Asian Journal of Distance Education

Integrating Technology in EFL: A Study on TPACK and Self-Efficacy Among Turkish Educators

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Abstract: This study explores the intersection of Technological Pedagogical Content Knowledge (TPACK) and Technology Integration Self-Efficacy (TISE) among EFL instructors in Turkey. Utilizing a quantitative approach, 101 EFL instructors were across various Turkish universities, employing the TPACK-EFL assessment and the TISE questionnaire. Our findings reveal a robust foundation in EFL educators' TPACK and a general confidence in technology integration. Obviously, a predictive relationship between TPACK levels and TISE beliefs was observed, indicating that educators' self-efficacy in technology integration significantly influences their TPACK proficiency. This research contributes to the understanding of EFL educators' capabilities in integrating technology into higher education and highlights areas for enhancing technology confidence and proficiency. The implications of these findings extend to the design of instructor training programs and curriculum development in EFL settings, advocating for an increased focus on technology integration competencies.

Keywords: EFL, TPACK, TISE, Instructor, Perception

Highlights

What is already known about this topic:

- EFL instructors often vary in TPACK proficiency.
- TISE reflects instructors' confidence in tech use.
- TPACK and TISE can influence instructional approaches.

What this paper contributes:

- Quantifies the TPACK-TISE relationship in EFL.
- Showcases a significant predictive correlation.
- Highlights areas for EFL tech-confidence enhancement.

Implications for theory, practice and/or policy:

- Suggests revamping EFL training for tech competence.
- Reinforces the need for TISE-centered curricula.
- Advocates for policy adjustments in EFL pedagogy.

Published by Asian Society for Open and Distance Education (ASODE), Japan
ISSN 1347-9008 http://www.asianjde.com/

Introduction

With the advent of the digital age, almost no industry has been spared the innovative influence of technology, including education. The emergence of Information and Communication Technology (ICT) has ushered in a major transformation of the conventional learning environment, reshaping the functions of educators and students. Gone are the days in which students were mere spectators in a teacher-dominated setting. Now, they are engaged members of a vibrant, cooperative, and interactive learning space (Hirschman & Wood, 2018). Prensky (2010) aptly described the current generation of students as 'digital natives' because of their consistent interaction with various digital tools, ranging from smartphones to gaming platforms. These tech-adept learners often find themselves in the same learning environments as instructors who, during their earlier years, didn't engage with technology as extensively. This generational tech gap can sometimes cause misunderstandings and tension in educational settings. To stay pertinent and effective in this swiftly transforming setting, it's crucial for educators to invest in continuous professional development, especially concerning technological tools. Digital competency is becoming one of the most critical skills that educators must possess. It's imperative now, more than before, for educators to hone their abilities to meet the demands of their tech-inclined pupils (Pilgrim & Martinez, 2015; Han, 2012).

In the current global education landscape, there is a strong emphasis on developing 21st-century competencies. This includes the cultivation of students' intellectual abilities, such as complex reasoning, problem-solving, and creative thinking. Various international organizations and government agencies have highlighted the importance of these competencies in education, including the European Union, the Ministry of Education, the Organization for Economic Co-operation and Development, UNESCO, and the US Department of Education. Researchers such as Mishra et al. (2011) and Voogt & Roblin (2012) have also recognized the significance of nurturing these cognitive abilities in students. Hence, the use of technology to facilitate these pedagogical advances has become crucial to educators.

In the domain of foreign language instruction, the footprint of technology is unmistakable. Numerous studies have indicated that using technology in the classroom enhances individuals' active learning (Coorey, 2016), helps them to develop their cognitive abilities (Sethy, 2012), encourages positive thinking, and strengthens their grasp of concepts. Yet technology can't increase the efficiency of learning on its own (Goodyear, 2005). In the instructional process, teachers are crucial in that they are potentially capable of transforming the environment and process by addressing the current needs and goals. However, the difficulty for instructors is in effectively using technology for instruction to enhance the quality of education (Rolf et al., 2019). How can instructors enhance their digital competency in order to more effectively incorporate technology into the classroom? The TPACK framework offers a novel viewpoint (Mishra & Koehler, 2016). The system effectively combines several elements, such as digital technology, instructional methods, and instructional resources, to evaluate instructors' proficiency in digital skills (Miguel-Revilla, 2020). The TPACK framework highlights the inadequacy of possessing alone content knowledge (CK), pedagogical knowledge (PK), and technology knowledge (TK) for instructors. The crucial aspect is in the mastery of combining these distinct forms of information. TPACK could be used in educational settings and demonstrates instructors' expertise and command of information (Mishra & Koehler, 2006). Hence, the TPACK skills could be regarded as a fundamental element of instructors' digital proficiency in the forthcoming era. This is because these abilities have the potential to impact teachers' instructional methods, which in turn will directly impact the growth and progress of learners.

