



Integrating Technology in Microteaching: Pre-Service EFL Teachers' Digital Pedagogical Development

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ABSTRACT

This study investigates the ways pre-service EFL teachers can achieve digital pedagogical competence through technology-integrated microteaching. Based on the increasing relevance of digital skills in teacher formation, this study aims to verify how microteaching enables technological integration and which factors condition this expansion. This study used a qualitative case study design with 23 pre-service EFL teachers at Universitas Pancasakti Tegal. Data were gathered through reflective journals, semi-structured interviews, classroom observations, videotaping and teaching documents and analysed with thematic analysis. The findings suggest a gradual development in participants' digital pedagogical awareness from merely using technology towards more pedagogically purposeful integrators. Also, technology use increased creativity in teaching and provided opportunities for building confidence through practice and reflection. Nonetheless, this development was affected by multiple elements such as technological hurdles, commentary from peers and lecturers, cooperative learning, and institutional assistance. The finding also shows the cognitive, emotional, social and contextual dimensions that shapes the digital

pedagogical competences. It suggests that microteaching creates a productive space for reflective and experiential learning on the topic of technology integration, and that teacher education programs should create supportive environments to further develop pre-service teachers' digital competence.

Keywords: digital pedagogy, microteaching, pre-service EFL teachers, technology integration

Introduction

Digital technology has transformed pedagogical practices, and much so, even in English language teaching. Consequently, teachers in a modern classroom are not just expected to have a strong pedagogical knowledge base but also the capability to use technology as part of their teaching. This change reflects the growing recognition that digital competence is an essential component of teacher professionalism in the 21st century. Technology integration in education helps students actively participate in their own learning and has access to a plethora of educational materials (Nashrullah et al., 2025; Salama & Eriyanti, 2025). Henceforth the upsurge of pre-service teachers' digital pedagogical competencies is a concern and key driver in teacher education programs. Consequently, it has become an important goal to prepare future teachers of English as a foreign language (EFL) for the use of technology in meaningful ways.

However, making such a demand turns microteaching from the traditional practice catering into technology-oriented learning environment. Microteaching provides a regulated setting for pre-service teachers to rehearse teaching techniques through scaled-down teaching sessions (Lindanatalia et al., 2025; Sezaki et al., 2023). The introduction of digital/technology, e.g., presentation software, learning management systems, or video-based platforms that can now be used for the purpose of microteaching has also brought the focus to both pedagogical and technological competencies. Technology also allows us to reflect more fully through video than any other form of giving and share more widely across digital platforms (Wu & Lee, 2024). Therefore, microteaching provides a proper platform for investigating the growth of pre-service teachers' digital pedagogical skills.

This characterisation of digital pedagogical development reflects teachers' competence in integrating the technology and pedagogy in ways that benefit teaching and learning (Yuvita et al., 2025). This is closely tied with models like TPACK which emphasizes this balance of technology and knowledge. Digital pedagogy refers to the process of choosing and implementing technology that underpin language learning outcomes such as developing communication skills, encouraging interaction and providing authentic experiences for EFL learners (Ye et al., 2024). But creating those competencies is not easy; it is a process that demands not only technical skills, but also critical and reflective thought. Hence, there is a dire need for structured opportunities for pre-service teachers to experiment technology integration into their teaching practices and reflect on that.

While the incorporation of technology in education is gaining importance, earlier studies have focused on either teachers' overall digital competence or on the efficacy of specific

technological tools as aids for language learning (Lindanatalia et al., 2025; Wu & Lee, 2024). These studies are needed as they provide important understanding, but for practice-based experiences such as microteaching to develop these digital pedagogical skills is not often considered. In addition, there is also the quantitative nature of many existing studies which may not provide a comprehensive picture regarding pre-service teachers and their learning situation (Maiier & Koval, 2021; Taherkhani & Ghaleei, 2024). Having said that, while there has been research on the use of technology in teacher education, determining how microteaching experiences enable pre-service EFL teachers to negotiate their digital pedagogy is still an under-explored area. It indicates an ignorance of the nature of encounters that are involved in gleaning, gazing, and dwelling: how they each play a role in determining digital pedagogies for oneself (Lu et al., 2025).

