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The strategy for enhancing students' digital literacy through teachers' professional competence

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Abstract
Adequate digital literacy skills among educators have a significant impact on the quality of classroom learning. However, many educators still use unverified information from the internet as teaching resources, due to a lack of proficiency in techniques for finding appropriate materials. Digital literacy is crucial for locating relevant and accurate sources. This study aims to measure the level of digital literacy, particularly in relation to teachers' ability to effectively utilize digital technology. The research method employed is quantitative with path analysis, conducted at junior high schools in Karawang Regency, Indonesia. The findings show that, among all tested variables, only the Communication and Collaboration variables significantly influenced Technological Capability, while the Information and Data Literacy variables had no significant impact within this model.

Keywords: Strategy, improvement, digital literacy, professional competence

Introduction

The Republic of Indonesia Law No. 14 of 2005 on Teachers and Lecturers states that teachers must be professional educators with four core competencies: pedagogical, professional, personal, and social competencies. These competencies are closely related to their duties as educators. A competent teacher is one who not only masters knowledge but also technology. In the 21st century, Information and Communication Technology (ICT) has undergone major transformations. ICT refers to the application of various digital technologies that enable the efficient creation, distribution, collection, and management of information. In this context, ICT includes various tools and systems that support real-time communication and information exchange, including platforms such as instant messaging, voice over IP (VOIP), and video conferencing. Instant messaging allows users to communicate quickly via text, while VOIP provides the ability to make voice calls over the internet, and video conferencing offers virtual face-to-face meeting solutions enabling both visual and audio interaction. With the rapid advancements in this technology, ICT has transformed how information is processed and communicated, expanded the reach of social interactions, and increased efficiency and productivity across various sectors of life (Reddy, Sharma & Chaudhary, 2020) [9].

According to data obtained from the Indonesian Internet Service Providers Association in 2022, there is a significant difference in the devices used by adolescents aged 13-18 when accessing the internet. The survey results indicate that only 9.39% of adolescents use a PC or laptop, while the majority, 90.61%, use smartphones for browsing the digital world. For junior high school students or those who have completed elementary education or its equivalent (including Paket A), the percentage of internet use through smartphones is extremely high, reaching 99.14%. Based on this breakdown, it can be concluded that the total number of internet users among junior high school students or those who have completed elementary education or its equivalent, using both smartphones and PCs, reaches 72.37%. This data highlights the dominance of smartphones as the primary device for internet access among teenagers and underscores the shift from PC usage to smartphones in their digital browsing habits.

Along with the advancement of technology, various forms of digital crime and delinquency are on the rise. Based on data from the Indonesian Child Protection Commission (KPAI) in 2020, there were 103 reports of children being victims of online sexual crimes, 9 reports of children as perpetrators of online sexual crimes, 91 reports related to children as victims of pornography and social media, 389 reports of children as perpetrators of possessing pornographic media, 46 reports of children being victims of bullying on social media, and 13 reports of children as perpetrators of bullying on social media. Additionally, according to a report from the Directorate of Elementary Education (2021), 40% of child bullying cases occurred through online platforms, primarily social media. These figures are alarming and highlight the need for collective efforts to ensure that children not only understand digital technology but also behave appropriately and respectfully in the digital world.

Digital literacy goes beyond merely operating technology in everyday life. According to the Directorate of Elementary Education (2021), digital literacy is one of the six core literacies that students must master today. Digital literacy, as applied in educational institutions, is closely related to the implementation of the School Literacy Movement Program initiated by the government, in this case, the Ministry of Education and Culture. The program outlines six essential literacies for students: reading and writing literacy, scientific literacy, numerical literacy, digital literacy, financial literacy, and cultural and civic literacy. In this era of disruption, change happens rapidly, and digital communication, reinforced by social media, presents unique challenges, especially regarding the rapid spread of fake news (Tsaniyah & Juliana, 2019) [10]. Therefore, digital literacy has become an urgent necessity for the nation to better sift through information.

The role of teachers, particularly their professional competence, is crucial in developing students' digital literacy. Teachers are not only expected to understand technology but also to integrate it effectively into the

learning process. Teachers' professional competencies, such as mastery of technology, digital classroom management, and the ability to teach students to use technology wisely, are key determinants of the quality of digital literacy that students will achieve.

This study aims to provide an overview of how teachers' professional competence can be enhanced and what strategies are effective in facilitating the improvement of students' digital literacy. By understanding this relationship, schools and educational policymakers can design more targeted teacher development programs, thereby improving the quality of education in this digital era.

