

EXPLORING THE DIGITAL LITERACY OF PRE-SERVICE TEACHERS: A STUDY ON THE TEACHING ASSISTANCE PROGRAM

Nur Hafizhah^{*1}, Nanik Mariani^{*2}, Fahmi Hidayat^{*3}
1710117120014@mhs.ulm.ac.id^{*1}, nanik_mariani@ulm.ac.id^{*2},
fahmihidayat@ulm.ac.id^{*3}
Faculty of Teacher Training and Education^{*1,2,3}
Lambung Mangkurat University^{*1,2,3}

Received: January 29, 2024

Accepted: February 30, 2024

Published: March 15, 2024

ABSTRACT

In today's educational landscape, digital literacy has emerged as a critical skill for pre-service teachers, enabling them to effectively utilize technology in classrooms and provide students with valuable information technology resources. This study aims to investigate the digital literacy levels of pre-service teachers participating in a teaching assistance program at school. Employing descriptive statistics, the research analyzed data collected from pre-service teachers enrolled in the Teaching Assistance Program, using a framework designed to assess teacher digital literacy across five key dimensions: information management, team-based learning, information processing and presentation, digital integrity, and social responsibility. The findings reveal that pre-service teachers demonstrated a high level of digital literacy across all dimensions. While highlighting their readiness to employ information and communications technology (ICT) for educational purposes, the results also underscore an ongoing need for further development in digital literacy skills. Importantly, these findings contribute significantly to providing insightful data regarding the level of digital literacy of pre-service teachers. Next, future research endeavors should address the limitations of this study by employing diversified methodologies and ensuring broader sample representations.

Keywords: *Digital Literacy, Teaching Assistance Program, Technology Education.*

DOI: <https://doi.org/10.31943/wej.v8i1.280>

INTRODUCTION

Pre-service teachers require to learn how the internet and other platforms are used to engage students learning. They need to acquire the appropriate knowledge and skills in an online network and use technology to effectively teach students (Akarawang et al., 2015). Some of these changes in the learning environment are giving pre-service teachers the performance they need especially the technology that aims to help pre-service teachers lead the classroom to success (Aslan, 2020). If a pre-service teacher understands the ability to choose the right tools it will guide learners to succeed in their learning (Suwanto et al., 2022). It can be seen that modern students own a smartphone with a large number of devices for accessing classroom and learning resources (Dias & Victor, 2017).

The use of digital technology in teaching and learning is an important key to facing today's situation in schools (Astuti et al., 2021). Both teachers and students are optimistic about the use of these digital tools and their impact on students' motivational communication skills and abilities (Dias & Victor, 2017). Pre-service teachers' belief can influence their attitudes and instructional choices toward digital learning and teaching environments (Nabhan, 2021).

Because of that reason, the Minister of Education, Culture, Research, and Technology, Nadim Makarim launched the *Merdeka Belajar Kampus Merdeka* (MBKM, freedom to learn, independent campus) program. The program aims to provide university students with experiential learning opportunities (Panduan, B. 2020). One of the standout MBKM programs is teaching assistant at the school. Students from universities who are passionate about education assist teachers at all grade levels, from elementary to secondary. They support educators as they manage teaching-learning activities (Kodrat, 2021).

Prachagool et al. (2022) studied the level of digital literacy of pre-service teachers during the period time of covid-19 pandemic; they were in a high level of aspects of digital literacy. This shows that they are willing to compromise with technology for education but digital literacy still involves them and science teachers.

Another research conducted by Liza & Andriyanti (2020); the study showed that they had a high level of digital literacy and were ready to apply digital technologies. In this way, students and pre-service teachers can meet the digital literacy needs of professional English teachers and improve the quality of English teaching and learning outcomes by integrating digital technologies.