Moreover, the context of private universities presents unique opportunities and challenges that influence the role of technology in teacher education. Pre-service teachers from different countries may have varying access to technology and use of digital resources, given the disparities in technological infrastructure and institutional support, which could impact their use of technology during microteaching (Mafulah & Febrianti, 2025). Additionally, students' prior experience with digital tools and attitudes toward technology are factors that affect how they approach their learning. However, there is a dearth of research that directly examines digital pedagogical development in such highly contextualised institutional settings. Thus, understanding these contextual forces is vital to designing and implementing appropriate teacher development programs. Therefore, in this study the perception of private university pre service teachers will be highlights tech-enhanced microteaching.

Thus, the study aims to explore how pre-service EFL teachers' digital pedagogical development is enhanced in microteaching through technology integration. The research in this study uses qualitative approach, which seeks to explore and understand participants lived experiences and meaningful actions as well as challenges of using digital tools while performing their teaching practice. Additionally, it aspires to find out what supports or inhibits digital pedagogy in microteaching contexts. In so doing, the study extends the existing body of knowledge about technology integration in teacher education in general and EFL contexts in particular. Its results are hoped, in the long run, to provide an input for emerging good practices which will lead to training digital competent English teachers. Thus, this study is guided by the following research questions: (1) How do technology-enhanced microteaching activities support pre-service EFL teachers in building their digital pedagogical competence?, and (2) What elements affect the growth of digital pedagogical competence among pre-service EFL teachers in technology-based microteaching environments?

Methodology

The present study used qualitative research design to investigate how pre-service EFL teachers enhance their digital pedagogical competence. A qualitative approach was deemed appropriate as the study sought to gain a deeper understanding of participants' experiences, perceptions, and meaning-making processes. Qualitative research is suitable to investigate complex phenomena in their natural context and understand how people create meaning from

their experiences (Creswell & Creswell, 2017) . Based on this view, the current study followed a qualitative case study design investigating bounded group of pre-service teachers partaking in one particular microteaching course.

The participants in this study were participants in the, 23 pre-service EFL teachers enrolled in English Language Education program at Universitas Pancasakti Tegal, Indonesia. They were in their 3rd or 4th year of study and undertaking a microteaching course where they had to incorporate digital tools into their teaching practice. In this study, the participants were select through purposive sampling since they have appropriate experience in technology-enhanced microteaching. This deliberate effort of qualitative sampling ensured that the data collected in the study were rich in information and directly relevant to the study objectives. Furthermore, the study was conducted within microteaching classrooms that incorporated various digital technologies. Participants were required to design lesson plans integrating tools such as presentation software, video-based platforms, online quizzes, and learning management systems. The microteaching sessions involved teaching demonstrations, peer observation, and feedback activities. Furthermore, the private university context provided a unique setting where access to technology, institutional support, and digital literacy levels varied among participants. These contextual factors played an important role in shaping participants' digital pedagogical development.

A variety of qualitative data collection tools were used to gain a holistic perspective on participants' digital pedagogical growth. The former was reflective journals in which participants shared their reflections about integrating technology into microteaching on a continuous basis. The journals shed light on their thought processes, challenges, and the decision-making involved in teaching strategies. Second, semi-structured interviews were conducted to explore participants' perceptions and experiences in greater depth. The interview protocol included open-ended questions focusing on participants' use of digital tools, their confidence in integrating technology, and the factors influencing their pedagogical choices. Third, classroom observations were conducted in the context of microteaching to record how participants used technology in their instruction. Observation notes (with emphasis on pedagogy, engagement, and a toolkit of digital resources) were also used. In addition, microteaching sessions were video-recorded so as to allow thorough analysis and repeated viewing of teachers' practices. Finally, to triangulate the data, other documents relevant to the study such as lesson plans, digital teaching materials and peer feedback forms were analyzed. The use of multiple instruments allowed for a more thorough, credible understanding of the phenomenon.