This research was conducted at SMPN 1 Klari, East Karawang, and SMP Tunas Utama, West Karawang, Indonesia. These locations were chosen to measure the level of digital literacy, which refers to an individual's ability to effectively use digital technology, including the ability to access, understand, evaluate, and communicate information through various digital devices and platforms used by educators in teaching.

Theoretical review

Definition of literacy

Etymologically, literacy refers to the ability to read and write. In English, the term "literacy" originates from the Latin word littera (letter), which encompasses mastery of written systems and the debates surrounding them. According to the Merriam-Webster dictionary, literacy stems from the Latin term *litterature* and the English word *letter*. Literacy is the skill or ability to be literate, which includes the ability to read and write. The definition of literacy is also outlined by the National Institute for Literacy (NIFL), which states that literacy is an individual's ability to read, write, speak, calculate, and solve problems at the skill level required for work, family life, and society. The Education Development Center (EDC) adds that literacy extends beyond reading and writing skills. It encompasses the individual's ability to utilize all of their potential and skills in life. According to UNESCO, one's understanding of literacy is heavily influenced by academic research, institutions, national context, cultural values, and personal experiences.

Kern (2015) [7] also defines literacy in a second language as something more complex than the separate abilities to read and write. Literacy involves a deep understanding of language and its usage, both in written language and oral communication contexts. Literacy demands broader discourse competence, including the ability to critically interpret and evaluate various types of texts, both written and spoken. In practice, literacy is not merely about reading and writing but also about having a solid grasp of reading, writing, and arithmetic, which serve as a foundation for higher levels of education (Fahmi *et al*., 2020) [4]. Literacy is not just the theory of reading or knowledge, but its application in everyday life, such as understanding written rules around us (Devianty, 2019) [2]. There are four main objectives of literacy activities: fostering a culture of reading and writing, creating literate members of the school community, establishing a pleasant school environment, and learning from various books beyond the subject matter.

Digital literacy

Professional competence is a teacher's ability to master learning materials broadly and deeply, covering concepts, structure, methods, technology, and arts related to their field (Helmi, 2015) [5]. A teacher's professionalism is not only evaluated by their ability to use technology and manage classrooms but also by their adherence to standards of behavior. According to Kulshrestha & Pandey (2013) [8], the professional competencies teachers need to support their teaching can be divided into three key competencies: instructional competence, organizational competence, and evaluative competence. A teacher's professional competence reflects the capabilities a teacher must possess, which are the hallmarks of professionalism. Not all competencies indicate professionalism, as professional competence not only involves how tasks are performed but also includes the efforts and thought processes aligned with the needs and goals of classroom learning (Jamin, 2018) [6].

Professional competence

Professional competence refers to a teacher's ability to understand learning materials deeply and broadly, encompassing concepts, structure, methods, technology, and arts relevant to their teaching field (Helmi, 2015) [5]. A teacher's professionalism is not only measured by their skills in using technology and managing classrooms but also includes appropriate behavior. According to Kulshrestha & Pandey (2013) [8], the professional competencies required by a teacher to support their teaching can be divided into three main categories: Instructional Competence, Organizational Competence, and Evaluative Competence. Additionally, a teacher's professional competence reflects the abilities they must possess, which are characteristic of their professionalism. However, not all competencies that an individual possesses reflect professionalism, as professional competence includes the methods of executing work and the various efforts and thoughts applied according to the needs and goals of classroom learning (Jamin, 2018) [6].

Methodology

This study employs a descriptive quantitative method using path analysis to test the proposed hypotheses. Path analysis is a statistical method used to model and test causal relationships among variables within a system. One important aspect of path analysis is measuring the strength and direction of the relationship between two variables. In this model, the researcher analyzes the interrelated variables to understand the extent of each variable's influence on the others. Path coefficients serve as parameters indicating how much a change in one variable will affect another variable. The independent variables in this study are Data Literacy Information (X1) and Communication and Collaboration (X2), the mediator variable is Digital Security (X3), and the dependent variable is Technological Capability (Y).

