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EFL PRESERVICE TEACHER AGENCY IN DIGITAL TECHNOLOGY INTEGRATION DURING THE TEACHING PRACTICUM: AN ECOLOGICAL CASE STUDY

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Abstract: This study explored how EFL preservice teachers integrated digital technologies during their teaching practicum and how teacher agency was shaped by past experiences, current conditions, and future goals. Drawing on the ecological approach to teacher agency, the study employed a qualitative case study of five EFL preservice teachers who undertook a three-month practicum at a junior high school in Jakarta, Indonesia. Data included five lesson plans, ten recorded classroom practices, and semi-structured interviews. Technology-mediated activities were analyzed using the SAMR model, learning objectives using Bloom's Taxonomy, and interview, observation, and document data through the three dimensions of the ecological model of teacher agency. The findings showed that technology integration was mainly at the Substitution and Augmentation levels. Alignment between technology-mediated activities and stated learning objectives varied across lessons. EFL preservice teachers' agency in integrating technology was shaped by familiar digital experiences, material and school conditions, and future professional aspirations. Agency was particularly evident when they adapted the technology in response to students' access to devices, internet connectivity, and other contextual conditions. The study indicates that technology-enhanced teaching practices and teacher agency are related but not equivalent. The findings highlight the importance of preparing preservice teachers to make purposeful, justified, and contextual decisions about technology integration during practicum and in their future professional teaching contexts in English language education settings.
Keywords: *ecological approach; SAMR model; teacher agency; teaching practicum; technology integration*

INTRODUCTION

Digital technology has become increasingly integrated into English language teaching. It creates opportunities for teachers to select and use digital tools that support instructional goals (Baako & Abroampa, 2023; Cao et al., 2023; Hasumi & Chiu, 2024). When used appropriately, digital technology has been found to support differentiated instruction, foster interactive learning, and broaden students' access to diverse learning resources (Hebibi et al., 2026; Merta et al., 2023; Panakaje et al., 2024; Rintaningrum, 2023). However, these benefits depend on how teachers select and adapt technologies to meet learning objectives and address instructional challenges (Cao et al., 2023; Jie & Sunze, 2023). In Indonesia, technology integration has gained particular relevance amid the implementation of the national curriculum, the *Kurikulum Merdeka*, which encourages flexibility and innovation in teaching practices (Ellen & Sudimantara, 2023; Emawati et al., 2024; Reza et al., 2023; Rohmah et al., 2024). For EFL preservice teachers, integrating technology during the teaching process involves both technological knowledge and pedagogical decision-making within the opportunities and constraints of actual school contexts.

Previous studies have approached preservice teachers' technology integration from different perspectives. Research on teachers' experiences and perceptions indicates a generally positive attitude toward digital technology and familiarity with various tools (Salim et al., 2023; Lu et al., 2025). However, studies examining classroom

practice suggest that technological familiarity does not necessarily translate into meaningful pedagogical integration. For example, Boonmoh & Kulavichian (2023) used the SAMR model to examine how preservice teachers integrated technology into instructional activities, highlighting its frequent use to support existing teaching practices rather than substantially transforming learning tasks. Research on digital competence similarly identifies difficulties in connecting technological skills with pedagogical problem-solving (Zhang et al., 2026). Research in EFL teacher education has underscored the role of pedagogical reasoning in designing technology-enhanced lessons (Hebibi et al., 2026), preparing teachers (Mandasari et al., 2025), and teaching language skills (Williyan et al., 2025). In Indonesia, Darsih et al. (2025) and Limbong et al. (2024) further highlight challenges in translating technological knowledge into effective teaching practices. These studies suggest that the central issue is not merely whether EFL preservice teachers can use digital technology, but how they connect technology choices with pedagogical purposes and intended learning outcomes.

Technology integration is also influenced by the conditions in which teaching occurs. Previous studies have identified challenges involving limited technological resources, institutional support, insufficient pedagogical and technological knowledge, internet connectivity, access to devices, and teachers' confidence and experience (Cao et al., 2023; Herdina & Ningrum, 2023; Jie & Sunze, 2023; Ridha & Fithriani, 2023; Sabourianzadeh & Ahmadi, 2023). These challenges become particularly relevant during the teaching practicum, when EFL preservice teachers move from university-based preparation to actual classroom teaching and must negotiate their instructional intentions with curriculum requirements, student needs, available resources, and school expectations (Çelik & Topkaya, 2024; Daud et al., 2025; Heinz, 2024; Pu & Wright, 2026; Purwasih et al., 2025; Su, 2026). Consequently, the practicum provides an important context for examining technology integration, as the application of technological competence and as a process of making and adapting pedagogical decisions within particular teaching conditions.

