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Research Paper

Online Teacher Quality and TPACK Framework of Knowledge: EFL Pre-service Teachers' Views

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Abstract

This study aimed at examining prospective EFL teachers' views about quality of online English language teaching and Technological Pedagogical Content Knowledge (TPACK) and the related skills. To this end, the viewpoints of 100 graduate students of TEFL (M = 23, F = 77) at Iran University of Science and Technology were investigated via administering two questionnaires, namely online teacher quality and frames of knowledge and skills, along with two-open ended questions to gain more insight into online teacher quality and their knowledge frames. Internet-based survey method was employed to administer the questionnaires and collect the required data. The quantitative and qualitative data obtained were analyzed through descriptive statistics and thematic analysis, respectively. With regard to online teacher quality, the results revealed that pre-service teachers agreed that an online teacher should be an organized mediator, communicator, and problem solver as well as being highly passionate, energetic, and competent in teaching. The results also indicated that having content and pedagogical knowledge, clearly organizing and structuring content, time management skills, using appropriate resources, and providing feedback and multiple opportunities for communication were the most significant knowledge types required of an online language teacher. Considering online teaching skills, effective online communication skills, effective content delivery, technological skills, and effective evaluation and assessment were the most frequent skills suggested for online language teachers. The findings of this study could give more insights into designing knowledge-based and skills-based professional development programs for prospective teachers to enhance the quality of their online teaching.

Keywords: *Teacher professional development, online teacher quality, online teaching skills, TPACK, EFL pre-service teachers*

Introduction

According to Koehler and Mishra (2009), Technological Pedagogical Content Knowledge (TPACK) is outlined as the relations among pedagogical knowledge (e.g., teaching/learning methods, procedures, strategies, processes, and practices), technological knowledge (e.g., digital video, Internet, and computers), content knowledge (subject to be taught), and the modification that takes place to incorporate these knowledge frames. TPACK denotes the types of knowledge that online teachers need to incorporate technology constructively into appropriate pedagogical activities (Mishra & Koehler, 2006) so as to achieve a high quality online learning environment (Koehler & Mishra, 2009). It also assists the clarification of the complicated correlations among technology, pedagogy, content knowledge, and the way they interrelate to form the kind of knowledge required to enhance online teacher professional development (Koehler & Mishra, 2009; Mishra & Koehler, 2006).

Given the studies on TPACK (e.g., Fishman & Davis, 2006; Maddux & Cummings, 2004; Morris & Finnegan, 2008; Oomen-Early & Murphy, 2009; Zhao et al., 2002), some teachers have shown resistance to technology integration into courses due to the failure of professional development programs to equip them with the required skills and knowledge to incorporate technology effectively into their courses. Therefore, in pre-service professional development courses, the TPACK development seems vital since TPACK is an important construct, which has the potential to improve teachers' teaching in an online course, and all language teachers need to be metacognitively aware of their knowledge regarding technological pedagogical knowledge, TPACK, and technological content knowledge (Hughes & Scharber, 2008).

As stated by Morris and Finnegan (2008) and Oomen-Early and Murphy (2009), online teachers argue that they require more support both instructionally and pedagogically. It is argued that TPACK attributes equip prospective teachers with a framework of knowledge and the related skills to become aware of the employment of technology to tailor online learning environments to be more effective and authentic and not just mere learning about the employment of technology for general objectives (Mishra & Koehler, 2006). Compared with traditional learning modality, faculty members have more significant responsibility for establishing specific structures and processes within an online environment (Keengwe & Kidd, 2010). The literature on TPACK about pre-service teachers has mainly examined other subjects, including sciences, mathematics, and educational technology (e.g., Chai et al., 2011; Jang & Tsai, 2012; Schmidt et al., 2009; Sezer 2015) or EFL in-service teachers (e.g., Liu & Kleinsasser, 2015; Liu et al., 2016; Mahmoodi et al., 2020; Najjari et al., 2021; Wu & Wang, 2015). However, gaining EFL pre-service teachers' perceived knowledge of TPACK is a crucial issue in online education that has not been widely investigated, as few studies (e.g., Alharbi, 2020; Ekrem & Recep, 2014; Ersanli, 2016; Sarıçoban et al., 2019) have focused on determining the TPACK of EFL pre-service teachers. In other words, in spite of the increase in online learning/teaching in tertiary education, the discipline in the EFL contexts still lacks in-depth studies on online teacher professional development in teaching online language courses. The findings of this study could be of great significance, because reaching quality teaching in online courses necessitates the understanding of how different areas of knowledge regarding content, pedagogy, and technology interact meaningfully and what conceptions and views prospective teachers have in order to be trained subsequently in their professional development programs. Accordingly, the main objectives of the current study were (a) to explore EFL teachers' views of quality of teaching online language courses and (b) to determine their awareness of TPACK framework with regard to knowledge and skills in language courses held online.

