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The Efficacy of Digital Pedagogy in the Professional Development of Teaching Competence

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Abstract
This study investigates the efficacy of digital pedagogy in enhancing the professional development of teaching competences among fourth-semester students of the English Education Study Program at Mandalika University of Education. Using a quantitative research design, data were collected from 25 participants through a structured 20-item questionnaire assessing key aspects of teaching competence, including digital communication, instructional design, and technology integration. The results show that digital pedagogy supports the growth of teaching competences by offering flexibility, access to diverse resources, and opportunities for independent learning. A majority of students reported improved skills in designing teaching materials and utilizing digital platforms for educational communication. However, several challenges were identified, such as limited real-time interaction and technical issues like unstable internet connectivity. While 60% of students perceived digital pedagogy as effective, others expressed the need for stronger pedagogical support and infrastructure. The study concludes that digital pedagogy has substantial potential to contribute to the professional preparation of future educators, provided it is implemented with careful planning, adequate technical support, and interactive instructional strategies.

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1. INTRODUCTION

In today's digital era, the advancement of information and communication technology has significantly transformed various aspects of life, particularly in education. **Digital pedagogy**, as a framework that integrates digital tools with effective teaching strategies, has emerged as a pivotal component in the professional development of teaching competences. Unlike traditional online learning, digital pedagogy not only facilitates remote access to learning but also emphasizes the pedagogical redesign of learning environments to enhance instructional quality and learner engagement (Anderson, 2016: 4).

In the context of English language education, the integration of digital pedagogy is crucial. The English Education Study Program, for instance, requires future educators to not only master language content but also to develop comprehensive teaching competences—ranging from lesson planning and technological literacy to classroom interaction and reflective teaching (Bates, 2015: 29). Digital pedagogy enables students to explore a wide array of teaching resources, such as language learning applications, multimedia materials, and interactive digital platforms, which are essential in fostering teaching readiness.

However, the transition to digital pedagogy poses challenges. While many higher education institutions in Indonesia have adopted online learning models—particularly during the COVID-19 pandemic—there remains a need to examine how these digital practices actually contribute to the development of teaching competences. As Hill (2012: 45) suggests, the effectiveness of digital instruction relies not only on access to technology but also on pedagogical planning and institutional support.

A critical issue in implementing digital pedagogy is the digital divide, particularly in regions with limited internet access or inadequate technological infrastructure (Zhang & Zhou, 2012: 331). These disparities can lead to unequal learning experiences and hinder the professional growth of future teachers. Moreover, while digital pedagogy offers flexible and independent learning opportunities, it may reduce real-time interaction and feedback—key components in teacher training, especially for language education that demands dynamic, communicative approaches (Thomas, 2011: 15).

At the tertiary level, English education must go beyond theoretical knowledge to include the practical and reflective aspects of teaching. Digital pedagogy supports this by enabling simulated teaching experiences through tools like video-based feedback, virtual classrooms, and collaborative online discussions (Bates, 2015: 61). Nonetheless, the lack of face-to-face interaction remains a limitation, as it may affect the depth of feedback and reduce opportunities for spontaneous pedagogical reflection (Clark, 2012: 35).

Previous studies (Bonk & Graham, 2012: 101) have highlighted that while digital pedagogy offers flexibility, it also demands intentional design to foster engagement and critical thinking. This research contributes to that body of knowledge by examining how digital pedagogy influences the development of teaching competences, especially in English language education.

The COVID-19 pandemic further accentuated the urgency of digital transformation in education. It exposed systemic vulnerabilities while also accelerating the adoption of digital tools in teaching. Muliadi, Mirawati, and Jannah (2021: 1) note that the rapid shift to online modalities required educational institutions to rethink delivery modes and learning objectives, particularly in teacher education.

Despite the convenience of digital platforms, issues such as digital literacy, interaction quality, and pedagogical readiness remain central concerns. As Sadikin and Hamidah (2020: 45) point out, the success of digital pedagogy depends not only on access but also on careful planning, training, and student-centered design.