Teacher agency provides a useful lens for examining how EFL preservice teachers make and negotiate pedagogical decisions regarding technology integration. From an ecological perspective, agency is achieved through interactions between individuals and the conditions of teaching environments (Priestley et al., 2026). Recent studies have investigated technology-related teacher agency through different theoretical and methodological approaches. (Hu & Shen, 2024) examined teacher agency in online foreign language teaching at the university level, identifying multiple teaching roles associated with technology-mediated instruction. Focusing on preservice teachers, Lopez-Paez (2024) employed a qualitative case study and demonstrated how EFL preservice teachers exercised agency by adapting digital resources to learners' needs while negotiating technological and institutional constraints. Similarly, Vafayi & Meihami (2024) used narrative inquiry to examine the development of professional agency through TPACK-based teacher preparation, highlighting pedagogical decision-making, technological knowledge, and professional voice. In the Indonesian context, Williyan et al. (2025) conducted a phenomenological study of EFL teachers' deliberate agency in ICT-supported writing instruction, emphasizing reflective and contextual pedagogical decisions. More recently, Ho (2026) employed an ecological multiple-case study involving three Vietnamese EFL teachers, demonstrating how past experiences, present teaching conditions, and future aspirations shaped their technology-related practices. These studies establish that teacher agency in technology integration involves professional judgment, contextual negotiation, and adaptive pedagogical practices. However, the existing research contexts and analytical emphases leave room for examining how EFL preservice teachers exercise technology-related agency during face-to-face, school-based teaching practicum. In particular, the relationship between the ecological achievement of agency, levels of technology integration, and alignment with intended learning objectives remains insufficiently examined within a single analytical framework, particularly in the Indonesian EFL context.

To address this gap, the present study adopts the ecological approach to teacher agency (Priestley et al., 2026) as its primary theoretical lens. This approach conceptualized agency through three interrelated temporal dimensions: the iterational dimension, concerning prior experiences and patterns of action; the practical-evaluative dimension, concerning judgments and actions within present cultural, structural, and material conditions; and the projective dimension, concerning short- and long-term professional aspirations. Rather than treating agency as an

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individual attribute, this perspective enables an examination of how preservice teachers draw on their experiences, evaluate available possibilities and constraints, and consider future goals when making technology-related pedagogical decisions. The ecological model of teacher agency is illustrated in Figure 1, adapted from (Priestley et al., 2026).

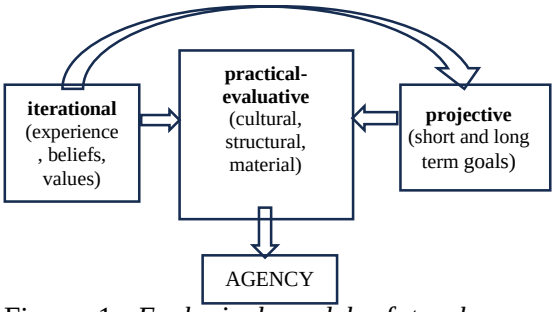

Figure 1. *Ecological model of teacher agency (adapted from Priestley et al., 2026)*

Two complementary analytical frameworks are also employed. The SAMR model (Puentedura, 2014), as illustrated in Figure 2, is used to characterize how digital technology functions within instructional activities. Previous studies have applied this model to examine technology integration in English language contexts (Alshammari, 2026; Boonmoh & Kulavichian, 2023; Hoang, 2024; Muslimin et al., 2023; Nuraeni et al., 2025). Meanwhile, Bloom's Revised Taxonomy (Krathwohl, 2002) is used to identify the cognitive demands represented in the stated learning objectives. Although these frameworks address different aspects of teaching, their combined use enables an examination of how technology functions within instructional activities and whether those activities provide opportunities for students to achieve the intended learning objectives. Together with the ecological approach to teacher agency (Priestley et al., 2026), they support an analysis that distinguishes among technology integration, pedagogical alignment, and teacher agency.

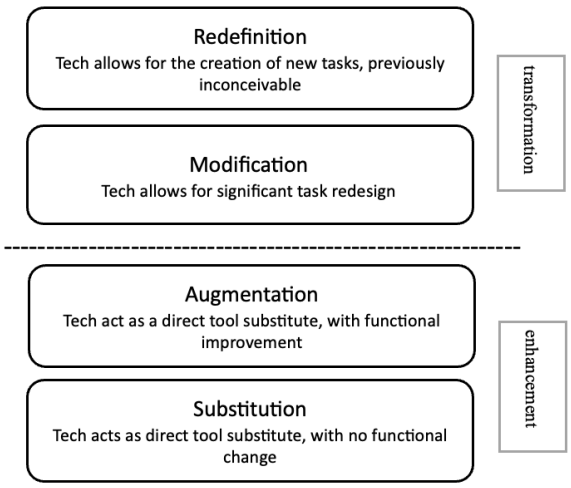

Figure 2. *SAMR model (adapted from (Puentedura, 2014)*

Accordingly, this study explores EFL preservice teachers' technology integration and teacher agency during a school-based teaching practicum in Indonesia. It addresses two research questions: 1) How do EFL preservice teachers integrate digital technologies into their instructional activities and align them with learning objectives during the practicum? 2) How do past experiences, teaching conditions, and future goals shape EFL preservice teacher agency in technology integration during the teaching practicum? The distinct contribution of this study is the combination of an ecological perspective on teacher agency with the SAMR model and Bloom's revised taxonomy to analyze technology-related teaching decisions. This integrated approach allows for a clearer understanding of the pedagogical functions of technology, their alignment with learning objectives, and both temporal and contextual processes, through which EFL preservice teachers exercise their agency. In particular, the study explores how agency can manifest through contextual adaptation rather than solely through technological transformation.