RQ1: What qualities do EFL pre-service teachers require to be capable of teaching online language courses?
RQ2: To what extent are EFL pre-service teachers aware of TPACK framework of knowledge?

Review of Literature

Online Teacher Quality

The positive effect of teachers with high quality on students' achievement and learning has been discussed, and its advantages have been confirmed by a number of researchers (e.g., Abate-Vaughn & Paugh, 2009; Bayar, 2014; Borman & Kimball, 2005; Collinson & Cook, 2001; Hanushek 2007; Palardy & Rumberger, 2008). Terhart (2011) argues that because certain teachers with particular practices are extremely influential to explain students' achievement, teachers' quality do matter. According to Shulman (1986), quality teaching is the integration of skills and knowledge pertaining to a particular content area along with the skills related to particular teaching methods and strategies. Online teachers are required to know how learning occurs in an online environment, be familiar with communication techniques in an online environment and digital tools, and be capable of using those tools effectively in order to enhance students' motivation, monitor their progress, assess them meaningfully, maintain time flexibility, and maximize interactions (Ferdig et al., 2009).

It has been argued that online teachers are early adopters, early innovators, or risk takers (Hislop & Atwood, 2019). Having analyzed 100 articles, Parker (2003) suggests some main motivators, such as sense of self-satisfaction, sense of intellectual challenge, ability to engage with a large audience via technological system, and having flexible schedule. With the purpose of fulfilling their responsibilities in online environments, as Levinsen (2006) states, online teachers are required to be capable of pedagogically organizing their courses with respect to divergent circumstances, such as group size, subject domains, and variations within communication and interactions. Teachers also need to gain knowledge and skills to handle Information and Communications Technology (ICT) and its pedagogical constraints (Levinsen 2006).

Patrick and Yick (2005) conducted a study to develop a systematic rubric interview to hire faculty members for online courses in universities. Having conducted an interview with 28 online faculty members, they pinpointed 15 highly related themes for the personal qualities and characteristics of the online faculty members: being open to online teaching methods, competent in practice, passionate for teaching, curious about learning, organized, empathetic, problem solver, good communicator, self-directed, embracing scholar-practitioner model, understanding teaching and practice, flexibility, experience, sense of humor, and high energy level. With the purpose of investigating the impacts of teachers' instructional practices, attitudes, and background qualifications on the first-grade students' math and reading achievements, Palardy and Rumberger (2008) conducted a longitudinal study with 3496 first grade students, and at the beginning and end of the first grade, achievement tests were administered to them. The findings revealed that the quality of teachers had a substantial effect on students' reading performance.

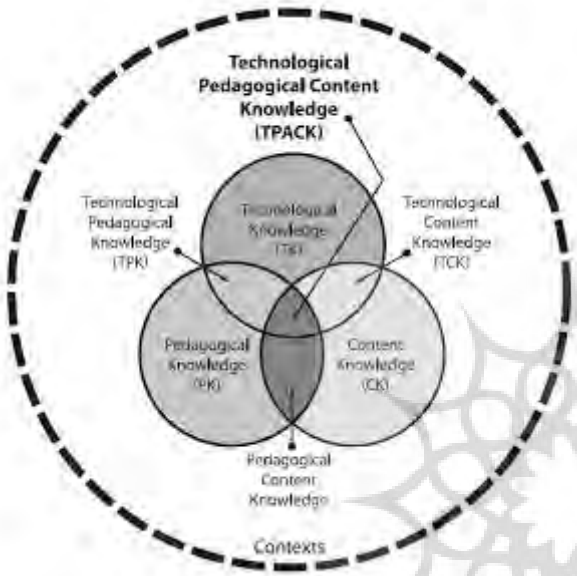
Knowledge Framework for Online Teaching

In the theoretical framework of TPACK driven based on Shulman's (1986) notion of Pedagogical Content Knowledge (PCK), an effective teaching capability is established and Pedagogical Knowledge (PK) and Content Knowledge (CK) are intertwined evenly. The entangled correlations that embody teacher's understanding of the subject under study, their methods of instructions, their knowledge of ICT, and knowledge of how to incorporate technology into their instructions are considered the basis of TPACK framework (Angeli &

