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Iranian Pre-Service EFL Teachers' TPACK Competencies: A Case Study of Semnan Farhangian University

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ABSTRACT

Background and Objectives: Over the past decades, the integration of technology in education has transformed how various subjects are taught and learned. This trend has also impacted English as a Foreign Language (EFL) education, opening up new possibilities for interactive learning, global communication, and cultural exchange through online tools and platforms. The increasing demand for engaging and interactive learning experiences has made it essential to train pre-service EFL teachers (PSEFLTs) in effectively merging technology and EFL instruction, allowing them to leverage the benefits of digital tools and resources. This training can begin with an assessment of their current Technological Pedagogical Content Knowledge (TPACK). To this end, the current study seeks to explore PSEFLTs' perceived TPACK competencies and their actual practices for incorporating technology into their teaching, ultimately enhancing their effectiveness in diverse educational contexts.

Materials and Methods: Ten undergraduate students enrolled in an English Language Teaching (ELT) program at Semnan Farhangian University in Iran were recruited, comprising six females and four males selected through purposive sampling. They were in their last year of their academic program. This study employed a qualitative case study design, with data collected through semi-structured interviews and classroom observations. The open-ended interview questions and observation checklist were formulated based on a review of the literature on TPACK. In this study, the EFL teacher educators acted as peer debriefers, which contributed to enhancing the validity of the research. Pilot interviews and observations, member-checking, and data triangulation were also conducted to strengthen the credibility of the study. To analyze the data, the researcher employed thematic analysis.

Findings: The findings indicated that while PSEFLTs demonstrated a solid foundation in CK, PK, and PCK, their TK, TCK, TPK, and TPACK competencies appeared to be limited. Specifically, the PSEFLTs exhibited a strong grasp of the content and effective teaching strategies; however, their understanding and application of technology in educational contexts were insufficient. This gap suggests that despite having the necessary knowledge to teach effectively, they struggled to integrate technological tools and resources into their instructional practices. Observations also revealed a limited use of technology for student-centered learning.

Conclusions: The findings of this study shed light on a concerning gap in the current Iranian pre-service EFL teacher education programs, indicating that future teachers, while possessing strong content and pedagogical content knowledge, are not adequately equipped with the essential TPACK foundation needed to incorporate technology into their teaching methodologies seamlessly. This deficiency in preparing pre-service teachers in the integration of technology could potentially impede their effectiveness in delivering engaging and innovative instruction to their students. The implications of this study extend beyond the classroom, calling attention to the need for policymakers, curriculum developers, and material planners to reassess and enhance teacher training programs to better align with the demands of the 21st-century educational landscape. By effectively addressing the identified weaknesses in the TPACK of PSEFLTs, stakeholders can equip them with the necessary knowledge and skills to utilize the potential of technology in teaching, thereby significantly improving student learning outcomes and fostering a more engaging educational environment.

NUMBER OF REFERENCES 55 | NUMBER OF FIGURES 0 | NUMBER OF TABLES 4

مقاله پژوهشی

بررسی شایستگی‌های دانشجومعلمان ایرانی رشته آموزش زبان انگلیسی در دانش فن‌آوری، تربیتی، موضوعی و تربیتی- موضوعی (مطالعه موردی: دانشگاه فرهنگیان سمنان)

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چکیده

پیشینه و اهداف: در طول دهه‌های گذشته، ادغام فناوری در آموزش، شیوه های تدریس و یادگیری موضوعات مختلف را متحول کرده است. این روند بر آموزش زبان انگلیسی به عنوان زبان خارجی نیز تأثیر گذاشته است و فرصت های جدیدی برای یادگیری تعاملی، ارتباطات جهانی و تبادل فرهنگی از طریق ابزارها و پلتفرم های آنلاین ایجاد کرده است. تقاضای فزاینده برای تجربیات یادگیری جذاب و تعاملی، آموزش به دانشجو معلمان رشته آموزش زبان انگلیسی در راستای ادغام موثر دو مقوله فن آوری و آموزش زبان را ضروری کرده است تا به آن ها امکان دهد از مزایای ابزارها و منابع دیجیتالی بهره مند شوند. این آموزش ها را می‌توان با ارزیابی دانش فن آوری، تربیتی، موضوعی و تربیتی-موضوعی آن ها آغاز کرد. مطالعه حاضر به بررسی و تحلیل نظرات دانشجو معلمان رشته زبان انگلیسی در خصوص شایستگی هایشان در دانش فن آوری، تربیتی، موضوعی و تربیتی-موضوعی و عملکرد واقعی آن ها در کلاس درس در استفاده از فن آوری می‌پردازد که در نهایت به افزایش اثربخشی آن‌ها در حیطه های مختلف آموزشی کمک می‌کند.

روش‌ها: ده دانشجوی سال آخر مقطع کارشناسی رشته آموزش زبان انگلیسی در دانشگاه فرهنگیان سمنان، ایران شامل شش زن و چهار مرد از طریق نمونه‌گیری هدفمند انتخاب شدند. در این تحقیق کیفی از روش مطالعه موردی استفاده و داده‌ها از طریق مصاحبه‌های نیمه‌ساختاریافته و مشاهدات کلاس درس جمع‌آوری شد. سوالات باز پاسخ مصاحبه و چک‌لیست مشاهده بر اساس مرور ادبیات تحقیق مربوط به الگوی تی پک طراحی شدند. بازبینی ابزار تحقیق توسط استادان رشته آموزش زبان انگلیسی، انجام مصاحبه‌ها و مشاهدات آزمایشی، بازبینی شرکت کنندگان و مثلث سازی داده ها به افزایش اعتبار مطالعه کمک کرد. برای تجزیه وتحلیل داده‌ها، پژوهشگر از روش تحلیل مضمون استفاده کرد.

یافته‌ها: نتایج نشان داد، در حالی که دانشجومعلمان از دانش موضوعی، دانش تربیتی و دانش موضوعی-تربیتی قوی برخوردار هستند، دانش و مهارت آن‌ها در دانش فن آوری، تربیتی، موضوعی و تربیتی-موضوعی محدود است. به‌طور خاص، دانشجومعلمان زبان انگلیسی دارای تسلط کافی بر محتوای درسی و شیوه‌های تدریس مؤثر بودند؛ با این حال، درک آن ها از فن آوری و توانمندیشان در استفاده از آن در امر تدریس ناکافی بود. این شکاف نشان می‌دهد که با وجود بهره مندی از دانش و مهارت لازم برای تدریس مؤثر، آن‌ها در ادغام ابزارها و منابع فن آورانه در تدریس با مشکل مواجه هستند. مشاهدات کلاسی نیز حاکی از استفاده محدود از فن آوری در امر آموزش به شیوه‌ی دانش‌آموز-محور بود.