An approach related to the expansion and development of information technology for pre-service teachers is to design and provide educational training to improve educational technology skills and digital learning competencies; although, the existence of reference standards and effective and useful teaching materials is the only prerequisite for genuine teaching and learning (Botturi, 2019). These elements may help students improve academic performance and positive attitudes toward learning with technology.

There are many studies about the digital literacy of pre-service teachers, however, this study aims to study the perception of pre-service teachers on digital literacy teaching assistance program at school. This will help educators design and transform their classrooms to foster digital literacy in the future as well as pre-service teachers.

LITERATURE REVIEW

Digital Literacy

In the digital age, literacy has evolved beyond its traditional confines of reading and writing, owing to the pervasive influence of digital technologies. Bawden (2001) notes this expansion, which now includes the ability to comprehend and engage with digital information across various formats, such as images, sound, and multimedia elements. This broadened concept of literacy mirrors the dynamic nature of modern communication, where individuals encounter a plethora of digital content through diverse platforms and mediums. Consequently, literacy necessitates the proficiency to navigate and critically evaluate information presented in digital contexts, encompassing multimedia

platforms, websites, social media, and online databases. Digital literacy extends beyond technical proficiency; it involves recognizing the credibility, relevance, and biases inherent in digital information sources. Individuals develop the cognitive skills and analytical abilities necessary to navigate the complexities of the digital landscape effectively. Recognizing digital literacy as integral to contemporary literacy underscores technology's transformative impact on communication, education, and social participation, as digital technologies continue to evolve and shape our interactions with information, literacy will continue to adapt, reflecting the ever-changing nature of the digital era.

The term "digital literacies" encapsulates a range of abilities required to navigate meaning in the contemporary digitally networked communications environment, where communication channels seamlessly blend analog and digital mediums, often with the assistance of mobile devices (Pegrum, 2019). Digital literacy involves not only technical proficiency but also reflection on diverse social practices and concepts associated with the mediation of distributed exchangeable texts produced through digital platforms.

Pre-service teachers need to deal with many digital platforms and mediums that require digital literacy skills. They must navigate blogs, video games, text messages, online social networks, and discussion forums, and conduct online research, among other tasks (Marais, 2023). Beyond simply using these platforms, digital literacy entails understanding the social dynamics, norms, and implications inherent in digital communication. It involves critically evaluating information, discerning between credible and unreliable sources, and engaging in responsible digital citizenship.

Incorporating digital literacies into education acknowledges the multifaceted nature of digital communication and information dissemination. By equipping pre-service teachers with digital literacy skills, educators empower them to effectively navigate and utilize digital resources in their teaching practice. Moreover, fostering digital literacies enables pre-service teachers to prepare students for active participation in an increasingly digitalized society, where effective communication and information literacy skills are indispensable for success. Therefore, recognizing and cultivating digital literacies among pre-service teachers is essential for preparing them to navigate and thrive in the digital landscape of modern education.

The rapid advancement of digital technologies has played a significant role in shaping the evolution of digital literacy phenomena. As these technologies progress, the skill sets necessary to effectively navigate them also undergo transformation. Failing to cultivate these skills can potentially impede social transformation, exacerbate existing social inequalities, and restrict participation in various aspects of life (Ata & Yıldırım, 2019). Consequently, there is an increasing imperative to continually update and enhance digital literacy skills to ensure individuals can fully capitalize on the opportunities presented by digital technology.

Digital literacy encompasses more than mere technical proficiency; it involves mastering conceptual ideas and principles (Strutynska et al., 2021). Digital literacy frameworks advocate for the development of diverse skills and competencies, including critical thinking, creativity, collaboration in secure online communication, and cultural awareness. These competencies are essential for

individuals to effectively engage with digital information, navigate digital platforms, and critically evaluate digital content.

By acquiring and refining digital literacy skills, individuals are better equipped to navigate the complexities of the digital landscape. They can critically assess information, communicate effectively in online environments, and adapt to evolving technological trends. Digital literacy serves as a gateway to meaningful participation in the digital age, empowering individuals to harness the transformative potential of technology for personal, professional, and societal advancement. Therefore, investing in the continual development of digital literacy skills is paramount to fostering inclusive, equitable, and empowered digital citizenship in the modern world.