The data collection process was conducted over one academic semester and followed a systematic and iterative procedure. Initially, participants were briefed about the study and provided informed consent. They were then asked to write initial reflective journal entries describing their prior experiences and perceptions of using technology in teaching. Following this, participants engaged in a series of technology-integrated microteaching sessions. Each session involved lesson planning, teaching performance, and feedback. During the teaching sessions, the researcher conducted non-participant observations and recorded the activities using video. After each session, participants completed reflective journals focusing on their use of technology, challenges encountered, and perceived improvements. Furthermore, midway

through and at the end of the semester, semi-structured interviews were conducted with selected participants to gain deeper insights into their digital pedagogical development. These interviews were audio-recorded and transcribed verbatim. In addition, lesson plans and digital teaching materials were collected throughout the study. The iterative nature of data collection allowed the researcher to continuously refine the focus and capture the evolving nature of participants' experiences.

The data analysis in this study was conducted using a rigorous and systematic thematic analysis approach to capture the complexity of pre-service EFL teachers' digital pedagogical development. The process began with data familiarization, in which the researcher immersed themselves in the data by repeatedly reading reflective journals, interview transcripts, observation notes, and reviewing video recordings. This stage was essential to gain a holistic understanding of participants' experiences and to identify initial impressions related to technology integration and pedagogical decision-making. During this phase, the researcher also wrote preliminary analytic memos to record emerging ideas and reflections.

Following familiarization, the analysis proceeded to the initial coding stage, where meaningful units of data were identified and labeled. Coding was conducted inductively, meaning that codes were derived directly from the data rather than being predetermined. Segments of text that reflected participants' experiences with digital tools, challenges in integrating technology, instructional strategies, and reflections on teaching were carefully examined and assigned descriptive codes. For example, excerpts describing difficulties in using digital platforms were coded as technological challenges, while those highlighting innovative teaching practices were coded as creative technology integration. This open coding process allowed for a detailed and nuanced representation of the data.

After generating initial codes, the researcher engaged in categorization, where similar or related codes were grouped into broader categories. This stage involved constant comparison across different data sources to identify patterns and relationships. For instance, codes such as difficulty managing time with technology, technical issues during teaching, and lack of familiarity with tools were clustered under a broader category of barriers to digital pedagogy. At the same time, codes related to increased student engagement, interactive activities, and effective use of multimedia were grouped under perceived benefits of technology integration*. This process helped to organize the data into meaningful clusters that reflected key aspects of participants' experiences.

Subsequently, these categories were further refined into themes which represented overarching patterns in the data. Themes were developed by identifying connections among categories and interpreting their significance in relation to the research questions. For example, categories related to experimentation, reflection, and adaptation were synthesized into a theme such as developing digital pedagogical awareness. The researcher ensured that each theme was coherent internally and distinct from others, thereby enhancing analytical clarity. Additionally, themes were continuously reviewed and revised to ensure they accurately represented the data.

To enhance the depth and credibility of the analysis, the researcher employed a constant comparative method, where data from different sources (e.g., journals, interviews, observations) were compared and contrasted. This approach allowed for triangulation and

helped validate the consistency of findings across multiple perspectives. Furthermore, the researcher revisited the raw data multiple times to ensure that interpretations were grounded in participants' actual experiences. Negative or discrepant cases were also examined to provide a more balanced and comprehensive understanding of the phenomenon.

Finally, the researcher engaged in interpretation and meaning-making, where the themes were linked to existing theoretical frameworks, such as digital pedagogy and technology integration in language teaching. This stage involved explaining how and why certain patterns emerged and what they reveal about pre-service teachers' learning processes. The findings were then presented with representative excerpts from participants to illustrate each theme and provide authentic evidence. Through this systematic and iterative process, the data analysis generated rich, credible, and insightful findings that address the research objectives.

Findings

This section presents the findings of the study, focusing on how pre-service EFL teachers developed their digital pedagogical competence through technology-integrated microteaching and the factors influencing this development. The analysis is based on reflective journals, interviews, classroom observations, and teaching documents. Through thematic analysis, several key themes and sub-themes emerged, illustrating participants' experiences and meaning-making processes.