The study offers theoretical and practical significance for EFL teacher education. It contributes to understanding technology-related teacher agency as an ecologically situated process of pedagogical decision-making shaped by the interplay of past experiences, current teaching conditions, and future aspirations. It also emphasizes the need to distinguish technological transformation from pedagogical alignment and teacher agency. Practically, the findings also inform teacher educators in designing preparation activities that connect technological knowledge with instructional objectives. They also assist university supervisors and cooperating teachers in

facilitating reflection and contextual decisions during practicum. Furthermore, curriculum developers can use the findings to strengthen the integration of pedagogical and technological learning across teacher preparation programs. These insights may help EFL pre-service teachers make intentional, contextually appropriate decisions about integrating digital technology into their teaching.

METHOD

This study employed a qualitative case study research design (Yin, 2018) to explore how EFL preservice teachers integrated digital technologies and enacted agency during their teaching practicum. A case study was chosen because the research aimed to provide a detailed, context-sensitive analysis of pedagogical decisions and practices within their natural practicum setting. The case was bounded by participants, setting, and time: five EFL preservice teachers undertaking a three-month teaching practicum at one junior high school in Jakarta, Indonesia. The study was informed by an interpretivist perspective, which assumes that participants' actions and experiences are understood in relation to the social and institutional contexts in which they occur (Merriam & Tisdell, 2016). Accordingly, technology integration was examined not only in terms of the digital tools used and observable classroom practices but also through participants' interpretations of their prior experiences, current teaching conditions, and future professional aspirations.

The study utilized purposive sampling to recruit five students from the English Language Education Department who were undertaking their teaching practicum at a junior high school in Jakarta. The participant was selected because they were completing the same school-based practicum and had opportunities to integrate digital technology into their English teaching. All participants were enrolled in the same English teacher education program and had no prior formal teaching experience before the practicum. The five participants formed a preservice teacher group undertaking the practicum within the bounded case. It allowed an in-depth examination across multiple sources of evidence. Table 1 summarizes the participants' demographic and characteristics.

Table 1. *Participant profile*

Participant	Gender	Age (y.o)	Teaching Grade	Formal teaching experience
PST1	F	21	8	None
PST2	F	21	7	None
PST3	F	22	9	None
PST4	M	21	8	None
PST5	M	22	7	None

At the time of the study, the school had implemented the national curriculum, *Kurikulum Merdeka*, for almost two years. The participants developed or implemented lesson plans within this curriculum context. The teaching practicum lasted three months, during which the participants taught English to students in Grades 7, 8, and 9, according to the schedules arranged with their cooperating teachers.

Ethical procedures were observed at all stages of the research. The university's institutional ethics board granted formal approval. Additionally, permission to conduct the study was obtained from both the university and the school. Informed consent was secured from all participants to ensure they were fully aware of the study's purpose and procedures. Participants were volunteers and were informed of their right to withdraw from the study at any time. They were assured that their responses would be kept confidential. Pseudonyms (PST1-PST5) were used to protect participants' identities.

Data were collected from three sources: lesson plans, classroom observations of recorded lessons, and semi-structured interviews. Using multiple data sources (Yin, 2018) enabled the study to examine both participants' observable technology-integration practices and their explanations of the experiences and considerations that underlie those practices. Five lesson plans were purposefully selected for analysis, one from each participant. The selection criterion was that the lesson plan explicitly indicated the use of one or more digital technology tools in the planned instructional activities. Each lesson plan corresponded to two recorded classroom meetings. This results in a direct link between five lesson plans and ten classroom recordings. The lesson plans specified the learning objectives, instructional materials, learning activities, media or digital technologies, and assessment activities. They were analyzed alongside the classroom recordings to compare the planned objectives and technology-supported activities as enacted. Bloom's Taxonomy (Krathwohl, 2002) was used to identify the cognitive processes represented in the stated learning objectives, while the observed activities

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were examined to determine whether they provided opportunities for students to perform the learning specified in those objectives.

Classroom recordings were used to examine how digital technologies were incorporated into actual English lessons. Participants were responsible for recording their teaching practices during the practicum and, when necessary, asked their peers to operate the recording devices. Two recorded lessons from each participant were included in the analysis, along with their corresponding lesson plans. The dataset consisted of five lesson plans and ten classroom recordings, with two recorded lessons corresponding to each lesson plan. This enabled direct comparison between planned learning objectives and enacted technology-supported classroom activities. The recordings were reviewed using an observation guide informed by the SAMR framework (Puentedura, 2014), with attention to the digital tools used, the instructional activities supported by those tools, how teachers and students interacted with technologies, and the extent to which technology changed or supported the instructional tasks.

Semi-structured interviews were conducted with all five participants after the practicum. The interviews gathered detailed information about teachers' experiences and decision-making regarding the integration of digital technology into their teaching practices. The interview guide was informed by the ecological approach to teacher agency (Priestley et al., 2026), with questions addressing participants' previous experiences with digital technology, their experiences of current school and classroom conditions, and their aspirations for future technology-supported teaching. Additional questions explored the digital tools participants selected, their reasons for selecting them, and challenges encountered during implementations, and their perceptions of the relationships between technology use and lesson objectives. Some questions included: "How did you select the digital technology tools for your lessons?" "Why did you use …. to teach during your lesson…?", "What experiences influenced your choice of digital technology for teaching?", "Did school or classroom conditions affect how you integrated technology?", "How do you plan to use digital technology in your future teaching?"