Integrating digital literacy into formal education has the potential to inspire students to establish connections between various subject areas and their personal and professional experiences (Churchill, 2020). By incorporating digital literacy across the curriculum, educators create opportunities for students to explore real-world applications of digital skills, fostering deeper engagement and relevance in their learning journey. For pre-service teachers, mastering digital literacy is imperative to effectively fulfill their roles in providing teaching assistance within school settings. Proficiency in digital literacy equips them with the tools and strategies needed to leverage technology to enhance teaching and learning processes. By mastering digital literacy, pre-service teachers can design interactive lessons, facilitate collaborative learning experiences, and engage students in multimedia-rich educational content. Moreover, integrating digital literacy into teacher preparation programs prepares pre-service teachers with the knowledge and skills needed to navigate the evolving landscape of educational technology, effectively meeting the diverse needs of 21st-century learners as technology continues to play an increasingly integral role in education.

Teaching Assistance Program

Teaching assistance is a vital aspect of MBKM programs, aiming to bridge the theoretical learning of pre-service teachers with the practical demands they'll face in school settings (Suyatno et al., 2023). Within this program, pre-service teachers engage in a spectrum of activities, ranging from school administration to non-academic tasks and academic responsibilities. These diverse tasks underscore the necessity for pre-service teachers to possess adept knowledge of digital tools and technologies. To navigate their responsibilities effectively, pre-service teachers must master digital competencies to design, manage, and execute their activities. This involves making informed decisions about integrating smart technology to optimize instructional delivery and administrative tasks.

Furthermore, as highlighted by Prachagool et al. (2022), pre-service teachers must proficiently navigate the complexities of the digital era, staying responsive to evolving technological landscapes and leveraging digital resources to enhance teaching and learning outcomes. By embracing digital literacy within teaching assistance, pre-service teachers not only gain practical insights but also cultivate adaptability and innovation essential for thriving in contemporary educational environments. Through deliberate engagement with smart technologies and strategic decision-making, pre-service teachers empower themselves to address the diverse needs of students and effectively navigate the

dynamic challenges of the digital age. Consequently, the integration of digital competencies within teaching assistance programs catalyzes preparing pre-service teachers to navigate the complexities of modern education and foster meaningful learning experiences for their future students.

RESEARCH METHOD

This research purpose is to examine pre-service teachers' perceptions of digital literacy during teaching assistance program at school. An online survey was conducted to investigate pre-service teachers' perception of digital literacy. This study employed the quantitative approach with a descriptive design. Quantitative research is an approach that tests certain theories by examining relationships between variables. These variables are measured - usually using research tools such as tests, questionnaires, and structured interviews, so numerical data can be analyzed based on statistical calculations (Adnan & Latief, 2020)

Participants

The participants are 27 pre-service English teachers who have taken the teaching assistance program or students batch 2020. Because online education streams and social networks are important for everyone now, they should adopt and apply digital learning technologies in professional practice.

The participants are pre-service English teachers from Lambung Mangkurat University, Faculty of Teacher Training and Education, English Language Education Study Program, batch 2020.

Research Tool

Participants rate their digital literacy experience on a five-point Likert scale, such as 1= strongly agree, 2= agree, 3= disagree, and 4= strongly disagree. The research tool is adapted and modified from Prachagool et al (2022). The research instrument based on teachers' digital literacy framework is a questionnaire with 5 sections: (1) information management (2) team-based learning (3) information processing and presentation (4) digital integrity and (5) social responsibility.

Data Collection

Data are collected by calling pre-service teachers who have taken the Teaching Assistance Program course in the English Language Education Study Program batch 2020. The researchers ask the pre-service pre-service teachers about digital literacy through an online survey. Collect capture and double-check data for completeness before creating and interpreting worksheets.

