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On the Relationship between Iranian EFL Teachers' Technological Pedagogical Content Knowledge (TPCK) and their Willingness to Attend Continuing Professional Development (CPD) Courses

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Abstract

The current study was done to investigate the correlation between Iranian EFL teachers' technological pedagogical content knowledge (TPCK) and their willingness to attend continuing professional development (CPD) Courses. To do so, 201 EFL teachers participated in the study. The setting of the study was different high schools in Mashhad. A correlational design was used to conduct the study. The main instruments of the study were the teachers' technological pedagogical (Tseng, 2016) and continuing professional development (Behzadi, et.al., 2019) questionnaires. Pearson correlation and multiple regression were used to answer the research questions of the study. The results showed that there was a significant relationship between Iranian EFL teachers' technological pedagogical content knowledge and their willingness to attend continuing professional development courses. The regression analysis revealed that the components of the technological pedagogical content knowledge significantly predicted the Iranian EFL teachers' willingness to attend CPD courses. It is concluded that teachers' continuing professional development courses and their familiarity with technological pedagogical content knowledge give credence to the value of personal qualities such as teachers' command of the language, interpersonal relationships with their students, creation of stress-free environments, and necessary personal qualities for being an effective teacher in the process of foreign language learning. The findings of this study can offer pedagogical implications to English teaching and learning stakeholders, educational policymakers, officials, and EFL teachers

Keywords: Content Knowledge; Continuing Professional Development; Pedagogical Knowledge; Technological Knowledge; Technological Pedagogical Content Knowledge.

1. Introduction

Since technological development has happened in recent years, education should be considered as one of the fields which have been affected by the impact of technology (Oliver, 2002). Continuous changes and innovations in technology have greatly affected the structure of educational environments and the methods and techniques teachers implement during the

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teaching and learning process (Kus, 2005). While the use of technology in education should be regarded as an indicator of quality (Çakır & Yıldırım, 2009), technology needs to be combined with appropriate pedagogical approaches to be implemented in education (Şad & Göktaş, 2014). Accordingly, proper integration of technology into educational practices needs enough knowledge of pedagogy, technology, and content (Jang & Tsai, 2012).

Technological Pedagogical Content Knowledge (TPCK) has been put forward in recent years by some researchers (Koehler & Mishra, 2005; Mishra & Koehler, 2006) to introduce the role of teachers' knowledge about using technology in an efficient way in the teaching and learning context (Yiğit, 2014). As a way of thinking about technology integration, TPCK has also been considered an influential teaching strategy that can increase teachers' sophisticated and dynamic knowledge (Lu, 2014). It has also been defined by Liu (2013) as a practical approach that helps teachers to integrate technology into their classes. Koehler and Mishra (2009) offered a framework to integrate digital texts and tools which regard the technological, pedagogical, and content knowledge of teachers. These three areas are simultaneously combined to "develop appropriate context-specific strategies and representations" for effective and efficient learning (Koehler et al., 2007, p. 741). Some researchers look at TPCK as a kind of competency as a fundamental standard to be known as a qualified teacher (Alpaslan, et.al., 2021; Apau, 2017; Şahin, 2011). Therefore, teacher training programs should consider the use of technology and also try to connect it with content and pedagogy (Kraglund-Gauthier & Moseley, 2019). Accordingly, TPCK integrates four areas of technology, pedagogy, content, and knowledge to provide a framework for analyzing the quality of teachers (Arya et al., 2020).

Educational reform movements that have taken place around the world have been opening a new window toward students' learning. Some changes have been demanded by the reform vision which depends mostly on teachers, their learning during the teaching process, and transforming their knowledge into some practices in classes (Vangrieken et al., 2017). This idea has led scholars to think about Continuing Professional Development opportunities for teachers to assist them improve their knowledge and enhance new instructional practices (Al Balushi, 2021). Continuing Professional Development known as CPD is the holistic commitment of professionals towards the enhancement of personal skills and proficiency throughout their careers. Farrell (2012) defined CPD as the promotion of teacher competence which is carried out in accordance with gradual and continuous needs to enhance professionalism. CPD is needed to develop the quality of teaching standards because teachers must be equipped with new teaching methods to improve their teaching skills and students' learning opportunities. Furthermore, Richards and Farrell (2005) stated that teachers need to expand their roles and responsibilities over time to find useful language teaching strategies because language teaching is a subject of rapid change. Mizell (2010) believes that CPD activities assist language teachers in finding out suitable pedagogical approaches to enhance the student's learning outcomes.