نتیجه‌گیری: یافته‌های این مطالعه به وجود یک شکاف نگران‌کننده در آموزش دانشجومعلمان زبان انگلیسی به عنوان زبان خارجی در ایران اشاره دارد. این نتایج نشان می‌دهد که معلمان آینده در عین برخورداری از دانش موضوعی و دانش تربیتی-موضوعی قوی، از دانش فن‌آوری، تربیتی، موضوعی و تربیتی-موضوعی کافی برخوردار نیستند تا بتوانند در تدریس خود به‌طور مؤثر از آن استفاده کنند. این نقص در آماده‌سازی دانشجومعلمان به طور بالقوه می‌تواند بر عملکرد آن‌ها در ارائه آموزش‌های جذاب و نوآورانه به دانش‌آموزان تأثیر منفی بگذارد. پیامدهای این مطالعه فراتر از کلاس درس است و از سیاستگذاران، برنامه ریزان و مولفان کتاب های درسی می‌خواهد برنامه درسی دانشجومعلمان را بازبینی نموده و بهبود بخشند تا بهتر با نیازهای آموزشی قرن بیست و یکم هم‌سو شود. با پرداختن موثر به نقاط ضعف شناسایی شده در زمینه‌ی دانش فن‌آوری، تربیتی، موضوعی و تربیتی-موضوعی دانشجومعلمان زبان انگلیسی، ذینفعان می‌توانند آن ها را با دانش و مهارت‌های لازم برای بهره گیری از ظرفیت های فن آوری در تدریس مجهز ساخته و بدین ترتیب، به طور قابل توجهی نتایج یادگیری دانش‌آموزان را بهبود بخشیده و یک محیط آموزشی جذاب‌تر ایجاد کنند.

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Introduction

In recent years, technology has transformed the landscape of education, offering new possibilities for teaching and learning. It is widely recognized that the COVID-19 pandemic has brought about significant changes in the way education is delivered, with a shift from traditional face-to-face instruction to online instruction [1]. While technology has become increasingly popular in education [2], its widespread availability doesn't automatically lead to effective use. This disconnect stems from a narrow focus on technology itself, with technology skills often taught in isolation from real-world context and pedagogical strategies. This separation hinders teachers' ability to understand how technology interacts with teaching methods and learning environments. Consequently, successful technology integration in education requires more than just providing computers and internet access [3]. It necessitates a holistic approach that considers the broader context and its implications for teaching and learning [4]. In the field of English language teaching (ELT), technology integration has become increasingly important as it provides opportunities to engage students, enhance language skills, and promote autonomous learning. To effectively teach, instructors must possess a strong foundation in three interconnected areas: technology, pedagogy, and content [5]. This understanding is known as Technological Pedagogical Content Knowledge (TPACK) and is crucial for delivering engaging and effective language instruction [6].

Pierson [7] initially proposed the concept of TPACK, which was further developed by other researchers who emphasized the importance of technology integration within specific subjects [8,9]. The influential work of Mishra and Koehler [10] significantly boosted the visibility and popularity of TPACK. The framework of TPACK builds upon Shulman's [11] model of PCK, adding the construct of technology [12]. Wang et al. [13] define TPACK as a teacher's intuitive grasp of how to bring together pedagogical knowledge and chosen technologies. In fact, TPACK is a framework that suggests teaching with technology is effective only when teachers utilize a combination of knowledge bases—specifically, technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK)—and can recognize the connections and interactions among these areas of knowledge [4].

TPACK in ELT can be defined as a framework that empowers teachers to use technology strategically to enhance the effectiveness and quality of language learning [14]. The success of technology-based language teaching hinges heavily on the effectiveness of teacher education programs for EFL teachers. These programs are crucial because they shape the knowledge and skills that teachers need to integrate technology effectively into language learning [15]. In fact, the importance of TPACK in pre-service ELT teacher education lies in its ability to prepare future teachers for the dynamic landscape of modern classrooms. By emphasizing the interconnectedness of technological knowledge, pedagogical strategies, and content mastery, TPACK encourages PSEFLTs to develop a comprehensive understanding of how to effectively integrate technology into their language instruction [16]. This framework enables them to critically evaluate and select appropriate digital tools and resources tailored to the diverse learning needs of their students [17]. Additionally, TPACK fosters a reflective teaching practice, prompting pre-service teachers to consider how their choices impact student engagement and learning outcomes [18]. Ultimately, cultivating TPACK in pre-service programs equips future EFL teachers with the essential skills and confidence to navigate the complexities of 21st-century

education, enhancing their effectiveness in fostering language acquisition and critical thinking among learners [19].

There has been a recent surge in quantitative studies assessing PSEFLTs' TPACK levels in Iran [4, 20, 21, 22] and in other EFL contexts [23,24,25,26,27]. For instance, Momenanzadeh et al. [4] aimed to compare pre-service teachers' TPACK perceptions in Iran and Oman using online questionnaires. The findings revealed that PSEFLTs generally had high perceptions of their TPACK, but Iranians' perceptions were significantly higher than those of Omanians across all TPACK subdomains. Nazari et al [21] investigated the differences in perceived TPACK between Iranian novice and experienced EFL teachers and how these differences influence their professional development using surveys. The results revealed that experienced teachers scored significantly higher in PK and PCK, while novice teachers excelled in TK, TCK, TPK, and overall TPACK. Farhadi and Öztürk's [25] study on Turkish PSEFLTs' TPACK level and needs revealed a generally high proficiency, but also highlighted a need for further development in TK, TCK, and TPK. Sarıçoban et al.'s [27] study quantitatively assessed the TPACK of 77 preservice EFL teachers using a survey. The results indicated a generally satisfactory level of TPACK competence, but also highlighted areas where these future teachers needed further development.

In a qualitative area of inquiry, Huang et al. [28] explored preservice English teachers' TPACK in the context of a teaching contest. The study involved interviews with three pre-service English teachers who took part in a teaching contest aiming to uncover how this experience shaped their TPACK development. The findings indicated that their TPACK was significantly enhanced through observing role models, engaging in instructional design practice, collaborating with peers, receiving expert feedback, and participating in self-reflection. In a mixed-methods study, Koşar [14] examined PSEFLTs' self-perceived TPACK. The content analysis of the data from the telephone interviews revealed that, while the interviewees largely perceived their TPACK level to be high, they recommended enhancing the curriculum by incorporating a course focused on the use of technology in EFL teaching. Limbong et al. [29] study explored the integration of digital technology into the teaching practices of PSEFLTs in Indonesia, leveraging the TPACK framework. The research involved six pre-service teachers, gathering data through Video-Stimulated Recall (VSR) interviews, direct classroom observations, and analysis of teaching materials such as lesson plans and multimedia resources. Findings indicated that while pre-service teachers possess theoretical knowledge about technology integration, practical implementation is often hindered by infrastructural limitations.