This study seeks to evaluate the efficacy of digital pedagogy in the professional development of teaching competences among 4th-semester students in the English Education Study Program at Mandalika University of Education. By analyzing students' experiences and perceptions, the research aims to uncover how digital pedagogy contributes to core teaching skills such as lesson design, technology integration, and pedagogical communication. Ultimately, this study aspires to offer practical insights for enhancing curriculum design and instructional strategies in teacher education programs that increasingly rely on digital pedagogical frameworks.

2. RESEARCH METHODS

This study employed a quantitative approach using a survey research design to evaluate the efficacy of digital pedagogy in fostering the professional development of teaching competences. The target population consisted of all 4th semester students enrolled in the English Education Study Program, Faculty of Culture, Management, and Business, Mandalika University of Education. A total of 25 students were selected as the research sample.

Data were collected using a structured questionnaire consisting of 20 items, designed to assess key dimensions of teaching competences influenced by digital pedagogy. These dimensions included effective communication, integration of digital tools in instruction, and the ability to design and implement pedagogically sound teaching materials. The questionnaire employed a 5-point Likert scale to capture students' perceptions and self-assessed growth in these areas (Garrison & Vaughan, 2008: 44).

For data analysis, descriptive statistics were used to summarize students' responses and provide an overview of their experiences with digital pedagogy. Additionally, a paired sample t-test was conducted to identify statistically significant differences in competence levels before and after the implementation of digital pedagogy-based instruction (Johnson et al., 2013: 62). This analysis aimed to determine the measurable impact of digital pedagogical practices on students' professional teaching development.

3. RESEARCH RESULTS AND DISCUSSION

This study aims to evaluate the efficacy of digital pedagogy in enhancing the professional teaching competences of 4th semester students enrolled in the English Education Study Program at Mandalika University of Education. Based on data collected through a questionnaire distributed to 25 students, the findings reveal that while digital pedagogy offers numerous advantages, it also presents several challenges that need to be addressed to optimize its effectiveness. This section provides a detailed analysis of the questionnaire results, interprets the findings, and discusses their implications for teaching and learning in a digitally mediated environment.

Questionnaire Data Analysis

The questionnaire comprised 20 items designed to assess key areas of teaching competence development influenced by digital pedagogy. These areas included: (1) communication competence in digital settings, (2) integration of technological tools in instructional practice, and (3) the ability to design and implement effective teaching materials using digital platforms. Responses were recorded using a 5-point Likert scale, capturing students' perceptions of how digital pedagogy impacted their professional development as future educators.

The following analysis summarizes students' responses and highlights the strengths and limitations of digital pedagogy in shaping teaching competences.

Table 1: Questionnaire Results on Student Teaching Skills

Questionnaire Results on Teaching Competences in the Context of Digital Pedagogy

The results of the questionnaire provide insight into how students perceive the impact of digital pedagogy on the development of their teaching competences. The data are categorized into four key areas: digital communication competence, technological integration, instructional material design, and overall perceptions of digital pedagogy's effectiveness.

Aspect	Question	Student Response (%)	Interpretation
Digital Communication	To what extent has digital pedagogy enhanced your communication skills?	72% positive, 28% limited	Most students reported improved communication in digital settings, though some noted limitations due to reduced real-time feedback.
Technology Integration	Do you feel confident using digital tools for	68% comfortable,	A majority feel confident using digital platforms, but a notable portion still

	instructional purposes?	32% uncomfortable	struggles, likely due to infrastructure or digital literacy gaps.
Instructional Design	Has digital pedagogy helped you design effective teaching materials?	80% agree, 20% disagree	Most students found digital tools beneficial for instructional planning, although some felt limited by the absence of face-to-face consultation.
Overall Perception	How effective is digital pedagogy in developing your teaching competences?	60% "effective", 24% "moderate", 16% "low"	While the majority view digital pedagogy as beneficial, some students perceive its effectiveness to be limited without sufficient interaction and technical support.