Valanides, 2009). Based on the adaptation of Shulman's (1986) notion of PCK, Koehler and Mishra (2009) further theorize that prospective teachers' education should attend to both the employment of technology and the examination of how technological knowledge integrates into CK and PK. Contributing to teachers' pedagogical design using technology, Koehler and Mishra identify the following seven TPACK factors appeared in Figure 1.

Figure 1

TPACK Framework (Koehler & Mishra, 2009)



There is strong evidence (Koehler et al., 2007; Koh et al., 2014; Koh & Divaharan, 2013) indicating that TPACK comes to play when teachers go about ICT course design collaboratively since it permits teachers to integrate TK, PK, and CK into instruction with ICT. Hughes and Scharber (2008) also assert that becoming aware of knowledge base metacognitively in relation to TPK, TCK, and TPACK is essential for all language teachers. According to Archambault (2011), use of TPACK framework is coordinated with the preparation of teachers for online teaching, and in order to design and facilitate instructional activities, the incorporation of TK, PK, and CK should be taken into account as three interconnected knowledge domains. Although the seven frames of knowledge in TPACK framework are well recognized and established, Herring (2016) argues that there are still debates about the factors of knowledge implied while developing ICT-integrated classrooms. Accordingly, teachers' applying the TPACK framework and ultimately designing online instruction can be influenced by their design knowledge (Benton-Borghi, 2013; Chai et al., 2012), their contextual knowledge (Rosenberg & Koehler, 2015), their practical concerns (Boschman et al., 2015), and the ecology of their work at school and affordance of ICT (Voogt et al., 2016).

Some researchers (e.g., Benson & Ward, 2013; Lin et al., 2012) have considered the nature of TPACK of in-service teachers static and reported that a significant negative relationship exists between TPACK domains and age, that high levels of TK do not indeed guarantee TPACK; and that teachers with more experience perceive possessing higher TPACK. Further, Jang (2010) and Doering et al. (2009) argue that developing and applying suitable teaching

pedagogical instructions and content are challenging for in-service teachers, since TPK and TCK are not efficiently adapted for actual course instruction. Moreover, in a systematic literature review, Moore-Adams et al. (2016) recommend a comprehensive list of skills for each of the seven factors of TPACK framework. Other criteria associated with technology-related behaviors and knowledge in technology use and TPACK are found to be teachers' subject domains (Hew & Brush, 2006; Jang & Tsai, 2012; Sezer, 2015) and years of experience in teaching (Jang & Tsai, 2013). Jang and Tsai (2012) determined the TPACK of elementary science teachers' and elementary mathematics teachers regarding the employment of interactive whiteboards in Taiwan. Six hundred and fourteen teachers took part in the survey study and filled out a 40-item questionnaire about interactive whiteboards-TPACK framework. The findings revealed that compared to those of mathematics teachers, the TK and TPACK of science teachers at elementary levels were significantly greater.

In another research, employing a new TPACK model being contextualized, Jang and Tsai (2013) investigated the TPACK of science teachers in a secondary school. A questionnaire with 30 items on TPACK was filled out with 1358 science teachers in Taiwan. The findings indicated higher levels of PCK and CK in the context for teachers with higher experience, whereas novice science teachers showed greater TK and TPACK in the context. To determine teachers' awareness of TPACK competencies, Sezer (2015) conducted a survey study. The participants were 216 science and technology, mathematics, social sciences, and Turkish literature teachers at secondary schools in Turkey. The results revealed that teachers of social science demonstrated significantly greater TK in comparison with teachers of mathematics, while teachers of technology and science had significantly greater TK than teachers of all other subjects. Additionally, teachers of literature were found to show lower TPACK compared with other subject teachers under study.

