



Exploring the Role of Self-Regulated Learning and Technology Acceptance in Shaping EFL Student Teachers' TPACK during Teaching Practicum

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ABSTRACT

The growth of Technological Pedagogical Content Knowledge (TPACK) among EFL student teachers during their teaching practicum is examined in this study in relation to self-regulated learning (SRL) and technology acceptance (TA). Three student teachers' semi-structured interviews, reflective journals, and lesson plans were all examined using a qualitative case study design. According to thematic analysis (Braun & Clarke, 2006), it is revealed that their lesson preparation, decision-making, and reflective practices were influenced by SRL processes like planning, monitoring, and reflection. Simultaneously, TA beliefs, which emphasize usefulness and ease of use, increased self-assurance, motivation, and digital tool experimentation. The findings show that both SRL and TA contributed to the development of TPACK by providing the necessary metacognitive support and motivation, respectively. Therefore, to support technology-enhanced pedagogy, teacher education programs ought to promote reflective SRL practices and constructive TA beliefs.

Keywords: Self-Regulated Learning, Technology Acceptance, TPACK, EFL Student Teachers, Teaching Practicum

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INTRODUCTION

The rapid development of educational technology has influenced the way that English as a Foreign Language (EFL) is taught, particularly in practicum settings where student teachers must demonstrate their ability to successfully incorporate digital tools into traditional classroom settings. The Technological Pedagogical Content Knowledge (TPACK) framework (Mishra & Koehler, 2006) states that a dynamic interaction between content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK) is necessary for effective technology integration. However, when working with diverse students or in situations where support is limited, pre-service teachers often struggle to develop the integrated TPACK required for their practicum (e.g., Rakerda et al., 2025, Indonesian EFL pre-service teachers showed confidence in CK and basic TK but often struggled with TPK and adaptive pedagogy).

Two concepts that may be useful in this complex integration process are self-regulated learning (SRL) and technology acceptance (TA). By using the metacognitive

processes of goal-setting, strategic planning, monitoring, and reflection that are a component of SRL, teachers can take responsibility for their professional practice and respond to classroom dynamics in a flexible manner (Zimmerman, 2002; Teng & Zhang, 2016). Recent studies have emphasized the significance of SRL in teacher preparation. For example, teacher-education students' understanding of how to promote SRL in the classroom was significantly enhanced by a professional learning program that employed an SRL-Promotion Framework (Stephenson et al., 2024). Another study found that teacher education that specifically integrates SRL strategies into sustainable professional development promotes more long-term pedagogical growth (Rodríguez-Gómez, Muñoz-Moreno & Ion, 2024).

According to the Technology Acceptance Model (TAM), users' intentions and actions to adopt technology are strongly affected by their perceptions of its perceived usefulness and ease of use (Davis, 1989). According to Galimova et al (2024), these constructs, which are impacted by social context, facilitating conditions, and attitudes, remain crucial in teacher education contexts. Research conducted during the COVID-19 pandemic demonstrates that teachers' adoption of remote-teaching technologies was largely influenced by perceived usefulness and ease of use, as well as social support and supportive environments (Teo & Yunus, 2023). Moreover, Wang et al. (2025), in their recent research on AI tools in education, suggest that intention to use advanced educational technologies is predicted by TAM constructs in conjunction with awareness and teacher self-efficacy.

Although SRL and TA have each been studied as separate predictors of teacher technology integration, fewer studies have explored how these two constructs interact to shape TPACK development in EFL teaching practicum contexts. This study is intended to fill that gap by proposing the following research question:

RQ: How do self-regulated learning processes and technology acceptance beliefs influence EFL student teachers' development of TPACK during their teaching practicum?

Thus, the study aims to contribute to the teacher education body knowledge by highlighting how self-regulated learning (SRL) and technology acceptance (TA) jointly scaffold the development of TPACK in teaching practicum contexts. The findings are expected to inform practicum design and professional development, particularly in EFL contexts where technology-enhanced pedagogy is increasingly expected but variably supported.

METHOD

This study used a qualitative research approach (Yin, 2014) within a case study design. Data sources like reflective journals, lesson plans, and interviews were utilized in order to capture the depth and complexity of student teachers' reflections, beliefs, and classroom practices through a qualitative method. The case study design allows for a limited number of cases from three participants during the teaching practicum.