Development of Digital Pedagogical Competence through Microteaching

Developing Digital Pedagogical Awareness

One major finding indicates that participants gradually developed awareness of how technology can be meaningfully integrated into teaching. Initially, many participants used digital tools in a limited way, mainly for presenting content. However, through microteaching and reflection, they began to align technology use with pedagogical purposes, such as enhancing interaction and comprehension.

"At first, I only used PowerPoint to explain the material, but after feedback, I tried to use interactive quizzes so students can participate more." (R2_SSI)

"I realized that technology should not only make the lesson interesting but also help students understand better." (R8_SSI)

"When I used videos, I saw that students were more engaged, so I started to think about how to use media effectively." (R11_SSI)

"Now I plan my lesson by thinking what technology fits the objective, not just what tools I know." (R21_SSI)

These findings suggest a shift from basic technological use to more pedagogically informed integration. This means that pre-service teachers moved beyond simply using technology as a tool for delivering content and began to consider how it could actively support learning objectives, student engagement, and interaction. In other words, their use of technology became more intentional and aligned with instructional goals rather than being driven by convenience or familiarity (Belda-Medina, 2021). Furthermore, this shift reflects a deeper understanding of the relationship between technology, pedagogy, and content, where digital tools are selected based on their potential to enhance specific aspects of language learning.

Enhancing Teaching Creativity through Digital Tools

Participants also became more innovative in crafting and executing lessons with digital tools. Microteaching offered them an opportunity to experiment with different applications and pedagogy for what they learned, thus creating more engaging learning experiences. Interviews reveal that technology integration inspired innovative teaching practices. Participants used digital resources not only to share information, but also to engage students in lessons using visuals, multimedia and task-based resources. As they adjusted their plans in response to feedback, they also felt more willing to experiment with new ideas and adapt materials to students' needs. The robust pedagogical goals strengthening the students over time with this process made nuggets of creative tool selection paving a way to richer, student-centered instruction.

"I tried using online games, and it made the class more fun and interactive compared to just explaining." (R5_SSI)

"I combined videos, quizzes, and discussion, so students were not bored during my teaching." (R14_SSI)

"Using digital tools pushed me to be more creative in designing activities. (R22_SSI)

"I feel more confident to try new ideas because microteaching is a safe place to experiment." (R23_SSI)

Building Confidence in Technology Integration

A significant finding is the growth of participants' confidence in using technology for their teaching. The initial uncertainty and lack of technical skills gave way to increasing confidence through repeated practice and feedback. Through planning and delivering technology-supported lessons in microteaching participants increasingly came to understand how they could choose suitable tools, and embed these tools into learning (tasks). They also learned to troubleshoot minor technical issues and adapt their teaching immediately, something that helped alleviate anxiety in the classroom.

“At first, I was afraid something would go wrong with the technology, but after several practices, I became more confident.” (R1_SSI)

“Now I feel more comfortable using digital tools in my teaching.” (R13_SSI)

“I used to avoid using technology, but microteaching helped me try and learn step by step.” (R15_SSI)

“I am more confident because I know how to prepare and handle technical problems.” (R20_SSI)

Further, feedback from peers and instructors were not only reassuring in terms of affirming the hypothesis of engaging students digitally but also demonstrating practical means of improving both technical usage as well as pedagogic efficacy. As their digital confidence grew, participants began to take a greater role in shaping what was happening in those spaces, trying new things and seeing technology as an integral component of their pedagogical practice rather than a hindrance. This finding shows that confidence develops gradually through experience and practice.

Factors Influencing Digital Pedagogical Development

Technological Challenges and Limitations

Participants reported a range of challenges associated with technology use during microteaching. These challenges were consistently described as including technical problems, limited proficiency with digital tools, and insufficient time to prepare lessons effectively. In several cases, the difficulties were not limited to practical barriers; they also produced emotional consequences that interfered with instructional delivery. Participants noted that unstable technological conditions sometimes disrupted planned teaching activities, reduced instructional control, and increased anxiety during teaching sessions. For example, Respondent 3 associated interruptions in teaching with unreliable internet connectivity, indicating that infrastructure instability can directly interrupt pedagogical flow and undermine teaching effectiveness.