Moreover, a number of studies (e.g., Liu et al., 2016; Mahmoodi et al., 2020; Najjari et al., 2021; Raygan & Moradkhani, 2020; Wu & Wang, 2015) have investigated EFL in-service teachers' perceptions of TPACK in integrating technology into their practices. Conducting a quasi-experimental research with 15 EFL teachers in Iran, Najjari et al. (2021) found that through holding TPACK workshops, teachers' perceptions about TPACK literacy could be developed. In a recent study, Raygan and Moradkhani (2020) also conducted a study with 209 Iranian EFL teachers to investigate the effect of EFL teachers' attitude, TPACK, and school climate on technology integration. Regarding TPACK, they found that teachers' technological knowledge could significantly predict the integration of technology into EFL classes. Similarly, having examined 22 EFL in-service teachers in Taiwan, Wu and Wang (2015) reported that teachers demanded more technological knowledge to be capable of integrating technology efficiently into their English courses.

However, few studies (e.g., Alharbi, 2020; Ekrem & Recep, 2014; Ersanli, 2016; Kwangsawad, 2016; Sarıçoban et al., 2019) have examined EFL pre-service teachers' views about TPACK. For instance, in a mixed methods research, Ersanli (2016) investigated the effect of training and holding workshops about TPACK on 59 EFL pre-service teachers' technology integration into their teaching. Given the findings of the study, Ersanli concluded that teachers' TPACK level was significantly developed after receiving instruction. Kwangsawad (2016) also found a positive relationship between technology integration into EFL Thai teachers' practices and TPACK competence, while Erkem and Recep (2014) found that EFL pre-service teachers' awareness of TK was not desirable enough to achieve high quality teaching. Given the existing literature on TPACK, there exists the need for more thorough studies in the EFL context, especially in Iran to determine EFL prospective teachers' conceptions and views of TPACK

knowledge and skills as well as the quality of online English language teaching to reach an optimum online learning environment.

Methodology

Participants

This study was carried out with 100 MA male and female students (female=77, male=23) at Iran University of Science and Technology (IUST) where online TEFL courses were offered at graduate level. Forty of the participants were TEFL students in the face-to-face classes, while 60 were studying TEFL at the e-learning campus of IUST at the time this research was conducted. The participants ranged in age from 23 to 53 and were selected based on availability sampling procedures. Moreover, all the participants in this study attended the CALL course offered by the university as a part of their MA program.

Instruments

The online teacher quality questionnaire, developed by Patrick and Yick (2005), included 15 items. This questionnaire was administered to explore the qualities of EFL teachers in order to be capable of teaching online language courses. The questionnaire on frames of knowledge with 77 items was developed by the researchers based on the findings of Moore-Adams et al. (2016). The aim of this questionnaire was to determine online teachers' required knowledge and skills for teaching language courses. The survey items consisted of seven categories of knowledge along with their related skills, which were content knowledge with three skills, technological knowledge with 18 skills, pedagogical knowledge with 30 skills, technological content knowledge with four skills, technological pedagogical knowledge with seven skills, pedagogical content knowledge with seven skills, and technological pedagogical content knowledge with eight skills. Furthermore, the scale was followed by two open-ended questions to gain more insights into the prospective teachers' views about the knowledge and skills required for teaching online English language courses.

Procedure

This descriptive study was run in the second semester of the 2019 academic year at IUST with 100 MA students of TEFL. The online teacher quality scale was developed considering the findings of Patrick and Yick (2005). For each online teacher quality, the participants were requested to select the significance of each quality in a Likert scale with five options (1= very little, 2= little, 3= moderate, 4= much, and 5= very much). In a systematic Literature review, Moore-Adams et al. (2016) provided a list of knowledge along with some related skills for effective online teaching. The list was revised to be employed as the items of the frames of knowledge scale. The initial list featured 132 skills for TPACK; however, because some skills were repeated, the ultimate scale reduced to 18 skills for TK, 3 skills of CK, 30 skills for PK, 4 skills for TCK, 7 skills for TPK, 7 skills for PCK, and 8 skills for TPACK. The participants were also requested to indicate the importance of knowledge frames and skills in terms of five options (1= very little, 2 = little, 3 = moderate, 4 = much, and 5 = very much). Finally, the link of the ultimate version of the scales written on Google Forms along with necessary instructions was sent to pre-service teachers via WhatsApp. The internal consistency of the items of the scales of teacher quality and categories of knowledge frames was also calculated via Cronbach's alpha, and the reliability coefficient was reported as teacher quality =.86, TK = .903, CK = .770, PK = .957, TCK = .812, TPK = .826, PCK = 858, and TPACK = .862.