Each interview lasted approximately 40 minutes and was conducted through an online meeting platform. Interviews were primarily conducted in English, though participants occasionally answered in Bahasa Indonesia. Because all five participants in the bounded case were interviewed, participant recruitment was determined by the case boundaries rather than by data saturation. All interviews were audio-recorded with participants' consent, accompanied by researcher notes, then subsequently transcribed verbatim using Turboscribe tools. The *Bahasa Indonesia* excerpt was translated into English by the author.

Data analysis involved three related yet distinct procedures: analyzing technology integration through the SAMR framework (Puentedura, 2014), assessing learning objectives using Bloom's Taxonomy (Krathwohl, 2002), and conducting thematic analysis of teacher agency using the ecological framework. The data analysis workflow is presented in Figure 2. First, the video-recorded lessons and corresponding lesson plans were examined to identify technology-mediated instructional activities. These activities were classified according to the SAMR model as Substitution, Augmentation, Modification, and Redefinition (Puentedura, 2014). For example, using PowerPoint to present information that could otherwise have been presented on a board was classified as substitution, whereas using Kahoot to conduct a quiz with immediate digital feedback was classified as augmentation. Padlet activities that enabled students to produce and share written work in a common digital space were classified as modifications.

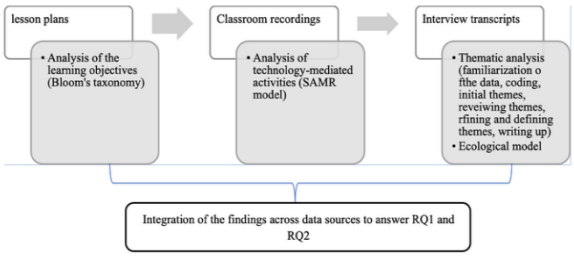

Figure 3. *Data analysis workflow*

Second, the stated learning objectives in the lesson plans were analyzed using Bloom's Taxonomy (Krathwohl, 2002). The cognitive processes represented in the objectives were categorized as Remember, Understand, Apply, Analyze, Evaluate, and Create. The stated learning objectives were analyzed by identifying the principal cognitive process represented by the action verb and the task required of students. For example, an objective requiring students to 'write a summary' was categorized as apply, while an objective requiring students to 'create their own narrative text' was categorized as create.

SAMR (Puentedura, 2014) and Bloom's Taxonomy (Krathwohl, 2002) were treated as separate analytical tools. SAMR was used to characterize how technology functioned within instructional activities, whereas Bloom's Taxonomy was used to characterize the cognitive demands represented in the learning objectives. The relationship between the learning objectives and the observed technology-supported activities was subsequently examined to determine whether the activities provided opportunities for students to engage in the learning specified in the objectives.

Third, interview transcripts, observation data, and relevant lesson plans were analyzed thematically using Braun and Clarke's procedures (Braun & Clarke, 2022). Analysis began with repeated readings of the dataset, generating initial codes concerning participants' previous technology experiences, pedagogical considerations and decisions, contextual constraints and affordances, adaptations, and future intentions. The ecological model of teacher agency provided a theoretically informed coding framework, while the analysis remained open to patterns emerging from the data. Evidence of teacher agency was evident when participants drew on their prior experiences, interpreted contextual conditions, and made personalized pedagogical decisions about technology integration informed by their future aspirations. Using technology alone was not considered a demonstration of agency; rather, the analysis highlighted the participants' professional judgments within their specific teaching contexts. The first author conducted the initial coding and thematic analysis manually. Codes were compared across participants and data sources and organized in relation to the iterational, practical-evaluative, and projective dimensions. Candidate themes were subsequently reviewed against the coded extracts and the full dataset and refined to ensure that they represented coherent patterns relevant to the research questions. Coded extracts and candidate themes were reviewed with the co-authors. Trustworthiness was supported through data triangulation by comparing evidence across lesson plans, classroom recordings, and interviews.

RESULTS AND DISCUSSIONS

The study examined how EFL preservice teachers integrated digital technologies during their teaching practicum and how their agency in integrating technology was shaped by their experiences and teaching contexts. The findings and discussions are organized according to two research questions. The first section examines how digital technologies were used in instructional activities and the extent to which these activities aligned with the intended learning objectives. The second section explores how EFL preservice teachers' past experiences, current teaching conditions, and future goals shaped their agency in integrating technology. Findings from classroom observations, lesson plans, and interviews are discussed.

RQ1: Technology integration and alignment with the learning objectives

The first research question examined how preservice English teachers integrated digital technologies into their instructional activities and learning objectives during the teaching practicum. The analysis drew primarily on classroom recordings and lesson plans, with interview data used to provide additional explanation where relevant. The findings are presented in two parts: 1) the patterns of digital technology integration across the observed lessons, and 2) the extent to which technology-supported activities aligned with the stated English-learning objectives.

Patterns of digital technology integration

The analysis of the recorded lessons demonstrated that EFL preservice teachers used a range of digital technologies for different instructional purposes, including presenting learning materials, providing digital resources, facilitating student activities, administering quizzes, supporting written tasks, and managing assignments, as summarized in Table 2. The most frequently used technologies included laptops, projectors, smartphones, PowerPoint, and Canva, while other tools such as YouTube, Padlet, Kahoot, Google Classroom, and WhatsApp, and an educational blog were used for more specific instructional activities.

