Analysis of the Implementation of Educational Technology in the Teacher Professional Education Program to Enhance Teachers' Digital Literacy at UMS Rappang

Suleha
sulehasurapati@gmail.com

Yusmah
yusmah@gmail.com

Aswadi
aswadi@gmail.com

Jumiati
jumiati@gmail.com

Muhammad Hanafi
afied70@gmail.com

Sam Hermansyah
sam.hermansyah82@gmail.com

Erma
erma.erma@gmail.com

Universitas Muhammadiyah Sidenreng Rappang

ABSTRACT

Digital literacy is an essential skill for teachers in the era of educational digitalization. The Teacher Professional Education (PPG) program at Universitas Muhammadiyah Sidenreng Rappang (UMS Rappang) aims to enhance teachers' competencies by integrating educational technology into the curriculum. This study examines the implementation of educational technology in the PPG program and its impact on improving teachers' digital literacy. The findings indicate that the use of tools such as Learning Management Systems (LMS), video conferencing platforms, educational software, and AR/VR technologies significantly enhances participants' ability to utilize digital tools in teaching. Furthermore, strategies such as intensive training, digital evaluation, and collaborations with technology industries contribute to achieving program goals. However, challenges such as infrastructure limitations, digital competency gaps, and resistance to change require targeted solutions. This study underscores the importance of continuous evaluation and innovation to optimize the integration of educational technology and promote teachers' digital literacy.

Keywords: Digital Literacy; Teaching Innovation; Digital Tools Integration

INTRODUCTION

The rapid advancement of technology in the 21st century has significantly transformed various sectors, including education. Digital literacy, defined as the ability to effectively and responsibly use digital tools and technologies, has become an essential competency for teachers. It equips educators with the skills needed to enhance the learning experience, foster student engagement, and address the challenges of modern educational practices.

In Indonesia, the Teacher Professional Education (PPG) program is a government-mandated initiative aimed at improving the quality of teaching by equipping educators with the pedagogical, professional, and technological skills necessary for effective instruction. Universitas Muhammadiyah Sidenreng Rappang (UMS Rappang) plays a pivotal role as one of the institutions implementing the PPG program, focusing on the integration of educational technology to enhance teachers' digital literacy.

The integration of educational technology in the PPG program encompasses various tools and platforms, such as Learning Management Systems (LMS), video conferencing applications, educational software, and interactive technologies like augmented reality (AR) and virtual reality (VR). These innovations aim to create a more dynamic and engaging learning environment, enabling teachers to adopt and adapt to digital pedagogical practices effectively.

This study seeks to analyze the implementation of educational technology in the PPG program at UMS Rappang and its impact on improving teachers' digital literacy. By examining the strategies, outcomes, and challenges of this integration, the research highlights the potential of educational technology to transform teaching practices and foster a culture of continuous professional development among educators. Moreover, this study provides insights into the ways institutions can address barriers to technology adoption and ensure the sustainability of digital literacy initiatives in education.

LITERATURE REVIEW

Digital literacy refers to the ability to use digital tools and resources effectively, critically, and responsibly in various contexts, including education. Scholars such as Gilster (1997) emphasize that digital literacy extends beyond technical proficiency to include critical thinking, creativity, and the ethical use of digital information. In the context of teaching, digital literacy is pivotal in enabling educators to design engaging learning environments, integrate digital tools into lesson delivery, and prepare students for a technology-driven world.

Several studies highlight the positive impact of digital literacy on teaching effectiveness. For instance, Ferrer et al. (2020) found that teachers with strong digital literacy skills are better equipped to adapt to online and blended learning

environments. Furthermore, integrating digital literacy into teacher training programs ensures that educators can meet the demands of 21st-century education. Educational technology encompasses a range of digital tools, platforms, and methods used to enhance teaching and learning. According to Mishra and Koehler (2006), the Technological Pedagogical Content Knowledge (TPACK) framework underlines the importance of integrating technology into pedagogy and content knowledge to create meaningful learning experiences. Professional development programs such as the Teacher Professional Education (PPG) program are critical for equipping educators with the necessary skills to use technology effectively. Studies by Darling-Hammond et al. (2017) show that training focused on the use of educational technology fosters improved teaching practices, student engagement, and learning outcomes. Institutions like UMS Rappang implement such programs to ensure teachers are prepared to integrate technology into their classrooms.