However, the number of studies that examined the teachers' approval regarding the technological efficacy in their teaching and the employment of technology in the process of language teaching has been known to be limited (Jahanban-Isfahlan et al., 2017) which holds with the Iranian EFL educational settings. Besides, the studies indicate the insufficient experience of language teachers regarding the technological pedagogical content knowledge

and its employment in the process of foreign language teaching (Jahanban-Isfahlan et al., 2017). According to Jahanban-Isfahlan et.al. (2017), many Iranian EFL teachers use technology for pedagogical knowledge on a very limited scale and this might be the result of insufficient training of teachers in integrating technology in the process of language teaching. Moreover, many educational institutes and organizations hold CPD courses for the improvement of their instructors; however, the number of participants is not that satisfactory. This is to say that teachers are not motivated or have no willingness to participate in such courses. Besides, some teachers are not qualified enough or are not that updated to answer all the questions of the wise students, and some classes are not that efficient. The effect of the CPD courses is neglected in Iranian educational settings. Therefore, the present study tried to investigate the relationship between Iranian EFL teachers' technological pedagogical content knowledge (TPCK) and their willingness to attend continuing professional development (CPD) courses.

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2. Review of Literature

2.1. Technological Pedagogical Content Knowledge (TPACK)

According to Abbasi and Tabatabaee-Yazdi (2021), new technological tools can change everything in the world and learners intend to use them in different situations. Shulman's (1986, as cited in Koh et al., 2017) concept of pedagogical content knowledge (PCK) is considered to be the basis of Technological Pedagogical Content Knowledge, which is primarily concerned with the development of the most suitable instructional performances and elements. With reference to the key PCK assumptions, TPACK has been offered as a framework defining the aspects of effective incorporation of technology into instructional activities (Mishra & Koehler, 2006).

Niess (2008) described TPACK as the knowledge that educators need to educate their pupils. In this approach, educators must teach and instruct their pupils by incorporating technology into their educational setting and integrating it with particular tactics and instruments. Teachers instruct pupils in the use of technology in education. For educational institutes to use the TPACK model to succeed in technology integration, they must have access

to technology resources, a suitable curriculum, and real-world experiences with technology to integrate duties and theories into specific educational programs for educator training (Niess, 2008).

The most successful technological way of implementing the TPACK system assumes that educators must conceptualize the relationship between the three components: technology, materials, and teaching. TPACK is characterized as a valuable method for educating and using technology to assist teachers in identifying the context in which to teach and increase learners' awareness in their learning process to conquer challenging challenges in learning scenarios (Koh et al., 2017). The notion of TPACK is utilized in technology-enabled classrooms as an effective way of conceptualizing subjects. Technology, as an educational tool, must be used effectively to enhance teaching and learning issues (Koh et al., 2017).

As a result, the notion of TPACK can help to clarify the relationship between three forms of knowledge: technological, media and strategy, and academic. Indeed, the TPACK model offers teachers a novel technique for incorporating technology into the educational setting to establish a learning environment for students (Niess, 2008). TPACK is seen to be a good foundation for instructors to use when integrating technology into the classroom. It truly clears the way for technology and education to interact. Integrating technology into school frequently results in a shift in how the topic is delivered. It helps instructors select and employ hardware and software, as well as recognize the benefits of specific characteristics and utilize the resources in pedagogically relevant and successful ways (Koh et al., 2017). Niess (2008) also stated that TPCK is extremely beneficial for developing teachers' material, pedagogical, and technological expertise.

