A TPACK-based Model of EFL teacher Preparation to Develop Student-Teachers' Professional Agency in CALL

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Abstract
Teacher agency plays a crucial role in teachers' professionalism and makes them capable of acting powerfully in their teaching context. The present study was an attempt to explore the role of the TPACK model in developing a professional agency for English as a foreign language (EFL) student-teachers. We conducted a qualitative study in which seven TPACK sessions were held involving eight student-teachers. We analyzed data collected through narratives and interviews using deductive-inductive thematic analysis. The findings of the thematic analysis indicated that the TPACK model has a constructive role in developing EFL student-teachers' professional agency. The findings of this study showed that the TPACK model enhances the integration of technology with content and pedagogy, ultimately amplifying individuals' ideas and voices. Additionally, it allows educators to explore more effective teaching methods, resulting in increased motivation among teachers. A deeper understanding of technological knowledge empowers educators to seamlessly incorporate technology into their teaching practices. By providing teachers with a sense of ownership and expertise in the material they present, the TPACK model enables educators to make well-informed decisions and enhance their pedagogical knowledge, skills, and strategies to meet the evolving needs of their students and adapt to the changing educational environment.
Key words: CALL, Professional Agency, TPACK model, EFL Student-Teachers

Introduction

L2 teachers have recognized the potential of CALL to enhance language instruction by providing learners with interactive and engaging experiences, personalized learning opportunities, and access to authentic language resources. CALL tools and applications offer a wide range of activities, including multimedia presentations, virtual simulations, online language exchanges, and self-paced exercises, which can promote language acquisition and proficiency development. Research studies have shown that CALL has a positive role in various aspects of language learning, such as vocabulary acquisition, listening comprehension, writing skills, and learner motivation (Son, 2020). Moreover, CALL can facilitate autonomous learning, as learners can access language materials and practice independently outside the classroom. However, while CALL can be a valuable tool in L2 teaching, it is important for teachers to critically evaluate and select appropriate technological resources that align with their pedagogical goals and learner needs. By effectively integrating CALL into their instructional practices, L2 teachers can create dynamic and interactive learning environments that foster language development and engage learners in meaningful language tasks.

According to Eteläpelto et al. (2013), student-teachers' professional agency is mostly the idea that professionals and employees are active and can influence, take positions, and make decisions about their jobs and professional agencies. In this term, the definition of professional agency can be defined. Generally speaking, agency as a whole and professional agency, more specifically, have been linked to extremely positive outcomes for incentive, welfare, and even contentment (Welzel & Inglehart, 2010), as well as for inventiveness (Littleton & Miell, 2004; Sawyer, 2007). Along with being an impetus for change and a form of struggle for formative agency (Casey,

2006), the agency is also seen to be linked to people's autonomy and sense of fulfillment (Giddens, 1984, 2020; Haj Seyed Javadi & Meihami, 2024; Meihami & Malmir, 2024). The subjects' innovative concepts and ideas for improving current work practices could be considered the most vigorous and productive demonstrations of professional agency (Littleton et al., 2012; Vähäsantanen et al., 2009). A collaborative workplace and a supportive, professional atmosphere where teachers are able to count on each other will inevitably improve teacher motivation. According to studies, collegial interactions and a positive work environment help teachers learn from one another more effectively (Pyhältö et al., 2012; Pyhältö et al., 2015), meaning that teachers will develop discernment and control education in the classroom within the specialized communal, and they become active facilitators who share common accountability (Soini et al., 2016).

One of the current models for integrating technology in the teaching space is called Technological Pedagogical and Content Knowledge (TPACK) (Mishra & Koehler, 2006). In this model, technology is viewed as a device that improves the education course under this paradigm; it is neither the ultimate purpose nor supersede collaboration for domination of the second language. According to Jang and Chen (2010), TPACK is a novel approach to comprehending the intricate relationships between materials, training, and technology that could lead to efficacious technology incorporation in the classroom. When TPACK is used in a language classroom, teachers take on the role of facilitators. Multi-level groups, or those that include learners at various levels of the language, present one of the major challenges for EFL/ESL teachers. Teachers may give information that is appropriate for each student's grade level and unique requirements by implementing the TPACK model. TPACK foundation enables the teachers to generate and elaborate extending data to create the best instructive setting for the learners. Creating an appropriate setting for the learners in the classroom is of great importance, and the teachers can utilize the features of TPACK to reach this goal. The application of TPACK in teacher improvement, focusing on the incorporation of technology, enables the acquisition of knowledge that encourages the meaningful utilization of technology. This, in turn, enhances the overall effectiveness and quality of training across all stages of teaching, including development and assessment, when delivering precise materials (Yurdakul, 2011).

This study aimed to investigate how a TPACK-model teacher preparation can contribute to the development of various dimensions of EFL teachers' professional agency. By examining the role of the TPACK model on professional agency components, the study intended to understand how the TPACK model could have a role in developing different professional agency components. The present study is an effort to respond to the subsequent question: What is the role of a TPACK-based model of EFL teacher preparation program in developing student-teachers' professional agency?

Literature Review

L2 Teachers' Professional Agency

The concept of agency has gained prominence in educational research, particularly in the context of self-directed and collective learning. Defined as the capacity and motivation to make decisions that lead to change, the agency is crucial for both individual and societal development (Bandura, 2001; Scardamalia, 2002). In the realm of second language acquisition (L2), the agency has shifted focus from teachers to learners, emphasizing the importance of understanding how learners navigate their educational environments. Various theoretical frameworks, including sociocultural theory and dialogism, have been employed to explore agency within L2 education,

revealing that while teacher agency remains underexplored, it is intricately linked to identity formation and societal influences (Duff, 2012; Miller, 2014).

Teachers' professional agency encompasses their autonomy and ability to influence their teaching practices and professional growth. This includes making informed decisions regarding curriculum design, instructional methods, and classroom management tailored to the needs of L2 learners (Johnson & Golombek, 2016). A strong sense of professional identity fosters teachers' commitment to their roles and drives them to advocate for their educational philosophies while addressing challenges faced by students (Kumaravadivelu, 2012). The interplay between motivation and professional identity is essential, as motivated teachers are more likely to pursue continuous improvement in their practices and adapt to the dynamic needs of their learners (Dörnyei, 2013).

