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Teacher's Digital Literacy in Learning Technology Integration

Risma Uly Manalu^{1*}, Melda Rumia Rosmery Simorangkir²

^{1,2} Universitas Kristen Indonesia

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*Corresponding author: Risma Uly Manalu

Universitas Kristen Indonesia

Abstract

Teachers with digital literacy tend to be more comfortable and effective in using various learning technology tools and platforms. Digital literacy can help teachers analyze and disseminate digital information, so they can teach critical digital skills to students. The purpose of this research is to answer whether digital literacy can help teachers analyze and disseminate digital information, so that they can teach digital critical skills in the classroom. This analytical research applies a descriptive qualitative approach as a methodology, with data collection techniques in this research involving questionnaires, Focus Group Discussion (FGD), and observation. Questionnaire results calculated using path analysis of the Total Effect of Information and Data Literacy on Learning Technology with a P-value of 0.708 which is greater than the threshold value of 0.05, indicate that there is no significant relationship, either directly or indirectly, between Information and Data Literacy with Learning Technology. Digital Communication and Collaboration on Learning Technology with a very low P-value, less than 0.001, shows that there is a significant relationship between Digital Communication and Collaboration and Learning Technology, both directly and through intermediary channels.

Keywords: Teacher; Digital literacy; Learning technologies

Introduction

The young generation is currently living life in an era of very rapid technological growth. Various activities, especially in terms of communication, have been integrated with technology and become an integral part of their daily lives. Gen Z have been accustomed to digital technology from an early age and even have a tendency to become very dependent on this technology. Most of their time is spent watching television, playing video games both online and offline, listening to music via digital music players connected to the internet, browsing the internet via smartphone or computer,

carrying out social interactions via social media, communicating with people or groups via calls, videos, and using various other digital devices (Setiawan, 2017). Deep skills in using technology lead teenagers to have preferences in learning styles that are different from previous generations. This is considered to have an impact on the obsolescence of the education system and as a consequence it is necessary to make changes to the education system, this is important to adapt to the needs of individuals who are already familiar with technology or what are known as "digital natives" (Prensky, 2001).

The demand for using technology in learning has been around for quite a long time, technological developments continue without stopping, often without us realizing it and are difficult to avoid, even though some gaps in its application are still clearly visible. In Indonesia, various infrastructure constraints hinder the implementation of this technology, some challenges include the availability of electricity, internet availability, laptops, cellphones, television, and geographic inequality even though the use of communication networks is also a necessity (Siswanto, 2022). The development of literacy throughout the world is growing very rapidly, in its application literacy itself is not just reading books but also involves many activities and elements both inside and outside school. Digital literacy refers to a person's ability to use information and communication technology (ICT) effectively to search, evaluate, process and communicate online (Sulianta, 2020). The Indonesian government has introduced programs to increase digital literacy among students, several schools have included curricula that focus on digital literacy to prepare the younger generation to face technological challenges (Raharjo & Winarko, 2021).

Even though the growth of internet users is increasing, there are still a number of challenges related to digital literacy in Indonesia. Some of these include a lack of awareness about privacy and data security, the spread of false information (hoaxes), and a lack of critical skills in assessing the veracity of online information. Literacy consists of several types, in the High School School Literacy Movement (GLS) guide it is stated that there are 6 basic literacies possessed by school members, including: reading-writing literacy; digital literacy; numeracy literacy; financial literacy; scientific literacy; and cultural and civic literacy (Directorate General of Primary and Secondary Education, 2019).

Based on information obtained from the Indonesian Internet Service Providers Association (APJII), in 2021, the number of Indonesian people connected to the internet will reach 210,026,769 people out of a total population of 272,682,600 people. This means that around 77.02% of Indonesia's population has access to the digital world, using it for various needs such as education, health, tourism, social media, banking services and lifestyle (APJII, 2022). With the development of technology, various crimes and digital abuse are increasing. According to data from the Indonesian Child Protection Commission (KPAI) in 2020, there were 103 reports of cases of children becoming victims of online sexual crimes, 9 reports of children becoming perpetrators of online sexual crimes, 91 reports of cases of children becoming victims of pornography and social media abuse, 389 reports of children as perpetrators of possession of pornographic media, 46 reports of children being victims of bullying on social media, and 13 reports of children being perpetrators of bullying on social media (Primary School Directorate, 2021).

Referring to this phenomenon, research was conducted on teachers' Digital Literacy in the Integration of Learning Technology, which aims to analyze Collaborative Learning through Technology carried out by teachers in the classroom. Recognizing that digital literacy also includes the ability to support collaborative learning through the use of technology, teachers need to integrate tools and platforms that facilitate group work, joint projects, and student interactions online.

Theoretical review

Digital Literacy

The concept of digital literacy, as the term is commonly used today, was introduced by Paul Gilster, he explained it generally as the ability to understand and use information from various digital sources and considered it the ability to read and write in the digital era (Gilster, 1997). Digital literacy learning can be accessed through formal education at school and involves the community informally and non-formally, in the school environment digital literacy can be embedded into the learning process as an integrated part of the curriculum, utilizing digital media such as computers, internet and smartphones and even students can invited to recognize and differentiate between fake news and true news spread on the internet (Lestari et al., 2020).

Learning Technologies

Learning Technology develops from educational practices and the development of audio-visual communication. Initially, Learning Technology was considered as technological equipment, related to the use of equipment, media and facilities to achieve educational goals, or in other words, teaching using audio-visual aids (Ramli, 2012). Learning Technology is a structured effort in planning, implementing and evaluating the entire learning process to achieve certain goals. This approach is based on research on how humans learn and communicate, by utilizing a combination of human resources and technology to ensure the effectiveness of the learning process (Rusydiyah, 2019).