“Sometimes the internet connection was unstable, and it disturbed my teaching.” (R3_SSI)

Respondent 10 emphasized that technology use required additional preparation time, suggesting that preparation demands may limit pre-service teachers’ ability to plan and rehearse adequately, particularly under time pressure.

“I needed more time to prepare because using technology is not easy” R10_SSI)

Participants also reported that limited familiarity with specific tools contributed to confusion during real-time instruction. This confusion reflects not only a skills gap but

also the challenge of managing instructional tasks while simultaneously operating unfamiliar technological features.

“I was not familiar with some tools, so I felt confused during my teaching.” (R1_SSI)

Furthermore, participants described technical difficulties as a trigger for performance anxiety, particularly when they feared that technology failures might negatively affect their teaching performance. Such accounts suggest that anxiety may intensify the perceived risk of instructional disruption and reduce teaching confidence.

“Technical problems made me nervous because I was afraid it would affect my performance” (R15_SSI)

Collectively, these findings highlight the necessity for improved technological support and more systematic training. The data suggest that effective technology integration in teacher education requires not only access to tools and reliable connectivity, but also structured technical preparation, guided practice, and sufficient time for pre-service teachers to develop competence and confidence before microteaching.

The Role of Feedback in Improving Digital Pedagogy

Peer and lecturer feedback was reported as a key mechanism by which participants advance their digital pedagogy. Feedback also prompted reflective practice, allowing participants to critically assess their teaching decisions and weaknesses and making targeted changes during successive microteaching experiences. These accounts reveal how feedback served practice-critical functions as a form of evaluative information and practical guidance to inform technology-related pedagogical planning based upon objectives related to both the selection of appropriate digital tools, but also surrounding more interactive learning designs for achieving shared teaching aims. Peer feedback was noted to be especially helpful in identifying specific areas for instructional improvements. For example, Respondent 7 reported that peer recommendations supported improvement through the adoption of interactive tools, stating that peer input helped them enhance their teaching effectiveness.

“My friends suggested using more interactive tools, and it helped me improve my teaching.” (R7_SSI)

Lecturer feedback was portrayed as essential for developing pedagogical alignment between technology use and learning objectives. Respondent 16 specifically emphasized that expert feedback helped them recognize the need to connect technological choices with instructional aims.

“The lecturer’s feedback made me realize that I need to connect technology with my objectives.” (R16_SSI)

Participants also described feedback as a means of clarifying which instructional strategies were effective and which were not, thereby supporting more informed decision-making in later teaching. Respondent 21 noted that feedback helped them differentiate successful practices from ineffective ones.

“Feedback helped me see what worked and what didn’t.” (R21_SSI)

Furthermore, participants linked the receipt of peer suggestions to measurable instructional improvement outcomes. Respondent 23 stated that after receiving recommendations from peers, they improved their teaching performance in subsequent practice.

“I improved my teaching after receiving suggestions from my peers.” (R23_SSI)

Peer Learning and Collaborative Support

Peer interaction emerged as a cornerstone of the participants’ learning process, serving as both a source of technical knowledge and a psychological buffer against the challenges of adopting new tools. The findings suggest that learning is rarely an isolated event; rather, it is a socially mediated experience where observing colleagues and engaging in shared reflections lead to a measurable increase in self-efficacy.

“I learned many new tools from my friends’ teaching.” (R4_SSI)

“Watching others helped me understand how to use technology better.” (R12_SSI)

“We discussed and shared ideas, which helped me improve my lesson.” (R17_SSI)

“Peer support made me feel more confident to try new tools.” (R20_SSI)

Through collaborative exchanges, participants were able to bridge gaps in their own expertise by tapping into the collective knowledge of the group. This social dynamic fostered a "safe-to-fail" environment, where the visibility of a peer’s success served as a powerful motivator for others to experiment with similar pedagogical strategies.

These findings highlight that a collaborative learning environment does more than just transmit information; it validates the learner’s journey. When educators move from solitary practice to peer-supported exploration, the transition to new technologies becomes less daunting and more integrated into their professional identity.