The relational aspect of teachers' professional agency highlights the importance of collaboration with students, parents, and the broader school community. Effective teacher-student relationships are foundational for creating a supportive learning environment that enhances student engagement and learning outcomes (Edwards, 2005). Professional agency is not merely an individual trait but is shaped by interactions within the educational community. Teachers are encouraged to take responsibility for fostering collaborative practices that promote innovative approaches to teaching and learning while navigating the complexities of school environments characterized by diverse demands and challenges (Greeno, 2006; Rainio, 2008).

Several key components contribute to teachers' professional agency: professional identity, decision-making, transformative agency, verbalizing individual voice, and motivation. Each component plays a critical role in empowering teachers to shape their practice actively. Professional identity involves a commitment to ethical teaching and reflective practice (Wayman, 2005), while decision-making allows teachers to respond proactively to challenges (Priestley & Biesta, 2013). Transformative agency enables educators to adapt effectively in complex situations (Hatano & Inagaki, 1986), whereas verbalizing individual voice fosters collaboration within the educational community (Hargreaves, 2003). Motivation serves as a driving force behind teachers' engagement in their roles and influences their willingness to integrate technology into their teaching practices effectively (Green, 2002; Scherer et al., 2019).

The TPACK Model

Mishra and Koehler's (2006) Technological Pedagogical Content Knowledge (TPACK) model (Figure 1) is a significant framework for understanding the integration of technology in education. It builds on Shulman's (1986) pedagogical content knowledge by incorporating technological knowledge, emphasizing the interplay between technology, pedagogy, and content. While TPACK provides a foundation for teacher knowledge necessary for effective technology integration, further exploration is needed to enhance teachers' technological pedagogical content knowledge. Studies suggest that developing TPACK is a complex process influenced by various situational factors, and while it outlines essential teacher competencies, it lacks specific strategies for improving integration practices. Additionally, there is a noted gap in understanding how educators apply TPACK principles in designing technology-enhanced curricula that foster 21st-century skills, highlighting the need for ongoing research in this area.

The TPACK model emphasizes the interconnectedness of three fundamental types of knowledge: Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK). CK refers to a teacher's expertise in a specific subject, encompassing concepts and best practices for teaching that subject. PK involves understanding instructional strategies and student learning styles, while TK pertains to the tools and resources available for integrating technology into teaching.

The model further delineates three specialized forms of knowledge: Pedagogical Content Knowledge (PCK), which connects teaching methods to specific content; Technological Content Knowledge (TCK), which explores the relationship between technology and subject matter; and Technological Pedagogical Knowledge (TPK), which examines how technology can transform teaching and learning dynamics. Ultimately, TPACK integrates these areas to foster effective technology use in education, recognizing that each teaching context is unique and requires a tailored approach that considers various factors such as grade level, cultural context, and individual educator characteristics (Koehler & Mishra, 2009).

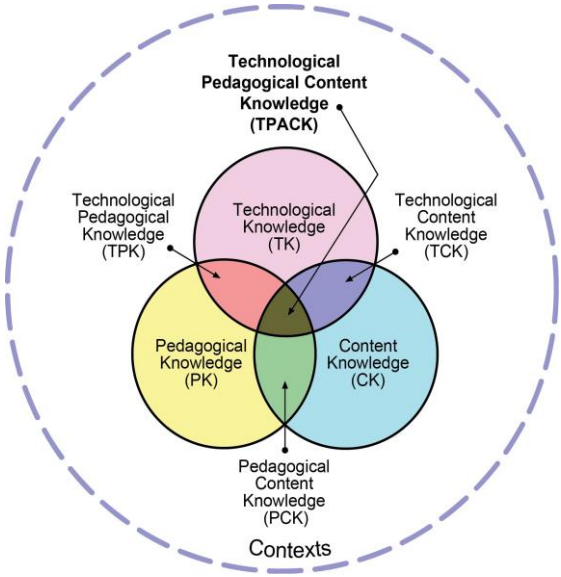


Figure 1. The TPACK model (Retrieved from http://tpack.org/)

Methodology

Research Design

We used a descriptive narrative inquiry in the current study. According to Ary et al. (2018), narrative inquiry involves researchers exploring people's life experiences and crafting a narrative analysis based on those stories. A descriptive narrative inquiry aims to characterize a phenomenon in relation to its participants and their contexts. Edmonds and Kennedy (2016) outline several key components of descriptive narrative inquiry, which include (a) participants' narratives about their life events, (b) situational factors that influence the narratives, (c) connections between different individuals' stories or the cultural contexts where these stories occur; and (d) the impact of unique life experiences on these narratives.

A descriptive narrative inquiry has seven stages. In the first stage, which focused on identifying the phenomena, we pinpointed the phenomenon, which in the current study was the TPACK model's role in developing student-teachers' professional agency. The second stage dealt with sampling. The third stage was the procedure in which the participants shared their tales with the researchers. We accurately sequenced the story events in the fourth stage and restated the stories obtained in stage three. We collaborated with the participants in the fifth step to ascertain the validity of

the experiences described in the narratives. Stage six allowed us to compose a narrative based on the participant's stories. Finally, stage seven allowed us to authenticate the accuracy and exactness with which the narrations have been written.

Participants

Eight EFL MA student-teachers employed as English language teachers in public and private institutions in Iran participated in the study. Iranian EFL student-teachers of various competency levels contributed as teachers throughout the whole course. They had varying amounts of teaching experience (between 1 and 5 years), and they instruct students at a range of English proficiency levels, from beginner to advanced. The participants may be from different universities, age range (20 to 38), and genders (both male and female). All of the student-teachers were native Persian speakers.