Data Analysis

The digital literacy of pre-service teachers were analyzed by descriptive statistics, mean, and standard deviation. The level of digital literacy can be calculated and interpreted as expressed in four-point Likert Scale levels of mean score: 1.00-2.00 are at a low level, 2.01-3.00 are at a medium level, and 3.01-4.00 are at a high level (Phoong, Seuk Yen, 2021)

FINDING AND DISCUSSION

Findings

In this study, pre-service teachers had a high level of digital literacy in all aspects. returning to each component's item can be described as a few items that have reached the highest level, *i.e.*, *Social responsibility*— I understood that cyberbullying was wrong, and *Information processing and presentation*— I'm aware they are different in presenting information through letters, images, or videos. However, the medium level did find 1 item that appeared in *Information processing and presentation*— I'm able to effectively analyze and present the data using the data. The level of digital literacy of pre-service teachers during teaching assistance program at school is at a high level and it shows that they have the capability to use technology in education (Table 1). Furthermore, they can create classrooms that carry out the standards for 21st-century teacher competency. The teaching assistance program allows and speeds up them to prepare the ICT for education in this era.

Table 1. Level of digital literacy

| Item | Mean | SD | Level of digital literacy |
|--|------|-------|---------------------------|
| <i>Information Management</i> | 3,24 | 0,084 | High |
| I can set up a search for information. | 3,37 | 0,62 | High |
| I can look for appropriate data using reliable online sources. | 3,26 | 0,64 | High |
| I can analyze information through online resources. | 3,15 | 0,65 | High |
| I can carry on the information and store it through online resources. | 3,19 | 0,72 | High |
| <i>Team-based learning</i> | 3,18 | 0,17 | High |
| I'm ready to collaborate and share knowledge via online media, | 3,22 | 0,63 | High |
| I like to do many projects with friends by using online media | 3,07 | 0,81 | High |
| I learned how to handle programs to work with my online's friends. | 3,00 | 0,72 | High |
| I want to make myself better to be able to connect with friends around the world online. | 3,44 | 0,74 | High |
| <i>Information processing and presentation</i> | 3,19 | 0,21 | High |
| I'm able to effectively analyze and present the data using the data. | 2,89 | 0,57 | Medium |
| I'm aware they are different in presenting information through letters, images, or videos. | 3,48 | 0,69 | High |
| I can use ICT to create and design presentations very well. | 3,19 | 0,67 | High |
| I was able to process information from many different sources. | 3,22 | 0,79 | High |
| <i>Digital Integrity</i> | 3,25 | 0,11 | High |

Nur Hafizhah^{*1}, Nanik Mariani^{*2}, Fahmi Hidayat^{*3}
 EXPLORING THE DIGITAL LITERACY OF PRE-SERVICE TEACHERS:
 A STUDY ON THE TEACHING ASSISTANCE PROGRAM