Koehler et al., (2006, p. 1026) introduced the TPACK model, which includes seven types of knowledge: "technological knowledge (TK), pedagogical knowledge (PK), content knowledge (CK), pedagogical content knowledge (PCK), technological content knowledge (TCK), and technological pedagogical content knowledge (TPACK). Graham (2011) defined TPCK as the integration of three major types of knowledge: technology knowledge, pedagogic knowledge, and content knowledge. Drajati et.al., (2018) investigated pre-service and in-service teachers' perceptions toward TPACK literacy. The questionnaires of 100 pre-service and in-service teachers were used for data collection. The results showed three components for the literacy of the TPACK literacy: Pedagogical Content Knowledge for Multimodal Literacy, Technological Pedagogical Knowledge (21st Century Learning), and Knowledge about digital media tools. The suggestion of this survey was to contribute to English teachers' professional development.

In a mixed-method study, Nazari, et al. (2019) attempted to find the novice and experienced EFL teachers' perception about TPACK and its effects on their professional development. To achieve this goal, 427 EFL teachers participated in the study. Also, 16 EFL teachers were chosen for a structured interview by a qualitative method. The outcomes of the study showed that experienced teachers were of significantly higher scores in terms of pedagogical knowledge and pedagogical content knowledge subscales. In contrast, novice teachers were of significantly higher scores considering their technological knowledge, technological content knowledge, technological pedagogical knowledge, and TPACK.

Moreover, the qualitative findings revealed that novice and experienced EFL teachers had different plans for professional development.

Similarly, in a study done by Bostancıoğlu and Handley (2018), a questionnaire was utilized to assess TPACK for English as a Foreign Language (EFL) teachers. The results revealed that technology can be implemented in language classes and can provide opportunities for promoting language acquisition; thus TK, PK, and CK should be integrated with teaching.

2.2 Continuing Professional Development (CPD)

The concept of professional development for teachers has been focused on by many scholars in various educational settings (Mbiti, 2016). As a crucial step in effective teaching, teachers' continuous professional development (TCPD) is seen as an important aspect of educators' professionalism. According to structural theory, teachers must have particular qualities to be effective and be able to create a successful educational setting and deal with uncertainties in classes. Teachers, for example, should cultivate personal connections with their students while maintaining a professional separation (Wichadee, 2011).

The idea of CPD in education is sometimes ill-defined. Day's (1999) definition of CPD includes any behaviors shown by the teacher which meant to affect improvement in the classroom. Professional development includes all spontaneous learning experiences as well as intentional and planned activities that are used in classes which can directly or indirectly be valuable to the person, group, or institution, and which can contribute to the standard of education in the educational setting. Saka (2009) said that by participating in continuing professional development courses, instructors may improve their efficacy in their teaching while also raising the standards. He stated that CPD assists instructors in creating a welcoming classroom environment, promoting learner willingness, excitement, and motivation, and establishing an engaging teacher-student interaction to improve learning (Saka, 2009).

Furthermore, Küçükbere and Balkar (2021) claimed that to employ professional development and continue this idea in teaching, EFL instructors must gain topic knowledge as well as ways for implementing this professional growth to create a pleasant and cheerful teaching environment. Professional Development is a process in which teachers renew themselves, develop their knowledge, skills, and emotional intelligence, and try to improve their professional thinking, planning, and practices (Day, 1999).

According to Rokhyati (2015), continuous professional development courses are important for EFL teachers. It is difficult for teachers to understand how to create effective and appropriate teaching approaches without this training. Teachers who participate in continuous professional development appear to use more suitable and efficient teaching tactics, and their learners appear to be more competent with them. As a result, professional development courses might assist instructors in recognizing and implementing suitable solutions for challenging and complicated circumstances in the classroom (Rokhyati, 2015). Moon (2004) suggests attaining professional growth through high-quality in-service training courses, peer observation, thorough reading, self-evaluation techniques, open dialogues, diary preparation, and action research.

Also, providing pre-service training to basic English language teachers is a challenging undertaking, but keeping the expertise and abilities of educators up to date is even more

difficult (Moon, 2004). According to Smith and Benavot (2019), if instructors have the opportunity to participate in continuing professional development courses, they will achieve long-term success in educational programs. This is significant because, in some industries, such as driving, professional advancement may halt when a person reaches a certain age. However, the teaching career is distinguished by long-term and ongoing lifelong professional growth. According to Eginli (2021), the aim of training programs should be to give instructors seminars in order for them to improve and have opportunities for professional development.