As TPACK is a comprehensive framework, several variables may influence the growth of teachers' TPACK competencies. The teachers' self-efficacy views on the use of technology significantly influence the development of their TPACK skills (Lopez-Vargas et al., 2017).

Moreover, recognizing the role of confidence in one's abilities, mastery over the subject, and cultural nuances in tech adoption is vital (Ertmer & Ottenbreit-Leftwich, 2010). However, most research in this

field has been concentrated on teachers still in training, leaving an information void about those seasoned educators currently guiding our digital natives.

Hence, the primary objective of this research is to shed light on the often-disregarded facets of in-service teachers' talents, requirements, and proficiencies within the framework of contemporary education. This study has a special objective of examining the ways in which in-service teachers are adjusting to the digital era. With the increasing integration of technology in education, it's essential to understand how instructors adapt and develop their competencies in this changing landscape, especially in the context of EFL teaching.The primary purpose is to shed light on their competencies and limitations, specifically in relation to the incorporation of technology into their teaching practices, as well as their confidence in their ability to effectively use technology.

As the tech wave continues to sweep across the globe, it becomes increasingly important to keep up with developments, adapt, and innovate, particularly in the sphere of higher education (Can & Şimşek, 2015). In order to make sense of this complex landscape, our study attempts to delve deeper into language education's key challenges. It seeks to ascertain if current language instructors have the necessary skills and understanding to successfully employ technology in educational context, and whether they have awareness regarding their self-efficacy towards technology integration.

Considering these parts, the research hopes to make understanding easier about how TPACK levels and TISE beliefs are deeply connected. By looking into how good teachers are in different areas of using tech for teaching, and checking the link between their skill with technology tools and overall education knowledge, this study helps us to know more about how EFL teachers include gadgets during lessons. This knowledge is very important for making good learning plans and teaching training classes. What we have learned may help teachers, leaders and rule makers to offer a better place for learning for people who are studying now. Thus, this study aims to find solid evidence for the following questions:

1. What level of proficiency do in-service EFL instructors in Turkey demonstrate in terms of TPACK levels?
2. What beliefs do in-service EFL teachers hold regarding their self-efficacy in integrating technology into their teaching practice?
3. Is it possible for the TISE beliefs to act as a predictor for the TPACK level among Turkish EFL instructors?

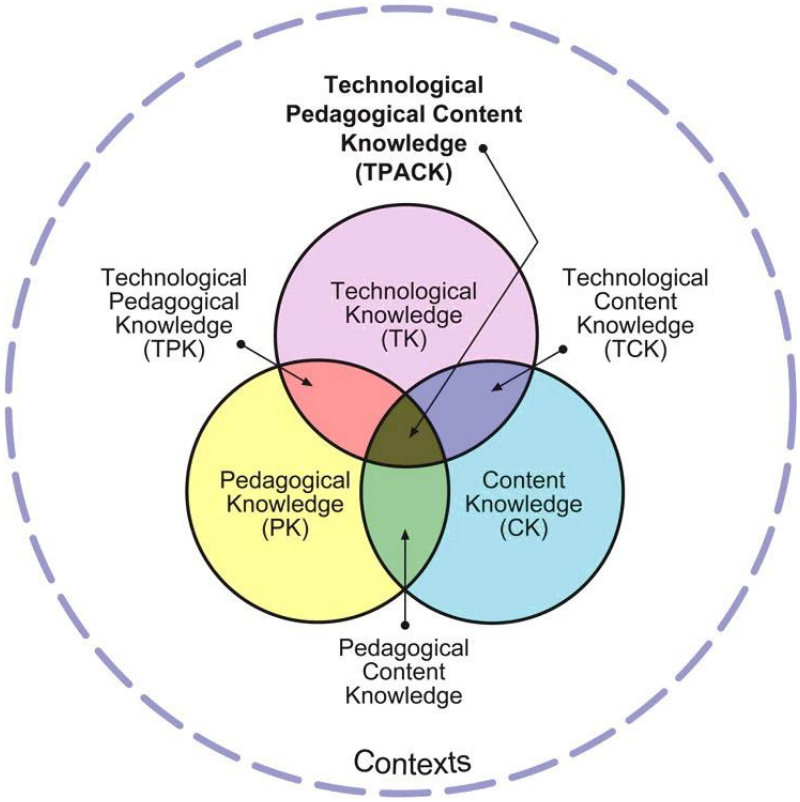
Literature

New technological advancements have transformed education, necessitating educators to incorporate technology into their teaching practices (Akgunduz, 2016). In this era, the multifaceted roles of teachers, who are central to the learning-teaching process, continue to evolve. Alongside content knowledge, various qualifications and competencies have emerged as essential aspects of effective teaching (Wright & Akgunduz, 2018).