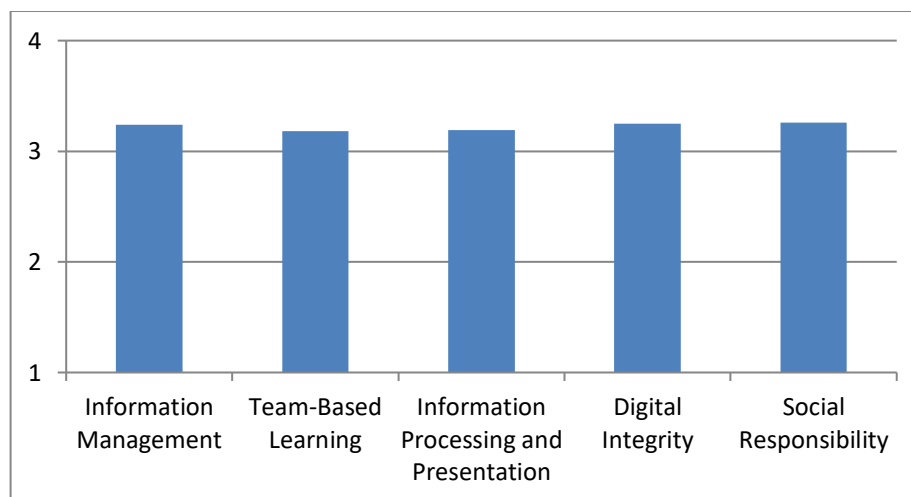
| | | | |
|--|-------------|-------------|-------------|
| I understand my right to use and access online information. | 3,41 | 0,68 | High |
| I'm aware of the copyrights (text or media) that appear on the internet. | 3,19 | 0,77 | High |
| I'm aware that ICT can be used to improve energy efficiency. | 3,15 | 0,70 | High |
| <i>Social Responsibility</i> | <i>3,26</i> | <i>0,25</i> | <i>High</i> |
| I'm conscious of the dangers connected with using the internet. | 3,22 | 0,74 | High |
| I have interacted with others on the internet in a kind and respectful manner. | 3,07 | 0,90 | High |
| I protected my files and digital devices with a strong password. | 3,22 | 0,79 | High |
| I understood that cyberbullying was wrong. | 3,74 | 0,64 | High |
| When I saw that hoax information had been posted, I will report that media. | 3,04 | 0,79 | High |

On the contrary, when educators actively integrate theoretical knowledge into practical applications, such as acquiring proficiency in new technologies or promoting the integration of Technical Pedagogical and Content Knowledge (TPACK) for their students, the effectiveness of digital literacy is heightened. The TPACK framework serves as a valuable tool in teacher training programs and professional development initiatives, including teaching assistance programs. This framework specifically targets the competencies and understanding necessary to leverage digital resources in facilitating subject learning, as highlighted by Falloon (2020).

By embracing the TPACK framework, educators can effectively bridge the gap between theoretical understanding and practical implementation in the classroom. This approach not only enhances educators' abilities to navigate digital tools but also empowers them to integrate technology seamlessly into their teaching practices, thereby fostering more engaging and effective learning experiences for students. Through structured training and ongoing professional development initiatives embedded within programs like teaching assistance programs, educators can continually refine their digital literacy skills and adapt to the evolving technological landscape of education. Consequently, students benefit from enriched learning environments that influence digital resources to promote deeper understanding and engagement with the subject matter

The level of social responsibility may be the highest mean score followed by, digital integrity, information management, information processing and presentation, and team-based learning (Figure 1). There is not too much difference, just 0, that's all, It looks to be essential to teachers' skills with technology in the classroom since they are able to introduce students to learning in the right way and with the necessary techniques (Prachagool et al., 2022).

Figure 1. Digital literacy



The findings indicate that pre-service teachers exhibit a commendable level of positive digital literacy. Effective instructional design should capitalize on technology within the classroom, development an environment conducive to digital literacy acquisition and global information retrieval online. It's pivotal that children and their surroundings become attuned to internet awareness, which can be facilitated through initiatives leveraging the Technological Pedagogical and Content Knowledge (TPACK) framework (Nuangchalerm, 2011). Integration of TPACK not only enhances innovative lesson implementation but also aids students in succeeding within the digital learning landscape, as presented by Kodrat (2021).

The significance of the TPACK framework in increasing digital literacy among pre-service teachers cannot be overstated. By seamlessly integrating technology with pedagogical and content knowledge, TPACK underscores its efficacy in teacher training and professional development, emphasizing the imperative of technology incorporation in educational practices.