Data Analysis

The percentage and median for all items of online teacher quality and frames of knowledge scales was calculated. To analyze the prospective teachers' responses to the seven categories of the scale of online teachers' frames of knowledge, descriptive statistics were further conducted. Moreover, to analyze the qualitative data gathered from the open-ended questions, thematic analysis was implemented, and the most recurrent themes in the participants' answers were scrutinized and reported along with some examples for each of the identified theme.

Results

Teacher Quality of Teaching Online Language Courses

The percentages and medians of the pre-service teachers' responses to each item of the teacher quality scale is provided in Table 1. It is important to highlight the fact that the combination of the results for 'very much' and 'much' is regarded as participants' positive replies, while that for ‘very little’ and ‘little’ is regarded as their negative replies.

Table 1

Percentages and Medians of Pre-Service Teachers' Quality of Online Teaching

Statements	Very Little	Little	Moderate	Much	Very Much	Median
1. An online teacher should be receptive to new teaching methods.	----	1	8	42	49	4
2. An online teacher should be competent in field of practice.	----	1	7	46	46	4
3. An online teacher should embrace scholar-practitioner model.	----	2	24	46	28	4
4. An online teacher should have a depth of practice and teaching.	1	----	11	36	52	5
5. An online teacher should have the experience to teach online.	1	3	20	41	35	4
6. An online teacher should have passion for teaching.	----	1	7	21	71	5
7. An online teacher should be curious about learning.	----	4	10	29	57	5
8. An online teacher should have high energy level.	----	2	13	31	54	5
9. An online teacher should have flexibility.	----	1	12	42	45	4
10. An online teacher should be organized.	----	1	3	32	64	5
11. An online teacher should be empathetic.	2	2	18	37	41	4

12. An online teacher should have sense of humor.	----	8	26	28	38	4
13. An online teacher should be a good communicator.	----	1	5	29	65	5
14. An online teacher should be problem solver.	----	1	16	35	48	4
15. An online teacher should be self-directed.	----	2	19	36	43	4

As shown in Table 1, by ranking the participants' responses, the highest level of importance was related to the following items, respectively: 'An online teacher should be organized' (96%); 'An online teacher should have high energy level' (95%); 'An online teacher should be a good communicator' (94%); 'An online teacher should be problem solver' (93%); 'An online teacher should be competent in the field of practice' (92%); 'An online teacher should have passion for teaching' (92%); 'An online teacher should be receptive to new teaching methods' (91%); 'An online teacher should have a depth of practice and teaching' (88%); 'An online teacher should have flexibility' (87%); and 'An online teacher should be curious about learning' (86%). Table 1 also shows that six qualities of online teaching, including having a depth of practice and teaching, having passion for teaching, having high energy level, being curious about learning, being organized, and being a good communicator received the highest median value (Median = 5), indicating that most of the participants chose the option of very much for these qualities of online teaching.

Knowledge and Skills to Teach Online Language Courses

The second questionnaire appeared in seven frames of knowledge and skills essential for teaching online English courses. The percentage of the amount of importance of each item mentioned in the questionnaire is provided in Tables 2. Table 2 shows the descriptive statistics of participants' technological knowledge.

Table 2

Percentages and Medians of Pre-Service Teachers' Technological Knowledge (TK)

Statements	Very Little	Little	Moderate	Much	Very Much	Median
1. Being skilled with basic uses of technology	1	----	9	27	63	5
2. Ability to use a range of software	----	3	10	43	44	4
3. Ability to deal with constraints and possibilities of different software	1	4	16	45	34	4
4. Ability to create basic web pages	8	10	32	34	16	3.5
5. Ability to construct interactive web pages	10	10	28	35	17	4