Historically, content knowledge was seen as the foundation of teaching. However, Shulman (1986) expanded this notion by introducing “curriculum knowledge,” “subject matter knowledge,” and “pedagogical content knowledge (PCK)” as crucial elements of teacher competency. Shulman argued that effective teachers should translate their experiences into knowledge that can facilitate student learning at various levels (Shulman, 1987). As education and technology continue to evolve, there is a need to understand and define the complex nature of teaching in the context of technology integration. Mishra & Koehler (2006) highlighted that simply possessing technological knowledge is not sufficient; the utilization and integration of technology into education need to be purposeful and effective.

This made Koehler and Mishra (2005) come up with the TPACK plan, which combines "technological knowledge (TK)" into Shulman's "PCK." TPACK is known as a learning that comes from how content, teaching ways, and tech facts work together (Koehler & Mishra, 2008). A teacher who knows about TPACK sees how useful technology can be in places where people learn and uses it well. The TPACK framework encompasses three primary dimensions: "knowing about technology (TK), teaching knowledge (PK), and knowing the subject matter (CK)". Also, the plan finds shared kinds of knowledge like "teaching subject matter know-how," "knowledge about teaching with technology," "knowing how to use tech tools for teaching and learning" and "understanding what is needed for using both content area knowledge along with how you teach skills in a technological context"(Koehler & Mishra,2009). In short, the TPACK system gives a full model to know what teachers should learn and understand so they can use technology well in their teaching. This shows how complex and many-sided education is today, as we are in the 21st century. Since Koehler and Mishra first showed it in 2006, the TPACK way has been investigated a lot. Many studies have been done to see how well we can use it and what other things are connected with this plan (Rosenberg & Koehler, 2015). They find out these answers in areas like art or music classes, science lessons where you study about different kinds of animals' plants rocks etc., math class work on numbers shapes patterns - basically anything that's taught through school teacher-led instruction group learning activities for kids adults alike (Dias & Ertmer, 2013).

Figure 1. TPACK Framework



The interconnections within each of the seven information sources in the TPACK architecture remain unclear (Rosenborg & Koehler, 2015). Empirical studies indicates that the possession of a component knowledge base does not have a direct causal relationship with the development of PCK or TPCK (Herring et al., 2016). According to Bostancioğlu and Handley (2018), there is an argument that PK and PCK should be combined into a single concept called PCK. According to some researchers (Pamuk et al., 2015), the core of the framework is believed to reside in the amalgamation of knowledge bases, namely PCK, TPK, TCK, and TPCK. However, differentiating between TCK, TPK, and TPCK remains challenging (Angeli & Valanides, 2009; Archambault & Barnett, 2010; Başer et al., 2016; Schmidt et al., 2009). However, TCK was able to forecast TPCK but not PCK, as stated by Cheng (2017). Additionally,

the impact of PCK on TPCK was shown to be minimal, according to Pamuk et al. (2015). These data suggest that PCK differs significantly from TPK, TCK, and TPCK among the synthesized knowledge bases.

Previous studies have suggested that considering the majority of teachers lacking digital literacy to address demands of the era, TPACK level could be increased with professional development programs for in-service teachers (Guzey & Roehrig, 2009; Uygun, 2013). Teachers generally demonstrate enthusiasm towards integrating technology into their instructional practices, despite their perceived limitations in effectively incorporating (Landry, 2010). Several research have investigated the factors that influence the development of teachers' TPACK skills, as well as the discrepancies in their TPACK capabilities in how they learn (Horzum, 2013). The findings demonstrated that educators who use the deep learning strategy in their instruction may enhance their TPACK competencies. Teachers who possess a higher degree of education are more likely to possess a greater depth of knowledge and proficiency in using technology and integrating ICT into their teaching process (Liang et al., 2013). Keser et al. (2015)

Assessing TPACK

There has been a notable increase in TPACK evaluations conducted in EFL contexts, as demonstrated by Arslan (2020). Whether derived from the general TPACK framework (Koehler et al., 2012) or created and verified separately (Başer et al., 2016), EFL-TPACK tools adhere to fundamental TPACK structures. However, the literature also promotes criticism of these EFL-TPACK instruments by emphasizing that they do not incorporate 21st-century learning or cognitive abilities. It is also stated that the comprehensive evaluations of these EFL-TPACK measuring instruments (Tseng et al., 2020) revealed a lack of assessments that specifically focus on the extent of technology integration or the development of teaching thinking abilities.

While utilizing above-mentioned instruments, it was seen that participants had high beliefs about their TPACK level (Drummond & Sweeney, 2017). Without considering the level of technology integration in teaching thinking skills, the existing instruments might provide the impression that participants had high competency in integrating technology (Tseng, 2019). Directing teachers' attention to observe if they incorporate thinking skills in their TPACK might help them reconsider the degree to what extent thy are effective in technology integration in actual practices. Yet this way of measuring has been generating concerns over verification so far (Nording & Ariffin, 2016). That's to say, there is much discussion going on over the instruments and their effectiveness.