The results of the questionnaire reveal important insights into students' perceptions regarding the role of digital pedagogy in developing their teaching competences. In terms of **technology integration**, 68% of students reported feeling comfortable using digital platforms for instructional purposes, such as communication, lesson delivery, and content sharing. This indicates a generally positive adaptation to technological tools in the learning environment. However, the remaining 32% experienced discomfort, which can be attributed to challenges like poor internet connectivity, insufficient access to devices, or lack of prior exposure to digital tools.

These findings highlight the necessity for better technological infrastructure and digital literacy training to support students in the professional use of educational technologies. In the aspect of **digital communication**, the majority of students (72%) stated that digital pedagogy enhanced their ability to communicate with instructors and peers, especially through asynchronous discussion forums and chat features on learning management systems. Nonetheless, 28% expressed concerns about reduced opportunities for direct interaction and immediate feedback, which are essential for pedagogical growth. This emphasizes that while digital tools can expand communication modes, they should be intentionally designed to simulate real-time, dialogic interaction whenever possible.

Regarding **instructional design and the application of teaching materials**, 80% of respondents found that digital pedagogy allowed them to be more flexible and structured in planning and preparing learning materials. They appreciated the ability to access resources anytime and create multimedia-based content. However, 20% of students reported difficulty in applying these materials effectively due to limited opportunities for live discussion and feedback. This illustrates the need for balanced approaches that integrate both digital tools and interactive, guided support to maximize the pedagogical value of instructional design activities.

Finally, when asked about their **overall perception of digital pedagogy's effectiveness**, 60% of students agreed that it was effective in enhancing their teaching competences, particularly in terms of autonomy, flexibility, and resource access. Meanwhile, 24% rated it as moderately effective, and 16% considered it less effective. This mixed response suggests that while digital pedagogy offers valuable opportunities for professional growth, its success heavily depends on factors such as instructional design quality, interaction intensity, and students' readiness to engage with digital learning environments.

These findings reinforce the importance of thoughtful implementation of digital pedagogy that goes beyond mere content delivery, aiming instead to support comprehensive professional development of future educators through active, reflective, and interactive learning processes.

4. CONCLUSIONS

This study aimed to evaluate the efficacy of digital pedagogy in supporting the professional development of teaching competences among fourth-semester students of the English Education Study Program at Mandalika University of Education. The results obtained through a structured questionnaire involving 25 participants indicate that digital pedagogy plays a significant role in fostering key teaching competences, such as instructional design, communication, and technological integration. Most students expressed positive experiences with the use of digital platforms, particularly in terms of learning flexibility and access to instructional resources. A substantial proportion (80%) agreed that digital tools facilitated the development of lesson plans and teaching materials, while 68% felt confident in using technology to support communication and instruction.

Furthermore, digital pedagogy was found to enhance students' independence and responsibility in managing their learning processes. The flexibility offered by digital platforms allowed students to organize their schedules and engage with learning content at their own pace. This level of autonomy is essential for future educators, as it nurtures self-regulation and proactive behavior in professional teaching contexts. However, despite these advantages, several challenges were identified. Some students (32%) encountered technical difficulties such as poor internet connectivity and limited access to digital devices, which hampered their participation and performance. In addition, 28% of the participants noted that limited real-time interaction and the lack of immediate feedback reduced the depth of their learning experiences.

In terms of overall perception, while 60% of students viewed digital pedagogy as effective in enhancing their teaching competences, others expressed mixed opinions—highlighting the importance of improving both the infrastructure and pedagogical design of digital learning environments. These findings suggest that for digital pedagogy to be truly effective, it must be supported by stable technology, continuous training in digital literacy, and instructional strategies that emphasize interaction, reflection, and feedback.

In conclusion, digital pedagogy presents a promising approach to teacher education in the 21st century, offering valuable opportunities for competence development through innovative and flexible learning experiences. Nevertheless, its successful implementation requires strategic planning, adequate resources, and a balanced integration of human-centered instructional methods. By addressing the challenges and enhancing the strengths, digital pedagogy can serve as a transformative force in preparing competent, reflective, and digitally fluent educators for the future of education.

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