Results and discussion

Table 1

Direct effects								
							95% Confidence Interval	
			Estimate	Std. Error	z-value	p	Lower	Upper
X1	→	Y	-0.023	0.051	-0.464	0.642	-0.123	0.076
X2	→	Y	0.171	0.071	2.414	0.016	0.032	0.309
Note: Delta method standard errors, normal theory confidence intervals, ML estimator								

In the presented direct effects table, the p-value of 0.642 indicates that the relationship between Data Literacy Information and Technological Capability is not statistically significant at the 0.05 significance level (or 5%). In other words, based on the analyzed data, there is insufficient evidence to conclude that Data Literacy Information has a significant direct effect on Technological Capability. Meanwhile, the p-value of 0.016 shows that the relationship between Communication and Collaboration and Technological Capability is statistically significant at the 0.05 significance level (or 5%). This means there is sufficient evidence that Communication and Collaboration have a significant direct effect on Technological Capability.

Table 2

Indirect effects										
									95% Confidence interval	
					Estimate	Std. Error	z-value	p	Lower	Upper
X1	→	X3	→	Y	0.008	0.031	0.273	0.785	-0.052	0.069
X1	→	X3	→	Y	0.015	0.054	0.274	0.784	-0.090	0.120
Note: Delta method standard errors, normal theory confidence intervals, ML estimator										

The p-value of 0.785 indicates that the indirect effect of Data Literacy Information through Security on Technological Capability is not statistically significant at the 0.05 significance level. With an estimate of 0.008, this effect is very small and does not provide sufficient evidence to demonstrate that Data Literacy Information influences Technological Capability through Security. The 95% confidence interval (-0.052, 0.069) also includes zero, indicating uncertainty in this estimate.

The p-value of 0.784 shows that the indirect effect of Communication and Collaboration through Security on Technological Capability is also not statistically significant. An estimate of 0.015 suggests that this relationship is likewise very small and does not provide strong evidence of its influence. Additionally, the 95% confidence interval (-0.090, 0.120) encompasses zero, indicating that these results are inconsistent and unreliable.

Table 3

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								

The total effect reveals a p-value of 0.708, indicating that the total effect of Data Literacy Information on Technological Capability is not statistically significant at the 0.05 significance level. An estimate of -0.015 suggests that its influence is very small and negative, but there is insufficient evidence to state that Data Literacy Information has a meaningful effect on Technological Capability. The 95% confidence interval (-0.094, 0.064) includes zero, indicating that these results are inconsistent and unreliable. In contrast, a p-value of less than 0.001 shows that the total effect of Communication and Collaboration on Technological Capability is statistically significant. An estimate of 0.185 indicates a meaningful positive influence, meaning that improvements in Communication and Collaboration are associated with enhancements in Technological Capability. The 95% confidence interval (0.095, 0.276) does not include zero, affirming that this influence is significant and reliable.

Conclusion

The variable Data Literacy Information does not show a significant influence either directly or indirectly on Technological Capability. Meanwhile, the variable Communication and Collaboration has a significant direct effect on Technological Capability, although the indirect effect through the Security variable is not significant. Overall, only the Communication and Collaboration variable demonstrates a significant influence on Technological Capability, while Data Literacy Information does not have a meaningful impact in this model.

References

1. Asosiasi Penyelenggara Jasa Internet Indonesia (APPJI). Profil Internet Indonesia, 2022.
2. Devianty R. Manfaat literasi untuk meningkatkan mutu pendidikan. Ijtimaiyah Jurnal Ilmu Sosial Dan Budaya, 2019, 3(1).
3. Direktorat Sekolah Dasar, Kemdikbud. Modul Literasi Digital Di Sekolah Dasar, 2021.
4. Fahmi F, Syabrina M, Sulistyowati S, Saudah S. Strategi Guru Mengenalkan Konsep Dasar Literasi di PAUD Sebagai Persiapan Masuk SD/MI. Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini,2020:5(1):931-940.
5. Helmi J. Kompetensi profesionalisme guru. AL-ISHLAH: Jurnal Pendidikan,2015:7(2):318-336.
6. Jamin H. Upaya Meningkatkan Kompetensi Profesional Guru. At-Ta'dib: Jurnal Ilmiah Prodi Pendidikan Agama Islam, 2018, 19-36.
7. Kern R. Language, literacy, and technology. Cambridge University Press, 2015.
8. Kulshrestha AK, Pandey K. Teachers training and professional competencies. Voice of research,2013:1(4):29-33.
9. Reddy P, Sharma B, Chaudhary K. Digital literacy: A review of literature. International Journal of Technoethics (IJT),2020:11(2):65-94.
10. Tsaniyah N, Juliana KA. Literasi digital sebagai upaya menangkal hoaks di era disrupsi. Al-Balagh: Jurnal Dakwah dan Komunikasi,2019:4(1):121-140.