Learning Management Systems (LMS) are widely used in professional development programs to facilitate online learning and communication. Platforms such as Moodle, Google Classroom, and Canvas allow teachers to access materials, interact with peers and instructors, and complete assessments digitally. Research by Al-Samarraie et al. (2018) demonstrates that LMS platforms enhance collaborative learning and provide flexible access to educational resources, making them valuable tools for teacher training programs like PPG. Emerging technologies such as augmented reality (AR) and virtual reality (VR) offer innovative ways to enhance teacher training. These technologies create immersive learning experiences that help teachers understand complex concepts and design interactive lessons. Studies by Akçayır and Akçayır (2017) show that AR/VR technologies increase engagement, comprehension, and retention, making them valuable additions to teacher professional development programs.

While the benefits of educational technology are well-documented, its implementation in teacher training programs faces several challenges. Infrastructure limitations, particularly in remote areas, hinder access to digital tools and the internet. Additionally, teachers' varying levels of digital competence and resistance to change pose significant barriers. Research by Ertmer and Ottenbreit-Leftwich (2010) highlights the need for targeted support and continuous training to overcome these challenges. The PPG program at UMS Rappang is a critical initiative for enhancing the professional competencies of teachers, with a strong emphasis on digital literacy. By integrating educational technology into its curriculum, the program seeks to produce educators who are adept at using digital tools to facilitate effective learning. Previous studies on PPG implementations, such as those by Widiati et al. (2019), show that such programs significantly improve teachers' pedagogical and technological skills.

METHOD

Design and Sample

This study employs a qualitative descriptive approach to analyze the implementation of educational technology in the Teacher Professional Education (PPG) program at Universitas Muhammadiyah Sidenreng Rappang (UMS Rappang). The research focuses on exploring strategies, tools, and their impact on enhancing teachers' digital literacy. The primary objectives of this study are to examine the types of educational technology integrated into the PPG program, analyze the strategies used to improve teachers' digital literacy, and evaluate the challenges and solutions in implementing educational technology within the program. The study uses purposive sampling to select participants directly involved in the PPG program at UMS Rappang. The sample includes five program coordinators and instructors, 20 PPG participants from various subject areas, and institutional staff responsible for managing the technological infrastructure.

Instrument and Procedures

Data were collected using three methods: semi-structured interviews, observations, and document analysis. Interviews were conducted with program coordinators, instructors, and PPG participants to gather insights into the use of educational technology and its impact. Direct observations of training sessions provided information on how technology is integrated into classroom and online environments. Additionally, program curriculum, training modules, participant assignments, and institutional reports were reviewed to identify key aspects of the implementation process. To ensure the credibility of the study, triangulation was applied by cross-verifying data from multiple sources, such as interviews, observations, and documents. Member checking was conducted by sharing key findings with participants to confirm accuracy, and peer review was carried out to enhance reliability. Ethical approval was obtained from UMS Rappang's research ethics committee, adhering to principles of informed consent, confidentiality, and voluntary participation. Participants were briefed about the research objectives, assured of their right to withdraw at any time, and their responses were anonymized to protect their privacy.

Data Analysis

Data analysis was carried out using thematic analysis, involving familiarization with the data, coding, thematic mapping, and interpretation to identify recurring themes and link findings to the research objectives. The scope of the study focuses specifically on the PPG program at UMS Rappang, which may limit the generalizability of findings to similar programs at other institutions. While the reliance on qualitative methods emphasizes context-specific insights, the in-depth analysis offers valuable understanding of the integration of educational technology and its role in enhancing teachers' digital literacy.

RESULT AND DISCUSSION

The analysis of data collected from interviews, observations, and document reviews reveals several key findings regarding the implementation of educational technology in the PPG program at UMS Rappang and its impact on improving teachers' digital literacy. Educational technology tools such as Learning Management Systems (LMS), video conferencing platforms, and digital content creation tools are extensively used in the PPG program. LMS platforms like Moodle facilitate asynchronous learning, allowing participants to access materials, submit assignments, and engage in online discussions. Video conferencing tools such as Zoom and Google Meet are utilized for synchronous training sessions, enabling real-time interaction between participants and instructors. Additionally, digital content creation tools like Canva and Microsoft Office are taught to help teachers create engaging learning materials.