The components inside the TPACK framework must be well described, and trustworthy tools for evaluating TPACK should be developed for different situations (Shinas et al., 2013). Multiple research projects are dedicated to evaluating different areas inside the TPACK framework. Mouza and Karchmer-Klein (2013) have used many methods to measure the TPACK of both pre-service and in-service teachers. These methods include interviews, classroom observations, self-reported inquiries, broad surveys, and performance-assessment tools. The TPACK measuring instruments may be classified into "self-assessment" and "external assessment" based on the kind of information used in these investigations.

The evaluations of both quantitative and qualitative TPACK metrics (Chai et al., 2016; Koehler & Mishra, 2016) indicate that previous studies on assessing TPACK mostly use self-examination questionnaires, where different knowledge areas are assessed separately (Saubern, et al., 2020). While self-assessment tools are convenient and affordable, and they allow for accessing a wide range of subjects, their accuracy in evaluating the actual TPACK of instructors is limited by the survey-takers' capacity to evaluate their own knowledge (Abbit, 2011) Typically, these surveys assess teacher confidence rather than their practical expertise, which are distinct concepts (Schmidt et al., 2009; Lyublinskaya & Tournaki, 2015). In order to get a precise evaluation of the TPACK, educators must showcase their practical

abilities in using technology to enhance the teaching and learning process within their specific subject area. The external evaluation of TPACK relies on the observation of behaviors such as instruction in the classroom, small-group instruction, instructional artifacts (such as syllabuses, student documents, and instructional showcases), and expertise assessments. This kind of evaluation is considered to have greater objectivity in comparison with self-reported data. Recent research primarily concentrates on differentiating various components within the TPACK framework, while also acknowledging the multidisciplinary character of TPACK. In contrast, Lyublinskaya and Tournaki (2011) created and verified the TPACK Levels Rubric to evaluate the gradual advancement of instructors' TPACK, which is a combined concept derived from lesson plans and classroom observations. A comprehensive comprehension of the research instrument is necessary to accurately assess educational artifacts utilizing it.

TPACK and TISE

Teachers' ideas about technology are likely to be shaped by how they use it in and out of the learning environment (Lumpe & Chambers, 2001).That's to say; based on the available evidence, it can be concluded that instructors who have a strong belief in the usefulness of technology are more inclined to incorporate technology into their classrooms in a manner that leads to favorable outcomes for learning (Karataş, 2014; Nathan, 2009). TPACK encompasses both the mental component of incorporating technology into education and the sensory aspect, as it recognizes the importance of technological self-efficacy in the implementation phase (Koh et al., 2014). Numerous prior research has directed their attention towards examining the correlation between teachers' self-efficacy and their TPACK, in light of the increasing significance of technology in the field of education. It has been stated that students are inclined to refrain from utilizing technology in their classes due to the teachers' limited technological literacy (Littrell et al., 2005). Likewise, Keser et al. (2015) provided that teachers' self-efficacy beliefs of technology have a substantial impact on their TPACK levels and the integration process while seeking digital solutions to problems going on in education. Additionally, Abbit (2011) found a strong relationship between teachers' self-efficacy and TPACK domains, namely TK, PK, and CK. In similar vein, Karataş (2014) explored self-efficacy and TPACK levels of mathematics teachers and found a robust connection between the variables with significant variation in genders. Male educators outperformed the females in terms of digital competency and confidence. It is also highlighted that the experience demonstrates negative correlation with the degree of self-efficacy. In a research conducted by Tuncer (2017), the aim was to investigate the correlation between the overall teacher effectiveness, its particular elements (student commitment, classroom management, and pedagogical approaches), and TPACK among pre-service EFL instructors in Turkey. The study uncovered greater awareness of both instructional perspectives and Technological Pedagogical Content Knowledge (TPACK), indicating a significant correlation between these two concepts. Furthermore, Damar et al. (2017) investigated how pre-service science teachers' views about various aspects of technology usage affected their self-efficacy beliefs on TPACK. The study found a strong relationship between teachers' attitudes about using technology, their skills and experiences, and how successful they believe they are at teaching PBL. Similarly, Wright and Akgunduz (2018) evaluated pre-service science educators' degrees of self-efficacy in utilizing Web 2.0 technologies in recent research. TPACK Framework served as the basis for this assessment. The study found a significant correlation between people's usage habits of these applications and TPACK. Yet the research was unable to find any meaningful relationship between the TPACK-related self-efficacy beliefs and the willingness to utilize Web 2.0 applications.