Table 1 The Information Regarding the Participants

Participants	Gender	Years of EFL experience	Years of ELT experience	Age
EFL teacher1	Female	10	3	23
EFL teacher2	Male	12	4	26
EFL teacher3	Female	14	5	25
EFL teacher4	Female	12	5	25
EFL teacher5	Male	15	5	26
EFL teacher6	Male	25	5	38
EFL teacher7	Female	15	5	26
EFL teacher8	Female	18	4	34

Data Sources

Autobiographical Narratives

We used autobiographical narratives as one of the data sources in the current study. Such narratives are defended by the fact that they emphasize the significance of interactions among all participants in the particular stories being told (De Fina, 2015). In this study, we explored how the participants enriched their professional agency. To evaluate the participants' idea development over time, they were asked to produce autobiographical narratives. As mentioned earlier, the agency has an ecological nature that necessitates the role of social resources to change specific conditions.

Semi-Structured Interviews

Semi-structured interviews incorporate arrangements of open pre-determined questions and empower the researcher with additional discussion. The idea of teacher agency is integrated with original concepts developed by the participants. We employed semi-structured interviews in the current study to allow for potential suggestions and additional arguments. Spontaneous inquiries that demand fast responses are inappropriate for examining teachers' agency. Therefore, semi-structured interviews were chosen. After implementing the examples and discussing the autobiographical narratives, the first researcher of this study and the participants met separately online. Moreover, TPACK courses were held for student-teachers to investigate the TPACK model's role in their professional agency. Having held the TPACK course, we investigated the role of the courses on student-teachers' professional agency.

TPACK-Based Teacher Education

In the present investigation, we conducted the TPACK course in eight sessions to explore the potential role of these sessions on their professional agency development concerning the technology-related issues they faced once they attempted to implement

the techniques. The use of techniques can be problematic due to several factors. Having completed the course, we explored the possible changes and improvements to their agency and professional agency.

The TPACK course was designed to equip student-teachers with a comprehensive understanding of the various components of the TPACK model and explore its potential impact on their professional agency. Throughout the course, student-teachers delved into the intersecting domains of technological, pedagogical, and content knowledge and examined how these elements intertwine to enhance teaching and learning experiences. The course began by introducing student-teachers to the foundational concepts of the TPACK model, emphasizing the importance of integrating technology effectively in educational settings. Student-teachers explored the technological knowledge domain, probing into various digital tools, applications, and resources relevant to their specific subject areas or teaching contexts. They gained hands-on experience with technology, learning how to select appropriate tools and leverage them to enhance instructional strategies and student engagement.

In parallel, student-teachers explored pedagogical knowledge, focusing on instructional design principles, learning theories, and effective teaching strategies. They learned how to align technology with pedagogy, considering how different technologies can support diverse instructional approaches and cater to the individual needs of learners. Student-teachers also examined the role of formative and summative assessments in leveraging technology to monitor students' progress and inform instructional decisions. Additionally, the course addressed content knowledge, emphasizing the importance of subject matter expertise in conjunction with technology integration. Student-teachers explored how technology could be used to enhance content delivery, facilitate inquiry-based learning, and foster critical thinking skills. They examined how technology could provide access to authentic resources, promote collaborative learning, and cultivate digital literacy among students.

Throughout the course, student-teachers engaged in practical activities, collaborative projects, and reflective discussions to apply the principles of the TPACK model in real-world teaching scenarios. They had opportunities to experiment with different technology tools, design lesson plans, and assess the impact of technology integration on student learning outcomes. Furthermore, the course encouraged student-teachers to reflect on their professional agency, fostering self-awareness and empowering them to make informed decisions about technology integration in their future teaching practice.

Data Analysis

We utilized the deductive thematic proposed by Braun and Clarke (2006, 2023) to analyze how the TPACK model influences the development of student-teachers' agency. This thematic analysis involved six interconnected phases: familiarization with the data, generating initial codes, searching for themes, reviewing and refining themes, defining and naming themes, and producing a comprehensive report. We engaged in a non-linear process, allowing for movement between phases as necessary. By thoroughly examining patterns in the data through this framework, we aimed to provide insights into the contributions of TPACK to educational practices.

Phase 1 involves familiarizing oneself with the data through careful reading and note-taking, utilizing software like MAXQDA 24 for organization and coding. Phase 2 focuses on generating initial codes based on significant features identified in the data. In Phase 3, these codes are organized into themes, allowing for deeper exploration and the creation of an initial thematic map. Phase 4 requires a thorough review of these themes to refine and validate them against the dataset, sometimes leading to the division of themes for better clarity. Phase 5 entails defining and naming each theme, ensuring they encapsulate the essence of the data while conveying an overarching

narrative. Finally, Phase 6 involves producing a comprehensive report that presents the findings clearly and analytically, integrating relevant data extracts to illustrate the identified themes. This structured approach facilitates meaningful insights and contributions to the field of study.

Findings

Specific codes related to both the TPACK model and student-teachers' professional agency were checked to see if they existed within the collected data. To that end, we used Code Matrix Browser in MAXQDA 24. The result of the CMB can be seen in Figure 2.

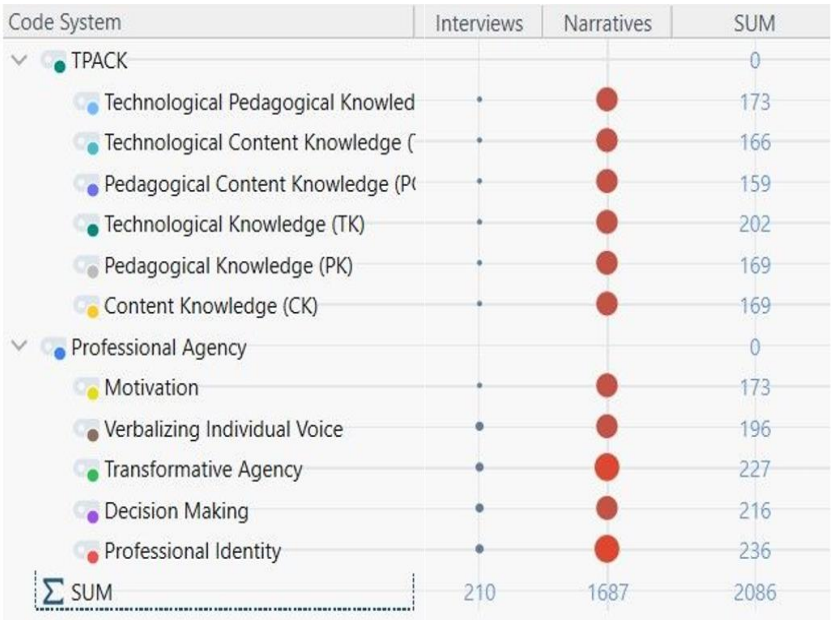


Figure 2. Code Matrix Browser: The Existence of the TPACK Model and Student-Teachers' Professional Agency Codes