A prominent pattern across the observed lessons was the use of technology for presenting instructional content. Four of the five participants used PowerPoint presentations, while PST2 used Canva to present lesson materials. In these activities, the digital presentations largely replaced conventional presentation media, such as textbooks or information written on the board, without substantially changing the nature of the instructional task. These activities were therefore classified at the Substitution level of the SAMR model (Puentedura, 2014). For example, PST1 used PowerPoint slides to introduce and explain lesson content, while PST2 used Canva to present instructional materials in a more visually designed

format. Although Canva provided a more visually engaging presentation, the main function remained the delivery of content.

Technology was also used to enhance existing classroom activities. These practices were classified at the Augmentation level. For example, PST5 used Kahoot to administer a quiz and provide students with immediate feedback, while PST4 used Google Classroom to distribute and collect students' assignments. Other participants used digital resources, including online videos and web-based materials, to support classroom activities. In these cases, technology enhanced the efficiency, accessibility, or interactivity of an existing task without substantially redesigning the task itself.

Table 2. *Digital technology-mediated activities and their SAMR levels*

Participants	Digital technology tools	Activities	SAMR level
PST1	Projector, Laptop, Smartphone, PowerPoint, YouTube channel, WhatsApp Group, Padlet	Presenting the materials, communicating with students, discussing a video, doing a group project using Padlet	Substitution Augmentation Modification
PST2	Projector, Laptop, Canva	Presenting the materials	Substitution
PST3	Projector, Laptop, Smartphone, PowerPoint, a Zenius blog, Padlet	Presenting the materials, Reading and doing tasks in Zenius, doing a group project	Substitution Augmentation Modification
PST4	Projector, Laptop, PowerPoint, a YouTube video, Google classroom	Presenting the materials, discussing video, doing /submitting the assignment	Substitution Augmentation
PST5	Projector, Laptop, Smartphone, PowerPoint, Kahoot	Presenting the materials Doing quiz with real time feedback	Substitution Augmentation

Modification-level activities were observed during the lessons of PST1 and PST3. Both participants used Padlet to support student tasks involving the production and sharing of written work in a common digital space. In these activities, technology-enabled changes in how students completed and shared their work were compared with a conventional paper-based task. However, no technology-mediated activity in the observed lessons was classified at the Redefinition level.

Overall, the findings indicate that technology integration was concentrated primarily at the Substitution and Augmentation levels, with fewer instances of Modification and none of Redefinition. Thus, digital technologies were most commonly used to support or functionally enhance established instructional practices rather than to create substantially different learning tasks. The predominance of Substitution and Augmentation is consistent with (Boonmoh & Kulavichian, 2023) and (Hebibi et al., 2026). who similarly found that EFL preservice teachers' technology integration was concentrated mainly at the lower and intermediate levels of the SAMR model, with relatively few examples of more substantial task transformation. However, the present findings extend this pattern by showing that the SAMR level alone provides an incomplete account of the pedagogical value of technology integration. Activities classified at a relatively higher SAMR level were not necessarily associated with greater cognitive demands, and conventional uses of technology could still support intended language learning outcomes when appropriately aligned with the objectives. Thus, technological transformation and pedagogical appropriateness should not be treated as equivalent. Purposeful technology integration may involve selecting or adapting even simple technologies when these appropriately address the intended learning and the conditions of the classroom.

The SAMR classifications describe the function of technology within particular instructional activities rather than the technological competence or agency of individual preservice teachers. Agency was sometimes most visible not when participants employed technologically transformative activities, but when they made contextual judgments about whether and how a technology could be used under existing classroom conditions. The predominance of Substitution and Augmentation, therefore, should not, by itself, be interpreted as evidence of weak teacher agency or ineffective instruction. Instead, the SAMR analysis describes how technology was used in the observed activities. Whether these uses appropriately supported the intended English learning objectives is examined in the following subsection.

Alignment between digital technology use and the learning objectives

Analysis across the lesson plans and classroom recordings identified variation in the alignment between stated learning objectives and enacted technology-supported activities. Interview data provided further explanation of the pedagogical considerations underlying these patterns. As shown in Table 3, some digital activities provided students with opportunities to perform the language task specified in the learning objective, whereas others addressed only part of the intended outcome or supported a related activity without enabling students to demonstrate the targeted language performance.

Table 3. *The alignment of learning objectives and technology integration*

PST	Intended learning objectives	Bloom Level	Technology-supported activities	Alignment	SAMR level
1	Students are able to write a summary of the news that contains the cause and effect of the case.	Apply	Use Padlet to write a summary of news	Aligned	Modification
2	Students are able to identify and interpret common idiomatic expressions.	Understand	Presenting samples of idioms and guessing idioms from pictures using Canva	Partially aligned	Substitution
3	Students are able to write a descriptive text.	Apply	Reading descriptive text from a blog and writing descriptive text in Padlet	Aligned	Modification
4	Students are able to write narrative text according to its structure and present the narrative texts	Apply	Watching a story from a video, writing a story in Microsoft Word at home, and submitting the story through Google Classroom.	Partially aligned	Augmentation
5	Students are able to create their own narrative text with transitional words.	Create	Reading a story from slides and doing a quiz about transitional words in Kahoot	Not aligned	Augmentation

Clear alignment was observed in the lessons of PST1 and PST3. PST1 aimed to have students write a summary of a news item containing cause-and-effect information, using Padlet as a space for students to produce the required summary. Similarly, PST3's learning objective required students to write a descriptive text. Students first accessed a descriptive text through an online resource and subsequently produced their own descriptive text using Padlet. Although the technology-supported activities were classified differently according to the SAMR model, in both cases they provided students with opportunities to perform the written-language task specified in the learning objectives.