The participants were three EFL student teachers enrolled in the English Education Department at a University in Tasikmalaya, West Java, Indonesia. They are referred to by pseudonyms, P1, P2, and P3, to ensure confidentiality. All three had accomplished prior courses in language pedagogy, ICT integration, and their teaching practicum, and were identified as demonstrating moderate to high levels of self-regulated learning (SRL) and technology acceptance (TA). Each participant was assigned to teach Grade VII students at junior high schools during their teaching practicum placement.

Three data sources were used in this study, namely lesson plans (LP), reflective journals (RJ), and semi-structured interviews (INT). The lesson plans were created before classroom instruction. They provided evidence of how the content knowledge (CK),

pedagogical knowledge (PK), and technological knowledge (TK) should be integrated. Reflective journals were written weekly during the teaching practicum. These journals recorded the participants' self-directed learning process through planning, monitoring, and reflection. Semi-structured interviews were conducted individually after the practicum to explore the participants' beliefs about technology adoption. This included their perceptions on usefulness, ease of use, and experiences with digital tools. The interviews lasted 30 to 50 minutes, were audio recorded with consent, and were conducted face-to-face. This triangulation process helped the study capture data on planned practice through LP, conducted reflections through RJ, and post-practice beliefs through INT. This ensured a complete view of participants' TPACK development.

The data were analyzed thematically, following the six phases outlined by Braun and Clarke (2006), that comprise (1) familiarization with data; (2) generating initial codes; (3) searching for themes; (4) reviewing themes; (5) defining and naming themes; and (6) producing the report. Deductive codes were derived from SRL processes (Zimmerman, 2002), TAM constructs (Davis, 1989), and TPACK domains (Mishra & Koehler, 2006), while inductive codes were allowed to emerge from the data. To enhance trustworthiness, triangulation was applied across LP, RJ, and INT, supported by peer debriefing and member checking.

FINDING

After analyzing data using six-phases of thematic analysis (Braun & Clarke, 2006), there are four emergent themes, as follows:

SRL enhances lesson structure and TPACK readiness

The data showed that participants' self-regulated learning processes in planning and goal setting played a key role in supporting TPACK readiness during the practicum. Rather than approaching lesson planning spontaneously, all three participants engaged in deliberate preparation by setting objectives, sequencing activities, and selecting appropriate media in advance. This proactive orientation reflects Zimmerman's (2002) claim that SRL provides learners with strategic foresight to manage complex tasks. Evidence from reflective journals, lesson plans, and interviews shows how SRL helped participants structure their lessons, align CK-PK-TK, and ensure purposeful technology integration.

Table 1. Evidence of SRL enhances lesson structure and TPACK readiness

	RJ	LP	INT
P1	"I prepared students' worksheet and pictures to help students understand descriptive text."	Her lesson plan followed a clear structure (observing→questioning→associating→communicating)	"I arranged the learning objectives based on elements and materials, then adjusted the use of PPT or Wordwall accordingly."
P2	"Planning was successful as I had prepared materials and media well."	Her lesson plan employed the ICARE model with PowerPoint and Wordwall .	"I always design learning goals according to the elements. For the diagnostic test, I used Bamboozle to check prior knowledge."
P3	"I chose activities the whole class could do together to avoid confusion."	Her lesson plan also applied the ICARE framework, supported by Wordwall and students' worksheet.	"I set learning objectives by considering the elements and chose authentic resources from the internet; PowerPoint was my main medium."

P1's SRL planning was evident in her careful preparation of both content scaffolds and lesson structure. This foresight enabled her to integrate content with media effectively, indicating the early formation of TPACK. This illustrates how her SRL strategies guided both pedagogical sequencing and the integration of technology. Similarly, P2's SRL was marked by systematic preparation and media readiness. Her ability to plan for both pedagogy and technology illustrates a more advanced TPACK readiness, showing integration of TK into pedagogical strategy. This indicates that her SRL strategies allowed her to align objectives with assessment and technology. Moreover, P3's planning to include authentic resources and class-wide strategies, reflecting reflective foresight and resource-rich preparation. Her ability to anticipate technical challenges reflects reflective foresight and supports more resilient TPACK development. Her SRL process ensured that her TPACK enactment was both structured and resource-rich. While P1 emphasized structuring steps, P2 combined planning with tool alignment, and P3 focused on adapting resources and strategies. Collectively, SRL in goal-setting, planning, and sequencing provided a solid foundation for TPACK readiness, ensuring that content, pedagogy, and technology was integrated intentionally rather than incidentally.