Code Matrix Browser in Figure 2 shows that almost all of the a priori codes of the TPACK model, as well as student-teachers' professional agency, are available within the collected data through the data collection sources of this research, including autobiographical narratives and semi-structured interviews. The TPACK model codes were available in all of the data collection sources. However, most of the codes related to the TPACK model as a parental code were found in autobiographical narratives, as the main source of data collection in the current study. Codes related to the TPACK model phases were available throughout various data sources and were mostly found in autobiographical narratives. Furthermore, as shown in Figure 2, codes related to student-teachers' professional agency were found in almost all of the data collection sources of the current study. However, CMB cannot show the co-occurrences among the codes. Therefore, we conducted the Code Map to achieve this purpose.

Having confirmed the existence of codes within the data, showing the role of the TPACK model in teachers' professional agency, we used the Code Map system to address the deductive-inductive thematic analysis proposed by Braun and Clarke (2006, 2023). Therefore, this Code Map helped us find new aspects of the phenomenon inductively. To put it in other words, we used the Code Map generated

by MAXQDA 24 to see how codes happen together; therefore, we could have a comprehensive understanding of the role of the TPACK model in developing EFL student-teachers' professional agency. Codes are grouped closely in a cluster, indicating a stronger and more related relationship. Closely clustered codes can create a zone that can be utilized in qualitative analyses. According to the Code Map shown in Figure 3, we found that codes related to the TPACK model and student-teachers' professional agency can be located in two zones. Through a careful investigation of these zones, we reached the following themes.

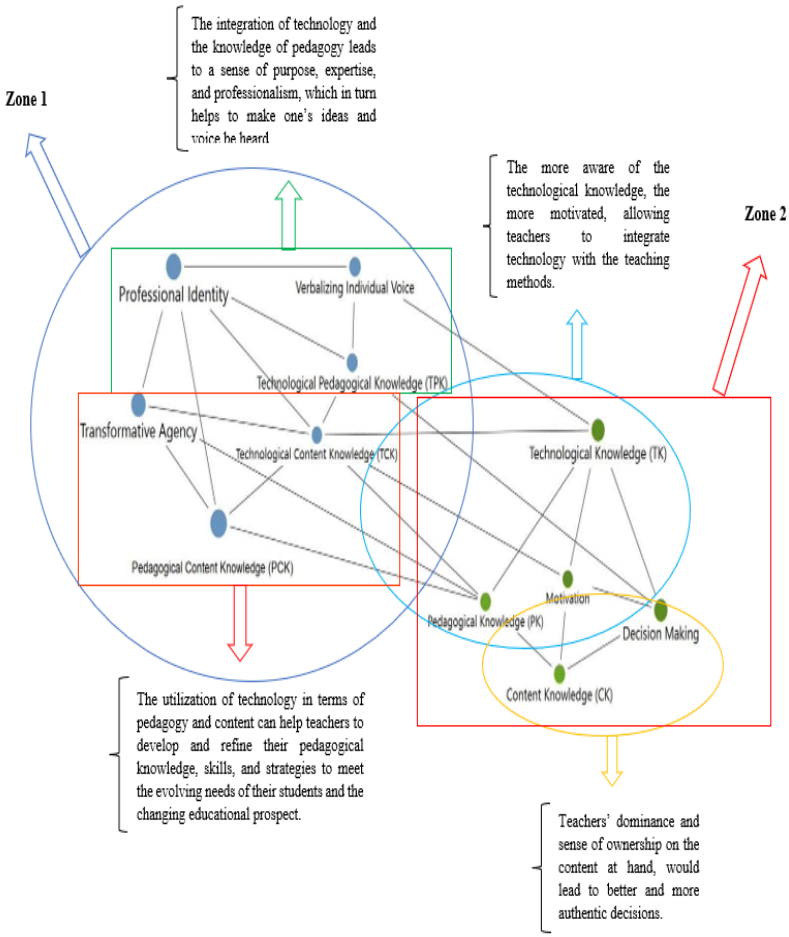


Figure 3. Code Map: Extracting the Themes

As shown in Figure 3, codes are clustered in two zones, and themes can be extracted from each zone. We found four themes: A) The integration of technology and the knowledge of pedagogy leads to a sense of purpose, expertise, and professionalism, which in turn helps to make one's ideas and voice be heard, B) The utilization of technology in terms of pedagogy and content can help teachers develop and refine their pedagogical knowledge, skills, and strategies to meet the evolving needs of their students and the changing educational prospects, C) The more aware of the

technological knowledge, the more motivated, allowing teachers to integrate technology with the teaching methods, and D) Teachers' dominance and sense of ownership on the content at hand, would lead to better and more authentic decisions.

The first theme appears in the first zone. The co-occurrence of the TPACK's technological pedagogical knowledge and two procedures of student-teachers' professional agency, including professional identity and verbalizing individual voice, helped us to reach the theme: The integration of technology and the knowledge of pedagogy leads to a sense of purpose, expertise, and professionalism, which in turns helps to make one's ideas and voice be heard.

Some participants reported that having opportunities for authentic interactions and activities with other EFL student teachers in the authentic and supportive context of the teacher education program helped them to express their feelings and concerns about online teaching. For instance, during a semi-structured interview with one of the participants, the EFL student-teacher emphasized the effectiveness of the authentic context and utilizing online platforms such as YouTube to fill in their knowledge gaps to overcome the difficult situations that might happen in the classroom, subjugating such issues can reduce anxiety and increase the ability to manage the situation, transcribed and translated from Persian in extract 1 (EFL student-teacher 2, Narrative).