Other lessons demonstrated partial alignment between the intended objectives and the technology-supported activities. PST2's learning objective required students to identify and interpret common idiomatic expressions. Canva was used to present examples of idioms and pictures from which students guessed the expressions. The activity supported the identification of idiomatic expressions but provided limited evidence that students were required to interpret their meanings beyond mere recognition or guessing. Similarly, PST4's objective required students to write a narrative text that followed its structure and present it. The observed activities included watching a story, writing a narrative in Microsoft Word, and submitting the completed work via Google Classroom. These activities supported the writing component of the objective, although the presentation component was not evident in the recorded activity. Thus, the technology-supported activities addressed part, but not all, of the stated objectives.

A clearer mismatch was found in PST5's lesson. The learning objective required students to create their own narrative text using transitional words. However, the technology-supported activity involved reading a story from presentation slides and completing a Kahoot quiz focusing on transitional words. Although the quiz provided practice with a linguistic feature relevant to narrative writing, it did not require students to produce the narrative text specified in the learning objective. The activity supported preparatory

knowledge related to the objective, but did not provide an opportunity for students to demonstrate the intended writing performance.

The interview data explained why such variation occurred. Although participants reported incorporating technology into their lesson planning, explicit consideration of learning objectives was not always central to their selection of digital tools. PST2, for example, explained, *"No, I did not check the learning objectives. I only remember the topic."* PST4 similarly emphasized comprehensibility and student engagement when selecting video:

> "I keep thinking how to make them understand the materials, but interestingly, to ask them to pay attention. Video is my choice*."* (PST4)

These accounts suggest that technology selection was influenced by several considerations, including the lesson topic, perceived ease of use, student attention and engagement, and learning objectives. The three data sources indicate that variation in alignment was not simply a feature of lesson planning. The lesson plans identified the intended outcomes, classroom recordings showed whether technology-supported activities provided opportunities to achieve those outcomes, and interviews revealed the considerations influencing participants' technology choices.

The analysis also showed that Bloom's Taxonomy and the SAMR model represented different dimensions of instructional practice. Bloom's Taxonomy was used to identify the cognitive processes represented in the learning objectives, whereas SAMR was used to characterize the role of technology in specific instructional activities. The two classifications did not necessarily correspond. For example, a learning objective requiring students to create a narrative text represented a relatively high cognitive demand, yet the associated Kahoot activity was classified as Augmentation. Conversely, the use of a more transformative, technology-supported activity did not automatically indicate that it addressed a higher-order learning objective. Therefore, the SAMR level of an activity cannot by itself determine its alignment with the intended learning outcome.

These findings suggest that the pedagogical value of technology integration depends not simply on the sophistication of the digital tool or its SAMR classification, but on whether the technology-supported activity enables students to perform the intended language-learning task. This finding supports the previous study that emphasized the importance of pedagogical considerations in technology-integrated lesson design (Hebibi et al., 2026). This study found that preservice teachers have integrated technology into their lesson plans, but they still use it at a lower level of instructional quality. For preservice English teachers, technology selection requires explicit consideration of the relationship among learning objectives, language-learning activities, and the pedagogical function of digital technology (Darsih et al., 2025). The variation identified in the present study suggests that developing this alignment remains an important aspect of preservice teachers' pedagogical decision-making. One of them is through effective training in integrating technology to align it with learning objectives.

RQ2: EFL preservice teacher agency in technology integration during the practicum

The second research question examined how EFL preservice teachers' past experiences, current teaching conditions, and future goals shaped their agency in technology integration. The findings showed that their technology-related decisions emerged through the intersection of the iterational, practical-evaluative, and projective dimensions of agency. Previous experiences provided a repertoire of familiar digital practices; current practicum conditions shaped which practices were feasible and how they were adapted; and experiences during the practicum informed participants' aspirations for their future teaching.

Iterational dimension: drawing on prior digital experiences

The iterational dimension was evident in participants' tendency to draw on digital tools they had previously encountered as learners. For example, PST3 explained that previous exposure to PowerPoint influenced the decision to use it in teaching:

> "I saw many teachers use PowerPoint slides to teach. I think it is easy, so I chose it for teaching my students, too." (PST3)

Similarly, PST1 connected the decision to use Padlet with a previous learning experience:

> "One of my lecturers used Padlet … I thought it was interesting. I wanted to try it with my students."(PST1)

These explanations indicate that participants drew on a range of familiar digital practices to make instructional choices. The familiarity with technology shows how past experiences influenced participants' perceptions of available and suitable teaching options. This finding is consistent with Zhang et al. (2026), who emphasize the influence of prior learning experiences and models of technology use on preservice teachers' developing digital practices. These findings suggest that prior learning experiences served as a source of possibilities that participants drew on when making instructional decisions. However, prior experiences could operate in different ways: familiar practices could be reproduced, as in the use of PowerPoint for content presentation, or recontextualized for new pedagogical purposes, as when PST1 transferred previous experience with Padlet from university learning to school teaching.