As the review indicated, there is a dearth of qualitative research [28][14][29] specifically looking at the perceptions and practices of PSEFLTs, particularly in the Iranian context. This research gap emphasizes the need for further investigation into how Iranian PSEFLTs perceive their TPACK competency for effectively integrating technology and how they put that into practice. Therefore, to address this gap, the current study seeks to explore PSEFLTs' perceived TPACK competencies and their actual practices for incorporating technology. It is guided by two research questions: How do PSEFLTs perceive their competencies in TPACK? And what are the actual practices of PSEFLTs in incorporating technology into their teaching?

Review of the Related Literature

TPACK and Teacher Education

The growing importance of integrating technology into teaching has given rise to the TPACK framework [14]. TPACK is a crucial framework for educators to understand how technology can enhance the teaching and learning process. In this framework, teachers' knowledge is comprised of three primary elements: content, pedagogy, and technology. Equally important in this framework are the interactions among these three knowledge areas, as represented by PCK (Pedagogical Content Knowledge), TCK (Technological Content Knowledge), TPK (Technological Pedagogical Knowledge), and TPACK. It emphasizes the importance of not just using technology for the sake of using it, but integrating it in a meaningful way that enhances the overall learning experience [30][12].

While pre-service teachers are often considered digital natives due to their comfort with technology and diverse digital tools, their primary focus is typically on personal learning needs. As they transit to the role of teachers, they require the development of TPACK to effectively integrate technology into their classrooms [31]. This transition, however, takes time and effort. Research by Roney et al. [32] suggests that teachers need 3-6 years of experience to fully integrate technology into their teaching. Therefore, fostering TPACK development during pre-service teacher education programs becomes crucial to ensure their readiness for effective technology integration in their future classrooms. Such programs must focus on fostering an understanding of how technology can enhance pedagogical methods and align with content goals, thus enhancing lesson engagement and accommodating diverse learning styles [33-35].

By emphasizing TPACK in teacher training, ELT education can prepare teachers to create dynamic learning experiences that not only retain student interest but also address the challenges associated with language acquisition in various contexts, including blended and online environments. Furthermore, a robust teacher education framework that nurtures TPACK competency encourages ongoing professional development, enabling teachers to remain abreast of technological advancements and educational trends [36]. Ultimately, integrating TPACK into ELT teacher education is essential, as it ensures that EFL teachers are well-prepared to positively impact student outcomes and facilitate success in a rapidly changing, technology-driven world [37]. The four-year pre-service ELT teacher education program at Farghangian University, Iran, categorizes its courses as General Knowledge (GK), PK, CK, and PCK [38]. The curriculum comprises 150 credit units and includes only three dedicated TPK courses focused on Technology-Assisted Language Teaching (I, II, and III), which are offered during the 2nd, 3rd, and 4th semesters of study. This lack of focus on TK, TCK, and TPACK represents a significant deficiency, as these areas are crucial for effective technology integration in education [39].

Studies on PSEFLTs' TPACK Development

Recent research has investigated the TPACK competencies of pre-service English as a Foreign Language Teachers (PSEFLTs), focusing on their perceptions and use of technology in language teaching. Alhamid and Mohammad-Salehi [40] conducted a correlational study involving sixty EFL teachers, who completed questionnaires on TPACK and online teaching. The findings indicated low to moderate positive

correlations between teachers' attitudes toward online instruction and TPACK domains, suggesting that those with positive attitudes also viewed their TPACK favorably. Atar et al. [41] examined the TPACK levels of 182 pre-service English teachers in Turkey using the TPACK-Deep scale. The results indicated that the teachers exhibited high TPACK competence in all three dimensions, except for Ethics, where their competence was moderate. Additionally, while gender and internet usage significantly influenced the Design dimension of TPACK, no other variables had a notable impact on overall TPACK. Cengiz and Kaçar' [42] study involved nine Turkish PSEFLTs in a six-week online teaching project, focusing on theoretical and practical training in online language instruction. Results indicated that the project enhanced the participants' overall TPACK development, yet some faced difficulties in effectively integrating technology with content and pedagogy. Faden [43] examined the relationship between pre-service English teachers' perception of their TPACK and their experience of technostress during teaching internships. The study focused on 83 pre-service English teachers who were participating in teaching internships using questionnaires. The findings revealed a low correlation between these two variables, indicating a weak, but statistically significant, association between higher perceived TPACK and lower levels of technostress during the internship period. Farhadi and Öztürk's [25] study on the TPACK levels and needs of Turkish PSEFLTs found that participants demonstrated a relatively high proficiency in TPACK. However, the results also indicated a need for further support in developing their TK, TCK, and TPK.

Within the body of research on TPACK in the Iranian context, particularly in ELT, Mansouri Qadikolaei et al. [20] investigated the level of TPACK among Iranian EFL teachers in relation to their educational background and teaching experience. The findings indicated that there were no significant differences in the scores of TK, CK, PK, PCK, TPK, and TPACK among participants at various educational levels. However, MA participants performed better than BA participants in terms of TCK scores. Additionally, the results revealed that participants with more experience achieved higher scores in PK, PCK, and TPACK compared to those with less experience. Maghsoudi' [44] study aimed at describing a causal model of variables influencing PSEFLTs' TPACK. The findings indicated that there were strong positive associations between the different aspects of TPACK. Furthermore, it was observed that both CK and PK had a direct influence on TPACK, while TK did not. Additionally, it was discovered that CK had the largest overall effect on TPACK, while PCK had the smallest effect out of all the variables measured. Momenanzadeh et al. [4] investigated differences in TPACK perceptions among preservice EFL teachers in Iran and Oman, while also exploring potential gender gaps in these perceptions. Using a quantitative design, data were collected through online questionnaires administered to pre-service teachers in both countries. The results indicated that generally preservice EFL teachers held high perceptions of their TPACK; however, Iranians demonstrated significantly higher TPACK perceptions than their Omani counterparts across all subdomains. Additionally, the study found no significant differences in TPACK perceptions based on gender in Oman, Iran, or among all participants collectively, regardless of nationality. Najjar et al. 's [15] study aimed to investigate the current state of Iranian EFL teachers' TPACK literacy, assess the impact of TPACK literacy development on their teaching practices, and explore how their perceptions of TPACK evolved through a targeted intervention. To achieve this, 15 teachers participated in TPACK workshops that utilized a learning by doing

approach based on the TPACK framework. Chi-square analysis revealed statistically significant improvements in the participants' TPACK literacy following the workshops. Furthermore, the study observed a positive shift in participants' perceptions of TPACK literacy as a result of their engagement in the workshops.