2.4 Institutional and Contextual Support

Finally, institutional factors such as access to technology, lecturer guidance, and classroom facilities influenced participants’ experiences. Supportive environments facilitated better integration of digital tools.

“The facilities provided by the campus helped me use technology in my teaching.” (R2_SSI)

“Lecturer guidance was important because it gave clear direction.” (R9_SSI)

“Having access to digital tools made it easier to prepare my lesson.” ((R23_SSI)

These findings indicate that contextual support plays a key role in shaping digital pedagogical development.

Overall, the findings reveal that digital pedagogical development is a dynamic process shaped by both individual learning experiences and external factors. Through microteaching, pre-service EFL teachers developed awareness, creativity, and confidence in integrating technology, while also navigating challenges and benefiting from feedback and social interaction. These results provide a comprehensive understanding of how digital pedagogy is constructed in microteaching contexts.

Discussion

The results of this study show that integrating technology into the microteaching process is a key factor in helping pre-service EFL teachers develop their digital pedagogical competence. This Digital Pedagogical Awareness, particularly has moved from technology being viewed as merely an enhancement tool to a central and fundamental part of teaching and learning. Using Hammer’s technology adoption continuum, while participants initially adopted a limited approach in using technology and were mostly focused on delivery of content in their early initiatives, with continued approaches to practice and reflection they moved towards consideration of pedagogical purpose for which digital tools were used. This development shows that digital competences cannot be reduced to technical skills but are fundamentally a pedagogical phenomenon. In addition, the discovery reinforces the concept that effective incorporation of technology must be founded in a knowledge of how technology can facilitate learning. Thus, microteaching is an opportunity to develop this self-awareness in that it allows the pre-service teacher to practice and reflect in a controlled environment (Akayoglu et al., 2020; Hartini et al., 2025). The study thus reaffirms the need for integrating digital-age pedagogy explicitly within teacher education programmes.

Moreover, the use of digital tools to enhance teaching creativity exemplifies how technology can broaden pedagogical possibilities. Our participants stated they tried a range of tools, (e.g. videos, online quizzes and interactive platforms) to make their lessons engaging. These results hint that technology inclusion also leads to flexibility, encourages creativity with pedagogy. In fact, by trailing creative concepts in a low stakes microteaching situation, participants could experiment with a range of methods without the fear of failing. As a result, their blossoming digital pedagogy validated creativity in the learning experience. This is consistent with wider views in language education that highlights the influence of technology to foster more collaborative and learner-centred pedagogy (Coşgun, 2024; Erdemir &

Yeşilçınar, 2021). Hence including digital tools in microteaching not only brings engagement but also fosters pedagogical innovation among pre service teachers.

In terms of confidence development, findings were consistent with prior research showing that repetition and long-term use of a technology-based tool can improve teacher self-efficacy. Participants' initial anxiety followed by a gradual increase in confidence mirrors patterns often found in research on the development of digital competences. Yet this study takes a veered from some previous work in that it foregrounds the interplay of emotional experiences and pedagogical development. Previous research generally has examined skill acquisition, whereas the current study finds that confidence is facilitated by opportunities to practice, receive feedback, and have peer support in microteaching environments (Humairoh et al., 2025; Mafulah & Febrianti, 2025). This indicates that readiness to be emotional is no less a factor in building digital pedagogy than technical ability. Therefore, this study contributes to literature on technology integration in teacher education through the addition of affective dimensions.

While positive outcomes were found, the study also captured significant technology-related challenges consistent with issues appearing in the broader literature (limited infrastructure resources, technical barriers and digital literacy constraints). The results of the present study resonate with literature that highlights the critical role institutional support plays in enabling successful technology integration. But this study does more, by demonstrating how these challenges are encountered in situated teaching practice and how they shape teaching pedagogical decisions. In contrast to studies considering barriers as purely external constraints, this study sheds light on the active negotiation and adaptation of pre-service teachers toward these challenges in the context of microteaching (Lee et al., 2023; Prastikawati et al., 2025). Thus, the study offers a more situated view of technological barriers, signifying that they are part of not only the hurdles but also the learning process described in hindsight.