6. Mastering the interfaces in which instruction will be delivered	2	7	22	44	25	4
7. Continually extending their content and technological knowledge	----	3	12	43	42	4
8. Using technology to deliver content	----	1	9	48	42	4
9. Knowledge of curriculum design and frameworks for online learning	----	6	22	32	40	4
10. Basic knowledge of course evaluation based on one or more frameworks and to modify components accordingly	----	----	22	48	30	4
11. Producing course requirements and timetable	----	2	14	43	41	4
12. Providing a comprehensive set of informational materials	----	----	15	48	37	4
13. Motivating students by clearly organizing and structuring content	----	1	6	37	56	5
14. Developing and delivering activities that are collaborative, highly interactive, and motivating while encouraging engagement with the content	----	----	11	41	48	4
15. Seeking out and making available a variety of supplemental support tools to meet the diverse needs of students	----	----	22	50	28	4
16. Creativity in using and adapting technology for online language learning tasks	----	2	15	38	45	4
17. Understanding how to use and select appropriate resources	----	----	9	44	47	4
18. Ability to troubleshoot basic browser problems	2	4	19	39	36	4

Table 2 indicates that being skilled with basic uses of technology and motivating students by clearly organizing and structuring content obtained the highest median (Median = 5), while ability to create basic web pages received the lowest median (Median = 3.5). As also shown in Table 2, the highest percentage for the option of very little was related to 'ability to construct interactive web pages' (% = 10), followed by ability to create basic web pages (% = 8). However, the highest percentage for the option of very much was obtained by being skilled with basic uses

of technology (% = 63) followed by motivating students by clearly organizing and structuring content (% = 56). Descriptive statistics of three frames of content knowledge are provided in Table 3.

Table 3.
Percentages and Medians of Pre-Service Teachers' Content Knowledge (CK)

Statements	Very Little	Little	Moderate	Much	Very Much	Median
1. Having extensive knowledge of an appreciation for the content area they teach	----	1	11	48	40	4
2. Having content and pedagogical knowledge	----	----	6	43	51	5
3. Continually extending their content and technological knowledge	----	2	13	34	51	5

As indicated in Table 3, the highest median (Median = 5) was obtained by two frames of knowledge: having content and pedagogical knowledge and extending content and technological knowledge, whereas the lowest median (Median = 4) was related to 'having extensive knowledge of an appreciation for the content area they teach'. Table 3 also highlights that no participant chose the option of very little for the three frames of content knowledge, while two frames of knowledge received the same percentage (51%) for the option of strongly agree. Descriptive statistics of the 30 frames of pedagogical knowledge are presented in Table 4.

Table 4
Percentages and Medians of Pre-Service Teachers' Pedagogical Knowledge (PK)

Statements	Very Little	Little	Moderate	Much	Very Much	Median
1.using multiple strategies to assess students learning	----	1	14	40	45	4
2. Using alternative assessment strategies that allow the students the opportunity to represent their knowledge in ways that are personally meaningful	----	3	11	43	43	4
3. Using strategies to connect with students	----	----	12	39	49	4
4. Engaging students in conversation about content and non-content related topics to form a relationship to each student	1	----	12	36	51	5
5. Understanding how and when to provide appropriate supports	----	----	11	39	50	4.5
6. Outlining materials and notifying students of changes	----	2	16	48	34	4
7. Supporting time management skills	----	3	9	44	44	4

8. Observing conduct and academic honesty policies	----	2	20	48	30	4
9. Monitoring student interactions and communication	----	2	13	42	43	4
10. Promoting full participation	----	3	13	37	47	4
11. Establishing a presence on the course to motivate students	----	----	11	48	41	4
12. Interacting with students with quick feedback to maintain their motivation for completing the course	----	1	8	43	48	4
13. Providing multiple opportunities for communication	----	----	12	37	51	5
14. Providing quick responses, meaningful feedback	----	----	10	40	50	4.5
15. Modeling and participating in student discussions	----	1	14	47	38	4
16. Facilitating discussion in a way that keeps students on task	----	1	10	43	46	4
17. Creating a supportive and interactive environment with mutual support and respect	----	2	11	37	50	4.5
18. Providing online leadership in a manner that promotes student success through regular feedback, prompt response, and clear expectations	----	4	11	47	38	4
19. Ability to facilitate communicative competence and online interaction	----	3	13	42	42	4
20. Fostering a sense of community and interaction	----	2	12	44	42	4
21. Managing student communication	----	3	16	41	40	4
22. Active teacher involvement in monitoring and engaging student discussion	----	3	15	33	49	4
23. Developing critical thinking skills	----	1	13	37	49	4
24. Accommodating student differences	2	3	16	45	34	4
25. Understanding and being responsive to students with special needs in the online classroom	1	3	15	34	47	4
26. Ability to apply language learning theories for online language learning	----	3	13	39	45	4
27. Ability to assess language learning using different assessment methods	----	2	14	39	45	4
28. Evaluating and assessing students, including student self-assessment	----	3	12	41	44	4
29. Developing and delivering assessments, projects, assignments that	----	1	16	42	41	4

meet standards-based learning goals and assesses learning progress by measuring student achievement of learning goals						
30. Demonstrating frequent and effective strategies that enable both teacher and students to complete self- and peer-assessments	----	4	15	49	32	4