In the qualitative research strand, there is a notable dearth of research focusing on the perspectives and actual practices of PSEFLTs, particularly within the Iranian context. Huang et al. [28] conducted a qualitative study examining the development of TPACK among pre-service English teachers within the context of a teaching competition. The research involved interviews with three pre-service English teachers who participated in this competitive event, aiming to understand how the contest influenced their TPACK growth. The findings revealed that their TPACK was significantly enhanced through various activities, including observing role models, engaging in instructional design practices, collaborating with peers, receiving feedback from experts, and participating in self-reflection. These experiences not only deepened their understanding of technology integration but also fostered a supportive learning environment that encouraged professional growth. Koşar [14] investigated the self-perceived TPACK of PSEFLTs. The findings revealed that while the participants generally rated their TPACK levels as high, they also identified a need for curriculum enhancement. Specifically, they recommended the inclusion of a dedicated course focused on the effective use of technology in EFL teaching, recognizing that structured learning in this area could further bolster their preparedness for the classroom. Limbong et al. [29] investigated the integration of digital technology in the teaching practices of PSEFLTs in Indonesia using the TPACK framework. The study involved six pre-service teachers and utilized Video-Stimulated Recall (VSR) interviews, classroom observations, and analyses of teaching materials. Findings revealed that while the teachers had a strong theoretical understanding of technology integration, their practical implementation was often limited by infrastructural challenges. This underscores the necessity for supportive environments and resources to enhance the effective use of technology in education.

The current study stands out by focusing on the qualitative exploration of Semnan Farhangian University PSEFLTs' perspectives on their TPACK competencies, as well as their actual practices, using interview and observation data collection instruments. This approach emphasizes an in-depth understanding of their experiences, challenges, and approaches to using technology in their teaching. The study goes beyond simply asking teachers about their TPACK perceptions and delves into their actual abilities and skills in using technology effectively in the EFL classrooms. This is a vital aspect often neglected in previous research.

Method

Participants

The study included ten pre-service teachers, comprising six females and four males, all in their final year of an ELT teacher education program, selected through purposive sampling. The researcher focused on last-year students for two main reasons: their accumulated experience and knowledge provide valuable insights into TPACK development, and assessing their TPACK levels can inform their readiness for real-world teaching and guide curriculum development to better prepare future EFL teachers for technology-driven classrooms (see Table 1).

Table 1: Participants' demographic information

Pseudonym	Age	Gender	Degree	Education
Anahita	23	Female	BA Students	English Language Teaching
Arman	22	Male		
Farhad	24	Male		
Fatima	22	Female		
Golnaz	23	Female		
Kiyn	21	Male		
Neda	25	Female		
Parisa	23	Female		
Ramin	22	Male		
Shirin	22	Female		

*BA: Bachelor of Art

Instruments

Semi-Structured Interviews

To gain insights into the PSEFLTs' perceptions regarding their TPACK competencies, semi-structured interviews were conducted. These interviews provided the researcher with the opportunity to delve deeper into specific variables and obtain detailed descriptions. Glesne [45] emphasizes the importance of interview data, arguing that interviews allow researchers to uncover valuable insights that may have been overlooked. Furthermore, interviews enable researchers to explore alternative interpretations and explanations for the observed phenomena.

The interviews employed open-ended questions and prompts designed to explore PSEFLTs' perceptions of their TPACK competencies at Semnan Farhangian University, Iran (see Appendix A). The questions were formulated based on a review of the literature on TPACK, including studies by Cengiz and Kaçar [42], Koehler et al. [5], Koşar [14], Cheng and Xie [46], and Sarıçoban et al. [27], as well as consulting experts in the field. In this study, the EFL teacher educators acted as peer debriefers [47], which contributed to enhancing the validity of the research. Their feedback indicated that the questions effectively elicited responses relevant to the research questions. To enhance the study's credibility, a pilot study was conducted with a small group of PSEFLTs who shared similar characteristics with the main participants. This pilot aimed to test the interview questions for relevance, clarity, and comprehensiveness. Feedback from the pilot participants led to revisions, including rewording some questions and adding a follow-up question to improve the interview instrument.

Individual interviews were then scheduled and conducted with the PSEFLTs who agreed to participate. The interviews took place in a comfortable and private meeting room. Informed consent was obtained from each participant before starting the interview. Each interview lasted around 90 minutes. Throughout the data collection procedure, ongoing communication and support were provided to the participants, addressing any concerns or questions they may have had. Regular reflection on the data collection process enabled adjustments to be made to improve the quality and rigor of the research.

Observations

Following a review of the relevant literature [14][28,29], an observation checklist was developed, grounded in the TPACK framework (see Appendix B). The checklist underwent a thorough validation process involving expert reviews from experienced educators and

researchers in English Language Teaching (ELT) and technology integration, ensuring it accurately represented the key dimensions of the TPACK framework. A pilot observation with a small group of PSEFLTs provided further refinements based on their feedback. These observations complemented qualitative data from semi-structured interviews by offering real-world context, validating participants' self-reported experiences, and identifying specific behavioral patterns and challenges encountered by PSEFLTs in implementing TPACK in their lessons.

Procedure

To address the research questions guiding the study, the researcher chose to use a qualitative case study design. According to Creswell and Poth [48], this design allows researchers to focus on either a single case or multiple cases, providing a comprehensive and detailed description and explanation within a specific context. The study employed semi-structured interviews to gather in-depth insights from a purposive sample of PSEFLTs at Semnan Farhangian University regarding their competencies in TPACK. Farhangian University is a renowned institution for teacher education, and its ELT program aims to equip PSEFLTs with the necessary knowledge and skills to become effective language teachers. These future teachers were also observed during their practice teaching sessions. The observations provided a comprehensive understanding of how they leverage their abilities to integrate technology into their teaching practice. By triangulating the observational data with interview insights, the study aimed to create a comprehensive understanding of pre-service teachers' TPACK competencies, enhancing the credibility of the findings.

Ethical approval was obtained from the relevant ethics committee to ensure the research was conducted in an ethical manner and protected the rights and confidentiality of the participants. Participants were recruited through invitations that provided detailed information about the research purpose, objectives, time commitment, and potential benefits of participation. To ensure the confidentiality of the participants, pseudonyms were employed when presenting the results of the study.

Individual, in-person interviews were conducted with ten PSEFLTs. All of the interviews were conducted by the researcher from September 2023 to November 2023. The interviews were recorded with the participants' permission, using appropriate recording equipment. The use of participants' own words in qualitative research would increase the interpretation of data, as Wallestad [49] points out. Detailed notes were also taken during the interviews to supplement the recorded data. The recorded interviews were transcribed verbatim, capturing the participants' responses accurately. Qualitative data analysis techniques, such as thematic analysis, were used to analyze the transcribed data. Recurring patterns, themes, and categories related to the participants' competencies in TPACK were identified. The findings were interpreted to answer the research questions and draw meaningful conclusions.