In conclusion, these studies shed light on the intricate relationships between TPACK, self-efficacy, and a variety of other variables in various educational contexts. As reflected in their TPACK competencies, they emphasize the critical role that teachers' self-efficacy plays in the effective integration of technology into their teaching practice. While the relationship between these factors is complex and varies depending on factors such as age, gender, experience, and subject area, it is evident that enhancing teachers' TPACK and confidence in integrating technology could significantly improve educational outcomes. However, additional research is necessary to fully comprehend the nuances of these

relationships and to develop effective strategies for enhancing teachers' technology integration skills.

Methodology

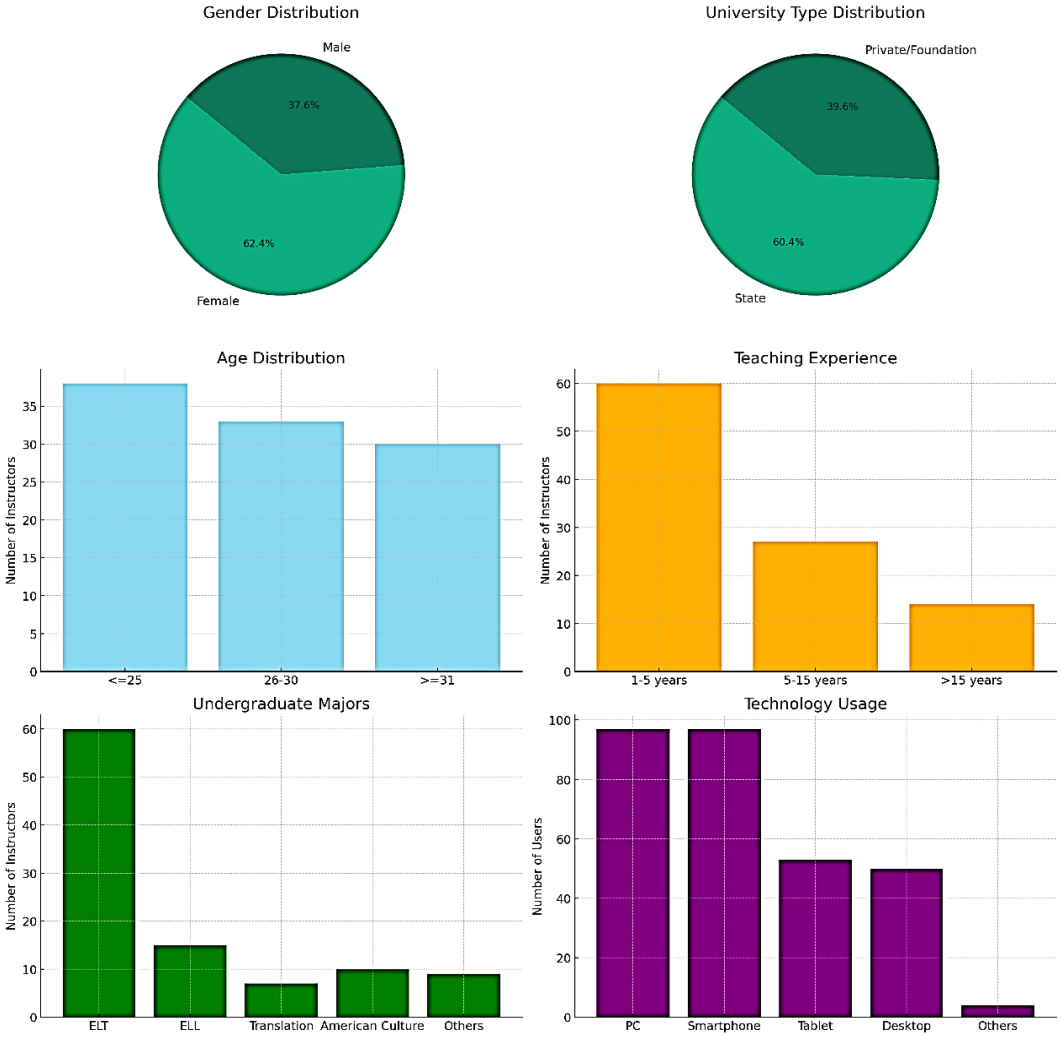
This study seeks to comprehend the TPACK levels and TISE of Turkish EFL instructors, and how these levels might predict their TISE. To do this, a quantitative research approach was adopted, as it allows us to collect numerical data and make assumptions based on them. Out of three potential quantitative research designs—experimental, correlational, or survey—the correlational design was chosen for the current research. This design enables researchers to predict scores and comprehend the relationships between different variables. Specifically, we used a prediction correlational design, which not only links variables but also identifies certain variables that can predict an outcome.

Setting and Participants

The research centered on EFL instructors currently employed, particularly those affiliated with public or private academic institutions in Turkey. For participant selection, the study employed a convenience sampling approach, opting for individuals who were easily reachable and open to involvement. As a result, the data was gathered from 101 EFL instructors from eight different universities. These participants were mainly instructors from preparatory classes at various Turkish universities. It was presumed that these instructors possess adequate pedagogical and content knowledge, as well as a basic level of technology understanding, given their educational backgrounds in the teaching field at either the undergraduate or graduate level, and the presence of teaching certificates among some of them.