According to Bailey (2004), a professional development course for EFL teachers comprises all types of tasks (formal and informal) done or obtained by teachers for the aim of in-service professional growth. In simple terms, professional development entails instructors' continual learning with an emphasis on improving classroom practices and student learning outcomes (Bailey, 2004). Bailey (2004) finds that professional development would increase teachers' efficacy in the classroom. Inusah (2014) investigated the impact of teacher motivation on their professional development and came to the idea that there are some demotivating factors for teachers such as lack of school collaboration, lack of societal appreciation for the teaching profession, and lack of services in educational settings. In another study, Chuang et al. (2018) investigated the attitude of high school students regarding the TPC knowledge of teachers. They administered a valid questionnaire to a sample of 287 high school students. The validated scale included four components knowledge of subject matter, knowledge of students' understanding, knowledge of technology, and technological pedagogical content knowledge (TPACK). The results showed that the high school students had a positive attitude regarding TPCK.

On the contrary, selflessness and internal factors were identified as the most motivating factors affecting teachers' professional practice. Leiberman (2002) divided CPD into three categories: direct teaching (courses and workshops), learning in school (peer instruction, critical relationships, mentoring, research on action, and task-related planning teams), and learning outside of school (learning systems, visits to other educational institutions, and school-university partnerships). Kennedy (2005) proposes nine CPD models, which are briefly summarized below :

- Training concentrates on abilities and excellent delivery, with little practical emphasis.
- Award Bearing - generally in association with a college or university institution, this puts to the forefront the troubling debate about academia's irrelevance.
- Deficit - this looks at tackling errors in a single teacher, it tends to be tailored, but it may not be beneficial to confidence and is dismissive of the development of a collective knowledge base within the school
- Cascade - This is relatively inexpensive in terms of assets, but there are issues related to the loss of a collaborative component to the original learning. It might be beneficial in terms of building a common language, but it can also be highly restricted and restrictive .
- Coaching / Mentoring - creating a non-threatening connection can stimulate dialogue, but a mentor or coach must have solid communication skills.

- Standards-Based – according to this, an influential and not flexible (regarding teacher learning) way of teaching is used for developing a common language. This may be considered to be limited and narrow.
- Community of Practice –these may stifle active and creative practice innovation, even though they can operate successfully by merging members'
- Action Research - this is applicable in the classroom and allows instructors to try out new practices when the action research is in a collaborative environment.
- Transformative - the incorporation of numerous various sorts of prior models, with strong knowledge and control over the agendas being addressed.

According to Kennedy (2005), the first four of these are simply transmission strategies that provide little chance for instructors to take control of their learning.

2.3 EFL Teachers' TPCK and Their CPD

Teachers' ability to use information and communication technologies in their teaching process is a major concern for language training researchers (Kai et al., 2010), given the rapid evolution of technology and technological tools during classroom instruction and learning. Therefore, to improve the process of language teaching and learning, research on computer-assisted language learning has been the focus of researchers' attention (Zhao & Tella, 2002). Although CALL (computer-assisted language learning) was widely believed to have been well received by teachers, more intensive studies are needed to enhance the ability of teachers to integrate technology into their language teaching process. This has led to the development of a theory based on technology pedagogical content knowledge. Mishra and Koehler introduced the current theoretical framework in 2006.

TPCK has been regarded as a valuable theory to describe teachers' technology integration into their teaching process in various educational settings. Some studies have demonstrated that TPCK has had an important influence on teachers' use of technology when teaching and has helped students increase their learning of the language (Graham, 2011; Niess, 2008).

In contrast, continuing professional development is known as CPD and it is a comprehensive commitment of professional teachers to improve their skills and competencies in their teaching career. According to Mizell (2010), the activities of the Continuing Professional Development Program help language teachers identify appropriate pedagogical approaches to improve the learning outcomes of students. CPD is essential for the development of teacher quality, as teachers must be equipped to use new teaching techniques to strengthen their skills and allow students to learn more. Moreover, Ferrell (2012) argued that teachers must step up their roles and responsibilities over time to find appropriate teaching strategies which take into account the rapid change of languages.