One of the main strengths of the TPACK method lies in its ability to bridge the gap between philosophical knowledge and practical application in educational settings. By integrating technology into broader curricula and professional competencies, TPACK prepares teacher candidates with the skills and abilities necessary to effectively use digital tools in the classroom. TPACK emphasizes the dynamic relationship between technology, pedagogy and content knowledge and illuminates the relationship between these elements in the teaching and learning process. Through TPACK, aspiring teachers learn how to integrate technology to enhance learning delivery, support student engagement, and promote deeper learning experiences. In addition, TPACK serves as a guidance framework for teacher training programs and professional development initiatives. By emphasizing the integration of technology into educational practice, TPACK prepares teacher candidates to navigate the complexities of the digital age and adapt to changes in educational technology. In general, the TPACK process emphasizes the important role of technology in modern education and emphasizes the importance of digital competence of future teachers.

While pre-service teachers generally demonstrate high digital literacy levels, a specific aspect, Information Processing and Presentation, reveals a moderate proficiency level. Notably, the capability to analyze and present data emerged as an area warranting potential improvement or focused attention within training programs.

Outstandingly, pre-service teachers show the highest mean score in social responsibility within the digital literacy spectrum. This underscores their acute awareness of ethical considerations in digital technology usage, encompassing areas like cyberbullying awareness and hoax information reporting, underscoring the need to instill responsibility and ethics in digital contexts among educators.

Pre-service teachers, practiced with the internet and technological aware, are well-established to conduct contemporary classes and influence Information and Communication Technology (ICT) effectively. This suggests that educators of the current generation possess essential skills and adaptability to redefine traditional classroom dynamics, exploring technology for instructional purposes. Because they are familiar with Internet technology, teachers are increasingly able to seamlessly integrate digital tools into their teaching methods. You can use various ICT resources to enhance the learning experience, engage students, and create a dynamic and interactive learning environment. With their skills and expertise, aspiring teachers can explore new teaching methods that leverage the power of digital platforms to meet different learning styles and interests. Furthermore, preservice teachers' ability to effectively influence ICT emphasizes their ability to navigate the changing educational technology landscape. They can use new technologies and digital materials to enhance teaching and learning and promote creativity, collaboration, and critical thinking among students.

A noticeable challenge in digital learning is the promotion of critical thinking and decision-making skills, grounded in meaningful information technology awareness. This highlights the evolving nature of digital literacy, transcending technical proficiency to emphasize the cultivation of higher-order thinking skills for navigating digital environments.

In summary, the findings underscore a robust foundation of digital literacy among pre-service teachers, with identified areas for enhancement such as data analysis and presentation. Moreover, the emphasis on frameworks like TPACK and the integration of ethical considerations reflects a comprehensive approach to preparing educators for contemporary teaching practices in an increasingly digital era.

Discussion

In the Teaching Assistance Program, promoting the digital literacy of pre-service teachers is critical to developing core quality educators equipped for the demands of the future educational landscape. By prioritizing digital literacy, the program not only improves the competence of pre-service teachers as well as helps improve equality and quality of education at a higher level.

Digital literacy comprehends a spectrum of skills essential to effectively navigate the digital world. These include operational skills, which include expertise in using digital tools and platforms; critical thinking skills, which enable teachers to critically evaluate and analyze digital content; collaboration skills, which facilitate effective teamwork and communication in a digital environment;

and awareness skills, which include an understanding of the ethical, social and safety implications of using digital technology.

Furthermore, curricula in colleges and universities play an important role in promoting digital literacy among pre-service teachers. By integrating digital literacy initiatives into the curriculum, educational institutions can equip future educators with the essential skills needed to thrive in the 21st-century learning landscape. This includes promoting the use of digital literacy in pedagogical strategies, encouraging the integration of educational technology into teaching practices, and developing the skills needed to use digital tools to improve learning outcomes.

By emphasizing digital literacy along with essential 21st-century learning skills, colleges and universities not only prepare in-service teachers for the challenges of modern education but also empower them to use technology effectively to create engaging and impactful learning experiences for students. This comprehensive approach to digital literacy ensures future educators are equipped with the skills and knowledge they need to excel in an increasingly digitized educational environment.