The study involved 101 in-service instructor teaching English, among which 63 were female and 38 were male. A diverse age range was represented with 38 instructors aged 25 years and below, 33 between the ages of 26 and 30, and 30 who were 31 years and above. The majority of the participants worked in state universities (61), while the remaining 40 worked in private or foundation universities. In terms of teaching experience, the majority of participants (60) had 1 to 5 years of experience, 27 had between 5 to 15 years, and 14 had over 15 years of experience. The participants' undergraduate fields of study also varied: 60 majored in English Language Teaching, 15 in English Language and Literature, 7 in Translation and Interpreting, 10 in American Culture and Literature, and 9 in other non-language-related fields. The participants' educational levels were diverse too, with 42 holding a bachelor’s degree and the majority either studying for or having completed a Master's degree. Only a small number (2%) were engaged in doctoral studies. When considering daily use of technology, nearly all participants used a personal computer (97) and smartphone (97), with 53 using tablets, and 50 still using desktop computers. Only a small number (4) used other devices like smartwatches or game consoles. The survey also inquired about the participants' training in educational technology post-graduation. It was revealed that 65 participants had received such training, while 36 had not. This paints a varied picture of the sample, hinting at a wide range of experiences and comfort levels with technology among the participants.

Figure 1. Setting and Participants



Instruments

The study employed an online questionnaire via Google Forms to collect data, chosen for its efficiency in time, analysis process, and capacity to reach a large audience simultaneously. This method also allowed participants to answer at their convenience, using their own devices. The questionnaire comprised three sections: demographic information, the TPACK-EFL survey, and the TISE survey.

Initially, participants were asked demographic questions, providing details about their gender, age, school, and years of teaching experience. They also provided information on the technological devices they use and any technology integration courses they had attended.

Next, participants filled out the TPACK-EFL survey, developed by Başer (2015). This tool was chosen for its unique focus on assessing EFL teachers' TPACK levels, differentiating it from other more general TPACK scales. It included 39 items that rated teachers' knowledge and perceptions of their technological, pedagogical, and content competencies, allowing us to determine their TPACK level.

The final part of the questionnaire was the TISE survey, created by Wang et al. (2004). This 21-item Likert-style survey measures participants' self-efficacy beliefs about technology integration. It was selected due to its wide usage in technology integration self-efficacy studies and its high validity and reliability.

Data Analysis

This study utilized quantitative data analysis techniques, using both descriptive and inferential statistics processed through SPSS 23.0. Descriptive statistics such as frequency, variability, mean, and standard deviation were used to profile the participants' demographic characteristics and assess the group's TPACK and TISE levels. Inferential statistics were used to interpret survey results, with correlation analysis and regression methods applied to both TISE and TPACK.

To address the initial research inquiry about the TPACK proficiency of the participants, scores derived from a 9-point scale were evaluated. For the subsequent query pertaining to the respondents' TISE proficiency, a 5-point scale evaluation was employed. Both inquiries utilized descriptive statistical methods for interpretation. The potential influence of perceptions in TPACK areas on TISE was assessed using regression analysis for the third research question.

Findings

The data collected from the TPACK-EFL survey provides insightful details about in-service EFL instructors' self-perception regarding their technological, pedagogical, and content knowledge. The survey, encompassing 39 items graded on a Likert scale from 1 to 9, has yielded varied mean scores ranging from 6.89 to 8.47.

In terms of content knowledge (CK), instructors perceive themselves as highly competent with the highest mean CK rate reported as 8.47. They particularly excel in reading comprehension in the English language, though they have slightly lesser confidence in their English expression of ideas or feelings. Technological Pedagogical Content Knowledge (TPCK), however, sees a dip in confidence, indicating instructors don't feel as proficient in integrating technology into their pedagogical instruction. The highest and lowest TPCK mean scores are reported for the items on professional development support using technological tools (M=7.47) and the use of collaborative tools like wiki and 3D virtual environments for student learning (M=6.52), respectively.

The other domains of knowledge displayed varying mean scores with Pedagogical Content Knowledge (PCK) and Pedagogical Knowledge (PK) considered high, with mean scores above the overall TPACK-EFL survey mean (M=7.45). Technological Pedagogical Knowledge (TPK), TPCK, and Technological Content Knowledge (TCK), on the other hand, showed lower competence levels with scores under the survey's mean score.