TAM fosters confidence and experimentation

Another key finding was that participants' beliefs about technology—particularly their perceptions of usefulness and ease of use—boosted their confidence and encouraged experimentation with digital tools. Evidence from journals, lesson plans, and interviews suggests that when participants perceived technology as simple and effective, they were more likely to integrate it meaningfully. Initially, they relied on familiar applications like PowerPoint, but over time they experimented with more interactive platforms like Wordwall and Bamboozle. This reflects how TAM beliefs serve not only as a gateway to adoption but also as a motivating force for pedagogical innovation.

Table 2. Evidence of TAM fosters confidence and experimentation

	RJ	LP	INT
P1	<i>"Using PowerPoint made it easier to explain the text."</i>	Her lesson plan positioned PPT as a scaffolding tool	<i>"I use tools that are familiar but effective, like PowerPoint, but I want to try more interactive ones in the future."</i>
P2	<i>"Technology encourages students to be more active."</i>	Her lesson plan incorporated Wordwall for interactive quizzes.	<i>"I prefer applications that are easy to use, like Wordwall or Bamboozle, because they make students engaged."</i>
P3	<i>"Technology was effective in building interaction."</i>	Her lesson plan reflected technology usage by combining PPT, Wordwall and worksheets.	<i>"PowerPoint is effective for explaining, and I will always use technology because students are comfortable with digital tools."</i>

P1 perceived PowerPoint as useful and easy to use, which boosted her confidence. Although limited to basic tools, this acceptance motivated her to explore further technology for pedagogy, a step toward TPACK enhancement. For P2, TAM beliefs translated directly into experimentation with interactive tools. Her choice of Wordwall, based on ease of use and usefulness, reinforced her ability to use technology for pedagogical innovation. P3's strong TA beliefs encouraged experimentation with

technology for fostering interaction, where student receptiveness further boosted her confidence. Her confidence in tool integration allowed smoother enactment of TPACK. Collectively, participants viewed technology as both useful for instruction and easy to integrate, which encouraged them to embed it confidently into their pedagogy. TA beliefs served as a motivational driver for TPACK enactment.

Challenges stimulate adaptive SRL strategies

Participants faced challenges during the practicum, such as time management difficulties, student passivity, and technological limitations, which required them to adapt their instructional strategies. Rather than undermining their lessons, these difficulties became catalysts for SRL monitoring and reflection. By adjusting activities, implementing backup plans, and recalibrating engagement strategies, participants demonstrated flexibility in both pedagogy and technology use. This adaptability illustrates SRL's role in sustaining TPACK growth in authentic classroom contexts.

Table 3. Evidence of Challenges stimulate adaptive SRL strategies

	RJ	LP	INT
P1	<i>"Some students were passive, so I gave additional questions."</i>	Her lesson plan indicated flexible questioning.	<i>"If I couldn't use the projector, I shared the file via WhatsApp. If time was limited, I modified the activity."</i>
P2	<i>"Monitoring was effective, but time management was an issue."</i>	Her lesson plan also showed activities that took longer than intended.	<i>"When the internet was weak, I tethered my connection. Students sometimes asked for extra exercises because they were curious."</i>
P3	<i>"Some students seemed confused... I adjusted by using class-wide activities."</i>	In her lesson plan, she simplified tasks for clarity.	<i>"I evaluated my lesson based on engagement and time. If students struggled, I adapted the strategy so everyone could join."</i>

Through monitoring and adjustment, P1 demonstrated SRL adaptability, refining her pedagogy to keep students engaged, thus reinforcing her PK and TK. P2's monitoring revealed mismatches between plan and execution. Reflection helped her recalibrate pacing strategies, strengthening her SRL cycle and supporting gradual TPACK development. P3 used SRL to simplify activities, preventing confusion and ensuring objectives were met. This shows flexible pedagogy reinforced by technology. Each participant used challenges acted as triggers for adaptive SRL where P1 modified questioning, P2 recalibrated timing, and P3 simplified tasks. These adjustments strengthened their TPACK by ensuring technology and pedagogy remained responsive to classroom realities.

Technology as a medium for pedagogical innovation

The findings also show that technology was not only used as a supporting tool for content delivery, but also for formative assessment, student motivation, and collaborative learning. Over time, participants expanded their use of technology from basic presentation tools (e.g., PowerPoint) to interactive games, quizzes, and group activities. This progression reflects a deepening maturity in TPACK enactment, where technology shifted from teacher-centered support toward student-centered innovation. The findings demonstrate

that when SRL planning intersects with positive TA, technology becomes a stimulus for meaningful and interactive EFL pedagogy.