The program has significantly enhanced teachers' digital literacy by equipping them with practical skills to use various digital tools. Participants reported increased confidence in using technology for lesson planning, content delivery, and student assessments. Teachers also demonstrated improved ability to navigate digital platforms, create interactive learning materials, and manage online classrooms effectively. However, the study identified several challenges, including infrastructure limitations, particularly inadequate internet connectivity in rural areas, and varying levels of digital competence among participants. Resistance to adopting new technologies was also observed, primarily among older teachers less familiar with digital tools.

To address these challenges, UMS Rappang implemented targeted solutions, including providing internet access during training sessions, offering remedial training for participants with limited digital skills, and fostering a supportive learning environment through peer collaboration and mentorship programs. Additionally, participants were encouraged to practice using digital tools regularly to build confidence. The integration of educational technology in the PPG program aligns with global trends emphasizing the need for digitally literate educators to meet the demands of 21st-century education. The findings demonstrate that the use of LMS, video conferencing, and digital content creation tools significantly contributes to enhancing teachers' digital competencies. These tools not only facilitate flexible and accessible learning but also prepare teachers to adapt to various teaching contexts, including blended and online learning environments.

The challenges observed highlight the need for continuous support and infrastructure development. Overcoming resistance to technology requires both technical training and a cultural shift within educational institutions. UMS Rappang's approach to addressing these barriers—through remedial training, mentorship, and peer support—provides a model for other institutions implementing similar programs. Moreover, the emphasis on practical applications of digital tools ensures that participants can immediately apply their learning in

real-world teaching scenarios. This aligns with the Technological Pedagogical Content Knowledge (TPACK) framework, which underscores the importance of integrating technology into pedagogical practices.

The study also underscores the importance of collaboration with technology providers to ensure access to up-to-date tools and resources. Such partnerships can bridge gaps in infrastructure and provide ongoing professional development opportunities for teachers. The success of the PPG program at UMS Rappang in enhancing digital literacy suggests several implications for future practice. Expanding access to infrastructure, such as reliable internet connections, is crucial to ensure the program's sustainability and inclusivity. Developing modular training programs tailored to different skill levels can help address disparities in digital competence among participants. Continuous evaluation and feedback mechanisms are essential to adapt the program to emerging technological trends and participants' evolving needs. By addressing these aspects, the PPG program at UMS Rappang can serve as a benchmark for similar initiatives aimed at fostering digital literacy among educators in Indonesia and beyond.

CONCLUSION

The integration of educational technology in the Teacher Professional Education (PPG) program at Universitas Muhammadiyah Sidenreng Rappang (UMS Rappang) has demonstrated significant contributions to enhancing teachers' digital literacy. By leveraging tools such as Learning Management Systems (LMS), video conferencing platforms, and digital content creation applications, the program equips teachers with practical skills to navigate and utilize digital tools in teaching. Participants have shown improved confidence in using technology for lesson planning, content delivery, and classroom management, highlighting the program's effectiveness in preparing educators for 21st-century teaching demands. Despite these achievements, challenges such as infrastructure limitations, varying levels of digital competence, and resistance to technology adoption remain significant barriers. UMS Rappang has addressed these challenges through targeted solutions, including providing internet access, conducting remedial training, and fostering collaborative learning environments. These strategies have proven effective in mitigating the barriers and supporting participants in their professional development. The findings emphasize the importance of continuous support, infrastructure development, and tailored training programs to ensure the sustainability of digital literacy initiatives. Collaboration with technology providers and ongoing evaluation mechanisms are also crucial to keep pace with emerging trends and the evolving needs of teachers. The success of the PPG program at UMS Rappang highlights its potential as a model for similar initiatives aimed at fostering digital literacy among educators in Indonesia and beyond. By addressing the identified challenges and refining strategies, the program can continue to serve as a benchmark for preparing digitally literate and competent educators in the digital age.

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