Table 1. Descriptive Results

Knowledge Category	Items	N	*M*	*SD*
TK	9	101	7.22	1.19
CK	5	101	8.47	1.02
PK	6	101	7.63	0.99
PCK	5	101	7.71	1.04
TCK	3	101	7.02	1.39
TPK	7	101	7.20	1.14
TPCK	4	101	6.89	1.27
TPACK-ELT	39	101	7.45	0.85

The second research question in this study aims to characterize the self-efficacy beliefs of English Language Teaching (ELT) instructors in integrating technology into their teaching, known as Technology

Integration Self-Efficacy (TISE). The study used descriptive analysis to achieve this, and the mean TISE score of ELT instructors was found to be 3.95 (SD=0.57), as per a 21-item questionnaire that asked respondents to rate their agreement on a five-point scale.

For deeper insights, TISE was categorized according to the systems developed by Yurdakul (2011). In the Yurdakul's categorization, a spectrum from low to high TISE was defined with scores from 1 to 2.33 representing low TISE, 2.34 to 3.67 as average, and 3.68 to 5 as high. Based on this, it was inferred that the ELT instructors demonstrate high TISE. On the other hand, classification which ranges from "very low" to "very high" showed that all TISE items scored above average, indicating that ELT instructors have moderately high self-efficacy beliefs in technology integration.

In this context, instructors feel they have the necessary skills to use technological tools for instruction, evidenced by the highest mean score (MD=4.28). However, they're less confident in creating innovative solutions to overcome system restrictions, as reflected in the lowest mean score (MD=3.51).

This study also aimed to investigate how self-efficacy beliefs in technology integration (TISE) could predict the Technological Pedagogical Content Knowledge (TPACK) levels of English as a Foreign Language (EFL) instructors. A series of regression analyses were carried out to establish the predictive power of TISE on the seven knowledge types encompassed by TPACK.

The regression analysis indicates that TISE beliefs significantly predict Technological Knowledge (TK) within TPACK. The model was significant ($F=219.752$, $p<0.05$), and 69% of the variation in TK could be explained by TISE beliefs. The Pedagogical Content Knowledge (PCK) was also significantly predicted by TISE, with 33% of the variation in PCK explained by the model ($F=48.999$, $p<0.05$). Technological Pedagogical Knowledge (TPK) was positively predicted by TISE with 51% of the variation explained by the model ($F=104.700$, $p<0.05$).

Furthermore, TISE beliefs significantly predicted TPACK, with the model accounting for 43% of the variation ($F=74.887$, $p<0.05$). Finally, a very significant prediction was observed for the overall TPACK by TISE beliefs, with 60% of the change in TPACK explained by TISE beliefs ($F=147.162$, $p<0.05$). These results underscore the influential role of TISE beliefs in predicting various facets of TPACK among EFL instructors, highlighting the importance of nurturing such self-efficacy beliefs to boost technological integration in teaching.

Table 2. Regression Analysis on TISE And TPACK Variables

Dependent Variable	Independent Variable	Coefficient (B)	*t*	*P*	*r2*
TK	TISE	.75	14.82	.00	.69
CK		.18	1.03	.31	.01
PK		.81	5.24	.00	.22
PCK		.70	4.09	.00	.14
TCK		1.41	7.00	.00	.33
TPK		1.43	10.23	.00	.51
TPCK		1.46	8.65	.00	.43
TPACK-ELT		1.16	12.13	.00	.60

Discussion

The study provides compelling insights into the TPACK and TISE beliefs of EFL instructors. The research demonstrates conclusively that in-service EFL teachers view their level of TPACK as adequate, particularly in the domains of PK, PCK, and CK. The study revealed, however, that their confidence decreased in domains involving the intersection of technological, pedagogical, and content knowledge (TPCK, TCK, TPK). This finding is consistent with the findings of Karsenti and Collin (2013), who emphasized that instructors feel adept in their pedagogical and content knowledge but may lack the confidence and expertise to effectively integrate technology. These findings are also consistent with the research of Karsenti and Collin (2013) and Ekrem & Recep (2014), who noted similar trends in EFL instructors' confidence in their pedagogical and content expertise. Additionally, your findings align with Mishra and Koehler's (2006) concept of TPACK as a complex, intertwined body of knowledge. The variation in proficiency across different TPACK domains in your study corroborates their assertion that understanding these intersections is key to effective technology integration in education.

Intriguingly, EFL teachers assessed their TISE beliefs highly, indicating a strong perception of their capacity to integrate technology into their instructional practices. These results are consistent with those of Yurdakul (2011) and Nathan (2009) who also found a high prevalence of TISE among teachers. This high level of TISE suggests that, despite some apprehension regarding the integration of technology into their instruction, EFL instructors have strong self-efficacy beliefs regarding their ability to use technology effectively. The most significant finding of the study may be the examination of the relationship between TISE beliefs and TPACK levels. In accordance with earlier research by Yurdakul (2011), the regression analysis reveals that TISE beliefs predict TPACK significantly. These findings illuminate the pivotal role of self-efficacy in technology integration within the EFL teaching context. The study suggests that bolstering TISE could be a key strategy in enhancing technological competencies, a perspective that aligns with current educational technology discourses.