Table 4. Evidence of Technology as a medium for pedagogical innovation

	RJ	LP	INT
P1	<i>"PowerPoint helped me explain descriptive text more clearly."</i>	Her lesson plan scaffolded text learning through PPT	<i>"PPT and the laptop were the core tools I used for material delivery. They made lessons more accessible."</i>
P2	<i>"Wordwall increased student engagement."</i>	Her lesson plan used Wordwall for formative quizzes.	<i>"I used Bamboozle for warm-ups and diagnostics; its interactive features like points made students more motivated."</i>
P3	<i>"Students became more collaborative with technology."</i>	Her lesson plan paired Wordwall with worksheets for group work.	<i>"I used technology depending on students' needs. I adapted the games so they stayed engaging and effective."</i>

P1's use of PPT shows technology as a scaffolding tool, helping bridge content with pedagogy, albeit at an early stage of TPACK enactment. P2's use of technology extended to assessment and student engagement, demonstrating how TAM beliefs shaped innovative pedagogical uses of technology. P3's design positioned technology as a catalyst for collaboration, showing deeper TPACK enactment in creating student-centered learning. While P1 used technology mainly for presentation, P2 leveraged it for formative assessment, and P3 used it for collaboration. This reflects a progression in TPACK maturity, from tool support to pedagogical innovation. Across participants, technology shifted from a support tool for delivery to a catalyst for innovation in assessment, motivation, and collaboration. This represents increasing TPACK maturity and a move toward student-centered pedagogy.

Table 5. Self-Regulated Learning, Technology Acceptance, and TPACK Development

No.	Theme	P1	P2	P3
1.	SRL enhances lesson structure and TPACK readiness	RJ: “I prepared LKPD and pictures to help students understand descriptive text.” LP: Activities sequenced: observing → questioning → associating → communicating. INT: <i>“I arranged the learning objectives based on elements and materials, then adjusted the use of PPT or Wordwall accordingly.”</i>	RJ: “Planning was successful as I had prepared materials and media well.” LP: ICARE model with PPT & Wordwall. INT: <i>“I always design learning goals according to the elements. For the diagnostic test, I used Bamboozle to check prior knowledge.”</i>	RJ: “I chose activities the whole class could do together to avoid confusion.” LP: ICARE design with Wordwall + worksheets. INT: <i>“I set learning objectives by considering the elements and chose authentic resources from the internet; PowerPoint was my main medium.”</i>
2.	TAM fosters confidence and experimentation	RJ: “Using PowerPoint made it easier to explain the text.” LP: PPT for scaffolding. INT: <i>“I use tools that are familiar but effective, like PowerPoint, but I want to try more interactive ones in the future.”</i>	RJ: “Technology encourages students to be more active.” LP: Wordwall for interactive quizzes. INT: <i>“I prefer applications that are easy to use, like Wordwall or Bamboozle, because they make students engaged.”</i>	RJ: “Technology was effective in building interaction.” LP: Wordwall + worksheets. INT: <i>“PowerPoint is effective for explaining, and I will always use technology because students are comfortable with digital tools.”</i>
3.	Challenges stimulate adaptive SRL strategies	RJ: “Some students were passive, so I gave additional questions.”	RJ: “Monitoring was effective, but time management was an issue.”	RJ: “Some students seemed confused... I adjusted by using class-wide activities.”

	LP: Adjusted questioning strategies. INT: <i>"If I couldn't use the projector, I shared the file via Whats.App. If time was limited, I modified the activity."</i>	LP: Some activities exceeded planned time. INT: <i>"When the internet was weak, I tethered my connection. Students sometimes asked for extra exercises because they were curious."</i>	LP: Simplified tasks for clarity. INT: <i>"I evaluated my lesson based on engagement and time. If students struggled, I adapted the strategy so everyone could join."</i>
4. Technology as a medium for pedagogical innovation	RJ: "PowerPoint helped me explain descriptive text more clearly." LP: PPT used to scaffold descriptive text learning. INT: <i>"PPT and the laptop were the core tools I used for material delivery. They made lessons more accessible."</i>	RJ: "Wordwall increased student engagement." LP: Wordwall for formative assessment. INT: <i>"I used Bamboozle for warm-ups and diagnostics; its interactive features like points made students more motivated."</i>	RJ: "Students became more collaborative with technology." LP: Wordwall + worksheets for group collaboration. INT: <i>"I used technology depending on students' needs. I adapted the games so they stayed engaging and effective."</i>

DISCUSSION

The findings of this study demonstrate that self-regulated learning (SRL) and technology acceptance (TA) interactively shaped the development of EFL student teachers' TPACK during their practicum.