Another finding that resonates with existing research centered on feedback as a valuable component of teacher development is the value of feedback in improving digital pedagogy. Like previous studies (Taghizadeh & Basirat, 2024; Ye et al., 2024), feedback in this study allowed participants to improve their teaching practices and align technology to learning objectives. But this study adds new insights on how feedback specifically influences digital pedagogical choices, rather than general teaching performance. It suggests that interventions focused on the use of technology offer role-specific feedback through these development areas and could speed up more effective and reflective ways of teaching. The study thus adds to the existing body of research by providing evidence on specificity of feedback in supporting digital pedagogy rather than categorizing it as a generic instructional tool.

Likewise, the recognized significance of peer learning and collaboration advocates for sociocultural views on how teachers learn, which place a premium on social cognition in knowledge building. Participants gained insights from peers, shared ideas, and worked together to problem-solve technology issues. This finding is aligned with previous findings from research into collaborative learning in teacher education (Lindanatalia et al., 2025; Yuvita et al., 2025). But, the current investigation greatly enriches this literature by demonstrating how interaction among peers offers exposure to a range of different digital tools

and solutions bringing about expansion and diversification of participants' pedagogical repertoire. Unlike the dominant studies that treat digital pedagogical competence either as an individual (re)action or as an isolated process of innovation, this research highlights the collective side of such change. Thus, it emphasizes the importance of designing microteaching environments that encourage collaboration and co-learning.

Finally, the findings from this study demonstrate that digital pedagogical development is a complicated and fluid process interacting between cognitive, emotional, social and contextual dimensions. This allows pre-service teachers the opportunity of developing their competence in a holistic manner as microteaching is one such improvised workshop model which combines all these dimensions seamlessly. Additionally, the study contributes to existing literature by emphasizing the experiential and reflective nature of technology integration in teacher education (Wu & Lee, 2024). Furthermore, it fills a niche in the research literature by attending to the ways in which digital pedagogy is constructed through microteaching practices as opposed to simply measuring tools or technology. This paper thus adds a clearer understanding on how pre-service teachers learn to infuse technology in an effective manner.

Conclusion

This study concludes that integrating technology into microteaching plays a significant role in fostering the digital pedagogical development of pre-service EFL teachers. The findings reveal that participants progressed from basic use of digital tools toward more intentional, pedagogically driven integration, demonstrating increased awareness, creativity, and confidence in using technology for teaching. Moreover, the study highlights that digital pedagogical competence is not developed solely through technical exposure but through a dynamic process involving reflection, feedback, peer collaboration, and contextual support. Microteaching, therefore, serves as a meaningful space where pre-service teachers can experiment with technology, evaluate their practices, and gradually construct their digital teaching competence (Erdemir & Yeşilçınar, 2021).

However, this study is limited by its focus on a specific group of participants within a particular institutional context, which may limit the generalizability of the findings. Additionally, the reliance on qualitative data may not fully capture measurable changes in digital competence over time. Therefore, future research is recommended to involve more diverse contexts, adopt mixed-methods or longitudinal designs, and examine additional factors such as digital self-efficacy, technological readiness, and the impact of specific digital tools. Further studies could also explore how digital pedagogical skills developed in microteaching transfer to real classroom teaching. Overall, this study underscores the importance of systematically integrating technology into microteaching to better prepare pre-service EFL teachers for the demands of digital-era education.

Declaration of AI and AI assisted technologies in the writing process

During the preparation of this work the author(s) used GRAMMARLY in order to fix the grammar mistakes in the article. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

Authorship Contribution Statement

Yuvita Yuvita: led the study by formulating the research idea, designing the study, collecting and analyzing the data, and preparing the initial draft of the manuscript. **Miasnikova Kseniia:** played a key role in refining the research design, supporting the data analysis process, and providing substantial revisions to strengthen the academic quality of the paper. **Maria Yosephin Widarti Lestari:** contributed to reviewing relevant literature, assisting in interpreting the findings, and editing the manuscript for clarity and coherence.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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