According to Lamper (2005), the CPD work helps language teachers find appropriate teaching approaches that would improve their students' educational outcomes. For teachers to use TPCK in their classrooms, they would have to attend professional education courses. According to Lamper (2005), professional development activities are helping language teachers understand the appropriate teaching practices that increase learning outcomes for students. For teachers to use the TPCK in their teaching, they would need to attend professional development courses. As mentioned by Mafakheri (2016), teachers' professional development courses should focus on the enrichment of teachers through some continued and ongoing

courses via live sessions with various durations. To acquire a new theory of teaching and TPCK, applying live courses could be beneficial for teachers in their process of teaching.

Technological pedagogical knowledge of teachers can create opportunities for sharing experiences in teacher education programs which can provide teachers with good sources of knowledge. In particular, continuing professional development courses are recommended for teachers to be able to share educational experiences with a large number of teachers as well as to acquire simple but essential skills (Brown, 2014). Brown (2014) also proposed that teachers should be given some training sessions with follow-up activities to receive feedback and coaching which are necessary for successful implementation of new ideas in classes and applying TPCK while teaching. Therefore, limited studies have been done regarding the relationship between teachers' TPCK and their CPD in Iranian educational contexts. To fill the gap this study was done to examine the relationship between Iranian EFL teachers' TPCK and their CPD. The research questions of this study were:

Q1. Is there any significant relationship between Iranian EFL teachers' technological pedagogical content knowledge and their willingness to attend continuing professional development courses?

Q2. Can the components of teachers' technological pedagogical content knowledge predict the teachers' willingness to attend continuing professional development courses?

3. Method

To do the study, a correlational design with a quantitative method was used. The correlational design is used to show the relationship between the variables. Furthermore, the quantitative method was used to answer the research questions of the current study.

3.1. Participants and Setting

The setting of this research was high schools in Mashhad, Iran. The reasons for choosing the setting were varied. The first reason for choosing the setting for this research was that the concept of online learning using special platforms depends directly on the situation in which they happen and the context of universities, private institutes, and public and private schools are not necessarily the same and the platforms used are not the same; therefore, all cannot be taken into account and a more limited and specified setting was needed. Thus, only high schools were selected. The second reason for the selection of setting deals with the researchers' access to the context. As the researchers were in Mashhad, there was limited access to other schools in other cities in Iran; therefore, only the high schools in Mashhad were considered in the present study. The third reason was that the platforms used in online classes are not the same in all educational contexts and the selection of the platforms can affect teachers' abilities in using instruments and tools in their classes; therefore, just one setting which was high schools was taken into account.

To collect the required data, 201 EFL teachers (males= 95, females= 106) who were teaching English at different high schools in Mashhad, Iran, were selected based on Krejcie and Morgan's Table (1970). Indeed, out of 420 English teachers, 201 EFL teachers were chosen to participate in the examination supported by Krejcie and Morgan's (1970) table for sample size. Their ages ranged from 28 to 40 (M=34) and they had different years of experience in language teaching. The teachers had different academic degrees (B.A. (N=36), M.A. (N=79),

Ph.D. (N=86)) (M=67) in English language teaching and translation. For the selection of setting and participants, the present study dealt with purposive sampling. As an intentional selection of subjects, purposive sampling is widely used in qualitative and quantitative studies for the identification and selection of information-rich cases related to the variables under study. Researchers often use a purposeful sampling technique to select informants based on the specific knowledge they have, and/or experience with the variables under study and the focus of empirical inquiry (Schutt, 2006). Iranian EFL teachers who taught at high schools in Mashhad, Iran were selected randomly based on diversity in demographic information (age, gender, teaching experience, and academic degree) to participate in the data collection part of the study.

3.2. Instrumentation

3.2.1 Technological Pedagogical Content Knowledge Questionnaire. The TPCK questionnaire which was designed, developed, and validated by Tseng (2016) was used to examine the perception of teachers regarding their TPCK. The questionnaire included 35 Likert-scale items (1= Strongly Disagree,2= Disagree, 3= Not Sure,4= Agree, and 5= Strongly Agree). It had seven constructs which were technological knowledge (Items 1-5), pedagogical knowledge (Items 6-10), content knowledge (Items 11-15), technological pedagogical knowledge (Items 16-20), technological content knowledge (Items 21-25), pedagogical content knowledge (Items 26-30) and technological pedagogical content knowledge (Items 31-35). Each construct included 5 Likert-scale items and the reliability of the questionnaire was reported to be .96 (Tseng, 2016) and it was reliable enough to be incorporated into the process of the conduction of the current study.

