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Analysis of Digital Literacy Capabilities of Prospective Vocational Education Teachers as Supporters of 21st Century Skills in Indonesia

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ABSTRACT
Analysis of the digital literacy capabilities of prospective vocational education teachers as a supporter of 21st-century skills in Indonesia will be important in understanding the extent to which the vocational education system in this country can prepare teachers to face the demands of an ever-evolving era. The aims of this research are (1) to explore how ready prospective vocational education teachers are to integrate digital technology into their learning process, (2) What obstacles are encountered when integrating digital literacy in learning, and (3) How to overcome these obstacles. This research includes understanding how to teach using technology, managing classes using digital tools, and selecting content that suits students' needs. Also, the obstacles faced by prospective vocational teachers in integrating digital literacy and solutions to overcome these obstacles. The research method used is a case study with a qualitative approach. The key informants in this research were four prospective vocational education teachers at one of the PTNs in Indonesia. The research results obtained are: (1) Prospective teachers are ready to integrate digital technology into the learning process; (2) Several obstacles in integrating digital literacy include: internet

network, understanding applications, application costs, difficulty focusing, forgetting passwords, insufficient devices, ownership of devices, security, and language issues; (3) Prospective teachers overcome obstacles by: moving places, training, web cracking, conducive environment, free applications, data security, buying devices, borrowing devices, and robust internet access.
Keywords*: candidate, digital, teacher, capability, literacy, vocational*

INTRODUCTION

In an era where digital technology has seeped into almost every aspect of life, the integration of technology in the learning process has become increasingly important. This is no exception in the context of vocational education in Indonesia, where prospective teachers need to have readiness and skills in integrating digital technology into their teaching. Understanding how to teach using technology, the ability to manage classes using digital tools, and skills in selecting content that suits student needs are key aspects in assessing how ready prospective vocational education teachers are to adopt digital technology in learning.

In facing rapid changes in the world of work and the demands of 21st-century skills, the integration of digital technology in learning is important to prepare vocational students to face an increasingly digitally connected world. The challenges faced by prospective vocational education teachers in integrating digital technology are not simple. Apart from understanding the technology itself, they also need to understand how to teach using the technology, manage classes that use digital tools, and choose content that suits students' needs (Voogt, J., & McKenney, S., 2017). Prospective teachers need to have a deep understanding of how to use digital technology effectively in the learning process. Some teachers have conducted meta-analyses on teachers' technological content pedagogical knowledge (TPACK) and technology integration in education, which can provide insight into the importance of teachers' understanding of technology in teaching contexts (Lee, MH, & Tsai, CC, 2017, Joo, YJ , Lim, KY, & Kim, NH, 2020, Ouyang, F., & Scharber, C., 2021). This

includes understanding various learning tools and applications, as well as how to integrate them into the curriculum and teaching strategies. Prospective teachers in Finland are integrating digital technology in vocational education and examining educational practices and teachers' beliefs regarding the use of technology (Mouza, C., & Barrett-Greenly, T., 2015, Thompson, AD, & Mishra, P., 2020, Autti, O., & Ruokamo, H., 2021). Managing a class that uses digital tools can be a challenge. Previous research discusses the challenges faced by vocational education teachers in integrating digital technology into their learning practices in China (Herrington, J., & Herrington, A., 2018, Lim, CP, et al, 2020). Prospective teachers need to be able to manage the use of technology in the classroom effectively, including ensuring fair access for all students, maintaining concentration and discipline, and minimizing distractions that may arise from the use of technology. The study conducted by Baepler et al (2014) discusses the use of digital technology to increase efficiency in classroom management, with a focus on an active learning approach. In integrating digital technology, prospective teachers need to be able to choose content that is relevant to students' needs and interests, and in accordance with learning objectives. This requires a good understanding of the learning material and the ability to assess the quality of digital content. Previous research conducted by Cook, J., & Murphy, J. (2021) explored vocational education teachers' perceptions of the challenges they faced in integrating technology in teaching, as well as the strategies they used to overcome these obstacles. Prospective teachers in Indonesia, when compared to those in Finland or China, will show both similarities and differences. From preliminary research in Indonesia, prospective teachers tend to struggle to prevent distractions from technology use in learning. Prospective teachers in Indonesia also face the same difficulties in applying appropriate digital technology into the learning process for various reasons.