Practical-evaluative dimension: adapting technology to practicum conditions

The practical-evaluative dimension was particularly evident when participants encountered material and institutional conditions that required them to adapt their planned use of technology. Access to devices and internet connectivity, for example, influenced how digital activities could be implemented. PST5 initially planned to use Kahoot, but found that some students did not have mobile phones or sufficient internet access. As PST5 explained,

> "...not all students had mobile phones. Some of them also had no internet credits. They depended on the school Wi-Fi. It was a bad connection sometimes. I asked them to work in pairs doing the quiz via Kahoot." (PST5)

Similarly, PST4 adapted a Google Classroom assignment after discovering that some students did not have access to do that:

> "I thought it made it easy to collect students' work. It turns out that not all of them have a laptop or computer at home; their mobile phones belong to their parents; some phones do not support accessing Google Classroom… some have issues with internet credits…So, I decided to make them work in groups. At least one student in a group can access Google Classroom." (PST4)

These examples show that contextual constraints did not simply prevent the use of technology. Instead, participants made practical judgments and reorganized classroom activities so that the planned technology could remain usable under existing conditions.

Other contextual factors also shaped technology-related decisions. Participants reported that preparing digital materials could be time-consuming, and four participants indicated that they worked with or revised lesson plans prepared by their cooperating teachers. In some cases, the content and topics had already been determined, which limited the range of instructional decisions available to the preservice teachers. At the same time, supervisors and cooperating teachers could also facilitate the use of technology. PST3 reported that the university supervisor encouraged participants to check the availability of school facilities and to prepare their own devices when necessary.

> "Before we were off to school for teaching practicum, our supervisor suggested checking if there were facilities to use digital technology; otherwise, we should prepare our own device and consult with the cooperating teacher." (PST3)

In another case, PST5 described how the cooperating teacher allowed the use of Kahoot and later asked how the application was created.

> "After observing the cooperating teacher, I saw that the students were not really enthusiastic about doing tasks. When I practice teaching, I use Kahoot to motivate my students. And the cooperating teacher allowed me to use it… and asked me how to create it." (PST5)

This suggests that the practicum environment functioned not only as a source of constraints but also as an affordance for technology-related agency. Participants' views that digital technology increases students' attention and motivation should be interpreted cautiously. These perceptions may result from the novelty of digital activities rather than a lasting impact. As this study did not assess student engagement or long-term learning outcomes, the findings reflect participants' perceptions rather than evidence of motivational effects.

The cooperating teacher's response in PST5's case also illustrates that the mentoring relationship could involve reciprocal professional learning rather than one-way guidance from the mentor to the preservice teacher. This reciprocal interaction also complicates a conventional view of practicum mentoring in which professional knowledge flows primarily from the experienced cooperating

teacher to the novice. In this case, the practicum can provide opportunities for preservice teachers not only to receive guidance but also to contribute emerging digital practices to the school context.

These examples demonstrate that practical-evaluative agency was achieved through contextual adaptation. EFL preservice teachers did not make technology-related decisions independently of their environment; rather, their choices were mediated by students' access to devices, internet connectivity, available facilities, time, existing lesson plans, and expectations from supervisors and cooperating teachers. This finding is consistent with the ecological view of teacher agency (Priestley et al., 2026), in which professional action emerges from interactions between individuals and the cultural, structural, and material conditions of their working environments. A recent study found that teacher agency in the era of digital transformation requires teachers to adopt and adapt technologies to improve student learning (Ho, 2026).

The findings also support prior research indicating that practicum conditions, mentoring, and institutional support can influence preservice teachers' opportunities to integrate technology into their teaching (Zhang et al., 2026). However, they extend this literature by showing that contextual constraints did not operate simply as barriers. Limited device ownership and internet access generated situations in which participants exercised practical-evaluative agency by reorganizing participation, grouping students, or modifying implementation. From an ecological perspective, constraints may simultaneously restrict available choices and create conditions requiring professional judgment.

Projective dimension: Aspirations for future technology integration

The projective dimension was evident in participants' intentions to continue using and exploring digital technologies in their future teaching. PST2, for example, reflected on the limited range of technologies used during the practicum and stated,

> "I mostly used simple tools, just Canva, but next time when I teach English, I want to use more digital tools like digital storytelling, Quizizz, Kahoot, and other apps." (PST2)

Similarly, PST1 explained:

> "I think digital technology really helps me grab students' attention, and the lesson was more interactive. Of course, I want to keep using digital technology in my teaching, and I think I need to explore more advanced tools and apps that can help teachers." (PST1)

These statements indicate that experiences during the practicum contributed to EFL preservice teachers' future-oriented intentions to continue developing their technology-supported teaching practices. This finding aligns with a previous study indicating that preservice teachers believe that teaching innovation is oriented toward technology integration (Farmasari et al., 2023). However, their aspirations were often expressed in terms of using a wider range of tools or more advanced applications, rather than explicitly explaining how future use of technology would support particular English-learning objectives.