3.2.2 Continuing Professional Development Questionnaire. The CPD (Continuing Professional Development) questionnaire was developed and validated by Behzadi et al., (2019) The questionnaire includes 55 Likert Scale items with eleven components. The components of the CPD questionnaire are the Technological Teachers CPD Method (8 items), Independent Teachers CPD Method (5 items), Combinational Teachers CPD Method (4 items), Team-work Teachers CPD Method (4 items), Local problem-solving Teachers CPD Method (7items), Cooperative Teachers CPD Method (4 items), Centralized and standardized Teachers CPD Method (4 items), Individually tailored Teachers CPD Method (4 items), Counselling and professional Teachers CPD Method (7 items), Skill-based Teachers CPD Method (4 items) and Research-based Teachers CPD Method (4 items). The reliability coefficient of the CPD questionnaire was estimated using Cronbach α Analysis and it was .81 (for the current study) which shows the high reliability of the questionnaire.

3.3.Procedures

The main objective of the present study was to investigate the relationship between the technological pedagogical content knowledge (TPCK) and their willingness to attend continuing professional development (CPD) courses through using correlational design among the Iranian EFL teachers. The participants were selected based on the purposive sampling method. To do the study, 201 EFL teachers of the high schools in Mashhad were selected. They had different academic degrees, ages, and teaching experiences and both males and females took part in the study. For collecting the required data, the researcher used the "Survey

Monkey" website to spread out the questionnaires to different high school teachers of different ages and years of experience to answer the questions. The main instruments of the study were the Technological Pedagogical Content Knowledge Questionnaire and the CPD Questionnaire. Collecting data was started in March 2022 until May 2022. The needed time for answering the items of the questionnaires was 45 minutes. To analyze the data, Statistical Package for Social Sciences software version 26th was used.

3.4 Data Analysis Method

Initially, descriptive statistics were calculated by using SPSS software to show the primary information of the data gathered from the main instruments of the study. To answer the first research question, the Pearson correlation was used. Finally, to answer the second research question, Multiple Regression was utilized.

4. Results

4.1 Data Analysis for the Research Question One

The first goal of the study was to investigate the relationship between the Iranian teachers' technological pedagogical content knowledge and their willingness to attend continuing professional development courses. To answer the first research question, descriptive statistics, and Pearson Product-Moment Correlation were used. The results of descriptive statistics for the TPCK and CPD questionnaires are exhibited in Table 1.

Table 1.
Results of Descriptive Statistics for the TPCK and CPD Questionnaires

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
TPCK	201	96.50	157.75	25713.81	127.92	12.65
CP	201	167.00	237.00	40362.00	200.80	13.99

According to Table 1, 201 EFL teachers took part in the study. The minimum and maximum scores for the TPCK questionnaire were 96.50 and 157.75, respectively. Furthermore, the sum of the scores was 25713.81. As the table shows, the mean score of the participants of the study was 127.92 and the standard deviation of the scores was 12.65. Furthermore, the minimum and maximum scores for the CPD questionnaire were 167.00 and 237.00, respectively. The sum of the scores was 40362.00. As the table shows, the mean score of the participants of the study was 200.80 and the standard deviation of the scores was 13.99. The next table is related to the results of the Pearson correlation.

Table 2.
Results of Pearson Correlation for TPCK and CPD Questionnaires

		NTP	CP
TPCK	Pearson Correlation	1	.55**
	Sig. (2-tailed)		.000
	N	201	201
CPD	Pearson Correlation	.55**	1
	Sig. (2-tailed)	.000	
	N	201	201

Table 2 shows the results of Pearson correlation for the technological pedagogical content knowledge and continuing professional development questionnaires. As the table showed, the level of significance was less than 0.05 (p=.00) and it showed that there was a significant relationship between the Iranian EFL teachers' TPCK and CPD. Furthermore, the reported correlation value was .55 and it showed a moderate correlation between the teachers' TPCK and CPD.