Extract 1

The teacher can learn the points that he doubts or does not know from YouTube so that he will be less in a critical situation in the class. Critical situations are inevitable; we have to accept that these situations may happen to any teacher and not only to us. Understanding this issue can reduce anxiety and increase the ability to manage the situation.

Furthermore, after an interview session in which the TPACK model and the TPK was discussed, EFL student-teachers mentioned how the integration of technology and pedagogy in the TPACK model during the sessions helped them cope better with emotional barriers in their real online classes. For instance, they mentioned, "*Our vision became more comprehensive in the field of online education, especially since these discussions were based on the powerful TPACK model. Our position as teachers of the age of artificial intelligence according to the TPACK model in education, the available educational resources to align with the TPACK model and the methods that are consistent with this model in education, everyone*" (EFL student-teacher 1, Interview).

According to Figure 3, the first zone reveals another theme: The utilization of technology in terms of pedagogy and content can help teachers develop and refine their pedagogical knowledge, skills, and strategies to meet the evolving needs of their students and the changing educational prospects. This theme is about the connection between Transformative Agency (a sub-code for Professional Agency), Technological Content Knowledge, and Pedagogical Content Knowledge (sub-codes of the TPACK model). For instance, EFL student-teacher 2 referred to this connection in their narratives (EFL student-teacher 2, Narrative).

Extract 2

The teacher must master the content. New technologies, such as artificial intelligence, can help both the teacher and the learner. They help the teacher spend less time collecting content and examples, and they also answer the teacher's problems and questions very quickly.

In the second zone in Figure 3, we found two themes. The first theme is that the more aware of the technological knowledge, the more motivated, allowing teachers to integrate technology with teaching methods. This theme is about the connection between motivation (a sub-code of Professional Agency), technological knowledge,

and pedagogical knowledge (sub-codes of the TPACK model). The second theme is that teachers' dominance and sense of ownership of the content at hand would lead to better and more authentic decisions.

For instance, EFL student-teacher 4 reflected on the role of the TPACK model sessions on their perception of online classes. Before attending these sessions, they might have had reservations about the effectiveness of online teaching and the ability to effectively engage with course material and peers. However, after participating in the sessions, they found themselves equipped with valuable strategies to navigate the challenges of online learning. This newfound digital literacy not only enhanced their productivity but also increased their confidence in their ability to succeed in an online academic setting. The TPACK model not only helped them adapt to the new learning environment but also empowered them to make the most out of their online classes. The following interview is transcribed and translated from Persian in extract 5 (EFL student-teacher 4, Interview).

Extract 3

The TPACK classes we had helped me to be able to control my emotions in online classes in better ways and not express them too much, which would have a negative effect on the atmosphere of my class. I didn't feel very good about online classes before because I was inexperienced and didn't know about the strategies that exist to solve online class crises, but in the TPACK model, with the knowledge of its different parts, I realized how much awareness and I want to increase my literacy so that I can be more useful for myself and for my language learners.

Furthermore, following a session focused on the pedagogical aspects of the TPACK model, EFL student-teacher 3 expressed during an interview that they found the TPACK model to be beneficial in addressing research-based challenges and selecting suitable materials to enhance the efficiency of online classes. As a result, they reported feeling more motivated and better equipped to navigate the demands of teaching in a digital environment. The following interview is transcribed and translated from Persian in extract 6 (EFL student-teacher 3, Interview).

Extract 4

This model has made it possible to solve problematic gaps by simply mastering its components and using them correctly, especially in research works and the access to resources it has provided has greatly simplified and speeded up the progress of work. Despite the problems of access and cost, etc., it has become very effective in its own way, and has removed the feeling of confusion and concerns that were previously in the field of resources and seeking advice to start or correct the work, etc.

Subsequently, during the sessions focused on Technological Content Knowledge (TCK) within the TPACK model, EFL student-teacher 7 expressed their views through a narrative discussing the interrelationship between technology and content knowledge, which in contemporary times are closely intertwined and cannot be separated when a teacher is preparing for online classes. An educator seeking relevant content while attempting to bridge their knowledge gaps can leverage technology to enhance their expertise in the subject, resulting in more authentic and professional decision-making. The following narrative is transcribed and translated from Persian in extract 7 (EFL student-teacher 7, Narrative).

Extract 5

In fact, the importance of the teacher's mastery of the subject he is teaching and the method he adopts for teaching according to the examination of various factors were discussed in the last session. And I realized more and more the importance of integrating these two items. Technology is very important in this integration.

Discussion

In the current study, we found four themes that contribute to understanding the constructive role of the TPACK model in developing professional agency for EFL student-teachers. In the following parts, we discuss the themes in different respects.

Theme 1: The Integration of Technology and the Knowledge of Pedagogy leads to a Sense of Purpose, Expertise, and Professionalism, which in turn helps to make one's Ideas and Voice be heard

As shown earlier in Code Map (Figure 3), the TPACK model's technological pedagogical knowledge (TPK) had a constructive role in developing the professional identity and verbalizing the individual voice of student-teachers' professional agency. The technological pedagogical knowledge (TPK) of the TPACK model is related to the professional identity and verbalizing the individual voice of student-teachers' professional agency. As previously mentioned, the combination of pedagogical knowledge and technological skills can greatly enhance the professional identity of teachers (Hargreaves, 2003; Koehler & Mishra, 2009; Wayman, 2005). This enhancement allows teachers to articulate their unique voice in second-language teaching, establishing a strong sense of purpose, expertise, and professionalism. This, in turn, influences their instructional choices, relationships with students, and contributions to the field. Developing a professional identity involves taking ownership and agency in decision-making processes, ensuring that both the teacher's voice and their students' voices are heard (Hargreaves, 2003; Koehler & Mishra, 2009; Wayman, 2005). This alignment of practices with beliefs, values, and goals empowers teachers to make informed decisions that positively impact their teaching practice. Research by Wayman (2005), Hargreaves (2003), and Koehler and Mishra (2009) support the idea that professional identity is crucial for teachers to take control of their professional development and continuously improve their teaching methods. By embracing their professional identity, teachers can elevate their teaching practice and make a lasting impact on their students' learning experiences.