Currently, participants are prepared to conduct modern classes and effectively navigate the world of information and communication technology (ICT). As an internet-savvy generation, they have a natural affinity and proficiency with digital tools, which facilitates seamless integration into their teaching practices. Technology and digital integration, once considered daunting, is now an accessible and adaptable resource for both teachers and students. Ongoing digital learning challenges go beyond technical proficiency and emphasize key elements such as social responsibility, critical thinking, and informed decision-making in the use of information technology (Sayaf et al., 2021).

These changes reflect a broader recognition of the multifaceted nature of digital skills, which go beyond technical competency and include ethical considerations, thoughtful analysis, and skilled decision-making in navigating digital environments. As educators begin to embrace the evolving digital learning landscape, they have a responsibility to instill in their students not only technical skills but also a deep understanding of the ethical and socially responsible implications of using digital technologies. By supporting critical thinking and informed decision-making, educators enable their students to navigate the complexities of the digital world with confidence and responsibility, paving the way for meaningful engagement and participation in an increasingly digital society.

Although preservice teachers play an important role in facilitating students' acquisition of cognitive information, it is important to realize that school curricula must cover a broader spectrum of attributes and abilities. While cognitive knowledge is undoubtedly valuable, developing skills and competencies that go beyond mere retention of information is equally important. To harness the full potential of information technology as a dynamic and long-lasting learning tool, increasing digital literacy in the learning environment is a must. Digital literacy encompasses a range of skills and proficiency, including but not limited to, the ability to effectively navigate digital platforms, critically evaluate online information, and engage with digital resources responsibly.

By integrating digital literacy initiatives into the school curriculum, educators can empower students to utilize information technology as a tool for learning, communication, and creativity. Encouraging digital literacy not only equips students with essential skills for success in the digital age but also fosters a deeper understanding of digital citizenship and ethical engagement in online spaces. Ultimately, by prioritizing digital literacy and cognitive learning, schools can create inclusive, forward-thinking learning environments that prepare students to thrive in an increasingly digital and interconnected world.

CONCLUSION AND SUGGESTION

Based on the pre-service teachers' digital literacy framework, the research tool is an online survey that consists of 5 aspects: (1) information management (2) team-based learning (3) information processing and presentation (4) digital integrity, and (5) social responsibility. This study found that pre-service teachers during the teaching assistance program showed high levels of digital literacy in all aspects. This program is expected to be a training and professional development in digital learning. After that, they will deal with digital literacy to help their students reach the goal of digital citizenship and sustainable learning environments.

REFERENCES

- Adnan, D. G., & Latief, M. A. (2020). *Penelitian Kuantitatif, Penelitian Kualitatif, Penelitian Tindakan Kelas*.
- Akarawang, C., Kidrakran, P., & Nuangchalerm, P. (2015). Enhancing ICT Competency for Teachers in the Thailand Basic Education System. *International Education Studies*, 8(6), p1. <https://doi.org/10.5539/ies.v8n6p1>
- Aslan, S. (2020). Analysis of Digital Literacy Self-Efficacy Levels of Pre-service Teachers. *International Journal of Technology in Education*, 4(1), 57. <https://doi.org/10.46328/ijte.47>
- Astuti, M., Arifin, Z., Mutohhari, F., & Nurtanto, M. (2021). Competency of Digital Technology: The Maturity Levels of Teachers and Students in Vocational Education in Indonesia. *Journal of Education Technology*, 5(2). <https://doi.org/10.23887/jet.v5i3.35108>
- Ata, R., & Yıldırım, K. (2019). Exploring Turkish Pre-Service Teachers' Perceptions and Views of Digital Literacy. *Education Sciences*, 9(1), 40. <https://doi.org/10.3390/educsci9010040>
- Bawden, D. (2001). Information and digital literacies: A review of concepts. *Journal of Documentation*, 57(2), 218–259. <https://doi.org/10.1108/EUM0000000007083>
- Botturi, L. (2019). Digital and media literacy in pre-service teacher education: A case study from Switzerland. *Nordic Journal of Digital Literacy*, 14(3–4), 147–163. <https://doi.org/10.18261/issn.1891-943x-2019-03-04-05>
- Churchill, N. (2020). Development of students' digital literacy skills through digital storytelling with mobile devices. *Educational Media International*, 57(3), 271–284. <https://doi.org/10.1080/09523987.2020.1833680>
- Dias, L., & Victor, A. (2017). Teaching and Learning with Mobile Devices in the 21st Century Digital World: Benefits and Challenges. *European Journal*