4.2 Data Analysis for the Second Research Question

The main goal of the second research question study was to predict the relationship between the components of the teachers' technological pedagogical content knowledge and the teachers' willingness to attend continuing professional development courses. To answer the second research question, multiple regression was used. The seven components of TPCK were TK, PK, (CK), TPK, TCK, PCK, and TPACK. The dependent variable is the continuing professional development variable (CPD). The Results of the model summary are shown in Table 3.

Table 3.
R Square Table for the Components of TPCK as the Predictor of Teachers' CPD

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.70[a]	.49	.47	10.12

According to Table 4, the r= .70 showed that there was a strong correlation between the components of the TPCK and teachers' CPD. Furthermore, its square value was 0.49 so it indicated that about 49% of the variation in teachers' willingness to attend continuing professional development courses can be explained by taking the teachers' technological pedagogical content knowledge into account. The results of the ANOVA test are shown in Table 4.

Table 4.
Results of the ANOVA Test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19418.11	7	2774.01	27.08	.000[b]
	Residual	19769.31	193	102.43		
	Total	39187.43	200			

As the significance value was less than p=0.05, we concluded that the regression model significantly predicted the Teachers' CPD. Indeed, the results of this table showed that the components of the TPCK significantly predicted the teachers' CPD. Furthermore, the results of Table 5 show which component can significantly predict the teachers' CPD.

Table 5.
Multiple Regression Analysis Between Independent Variable (the Components of TPCK) and Dependent Variable (CPD)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	109.301	8.96		12.19	.000
	TK	.197	.28	.03	.70	.48
	PK	1.24	.26	.24	4.64	.000
	CK	1.48	.17	.44	8.47	.000
	TPK	.39	.16	.14	2.43	.01
	TCK	-.18	.14	-.06	-1.29	.19
	PCK	.88	.19	.26	4.64	.000
	TPCK	.78	.15	.28	4.99	.000

According to Table 5, the level of significance for the content knowledge was less than 0.05 and the Beta number equals 44. Therefore, we concluded that 44% of the relationship between the components of the TPCK and CPD was predicted by the content knowledge (CK). The next component that significantly affected the relationship between the TPCK and CPD was the TPCK since the level of significance was less than 0.05 and the Beta number was .28. Therefore, we concluded that 28% of the relationship between the components of the TPCK and CPD was predicted by TPCK. The other variables which significantly contributed to the model were PCK and PK. Indeed, 26% of the relationship was predicted by the component of PCK, and 24% of the relationship was predicted by PK. Therefore, the results of the study showed that the five components of the TPCK such as CK, TPCK, PCK, PK, and TPK significantly predicted the teachers' willingness to attend continuing professional development courses and other components (such as Technological knowledge and technological content knowledge) did not have any significant effect on the relationship between the teachers' TPCK and their CPD.

5. Discussion

The first research goal of the current study was to assess the relationship between Iranian EFL teachers' technological pedagogical content knowledge and their willingness to attend continuing professional development courses. To gather the data, the two questionnaires (TPCK and CPD Questionnaires) were distributed among the 201 Iranian EFL teachers of the study. To analyze the data gathered from the main instruments of the study, Pearson Product Moment Correlation was used as a parametric test. The level of significance (p=.00) and correlation (r=.55) values showed the relationship between the Iranian teachers' technological pedagogical content knowledge and their willingness to attend continuing professional development courses was significant. The second research goal of the study was to predict the relationship between the components of teachers' technological pedagogical content knowledge predict the teachers' willingness to attend continuing professional development courses. To test the second research question, Multiple Regression was utilized. The results

showed that the components of technological pedagogical content knowledge (CK, TPCK, PCK, PK, and TPK) significantly predicted the teachers' willingness to attend continuing professional development courses.

The results of the study are in line with the results of the study conducted by Tseng (2016). He distributed the TPCK questionnaire with 35 Likert-scale items among the 257 Taiwanese teachers. He found the significant effect of technological pedagogical content knowledge on the language learning performance of EFL teachers in the EFL teaching process. He added that using TPCK assists the language teacher in solving the problems in the process of foreign language teaching. Similarly, Bostancıoğlu and Handley (2018), utilized a questionnaire to examine the TPCK of EFL teachers. The results showed that integrating TPCK provides opportunities for communication and assists the learners in improving their language learning process. Furthermore, the results of the study are in congruence with the results of the study done by Chuang et al. (2018). They investigated the attitude of high school students regarding the TPC knowledge of teachers. The results showed that there was a strong relationship between the students' perceptions of technological knowledge and knowledge of students' understanding and teachers' TPCK.