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This introduction creates a foundation for further analysis of how ready prospective vocational education teachers are in integrating digital technology into their learning processes, as well as the challenges and opportunities faced in this process. This research aims to investigate the readiness of prospective teachers regarding digital literacy competencies in supporting 21st-century skills in school learning in Indonesia. This research also seeks to examine the role and institutional support as well as policy initiatives in enhancing the digital literacy skills of prospective vocational education teachers in Indonesia. By understanding more deeply their readiness in this regard, we can identify the steps that need to be taken to improve their digital literacy capabilities and prepare them to become 21st century skills advocates for vocational students in Indonesia.

RESEARCH METHOD

The case study method with a qualitative approach is an in-depth research approach to understand certain phenomena through detailed analysis of one or several representative cases. This method is usually used to gain a deep understanding of the context, processes and interactions in a particular situation. The key informants in this study were four prospective vocational education teachers at one of the state universities in Indonesia. The following are the general steps in conducting a case study with a qualitative approach: Case identification, planning the research framework, collecting data, analyzing data, interpreting data, drawing conclusions and reporting research results.

Table 1. Data on informants for prospective teachers participating in PPG

No	Initial	Gender	Place and Date of Birth	Bachelor	University(Year entry)
1	IPS	Female	Kudus, 8 Agustus 1998	Civil Engineering Education	Unnes 2016
2	SUB	Male	Banyumas, 11 Mei 1994	Civil Engineering	Balikpapan Univ 2016
3	AZH	Male	Grobogan, 4 Maret 1997	Civil Engineering	Unisula 2016
4	DIM	Male	Demak, 20 Agustus 1999	Civil Engineering	Unnes 2017

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DISCUSSION

In the results and discussion of the case study research method with a qualitative approach, the researcher discuss the main findings found during the research process, as well as the implications and meaning of these findings. Here is how the results and discussion of qualitative case study research methods are usually structured: describe the case, present the main findings, discuss the findings, explore practical implications, reflect on the research process, acknowledge the limitations of the research, and provide suggestions for further research.

Prospective teachers who are key informants generally understand digital literacy and often use digital literacy in learning. From the interview excerpts, the following data were obtained:

As prospective teachers, they must develop following technological developments so that they are ready to face the challenges of education in the future (IPS).

Also reinforced by the opinion of SUB as a prospective teacher who is currently taking PPG.

whatsapp for communication, collecting assignments, sharing learning materials (Sub).

Prospective teachers who are also PPG participants also encounter several obstacles in using digital literacy in the learning process. Researchers found several obstacles including: internet network and understanding of applications. This was expressed by the IPS informant as follows.

Prospective Internet connection is unstable in some places or areas (IPS).

It takes time to understand/master the platform used (IPS).

Researchers also found facts related to the obstacle of application fees in accessing digital literacy and difficulty focusing from students who are assigned to access digital literacy. This was expressed by the SUB, DIM and IPS informants as follows.

Several learning resources that require fees (not free) to access, such as certain books or journals/articles (IPS).

Paid applications or content (SUB).

There are several journals that must be purchased to read the contents of the journal (DIM).

Difficulty maintaining student focus in learning (IPS).

There are several other obstacles expressed by key informants, namely: forgetting passwords, lacking devices (support), ownership of tools (lack of), security issues and language barriers.

Researchers also explored the solutions that informants have done to overcome the obstacles faced. Some of the things that were obtained include: informants tried to move to find a stable signal, seek training to understand the application, access shadow journals (web cracking), create a conducive environment, access free applications, increase awareness of digital security, buy new devices that support the use of digital literacy, borrow the tools needed to access literacy and provide a strong quota or wifi network.

The challenges or obstacles encountered by the researchers are important aspects that emerged in the field. This research has not yet categorized the most important aspects of the findings. The nature of this research is also limited to a case in one region of Indonesia. The researchers have not yet compared these findings with various other places in Indonesia.

CONCLUSION

Conclusions in the case study research method with a qualitative approach will summarize the main findings, implications and contributions to existing knowledge. The

conclusions in this research include: (1) Prospective teachers are ready to integrate digital technology into the learning process; (2) Several obstacles in integrating digital literacy include: internet network, understanding applications, application costs, difficulty focusing, forgetting passwords, insufficient devices, ownership of devices, security, and language issues; (3) Prospective teachers overcome obstacles by: moving places, training, web cracking, conducive environment, free applications, data security, buying devices, borrowing devices, and robust internet access. The level of effectiveness of the solutions found in this research is highly subjective and depends on the specific conditions in the field. The findings of this qualitative research are not intended to be a general solution for effective solutions in similar cases elsewhere, but can serve as one of the references and secondary data for future research.

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