- of *Multidisciplinary Studies*, 5(1), 339.
<https://doi.org/10.26417/ejms.v5i1.p339-344>
- Falloon, G. (2020). From digital literacy to digital competence: The teacher digital competency (TDC) framework. *Educational Technology Research and Development*, 68(5), 2449–2472. <https://doi.org/10.1007/s11423-020-09767-4>
- Kodrat, D. (2021). Power Relation in English Classroom: A Case Study in Teaching Assistance of MBKM Program. *TLEMC (Teaching and Learning English in Multicultural Contexts)*, 5(2), 191-199.
- Liza, K., & Andriyanti, E. (2020). Digital literacy scale of English pre-service teachers and their perceived readiness toward the application of digital technologies. *Journal of Education and Learning (EduLearn)*, 14(1), 74–79. <https://doi.org/10.11591/edulearn.v14i1.13925>
- Marais, E. (2023). The Development of Digital Competencies in Pre-Service Teachers. *Research in Social Sciences and Technology*, 8(3), 134–154. <https://doi.org/10.46303/ressat.2023.28>
- Nabhan, S. (2021). Pre-Service Teachers' Conceptions and Competences on Digital Literacy in an EFL Academic Writing Setting. *Indonesian Journal of Applied Linguistics*, 11(1). <https://doi.org/10.17509/ijal.v11i1.34628>
- Panduan, B. (2020). Merdeka Belajar Kampus Merdeka. Retrieved from *Merdeka Belajar Kampus Merdeka website: <http://dikti.kemdikbud.go.id/wpcontent/uploads/2020/04/Buku-Panduan-Merdeka-Belajar-Kampus-Merdeka-2020>*.
- Pegrum, M. (2019). Digital literacies in language education. *Matraga - Revista Do Programa de Pós-Graduação Em Letras Da UERJ*, 26(47). <https://doi.org/10.12957/matraga.2019.44077>
- Phoong, Seuk Yen. (2021). The Influence of Learning Styles and Motivation on Undergraduate Student Success in Mathematics. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, 12(3), 658–665. <https://doi.org/10.17762/turcomat.v12i3.771>
- Prachagool, V., Nuangchalerm, P., & Yawongsa, P. (2022). Digital Literacy of Pre-service Teachers in the Period Time of COVID-19 Pandemic. *Journal of Educational Issues*, 8(2), 347. <https://doi.org/10.5296/jei.v8i2.20135>
- Strutynska, O. V., Torbin, G. M., Umryk, M. A., & Vernydub, R. M. (2021). *Digitalization of the educational process for the training of the pre-service teachers*.
- Suwarto, D. H., Setiawan, B., & Machmiyah, S. (2022). Developing Digital Literacy Practices in Yogyakarta Elementary Schools. *Electronic Journal of E-Learning*, 20(2), pp101-111. <https://doi.org/10.34190/ejel.20.2.2602>
- Suyatno, S., Wantini, W., Pambudi, D. I., Muqowim, M., Tinus, A., & Patimah, L. (2023). Developing Pre-Service Teachers' Professionalism by Sharing and Receiving Experiences in the Kampus Mengajar Program. *Education Sciences*, 13(2), 143. <https://doi.org/10.3390/educsci13020143>