The disparity between the high level of TISE and the relatively lower levels in technology infused TPACK domains suggests that, while EFL instructors believe they can effectively utilize technology, integrating it into pedagogy and content remains a challenge. This is consistent with Mishra and Koehler's (2006) contention that TPACK is a unique body of knowledge that requires a comprehension of the complex relationships and interactions between technology, pedagogy, and content and goes beyond the simple addition of its constituents.

These findings provide essential insights for teacher training and professional development. They emphasize the significance of enhancing EFL instructors' confidence in integrating technology with their pedagogy and content knowledge, while recognizing and nurturing their already high self-efficacy beliefs regarding technology integration. Thus, the study highlights the need for professional development programs that develop not only technical skills, but also a deeper understanding of how technology can be embedded in pedagogical and content knowledge to transform teaching and learning.

Conclusion

The primary objective of this research was to discern the correlation between the TISE and TPACK proficiency of currently employed EFL educators. The study delved deep into the confidence levels of these teachers when integrating technological tools into their teaching. The data revealed that, generally, EFL educators held positive views about their ability to incorporate technology. However, enhancing their technical skill set could further reinforce this belief and foster more robust TISE sentiments.

Furthermore, the self-assessments from the participants indicated that they perceived themselves as having a commendable grasp of TPACK, feeling adept across most TPACK domains. Intriguingly, while they displayed higher aptitude in content knowledge than in other TPACK components, their TPCK was

slightly less pronounced. Regression analysis validated a notable linkage between the self-efficacy beliefs in technology integration of the EFL educators and their overall TPACK competence.

What sets this investigation apart is its utilization of the TPACK-EFL survey, a tool crafted specifically for English language educators and seldom applied to on-duty EFL teachers in current academic works. Additionally, the exploration of the nexus between TISE and TPACK among active EFL educators remains a relatively uncharted area in the realm of English pedagogy. As such, these insights are both novel and pivotal, laying the groundwork for future academic endeavors, tech-integration training modules, and tertiary educational syllabi.

Implications

This study's findings have significant implications for language education stakeholders, including teacher educators, curriculum designers, and English as a Foreign Language (EFL) instructors. The process of integrating technology into instruction extends beyond the use of digital instruments alone. As articulated by Chun, Smith, and Kern (2016), it entails introducing novel methods to represent, convey, and comprehend languages and cultures. However, the effectiveness of this integration is highly dependent on the attitudes and approaches of instructors towards technology (Huang & Liaw, 2005).

The outcomes of this research underscore the importance of fostering affirmative self-belief in aspiring educators concerning the melding of technology into teaching. It's pivotal to spotlight the intricate confluence of technology, teaching methods, and content, thereby emphasizing the essence of the tech-adoption process to enrich both instruction and learning. By immersing future educators in an environment that cultivates positive convictions about tech integration, they're more inclined to weave technology seamlessly into their impending instructional approaches.

Curriculum architects overseeing teacher training modules ought to think about crafting a syllabus that grants aspiring educators ample interaction with technology. Such a curriculum should encompass tasks that steer and support students in honing their techno- pedagogical abilities, which in turn can amplify successful learning results.

Additionally, the results from this research imply that teacher training initiatives ought to contemplate formulating vigorous professional enhancement strategies. This will ensure in-service educators are aptly prepared to judiciously incorporate technology in their teaching environments. Regrettably, a significant number of EFL educators don't have sufficient access to such development opportunities (Saglam & Sert, 2012). As a solution, curated training modules should be established that seamlessly weave educational technologies into the teaching framework, granting English educators exposure to the latest tech tools and platforms.

In addition, these professional development initiatives should not consist of isolated training programs or seminars (Enochsson & Rizza, 2009). To maximize their effectiveness, they should be designed as continuous programs that provide participants with sustained exposure to TPACK-related experiences, thereby reinforcing their TISE beliefs and encouraging innovation in their language classrooms. As these training programs meet the requirements of instructors, they are likely to acquire confidence and improve their teaching techniques (Mede & Işk, 2016). This process would cultivate a deeper and more nuanced comprehension of the interaction between different categories of knowledge, thereby increasing teachers' self-efficacy to use technology to enhance teaching and learning (Karataş, 2014).

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Acknowledgements

Not applicable.

Funding

Not applicable.

Ethics Statement

The consent form was gathered from the participants. The ethical approval has been taken from Bahçeşehir University.

Conflict of Interest

The authors do not declare any conflict of interest.

Data Availability Statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Article History

Submitted: October 4, 2023 – Accepted: January 14, 2024

Suggested citation:
Dinçer, R., Polat, M., & Dinçer, N. (2024). Integrating Technology in EFL: A Study on TPACK and Self-Efficacy Among Turkish Educators. *Asian Journal of Distance Education, 19*(1), 64-81. https://doi.org/10.5281/zenodo.10504960