The projective dimension, therefore, revealed an important tension between technological aspiration and pedagogical intentionality. EFL preservice teachers' willingness to use a wider range of, or more advanced technology, indicates future-oriented agency, but such aspirations did not necessarily include clearly articulated connections among technology, learning activities, and intended language-learning outcomes. Future-oriented agency in technology integration may require not only a willingness to experiment with new tools but also the capacity to justify their pedagogical purposes. This finding suggests that future-oriented agency may benefit from opportunities for EFL preservice teachers to reflect not only on which technologies they want to use, but also on why particular tools are pedagogically appropriate for specific language-learning goals.

Overall, the findings indicate that the three dimensions of agency did not operate independently. EFL preservice teachers entered the practicum with familiar digital practices developed through previous learning experiences (iterational), evaluated whether and how these practices could be enacted within the school's material and institutional conditions (practical-evaluative), and drew on their practicum experiences when imagining future technology-supported teaching (projective). For example, a familiar digital tool could initially be selected because of prior experience; later, it could be adapted in response to students' access or school conditions, and evaluated as something to retain, modify, or extend in future teaching. Technology-related agency was achieved through the

interaction of temporal experience and contextual conditions.

The findings of this study have several implications, particularly for teacher education and EFL preservice teachers. Teacher education programs should move beyond technical skills training to create opportunities for preservice English teachers to critically reflect on how technology use connects to their pedagogy and the contexts in which they teach. It can be achieved by integrating technology across the curriculum (Warr et al., 2023) throughout all teacher preparation courses. EFL Preservice teachers should learn what to consider and how to make decisions when designing lesson plans that integrate technology (Hebibi et al., 2026). In planning a lesson, preservice English teachers formulate learning objectives, select learning materials, and choose media, including technology, to achieve them. The SAMR model can also be introduced to EFL preservice teachers (Loo & Nagaletchimee, 2025) to help them identify the extent to which their technology integration enhances learning.

Another approach is collaborative professional development programs (Dai, 2023), such as workshops, which provide time and resources for preservice English teachers to work with their peers and teacher educators, sharing best practices to solve problems and build collective agency (Scott & Smith, 2024). Preservice teachers expanded their knowledge and use of technology through collaboration during a paired teaching practicum (Yang & Ross, 2023). Their agency can also be promoted through professional learning interventions that help them use technology (Yang & Markauskaite, 2025). Coordinating teachers and supervisors play a crucial role in guiding the integration of technology into English language teaching. They serve as role models for preservice English teachers, particularly in the effective integration of technology. They could encourage preservice English teachers to enhance their digital knowledge and integrate technology into their teaching, particularly by implementing emerging technologies to benefit future generations (Kim et al., 2023).

The findings suggest that teacher education programs should move beyond introducing digital tools and provide greater support for pedagogical decision-making, particularly in connecting learning objectives, language-learning activities, technology choices, and classroom conditions. Reflective practice and guided experimentation during the practicum may help preservice teachers develop more purposeful and contextual technology integration.

CONCLUSION

This study examined how preservice English teachers integrated digital technologies during their teaching practicum and how their agency was shaped by past experiences, current teaching conditions, and future goals. The findings revealed that technology use primarily occurred at the Substitution and Augmentation levels of the SAMR model, with fewer activities at the Modification level and none at the Redefinition level. The alignment between technology-supported activities and intended English-learning objectives varied among participants. Notably, the teachers drew on familiar digital practices, adapted their technology-related decisions to the practicum context, and developed intentions for their future technology-supported teaching.

This study contributes to research on technology integration and preservice English teacher agency in key ways. First, it underscores the importance of an ecological perspective, viewing technology integration as a context-dependent process of pedagogical decision-making. Second, the use of SAMR and Bloom's Taxonomy reveals that the technological function of an activity, its alignment with learning objectives, and the exercise of teacher agency are related yet distinct. Higher levels of technological transformation do not always indicate stronger agency or better pedagogical alignment; agency can also arise from adaptations using conventional technologies. Lastly, teacher education and practicum programs should move beyond simply introducing digital tools. They should create opportunities for preservice teachers to justify their technology choices based on learning objectives and classroom conditions, and to reflect on these choices during their teaching practice.

The findings of this study have several limitations. It involved five EFL preservice teachers who completed a three-month practicum at a single junior high school, limiting the generalizability of the results. The analysis focused on five lesson plans that integrated digital technology and ten corresponding classroom recordings, providing insights only into those specific lessons rather than a broader view of the teachers' practices. Additionally, post-practicum interviews relied on participants' retrospective accounts, which may have been affected by memory or social desirability biases, although these were verified against lesson plans and

recordings. Lastly, the study did not follow participants beyond the practicum, so it cannot assess whether their technology-related practices and aspirations continued in their future teaching.

Future research could use longitudinal designs to study how EFL preservice teachers' agency in technology integration develops from their teacher education and practicum experiences into their early careers. Comparative case studies in schools with different technological resources and mentoring approaches could reveal how various contexts shape this agency. Additionally, intervention studies should explore whether structured reflective practices, mentoring, or technology-integrated lesson design activities enhance EFL preservice teachers' ability to align digital technology with language-learning objectives.

In conclusion, the study emphasizes that preparing EFL preservice teachers to integrate technology involves more than mastering digital tools; it also requires developing their ability to make purposeful, contextually appropriate decisions about technology across different teaching environments.

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