The participants then received a pre-observation briefing on the study's purpose and ethical considerations. Observations were conducted in English classrooms where PSEFLTs were engaged in their practice teaching. Settings varied in terms of class size, students' demographics, and technology availability to capture a diverse range of teaching scenarios. Observations were carried out over multiple sessions across different teaching environments, using a structured form to

ensure consistency and objectivity in data collection. Detailed field notes were also taken to capture nuanced observations. The observer conducted sessions unobtrusively, allowing for naturalistic data collection over 60 to 90 minutes. The observational data were analyzed by coding the notes, categorizing behaviors, and identifying patterns related to TPACK competency. The researcher looked for examples of successful integration of technology, effective pedagogical practices, and coherent content delivery in the observed teaching practices. The observations took place after the interviews.

Six stages were followed to analyze the interview and observation data, guided by the TPACK framework [5,10]. First, the data were read multiple times to familiarize the researcher with the responses. Following this, initial codes were generated through an iterative analysis of the transcripts. The researcher then grouped these codes to form broader themes. Afterward, the extracted macro-themes were reviewed and refined before finalizing the report. Each theme was given a specific name and label. Finally, a comprehensive report detailing the overall findings was prepared. To ensure trustworthiness in this qualitative study, several measures were implemented. First, member-checking involved participants scrutinizing the extracted themes and findings. Second, an expert coder was invited to analyze the data, and inter-coder reliability was assessed using Cohen's Kappa Coefficient, yielding a satisfactory index (r = 0.80). To enhance transferability and confirmability, a detailed description of participants, context, instruments, data collection, and analysis was provided. Finally, acknowledging the researcher's positionality, both data collection and analysis were conducted by the same researcher.

Results and Discussion

The findings of the present study are classified based on PSEFLTs' perspectives and practices regarding their TK, CK, PK as well as the intersections among these areas, namely TCK, TPK, PCK, and TPACK, which will be presented respectively.

PSEFLTs' Perspectives and Practices regarding their TK

The following table (Table 2) provides an overview highlighting the primary interview findings related to PSEFLTs' TK.

Findings indicate that nine out of ten PSEFLTs at Semnan Farhangian University perceived their level of TK to be moderate. They justified this by stating that many students are tech-savvy and can assist teachers with troubleshooting software or hardware problems, while there is one technology technician at every school. As an example, Kiyan mentioned,

> *… I use technology in my lessons, but I wouldn't say I fully utilize all available tools...To be honest, I rely on my students to help troubleshoot any technical issues that arise.*

Interestingly, Anahita diverged from this general perception, identifying herself as a 'high-tech person' due to her personal interests in technology. She argued,

> *I am adept at using technology, both in general and specifically for language teaching. This proficiency is largely due to my personal interest in English, as well as my commitment to exploring and staying updated on the latest educational technologies.*

Table 2: Key interview findings on TK of PSEFLTs

Theme	Sub-Theme	Description	Frequency %	Evidence from Text
PSEFLTs' TK	Level of TK	PSEFLTs at Semnan Farhangian University possess a moderate level of TK.	90%	I wouldn't say I'm a tech expert… I rely on my students to help troubleshoot any technical issues that arise.
	Familiarity with Basic Tools	They demonstrated familiarity with basic tools and applications used in language teaching.	100%	I often use PowerPoint for my presentations and sometimes incorporate online videos.
	Limited Knowledge of Advanced Tools and Emerging Trends	Their knowledge of advanced technological tools and emerging trends in educational technology appeared to be limited.	90%	The use of virtual reality in language learning offers exciting immersive experiences. However, the lack of training on effective implementation makes it overwhelming for me.
	Professional Development for Technology Integration	The PSEFLTs acknowledge their need for further training in technology integration and best practices.	100%	Hands-on workshops and online courses would help deepen our understanding and proficiency in using these tools effectively.

All ten participants demonstrated familiarity with basic tools and applications commonly used in language teaching, such as PowerPoint, Microsoft Word, interactive whiteboards, language learning software, and online resources. For instance, Fatima argued,

> *I primarily use tools like PowerPoint for presentations and Microsoft Word for creating handouts and lesson plans. I find that these tools are easy to use and help me organize my lessons effectively.*

Parisa remarked,

> *I use Duolingo and Quizlet. What I appreciate is the personalized feedback; students can see where they need to improve right away. It's been beneficial, especially for those who learn differently.*

However, the PSEFLTs' knowledge of more advanced technological tools and emerging trends in educational technology appeared to be limited. Nine participants reiterated that they had not received sufficient training or exposure to innovative technologies, stating that their coursework primarily focused on basic applications. For instance, Neda stated,

> *I feel like I only know the basics. I have used tools like PowerPoint and some language learning software, but when it comes to things like virtual or augmented reality, I just don't have any experience.*

All of the participants expressed the need for additional training to become familiar with the latest technologies in the field of ELT. They indicated that while they are comfortable using basic tools, they recognize the importance of staying updated with emerging technologies and educational trends that could enhance their teaching practices and improve student engagement. This desire for professional development reflects their commitment to providing high-quality language instruction in an increasingly digital learning environment. For instance, Farhad maintained,

> *Hands-on workshops and online courses would help deepen our understanding*

and proficiency in using these tools effectively.

While the majority of the PSEFLTs included basic technologies in their lesson plans, observations revealed a limited use of technology. For example, in one lesson, Shirin used a PowerPoint presentation to introduce vocabulary, but then reverted to traditional exercises from a textbook for practice. In another scenario, although the lesson plan included using an online vocabulary quiz, it was not implemented, and Fatima opted for a traditional paper-based quiz instead. Or, Ramin appeared hesitant to use the interactive whiteboard for collaborative activities and preferred to conduct the lesson individually at the front of the class. This indicates a need for further development in their TK to effectively leverage technology for enhancing EFL learning. Only Anahita was able to use online collaboration platforms and virtual reality applications effectively.

To conclude, participants assessed their technological knowledge (TK) as moderate, indicating familiarity with basic tools like word processors and presentation software. This self-assessment reflects an awareness of the changing educational technology landscape and the need for ongoing professional development. It suggests a gap between their current skills and the advanced technological abilities required to create interactive learning experiences. Their moderate TK may lead them to rely on familiar tools rather than exploring innovative technologies that could boost student engagement. Contributing factors to this moderate level include insufficient integration of technology in ELT teacher education programs, challenges in keeping up with rapid technological advancements, limited access to resources, and a lack of practical training. Pre-service teachers expressed a desire for more hands-on training and guidance in integrating technology into language learning, emphasizing the need for support to enhance their TPACK competencies.