SRL enhances lesson structure and TPACK readiness.

The data reveal that participants' ability to set goals, plan activities, and sequence content established a foundation for integrating technology with pedagogy and content knowledge. This resonates with Zimmerman's (2002) model of SRL and recent evidence that reflective planning enhances pre-service teachers' preparedness for digital pedagogy (Brenner, 2022). Stephenson et al. (2024) similarly report that structured SRL strategies help novice teachers translate pedagogical goals into technology-supported lesson designs. In this study, the participants used frameworks such as ICARE and structured activity sequencing to align objectives, materials, and technological tools. These findings confirm prior research but extend it by showing how SRL not only supports planning in general, but also directly scaffolds TPACK readiness in practicum contexts.

TAM fosters confidence and experimentation.

Participants consistently emphasized that ease of use and perceived usefulness of tools such as PowerPoint, Wordwall, and Bamboozle encouraged them to experiment with technology in their lessons. This is consistent with Davis's (1989) TAM theory and later meta-analytic studies showing that TAM strongly predicts teachers' technology integration (Scherer et al., 2019). It is also in line with Teo's (2011) model which shows that teachers' intentions to use technology are greatly influenced by these beliefs. In addition, teachers' confidence grows when tools are perceived as both simple and effective, fostering more experimentation (Hsu, 2016; Teo & Yunus, 2023; Galimova et al., 2024). In this study, participants' willingness to extend beyond familiar tools (e.g., PowerPoint) to interactive applications shows that TAM beliefs operated as motivational drivers. This underlines the importance of TAM not only for adoption but also for sustaining innovative use of digital tools in language classrooms.

Challenges stimulate adaptive SRL strategies.

Classroom realities such as student passivity, limited time, and technological constraints prompted participants to adjust their teaching in real time. These adaptive responses reflect the monitoring and reflection components of SRL (Teng & Zhang, 2016). For instance, when technology failed, participants substituted with offline strategies or alternative platforms such as WhatsApp. Such adaptability is crucial in practicum settings, where contextual unpredictability requires pedagogical flexibility. Rodríguez-Gómez et al. (2024) similarly argue that SRL strategies allow teachers to sustain professional growth under complex conditions by engaging in ongoing reflection and adjustment. The present study strengthens this claim by illustrating how SRL strategies not only managed challenges but also maintained the integration of technology, thereby sustaining TPACK growth despite limitations.

Technology as a medium for pedagogical innovation.

Finally, participants' use of technology evolved from a supportive presentation tool to a platform for formative assessment, student motivation, and collaborative learning. This trajectory suggests increasing maturity in their TPACK enactment. Previous studies by Mouza et al. (2017) and Valtonen et al. (2017) found that innovative uses of technology often mark a transition from novice to more advanced TPACK practices. The present findings echo these results and further illustrate how SRL and TAM jointly support this shift: SRL provides the scaffolding for planning and reflection, while TAM provides the motivational drive to experiment with interactive platforms. More recent evidence also

underscores that meaningful innovation arises when teachers' confidence in technology intersects with reflective pedagogical design (Wang et al., 2025).

CONCLUSION

This study explored how self-regulated learning (SRL) processes and technology acceptance (TA) beliefs influence EFL student teachers' TPACK development during their teaching practicum. The findings indicate that SRL functioned as metacognitive scaffolding, guiding participants through planning, monitoring, and reflection, while TA operated as a motivational driver, fostering confidence and willingness to experiment with digital tools. Together, these constructs enabled participants to integrate CK, PK, and TK in increasingly student-centered and innovative ways, thereby answering the research question.

The findings suggest implications for Teacher education programs, such as 1) embedding SRL-focused practices such as reflective journaling and structured lesson planning templates to strengthen metacognitive awareness; 2) providing scaffolded digital training that emphasizes both technical proficiency and pedagogical affordances of tools; 3) cultivating positive TA beliefs by ensuring access to reliable facilities and demonstrating the usefulness and ease of technology in real teaching contexts.

However, this study was limited to three EFL student teachers in a single institutional context and one practicum cycle. Thus, the findings may not be generalizable across broader populations or teaching levels. For future research, it is recommended to utilize larger-scale and longitudinal studies. In addition, using mixed-method design is suggested to examine how SRL and TAM interact over time and across contexts. Future research should also explore additional mediators such as student teacher's self-efficacy, facilitating conditions, and mentor feedback in shaping TPACK trajectories.

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