In the current research, EFL student-teachers actively participated in activities that were specifically designed to be relevant to real-life situations. They collaborated with their peers in a contextualized setting to share their ideas. Drawing upon the Technological Pedagogical Content Knowledge (TPACK) model, participants were encouraged to engage in group discussions, reevaluate their solutions, and make revisions that are in line with the needs of their students and learning objectives. As highlighted by Hargreaves (2003), verbalizing individual voice involves empowering learners to express their unique perspectives, opinions, and ideas in the target language. This process includes active participation in professional learning communities, engaging in collegial dialogue, and fostering collaborative relationships to improve teaching practices and student outcomes. This aspect is crucial for the professional growth of student-teachers. Throughout this phase, student-teachers had the opportunity to exchange ideas, analyze various viewpoints, and participate in discussions about their aspirations, concerns, and future goals. This collaborative approach not only enhances their teaching practices but also contributes to their overall professional development.

Theme 2: The Utilization of Technology in terms of Pedagogy and Content Can Help Teachers Develop and Refine their Pedagogical Knowledge, Skills, and Strategies to Meet the Evolving Needs of their Students and the Changing Educational Prospects

One crucial aspect of a teacher's professional agency is their ability to adapt and respond effectively in diverse and complex teaching situations, a concept known as transformative agency (Hatano & Inagaki, 1986). Transformative agency refers to a

teacher's capacity to innovate and make meaningful changes in their teaching practices to better meet the needs of their students. This skill is essential for educators to create engaging and impactful learning experiences. Pedagogical Content Knowledge (PCK) encompasses a teacher's understanding of the fundamentals of teaching and learning, including curriculum development, student evaluation, and reporting of findings. Similar to content knowledge (CK), PCK is specific to subject and grade level, focusing on the connections between pedagogy and supporting practices such as curriculum development and evaluation. Technological Content Knowledge (TCK) explores how educators perceive the ways in which material and technology can both support and contradict each other. TCK involves considering which educational technology tools are most appropriate for specific subject topics or classes, as well as understanding how the subject matter can be presented using various educational technology products (Koehler & Mishra, 2009).

The TPACK model, as proposed by Koehler and Mishra (2009), empowers EFL student-teachers to effectively integrate technology into their pedagogy and content delivery. Throughout the TPACK teacher-preparation program, EFL student-teachers are encouraged to engage in autobiographical narratives and interviews, allowing them to openly share their concerns and express their genuine emotions. Following the instructor's presentation of Technological Content Knowledge (TCK) and Pedagogical Content Knowledge (PCK), participants reflect on their experiences in both online and real-life teaching environments. They strive to uncover the intricate relationship between technology, pedagogy, and content, seeking to understand how these elements interact with one another. Through this exploration, participants draw upon their professional histories and past experiences, integrating newfound insights into their teaching practices (Koehler et al., 2019).

Theme 3: The more aware of Technological Knowledge, the more Motivated, allowing Teachers to integrate Technology with Teaching Methods

According to Priestley et al. (2015), agency can be achieved through a variety of contexts, making the context in which individuals find themselves crucial for both the acquisition and development of agency. Technology Knowledge (TK) encompasses the technical tools, resources, and expertise that teachers possess regarding various technologies. TK involves understanding educational technology, considering how it can be applied in specific subject areas or classrooms, knowing when it will facilitate the process of finding suitable materials, lesson planning, evaluation, classroom management, and understanding students' learning styles or impede learning. Additionally, it involves continuously learning about and adapting to new technological advancements (Koehler & Mishra, 2009). The greater the awareness of technological knowledge, the more motivated teachers become to integrate technology into their teaching methods and the finding of their pedagogical materials. This integration of technology not only enhances the learning experience for students but also helps teachers stay current and effective in their teaching practices. By staying informed and adaptable to technological advancements, teachers can better meet the needs of their students and create a more engaging and dynamic learning environment.

Educators engage in the practice of integrating technology, pedagogy, and material aspects of teacher agency within diverse teaching environments. Motivation is defined as an internal state that drives and directs teaching behavior (Green, 2002; Lauermann et al., 2017). In addition to other crucial motivational factors such as teaching enthusiasm (Keller et al., 2016; Kunter et al., 2008; Lazarides et al., 2019) and goal orientation (Butler, 2007; Han et al., 2016; Retelsdorf et al., 2010), a commonly explored motivational theory in teacher education is the expectancy-value theory (Hwang et al., 2018; Kale, 2018). This theory posits that teaching behavior is

primarily influenced by self-efficacy beliefs (individual confidence in successfully completing a task) and the perceived value associated with the task (Eccles & Wigfield, 2002). In the realm of technology integration by teachers, specific models have been developed and tested to examine the relationship between technology integration (acceptance of technology) and teachers' self-efficacy in using technology TPACK self-efficacy (Scherer et al., 2019) and their perceived utility of technologies (Petko, 2012; Scherer et al., 2019; Van Braak et al., 2004). In their 2019 study, Scherer et al. conducted a comprehensive meta-analytic structural equation modeling analysis of 114 empirical studies. Their research aimed to explore the impact of teachers' motivational beliefs, specifically self-efficacy and utility-value, on their intention to use technology and actual technology use in the classroom. The findings of the study revealed that teachers combined motivational beliefs of self-efficacy and utility-value significantly predicted their intention to incorporate technology into their teaching practices. The results indicated a strong relationship ($\beta = 0.334$) between these motivational beliefs and teachers' intention to use technology.

Theme 4: Teachers' Dominance and Sense of Ownership of the Content at hand would lead to better and more Authentic Decisions

Decision-making is a crucial component of a teacher's professional agency, as it involves the ability to anticipate, plan, and take action based on professional judgment (Priestley & Biesta, 2013). It requires teachers to be proactive in addressing challenges, seeking opportunities for growth and innovation, and actively shaping their teaching practice. By making informed decisions, teachers can effectively respond to the needs of their students and the educational environment (Priestley & Biesta, 2013). Content Knowledge (CK) refers to the expertise that professors possess in a particular subject area. This includes concepts, ideas, evidence, and organizational models relevant to the topic. Additionally, CK encompasses best practices and effective methods for teaching this knowledge to students. It is important to note that CK will differ depending on the discipline and grade level being taught. For example, middle school science and history classes may not require as in-depth knowledge as university or graduate courses. Therefore, the level of CK possessed by teachers in these subjects will vary, as will the level of CK acquired by students in each session (Koehler & Mishra, 2009).