The findings of the present study are in line with that of Sánchez et al. [16] who conducted an analysis of TPACK implementation in Spanish primary EFL teacher education. They concluded that TPACK integration in that context was moderate, underscoring the need for a more thorough integration of technology in EFL teacher training programs. The results are also similar with Hadidi et al.'s [50] findings indicating that Iranian EFL teachers possess a limited understanding of technology and are not adequately equipped to effectively incorporate technology into their teaching practices. Similarly, Fathi and Yousefifard [22] reiterated that Iranian teachers should enhance their understanding and proficiency in pedagogical technology and content technology. However, the findings of this study stand in contrast to those reported by Cengiz and Kaçar [42] and Koşar [14], where participants generally assessed their levels of TPACK as high in almost all TPACK dimensions. While Cengiz and Kaçar, along with Koşar, indicated a perception of strong competence in integrating technology into pedagogy and content, this study reveals a moderate level of TK competence among participants. This discrepancy raises important questions about the self-assessment practices of participants in different educational contexts and suggests that while individuals may feel confident in their TPACK abilities, actual implementation may vary significantly. Further investigation into the factors influencing this perception could provide valuable insights into the effectiveness of teacher training programs in fostering robust TPACK integration.

PSEFLTs' Perspectives and Practices regarding their CK, PCK, and TCK

The following table (Table 3) provides an overview of key findings from interviews concerning the CK, PCK and TCK of PSEFLTs.

The interview findings indicated that nine out of ten PSEFLTs possess a strong foundation in the fundamental CK required for effective English language teaching. This includes expertise in grammar, vocabulary, language skills, assessment methods, and the strategies and techniques for delivering these elements.

In terms of grammar, nine participants reiterated that they had proficiency in identifying and explaining various grammatical structures, which is crucial for helping learners grasp the complexities of the English language. Their knowledge extended beyond mere rules and included an awareness of contextual application and common grammatical pitfalls that language learners often encounter. For instance, Anahita stated,

> *Grammar isn't just about memorizing rules; it's about application. I focus on common challenges, like subject-verb agreement and tense usage, because addressing these can significantly help my students' understanding of the language.*

When it came to vocabulary, nine PSEFLTs articulated an understanding of both the breadth and depth required to effectively teach vocabulary. They recognized the importance of teaching not just individual words but also phrases and the nuances of meaning that can change depending on context. This insight reflects their preparedness to equip students with the lexical resources needed for effective communication. As an example, Golnaz discussed,

> *… I focus on phrases and context because meaning can shift based on how words are used. For instance, teaching the phrase 'kick the bucket' helps students understand idiomatic expressions, which is essential for real communication.*

Additionally, the interviews revealed that nine candidates possessed a solid grounding in the four primary language skills: listening, speaking, reading, and writing. They articulated various strategies for integrating these skills into their lesson plans, recognizing that an integrated approach is essential for language acquisition. Their awareness of the interplay between these skills suggests a readiness to design comprehensive learning experiences tailored to diverse student needs. To give an example, Neda asserted,

Table 3: Key interview findings on CK and TCK of PSEFLTs

Theme	Sub-Theme	Description	Frequency	%	Evidence from Text
PSEFLTs' CK, PCK, and TCK	Strong Foundation in CK	They possessed a solid understanding of grammar, vocabulary, language skills, and language assessment.		90%	I have gained a deep understanding of English grammar, syntax, and vocabulary, equipping me with the skills needed to teach these elements effectively.
	Solid Foundation in PCK	They knew the strategies and techniques for teaching English effectively to learners.		90%	I often use interactive activities such as role-playing to teach vocabulary in context.
	Technology Gap in Educational Practices	They felt unprepared to fully integrate technology while delivering content.		90%	I know some tools, but during lessons, I often struggle to make the most of them and worry I'm not engaging my students.

After completing a reading assignment, I organize group discussions where they can express their thoughts and opinions. This approach not only improves their comprehension of the text but also boosts their speaking confidence.

However, one participant, i.e. Kiyan believed that since he has not been interested in ELT from the very first day, he often struggles to find motivation in his coursework. He expressed that this lack of enthusiasm affects his engagement with the subject matter, making it challenging for him to fully invest in learning the necessary skills and technologies required for effective language teaching. Kiyan indicated that he feels disconnected from the material and worries that his limited interest might hinder his ability to effectively teach English in the future. As a result, he recognized the need for a more compelling approach to his studies that could spark his interest and foster a deeper connection to the field of ELT.

The interview findings revealed that eight out of ten PSEFLTs possess reasonable assessment expertise, which are crucial for effective language teaching. They recognized the importance of formative assessments, such as quizzes and class activities, to monitor progress and provide ongoing feedback. Additionally, the candidates emphasized their commitment to utilizing summative assessments, like tests and projects, to gauge overall proficiency at the end of instructional units. For instance, Shirin reiterated,

I use quick quizzes and group activities to gauge understanding in real-time. It helps me adjust my teaching on the spot. In addition, I always incorporate summative assessments at the end of a unit to evaluate overall progress.

However, two participants expressed concerns regarding their ability to develop and implement diverse assessment methods effectively. For instance, Neda admitted,

I struggle with creating assessments that truly reflect my students' understanding. Sometimes, I rely too heavily on traditional tests and worry that I'm missing out on important aspects of their learning.

While all participants recognized the importance of incorporating technology into classroom content delivery, nine admitted to lacking specific TCK that would enable them to seamlessly integrate tech tools with their language instruction. For instance, Fatima stated,

I'm comfortable with the content, but I find it challenging to connect that content with appropriate technological resources.

During the observation of the PSEFLTs, it was evident that they displayed a robust foundation in CK and PCK. Their lessons were structured and well-paced, ensuring that students had ample time to grasp the concepts without feeling rushed or overwhelmed. They confidently led grammar lessons, providing students with clear explanations of verb tenses, sentence structures, and other key grammatical concepts. For example, during her lesson on present perfect continuous, Parisa, one of the PSEFLTs, effectively conveyed the concept using clear explanations, real-life examples, and a fun game. She started by explaining the form and usage of the tense using a timeline visual, then provided examples of how it's used to talk about ongoing activities that started in the past. She then engaged the students in a game where they had to guess which activities were still

ongoing. This demonstrated her understanding of how to make grammar concepts relatable and engaging for students.

PSEFLTs supplemented explanations by guiding students through targeted practice activities, such as error correction exercises, transformation drills, and sentence combining tasks. These practice activities allowed students to actively apply the grammatical rules and receive immediate feedback to reinforce their understanding. As an example, while teaching phrasal verbs, Ramin began by eliciting common phrasal verbs from the students themselves, creating an immediate connection to their own experiences. He then transitioned into a fun game where students had to match phrasal verbs with their definitions, using visuals and real-life scenarios. This interactive approach kept the students actively involved and fostered a positive learning environment. By tapping into their existing knowledge and incorporating playful elements, Ramin made the lesson both enjoyable and effective.