Methodology

This analytical research applies a descriptive qualitative approach as a methodology, which aims to provide descriptions and analyzes of phenomena, events, social activities, attitudes, beliefs, perceptions and thoughts of individuals and groups (Sugiyono, 2017). In its implementation, data collection techniques in this research involved questionnaires, Focus Group Discussions (FGD), and observation.

Results and Discussion

SMPN 1 Klari and SMP Tunas Utama are secondary schools in Karwang Regency, Indonesia. SMPN 1 Klari and SMP Tunas Utama apply digital literacy in various conditions, and this research location has good digital literacy facilities in schools and is designed to facilitate the development of teachers' and students' digital understanding and skills. This infrastructure is very important in implementing digital literacy because it provides an adequate foundation to support the development of students' understanding and skills in the context of the digital world. Several elements that can be considered part of good digital literacy facilities are found at SMPN 1 Klari and SMP Tunas Utama. Based on observations, SMPN 1 Klari has 150 units of computers and adequate internet access for all students, while SMP Tunas Utama has 35 units of computers and adequate internet access for all students. The number of units is considered adequate because it complies with the school's quality standards, which stipulate that 30% of the number of students must be covered in such facilities.

Teachers at these schools realize that professional competence is needed in applying skills in using digital technology, this is crucial to ensuring that they are able to integrate technology effectively in the learning process. Digital literacy is the key for teachers to have a deep understanding of the various hardware and software commonly used in the classroom, so that they can apply

technology effectively in learning, increase engagement, and encourage student participation. Teachers' ability to use digital learning applications and platforms productively is very important for designing and compiling learning materials that utilize technology with the aim of achieving learning targets. If you look at the observation table regarding digital use among teachers in the two research locations, it is found as follows:

No.	Availability	Yes	No
1.	Using Zoom or Gmeet	√	
2.	Using GCR	√	
3.	Actively using PMM	√	
4.	Actively Using Email	√	
5.	PPT Presentation	√	
6.	Using online storage (Gdrive)	√	
7.	Have a social media account	√	
8.	Post and share good practices on social media	√	
9.	Have a USB drive	√	
10.	Has google drive storage	√	

However, in reality, teachers who are approaching retirement face major challenges in implementing and utilizing information and communication technology. These obstacles are mainly related to the individual abilities of each teacher and the impact of older age on their limitations in dealing with technological developments. This condition creates difficulties in integrating technology into the learning process. Apart from that, factors such as school policies that do not emphasize the use of technology, internet network instability, and limited hardware such as LCDs and computers also become obstacles to optimizing the use of technology in the educational environment. Although technological facilities are available in schools, without the support of teachers' skills and motivation to use them, the full potential of these facilities cannot be fully exploited. Through the results of questionnaires on

Total effects

				95% Confidence Interval	
	Estimate	Std. Error	z-value p	Lower	Upper
X1 → Y	-0.015	0.040	-0.374 0.708	-0.094	0.064
X2 → Yi	0.185	0.046	4.008 < .001	0.095	0.276

Note. Delta method standard errors, normal theory confidence intervals, ML estimator.

Information and data literacy (X1), Digital Communication and Collaboration (X2) and Learning Technology (Y), the total effect obtained using path analysis is as follows:

The total effect in path analysis includes the direct and indirect impact of the predictor variable (independent variable) on the response variable (dependent variable).

- 1) Total Effect of Information and Data Literacy → Learning Technology P-value: 0.708 is greater than 0.05, indicating that there is no significant relationship, either directly or indirectly, between Information and Data Literacy and Learning Technology. Statistically, these results do not support the conclusion that Information and Data Literacy has a significant impact on Learning Technology, either directly or through intermediary channels.
- 2) Total Effect of Digital Communication and Collaboration → Learning Technology P-value < 0.001 which is very low, less than 0.001, indicating that there is a significant relationship between Communication and Collaboration and Learning Technology, both directly and through intermediary channels. These results validate the hypothesis that the level of Communication and Collaboration has a significant impact on improving Learning Technology.

Thus, there are differences in the influence of Information and Data Literacy as well as Digital Communication and Collaboration on Learning Technology. Even though Information and Data Literacy do not show a significant impact, Communication and Collaboration have a strong and significant influence on improving Learning Technology, both directly and through intermediary channels. Therefore, it is recommended to focus more development on aspects of Digital Communication and Collaboration in an effort to improve Learning Technology, in accordance with the findings in this study.

Conclusion

Teachers' digital literacy plays a very important role in classroom learning, especially when teachers integrate it into classroom learning technology. It can be seen in the Total Effect of Information and Data Literacy on Learning Technology with a P-value of 0.708 which is greater than the threshold value of 0.05, indicating that there is no significant relationship, either directly or indirectly, between Information and Data Literacy and Learning Technology. On the other hand, in the case of the Total Effect of Digital Communication and Collaboration on Learning Technology with a very low P-value, less than 0.001, it shows that there is a significant relationship between Communication and Collaboration and Learning Technology, both directly and through intermediary channels.

These results do not statistically support the conclusion that Information and Data Literacy has a significant impact on Learning Technology, either directly or through intermediary channels. However, these results validate the hypothesis that the level of Digital Communication and Collaboration has a significant impact on improving Learning Technology.

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