

or method tested to determine whether it has an effect on increasing the level of digital literacy skills of students and teachers/lecturers. All of the research topics above were carried out by researchers with a major goal, namely to improve the digital literacy of the Indonesian people, especially those whose main focus is high school students and teachers/lecturers in various educational institutions in Indonesia.

### Data Collection Instruments

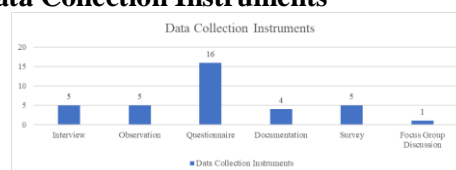


Figure 5. The Distribution of Instrument Selection for Data Collection in Some Educational Researches with Digital Literacy Skill as the Main Concern in Indonesia

In conducting research, researchers need an instrument to help them collect the data. Students' digital literacy skill can be measured by means of numerous instruments developed and researched by previous researchers. According to Figure 5 shown above, questionnaire instrument has been the most commonly used instrument to collect the data about digital literacy skill in educational research. This is because questionnaire provide a quick, effective, and affordable way to gather a lot of data from sizable sample volumes, questionnaires are a common research method. These instruments work particularly well for gauging the attitudes, preferences, intentions, and behavior of the subjects. Researchers are able to collect both qualitative and quantitative data thanks to their use of open and closed research questions, which produces results that are more thorough.

Fundamentally, being digitally literate means being capable of performing each step—analysis, synthesis, evaluation, and creation of a new product—completely

and accurately. Being considered digitally literate requires a variety of skills, including the capacity for innovative use of digital resources, understanding of how to ensure digital environment security, and the capacity to take into account social context. There are also some of the other data collection instruments that used by the researchers to measure the digital literacy skill in students and teachers/lecturers. Interview, observation and survey holds as the second most widely used data collection instrument in conducting educational research with digital literacy as the topic.

## 5. CONCLUSION

In the current study, articles from 2017 to 2022 that highlighted digital literacy skill and were registered on the Science and Technology Index (SINTA) website were examined. It has been observed that over the past three years, there has been a significant increase in the number of publications focusing on research on digital literacy skill. The majority of the 36 publications the researcher reviewed showed that quantitative researches were one point or more superior to qualitative research. The quantitative and qualitative research are almost equally distributed in the publications on digital literacy skills, with the qualitative research ranking second in terms of usage.

Furthermore, senior high school students were primarily selected as the research subjects, with the topic of measuring the level of digital literacy skills being the most popular one. In light of the study's findings, some recommendations have been made for additional research. First and foremost, it is essential to improve the research and development method in order to create more educational materials with the goal of raising teachers' and students' low levels of digital literacy. Second, it is advised that when conducting any

research, the researchers choose the test that best fits their hypothesis and research design.

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