Additionally, PSEFLTs implemented effective vocabulary acquisition techniques, such as using visual aids, contextual clues, and word mapping strategies to help students build their lexical repertoire. For instance, during a lesson on weather vocabulary, Golnaz used flashcards with images of different types of weather (e.g., sunny, rainy, snowy) alongside their corresponding words. This allowed students to associate the word with a visual representation, aiding their understanding and memorization.

PSEFLTs created interactive language learning activities such as role-plays, discussions, and task-based exercises to enhance students' communicative skills. Their subject knowledge was demonstrated through their ability to answer student questions and provide relevant examples. They employed diverse instructional strategies in their lesson plans to meet various student needs and promote language proficiency. For instance, in a lesson on 'travel', Farhad designed a task where students planned a fictional trip, requiring them to use English for communication and decision-making. His expertise was evident as he addressed questions about cultural norms and transportation, offering valuable insights to aid student success.

Observations revealed that teachers' limited familiarity with technological tools impeded their ability to create dynamic and interactive learning experiences. Although they were eager to incorporate technology, their lack of expertise sometimes resulted in logistical challenges. For instance, during a lesson on location descriptions, Ramin struggled with Google Earth due to his inexperience, leading to technical difficulties that disrupted the flow of the lesson and caused students to lose focus. Additionally, the preservice teachers' limitations in TCK restricted their ability to address diverse learning styles and engage students innovatively. To give an example, in a vocabulary acquisition lesson, Neda attempted to use Quizlet to cater to different learning styles. However, due to her limited understanding of the app's features, she was unable to customize the flashcards with multimedia elements such as images and audio, which could have benefited visual and auditory learners. As a result, the activity relied solely on text-based flashcards, failing to engage kinesthetic learners who might have benefited from interactive elements. Their unfamiliarity with technological tools also hindered their capacity to provide timely, personalized feedback. For example, Shirin's attempt to use Kahoot for assessing grammar understanding fell short because she relied on default settings, resulting in simplistic multiple-choice quizzes that failed to address student misconceptions. This limited assessment approach negatively

affected both her teaching effectiveness and the students' language development.

Overall, PSEFLTs often face limitations in TCK primarily due to a lack of targeted training in the integration of technology within their subject area. ELT Teacher education programs frequently emphasize traditional language teaching methodologies and CK without adequately addressing how to leverage technology effectively for instructional purposes. Consequently, PSEFLTs might graduate with a strong understanding of English language content and delivery techniques, yet they may not have a sufficient grasp of how to effectively utilize digital tools to enhance that content. Additionally, the rapid pace of technological advancement can render training and resources quickly outdated, making it challenging for educators to stay current. This gap in TCK can inhibit their ability to create engaging, technology-enhanced learning experiences for their future students, ultimately impacting their effectiveness in the classroom.

The findings of this study are congruent with those of Dinçer et al. [24]. In their study, participants rated their CK and PCK very high, with an average score of 8.47. They felt confident in their English reading comprehension, while they expressed a slight hesitation in their ability to articulate ideas and feelings in English. However, TCK showed lower competence levels, with scores under the survey's mean score. The findings of this study also align with those of Archambault and Crippen [51] and Valtonen et al. [52], where participants identified TCK as the most challenging area. They expressed less confidence in their technology-related skills and in their ability to effectively use technology to deliver content to students. However, the findings of this study contrast with those of Koşar [14], where participants demonstrated confidence in using various technological tools and platforms effectively, indicating comfort in integrating technology into their teaching. However, they recognized a need for additional support in mastering content specific to English language instruction.

PSEFLTs' Perspectives and Practices regarding their PK, TPK, and TPACK

Table 4 below summarizes the key findings from interviews related to the PK, TPK, and TPACK of PSEFLTs.

Table 4: Key interview findings on PK, TPK, and TPACK of PSEFLTs

Theme	Sub-Theme	Description	Frequency	%	Evidence from Text
PSEFLTs' PK, TPK, and TPACK	Strong Foundation in PK	The PSEFLTs exhibited a solid grasp of various pedagogical approaches and strategies crucial for effective teaching.	80%		I always prioritize student-centered activities in my lessons because they encourage learners to take ownership of their learning.
	Technology Gap in Educational Practices	They struggled to translate their PK into practical, effective implementations with technology.	90%		Although I understand the advantages of using technology in teaching, I find it challenging to effectively integrate these tools into my pedagogy, often reverting to traditional methods.

Eight out of ten PSEFLTs demonstrated a solid understanding of pedagogical approaches and strategies. They were aware of the importance of student-centered learning, task-based instruction, and communicative language teaching. As an example, Neda mentioned,

I developed a solid understanding of diverse pedagogical approaches, emphasizing student-centered learning. I have also been introduced to different instructional techniques, such as scaffolding and guided practice, to support students' language development.

However, Kiyan mentioned,

I've been taught concepts like task-based instruction and the flipped classroom, but I can't say I fully grasp how to apply them. I sometimes feel overwhelmed and end up going back to what I know best, just delivering content.

While the PSEFLTs grasp the theoretical principles of teaching, they often struggle to translate this knowledge into practical technology-based applications, as nine of the PSEFLTs highlighted. As an example, Arman argued,

I get the theory of digital storytelling, but putting it into practice is a whole different ballgame. I can't seem to find the right tools, and I'm lost with all the technical stuff!

Observations of the PSEFLTs highlighted their strong understanding of various pedagogical approaches and strategies. They effectively incorporated methods such as collaborative and task-based learning into their lesson plans, demonstrating an ability to cater to diverse learning styles through differentiated instruction and scaffolding techniques. Their classroom management skills, including clear expectations and positive reinforcement, kept students engaged. For example, in Farhad's class, he established a conducive learning environment by outlining lesson objectives and starting with an engaging icebreaker activity that encouraged students to introduce themselves in English. He actively monitored participation, providing support to shy students like Reza through gentle prompts and positive reinforcement. The lesson concluded with a reflective session that valued every student's input, fostering a respectful and inclusive atmosphere.

However, the PSEFLTs demonstrated a limited ability to translate their knowledge of pedagogical approaches into practical implementation with technology, particularly advanced tools. For instance, Fatima struggled to integrate multimedia elements into her lesson and opted for traditional presentation software instead of utilizing virtual reality, missing opportunities for more immersive learning experiences. Similarly, Arman faced challenges in setting up and managing Google Classroom for project-based learning activities, which hindered his ability to facilitate meaningful collaboration and communication among students.