The objective of the present study was to conceptualize the professional agency of EFL student-teachers through the TPACK model. Teaching is a multifaceted endeavor that necessitates a blend of various forms of knowledge, attitudes, skills, and values. In order for teaching to be effective, it must embody a standard of excellence and introspection. Within the classroom, educators are consistently tasked with making decisions that facilitate the teaching-learning dynamic and cultivate an atmosphere conducive to the physical and psychological growth of their students. Decision-making holds significance in the realm of education as adept classroom management not only enhances student behavior but also fosters a positive classroom climate and strengthens the student-teacher relationship (Hattie, 2009). Advancements in technology have enabled us to discreetly monitor and analyze students' non-verbal cues, including facial expressions (Li et al., 2016). These cues are expressed unconsciously and offer valuable insights into students' emotions and cognitive processes. Teachers can utilize this information to tailor their teaching methods and enhance the learning experience, leading to better decisions. By collecting and analyzing this data, educators can improve communication, prevent misunderstandings, and better assess students' comprehension and proficiency. This innovative approach not only enhances the teaching-learning process but also fosters a more effective and engaging educational environment.

Conclusion and Implications

The current study's results indicate that the TPACK model is essential for enhancing the professional agency of EFL student-teachers. It can be concluded that the challenges EFL teachers face when implementing the TPACK model can be addressed by integrating their professional agency into the process of developing their professional identity. Analyzing participant narratives and conducting semi-structured interviews revealed that while challenges do exist in implementing the TPACK model, they can be somewhat alleviated through participation in professional learning communities.

The findings of the current study have significant implications for EFL teacher education programs. It is expedient for these programs to incorporate the Technological Pedagogical Content Knowledge (TPACK) model to cultivate the professional agency of EFL student-teachers. Teacher education must prioritize the enhancement of digital literacy in the modern era and foster teachers' proficiency in utilizing technology effectively. This study has demonstrated that the TPACK model facilitates the seamless integration of technology with content and pedagogy, thereby amplifying one's ideas and voice. Moreover, it enables teachers to discover more efficient pedagogical approaches, leading to increased motivation among educators. A heightened awareness of technological knowledge empowers teachers to seamlessly integrate technology into their teaching methodologies. By empowering teachers with a sense of ownership and mastery over the content they deliver, the TPACK model enables educators to make informed decisions and refine their pedagogical knowledge, skills, and strategies to meet the evolving needs of their students and adapt to the changing educational landscape.

Bibliographic references

Ary, D., Jacobs, L. C., Irvine, C. K. S., & Walker, D. (2018). Introduction to research in education. Cengage Learning.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. Annual Review of Psychology, 52(1), 1-26.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77-101.

Braun, V., & Clarke, V. (2023). Toward good practice in thematic analysis: Avoiding common problems and be (com) ing a knowing researcher. International Journal of Transgender Health, 24(1), 1-6.

Butler, R. (2007). Teachers' achievement goal orientations and associations with teachers' help seeking: Examination of a novel approach to teacher motivation. Journal of Educational Psychology, 99(2), 241.

Casey, C. (2006). Workers, subjectivity and decent work. In Work, Subjectivity and Learning: Understanding learning through working life. Netherlands, Springer, 229-245.

Duff, P. (2012). Issues of identity. In A. Mackey and S. Gass (Eds.). The Routledge handbook of second language acquisition, Routledge, 410-426.

Dörnyei Z. (2013). The psychology of second language acquisition. Oxford University Press.

De Fina, A. (2015). Narratives and identity. In A. De Fina, & A. Georgakopoulou (Eds.), The handbook of narrative analysis (pp. 351-368). John Wiley & Sons.

Edwards, A. (2005). Relational agency: Learning to be a resourceful practitioner. International Journal of Educational Research, 43(3), 168-182.

Edmonds, W. A., & Kennedy, T. D. (2016). An applied guide to research designs: Quantitative, qualitative, and mixed methods. Sage Publications.

Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. Annual Review of Psychology, 53(1), 109-132.