The findings of the study are in line with the findings of the study conducted by Nazari et al., (2019). They examined the perspectives of novice and experienced teachers regarding the importance of TPCK and its impact on their professional development. Based on the results, they concluded that the experienced teachers' scores were more than the scores of novice teachers in terms of technological pedagogical content knowledge. Furthermore, the components of content knowledge significantly predicated the teachers' professional development. In another study, Drajati et al., (2018) investigated the perspectives of pre-service and in-service teachers regarding their TPCK. They distributed a questionnaire with 100 items among the high school teachers and they revealed that both pre-service and in-service teachers had a positive attitude regarding the pedagogical content knowledge, technological pedagogical knowledge, and knowledge about digital media tools in the process of teaching and their results are in line with the findings of the current study. Furthermore, the results of the study are in line with the study conducted by Arkani (2023). She assessed the relationship between Iranian ESP teachers' TPCK and their reflective teaching. The findings showed that there was a significant relationship between Iranian ESP teachers' TPCK and their reflective teaching.

Similar to the results of the study, Inusah (2014) investigated the effect of teachers' motivation on their professional development. He concluded that the teachers' motivation had a significant effect on the professional development of the teachers. Finally, the results of the study are in congruence with the findings of the study conducted by Heidarian (2016). He examined the relationship between professional development and job burnout in Iranian EFL teachers. He found that knowledge mediation, ICT skills, innovative teaching, pursuing training plans, students' behaviors and discipline, job-related obstruction, emotional tiredness, unwillingness, workplace mood, and spiritual challenges are among the factors that influenced the relationship between Iranian EFL teachers' professional development and their job burnout.

Therefore, the findings of the study showed that teachers need to expand their roles and responsibilities over time to find useful language teaching strategies because language teaching

is a subject of rapid change. Furthermore, the teachers need to attend continuing professional development courses since CPD activities assist the language teachers in finding suitable pedagogical approaches to enhance the student's learning outcomes. Therefore, TPCK can present a sustained source for professional development and create communities of practice in teachers' education programs. Finally, by using TPCK and CPD courses in the process of language teaching, the teachers can share their teaching and learning techniques with many teachers and find new strategies and techniques to overcome the difficulties of the learners in the process of foreign language learning.

6. Conclusion

In this study, the relationship between Iranian EFL teachers' technological pedagogical content knowledge and their willingness to attend continuing professional development courses was examined. The results showed a significant relationship between the teachers' TPCK and their CPD. Furthermore, the results showed that the five components of technological pedagogical content knowledge (CK, TPCK, PCK, PK, and TPK) explained teachers' CPD by 49%. The main reason is that the literacy in TPCK assists the teachers to acquire the required knowledge in teaching and they can incorporate that knowledge to teach successfully in the complex and varied educational contexts. Technological knowledge, content knowledge, and pedagogical knowledge alone are not sufficient for successful teaching and they should be combined in order to have an effective teaching process. So, to have an effective technological teaching process, TPCK is needed. To help teachers to develop the capacity to address their classroom realities and to evolve as professionals there is a need for alternative post-transmission approaches to help teachers learn and develop professionally. In this regard, there is a real need for using technological pedagogical content knowledge to train teachers professionally.

The findings of the study assist the teachers to have an active role in the process of teaching and gather the required practice knowledge to fulfill the students' needs. The findings showed that the CPD courses should be continuous and they must focus on the teachers' needs and interests. Furthermore, teachers are the ones who hold the responsibility to facilitate the process of learning for students.

To better understand how TPACK develops in teacher education, we need to have more longitudinal studies. Gender differences were not the main goal of the study and further study can be done to assess the relationship between the Iranian male and female teachers' TPCK and their willingness to attend continuing professional development courses. The current study was done in Mashhad, different studies can be done to consider other cities to generalize the results. The study utilized a quantitative method to assess the relationship between TPCK and CPD, more studies can be done using a qualitative method.

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