To conclude, preservice teachers face challenges in applying their PK to technology-enhanced teaching, which can be linked to the TPACK framework. TPACK emphasizes the integration of CK, PK, and TK. A significant gap in TK arises from inadequate training and exposure to technology during pre-service programs, limiting their ability to effectively integrate technology into their teaching. The lack of hands-on experience with digital tools hinders their connection between theory and

practice, resulting in less engaging learning environments. Additionally, limited access to reliable technology in training institutions and future teaching contexts restricts opportunities for preservice teachers to develop their technological skills. The rapid evolution of technology and educational software further complicates their ability to stay updated and adapt their teaching strategies. This situation underscores the need for a comprehensive TPACK framework that fosters the development of all three knowledge areas, enabling preservice teachers to successfully integrate technology into their teaching practices.

The findings of this study align with those of Akyuz [53] and Farhadi and Öztürk's [25] research on the TPACK levels of Turkish PSEFLTs, indicating a need for additional support in enhancing their TK, TCK, and TPK. However, the findings of the present study contrast with those of Sarıçoban et al. [27]. In their study, the participants surveyed indicated a high level of confidence in their TPK. They reported feeling proficient in using multimedia to support language learning, designing learning materials using technology, deciding when technology is beneficial for specific English standards, and managing the classroom environment while utilizing technology.

This study has several limitations that should be considered when interpreting its findings. The results may be specific to the PSEFLTs at Farhangian University in Iran and may not represent the broader population across the country, thus caution is advised in generalizing the findings. The focus on a single institution limits the applicability of the results, and conducting similar studies in various institutions or locations could enhance understanding of PSEFLTs' competencies in TPACK. Additionally, longitudinal studies tracking the development of these competencies over time would provide valuable insights into how TPACK evolves throughout teacher training.

The findings of this study have important implications for teacher education programs. While many programs worldwide include courses on teaching with technology [54,55], they often overlook the specific contexts that affect participants' engagement with technology. By understanding the factors that influence technology use, teacher educators can make necessary adjustments to their programs. The study's insights can help design more effective teacher training that integrates technology with pedagogical content knowledge. Additionally, these findings can guide the development of tailored professional development opportunities for PSEFLTs, addressing specific challenges and enhancing their understanding of TPACK. Universities can use the identified gaps in TPACK knowledge to inform investments in technological resources and training, ensuring that new teachers are well-equipped for modern language education. Overall, the study highlights the essential connection between technology and pedagogy in effective language teaching, advocating for a comprehensive approach to preparing future EFL teachers.

Future research could expand on the findings of this study by conducting interviews with professors in the ELT department and technology instructors at the university, which will help improve understanding of the conditions affecting TPACK development. Additionally, comparing the TPACK competencies of PSEFLTs with those of experienced EFL teachers would help identify any gaps or differences in their TPACK. This comparative analysis would contribute to a better understanding of how TPACK is developed and enhanced over time, providing valuable insights into effective practices for

integrating technology in language education. Finally, investigating the impact of the PSEFLTs' competencies in TPACK on student learning outcomes can provide valuable insights into the effectiveness of technology integration in language classrooms. This could involve examining students' language proficiency, engagement, and motivation when technology is effectively utilized by their teachers.

Conclusions

This study aimed to investigate the perceived TPACK of PSEFLTs as well as their actual teaching practices. The findings indicated that while PSEFLTs demonstrated a solid foundation in CK, PK, and PCK, their TK, TCK, TPK, and TPACK competencies appeared to be limited. To improve the development of TPACK among PSEFLTs, it is recommended to provide more hands-on training, practical experiences and promoting collaboration and networking with various educational technologies. Ongoing professional development opportunities should be made available to pre-service teachers to enhance their TPACK competence. Additionally, integrating TPACK principles across all courses in the curriculum would help reinforce the importance of technology integration in ELT. By continuously exploring and advancing our understanding of TPACK in ELT, we can ensure that our educators are equipped with the knowledge and skills to navigate the digital landscape of education successfully.

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Conflicts of Interest

The author has no conflicts of interest.

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Appendix A

Interview Questions

Participant Name:

Date of Interview:

Interviewer Name:

Location:

1. How would you rate your level of technological knowledge in relation to your teaching practices? Would you describe it as basic, moderate, or advanced? Why?
2. To what extent are you familiar with basic technological tools that can be used in your classroom?
3. How confident do you feel in your knowledge of advanced tools and emerging trends in educational technology?
4. What types of professional development opportunities do you believe would best support your integration of technology into your teaching?
5. How confident do you feel in your understanding of grammar, vocabulary, language skills, and language assessment?
6. How well do you believe you understand various pedagogical approaches and strategies that are essential for effective teaching?
7. To what extent do you believe you are prepared to integrate technology effectively while delivering content in your lessons?
8. What challenges do you face in applying your pedagogical knowledge to effectively implement technology in your teaching practice?

Appendix B

Observation Checklist for TPACK Competencies

Observer Information
Observer Name:
Date:
Class Session:
Instructor Name:
TPACK Components (Please mark as Observed/Not Observed (O/NO)

TPACK Component	Criteria/ Indicators	O / NO	Comments
Content Knowledge (CK)	Demonstrates strong knowledge of English language content		
	Explains content concepts clearly and accurately		
	Uses authentic materials and resources		
Pedagogical Knowledge (PK)	Utilizes various teaching strategies and techniques suited to EFL contexts		
	Encourages student interaction and engagement		
	Differentiates instruction based on student needs		
	Manages classroom effectively and fosters a conducive learning environment.		
Technological Knowledge (TK)	Demonstrates proficiency in using technology for teaching and learning.		
	Selects appropriate technological tools and resources to enhance instruction.		
	Integrates technology seamlessly into lesson plans and activities.		
Technological Content Knowledge (TCK)	Integrates technology directly related to specific language content		
	Chooses appropriate tech tools for teaching language		
	Utilizes software/tools to facilitate language practice (e.g., online quizzes, apps)		
Technological Pedagogical	Designs tech-enhanced		

TPACK Component	Criteria/ Indicators	O / NO	Comments
Knowledge (TPK)	lessons that promote active learning		
	Demonstrates effective management of technology in the classroom		
	Guides students in using technology collaboratively		
Pedagogical Content Knowledge (PCK)	Adapts teaching strategies for specific language content		
	Integrates culture and real-life context into language lessons		
	Employs formative assessments to gauge understanding		
Overall TPACK Integration	Demonstrates a strong understanding of how technology can be used to enhance the teaching and learning of English language content.		
	Uses technology to engage learners, provide feedback, and personalize learning experiences.		
	Effectively integrates technology to create meaningful and engaging learning experiences for EFL learners.		
	Encourages critical thinking and problem-solving through tech integration		

Additional Observations
Strengths:
Areas for Improvement:

Conclusion
Overall Impression of TPACK Competency:
Comments

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