Eteläpelto, A., Vähäsantanen, K., Hökkä, P., & Paloniemi, S. (2013). What is agency? Conceptualizing professional agency at work. Educational Research Review, 10, 45-65.
Giddens, A. (1984). The constitution of society. Berkeley.
Giddens, A. (2020). Modernity and self-identity: Self and society in the late modern age. In S. Seidman, & J. C. Alexander (Eds.). Routledge, The new social theory reader, 354-361.
Greeno, J. G. (2006). Authoritative, accountable positioning and connected, general knowing: Progressive themes in understanding transfer. The Journal of the Learning Sciences, 15(4), 537-547.
Green, S. K. (2002). Using an expectancy-value approach to examine teachers' motivational strategies. Teaching and Teacher Education, 18(8), 989-1005.
Hatano, G., & Inagaki, K. (1986). Two courses of expertise. In H. Stevenson, H. Azuma, & K. Hakuta (Eds.), Child development and education in Japan, 262-272.
Hargreaves, A. (2003). Teaching in the knowledge society: Education in the Age of Insecurity. Teachers College Press.
Hargreaves, A., & Fullan, M. (2014). Professional capital: Transforming teaching in every school. Teachers College Press.
Han, J., Yin, H., & Wang, W. (2016). The effect of tertiary teachers' goal orientations for teaching on their commitment: The mediating role of teacher engagement. Educational Psychology, 36(3), 526-547.
Haj Seyed Javadi, Y.S. and Meihami, H. (2024). An ecological perspective into the role of case-based instruction in developing EFL student-teachers' agency. English Teaching: Practice & Critique. https://doi.org/10.1108/ETPC-04-2024-0059
Hattie, J. (2009). Visible Learning: A synthesis of over 800 meta-analyses relating to achievement. Routledge
Hwang, M. Y., Hong, J. C., & Hao, Y. W. (2018). The value of CK, PK, and PCK in professional development programs predicted by the progressive beliefs of elementary school teachers. European Journal of Teacher Education, 41(4), 448-462.
Jang, S. J., & Chen, K. C. (2010). From PCK to TPACK: Developing a transformative model for pre-service science teachers. Journal of Science Education and Technology, 19(6), 553–564.
Johnson, K. E., & Golombek, P. R. (2016). Mindful L2 teacher education: A sociocultural perspective on cultivating teachers' professional development. Routledge.
Kumaravadivelu, B. (2012). Language teacher education for a global society: A modular model for knowing, analyzing, recognizing, doing, and seeing. Routledge.
Koehler, M., & Mishra, P. (2009). What is technological pedagogical content knowledge (TPACK)? Contemporary Issues in Technology and Teacher Education, 9(1), 60-70.
Koehler, A. A., Ertmer, P. A., & Newby, T. J. (2019). Developing pre-service teachers' instructional design skills through case-based instruction: Examining the impact of discussion format. Journal of Teacher Education, 70(4), 319-334.
Keller, M. M., Hoy, A. W., Goetz, T., & Frenzel, A. C. (2016). Teacher enthusiasm: Reviewing and redefining a complex construct. Educational Psychology Review, 28, 743-769.
Kunter, M., Tsai, Y. M., Klusmann, U., Brunner, M., Krauss, S., & Baumert, J. (2008). Students' and mathematics teachers' perceptions of teacher enthusiasm and instruction. Learning and Instruction, 18(5), 468-482.
Kale, U. (2018). Technology valued? Observation and review activities to enhance future teachers' utility value toward technology integration. Computers & Education, 117, 160-174.
Littleton, K., & Miell, D. (2004). Collaborative creativity: Contemporary perspectives. Free Association Books.

Littleton, K., Taylor, S., & Eteläpelto, A. (2012). Special issue introduction: Creativity and creative work in contemporary working contexts. Vocations and Learning, 5, 1-4.
Lauermann, F., Eccles, J. S., & Pekrun, R. (2017). Why do children worry about their academic achievement? An expectancy-value perspective on elementary students' worries about their mathematics and reading performance. ZDM, 49, 339-354.
Lazarides, R., Gaspard, H., & Dicke, A. L. (2019). Dynamics of classroom motivation: Teacher enthusiasm and the development of math interest and teacher support. Learning and Instruction, 60, 126-137.
Li, Z., Gong, D., Li, X., & Tao, D. (2016). Aging face recognition: A Hierarchical learning model based on local patterns selection. IEEE Transactions on Image Processing, 25(5), 2146-2154.
Miller, E. R. (2014). The language of adult immigrants: Agency in the making. Multilingual Matters.
Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. Teachers College Record, 108(6), 1017-1054.
Meihami, H., & Malmir, A. (2024). Student-teachers' professional agency development through ADDIE model of CALL teacher preparation. Language Teaching Research, 13621688241254907.
Pyhältö, K., Pietarinen, J., & Soini, T. (2015). Teachers' professional agency and learning–from adaption to active modification in the teacher community. Teachers and Teaching, 21(7), 811-830.
Pyhältö, K., Pietarinen, J., & Soini, T. (2012). Do comprehensive school teachers perceive themselves as active professional agents in school reforms? Journal of Educational Change, 13, 95-116.
Priestley, M., Biesta, G., & Robinson, S. (2013). Teachers as agents of change: Teacher agency and emerging models of curriculum. Reinventing the Curriculum: New Trends in Curriculum Policy and Practice, 1, 187-206.
Priestley, M., Priestley, M. R., Biesta, G., & Robinson, S. (2015). Teacher Agency: An Ecological Approach. Bloomsbury Publishing.
Petko, D. (2012). Teachers' pedagogical beliefs and their use of digital media in classrooms: Sharpening the focus of the 'will, skill, tool model and integrating teachers' constructivist orientations. Computers & Education, 58(4), 1351-1359.
Rainio, A. P. (2008). From resistance to involvement: Examining agency and control in a playworld activity. Mind, Culture, and Activity, 15(2), 115-140.
Retelsdorf, J., Butler, R., Streblow, L., & Schiefele, U. (2010). Teachers' goal orientations for teaching: Associations with instructional practices, interest in teaching, and burnout. Learning and Instruction, 20(1), 30-46.
Son, J. (2020). CALL research and practice in second language acquisition. In The Routledge Handbook of Second Language Acquisition and CALL, 375-391. Routledge.
Sawyer, K. (2007). Group genius. Basic Books.
Soini, T., Pietarinen, J., & Pyhältö, K. (2016). What if teachers learn in the classroom? Teacher Development, 20(3), 380–397.
Scardamalia, M. (2002). Collective cognitive responsibility for the advancement of knowledge. Liberal Education in a Knowledge Society, 97, 67-98.
Scherer, R., Siddiq, F., & Tondeur, J. (2019). The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. Computers & Education, 128, 13-35.
Shulman, L.S. (1986). Those who understand: Knowledge growth in teaching. Educational Researcher, 15(2), 4-14.

Vähäsantanen, K., Saarinen, J., & Eteläpelto, A. (2009). Between school and working life: Vocational teachers' agency in boundary-crossing settings. International Journal of Educational Research, 48(6), 395–404.
Van Braak, J., Tondeur, J., & Valcke, M. (2004). Explaining different types of computers use among primary school teachers. European Journal of Psychology of Education, 19, 407-422.
Welzel, C., & Inglehart, R. (2010). Agency, values, and well-being: A human development model. Social Indicators Research, 97, 43-63.
Wayman, J. C. (2005). Involving teachers in data-driven decision making: Using computer data systems to support teacher inquiry and reflection. Journal of Education for Students Placed at Risk, 10(3), 295-308.
Yurdakul (2011). Examining techno pedagogical knowledge competencies of pre-service teachers based on ICT usage. Hacettepe University Journal of Education, 40, 397-408.

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