As highlighted in Table 4, two frames of pedagogical knowledge: providing multiple opportunities for communication and engaging students in conversation about content and non-content related topics received the highest median (Median = 5), followed by two other types of knowledge; i.e., understanding how and when to provide appropriate supports and providing quick responses and meaningful feedback, which also obtained the highest median (Median = 4.5). Table 4 also shows that five frames of knowledge: using strategies to connect with students, understanding how and when to provide appropriate supports, establishing a presence on the course to motivate students, providing multiple opportunities for communication, and providing quick responses and feedback received no percentage regarding the options of 'very little' and 'little', indicating the importance of these types of knowledge for pre-service teachers. Table 5 provides participants' responses to items of technological content knowledge.

Table 5

Percentages and Medians of Pre-Service Teachers' Technological Content Knowledge (TCK)

Statements	Very Little	Little	Moderate	Much	Very Much	Median
1. Using their content knowledge and knowledge of students to drive the integration of technology	----	3	17	53	27	4
2. Arranging media and content to help students and teachers transfer knowledge most effectively in the online environment	----	3	16	45	36	4
3. Developing and delivering activities that are collaborative, highly interactive, and motivating while encouraging engagement in the content	----	2	8	43	47	4
4. Knowing when to develop resources to service specific purposes	----	2	21	46	31	4

As Table 5 highlights, all four types of technological content knowledge obtained the same median (Median = 4). Table 5 also shows that no one chose the option of very little when asked about indicating the significance of four types of technological content knowledge for

online teaching. However, 47% of the pre-service teachers chose the option of very much to show the importance of developing and delivering activities that are collaborative, highly interactive, and motivating while encouraging engagement in the content. Descriptive statistics of seven types of technological pedagogical knowledge are calculated, and the results are presented in Table 6.

Table 6

Percentages and Medians of Pre-Service Teachers' Technological Pedagogical Knowledge (TPK)

Statements	Very Little	Little	Moderate	Much	Very Much	Median
1. Developing and delivering activities that are collaborative, highly interactive, and motivating while encouraging engagement in the content	----	1	11	47	41	4
2. Knowledge of language learning theories for online language learning	----	3	13	45	39	4
3. Providing multiple opportunities for communication	----	1	15	38	46	4
4. Providing multiple opportunities for interaction through various media	----	3	17	39	41	4
5. Modeling, guiding, and encouraging legal, ethical, safe, and healthy behavior related to technology use	----	3	12	42	43	4
6. Understanding how to provide opportunities for students to interact with one another and the instructor	----	----	15	47	38	4
7. Experiencing online learning from the perspective of a student	2	4	16	38	40	4

As shown in Table 6, all seven types of technological pedagogical knowledge received the same median (Median = 4). Table 6 also shows that only two pre-service teachers chose the option of 'very little' for experiencing online learning from the perspective of a student, while no one chose this option for the other types of this knowledge. With regard to the options of very much and much, the following types of knowledge received the highest percentage, respectively: providing multiple opportunities for communication (46%) and Understanding how to provide opportunities for students to interact with one another and instructor and developing and delivering activities that are collaborative, highly interactive, and motivating (47%). Table 7 shows descripting statistics of participants' views of pedagogical content knowledge.

Table 7

Percentages and Medians of Pre-Service Teachers' Pedagogical Content Knowledge (PCK)

Statements	Very Little	Little	Moderate	Much	Very Much	Median
1. Outlining materials and notifying students of changes	----	----	16	55	29	4
2. Supporting time management skills	1	1	11	51	36	4
3. Observing conduct and academic honesty policies	----	3	16	45	36	4
4. Monitoring student interactions and communication	1	2	14	45	38	4
5. Promoting full participation	----	4	11	41	44	4
6. Providing multiple opportunities for communication	----	----	10	50	40	4
7. Understanding how to provide opportunities for students to interact with one another and the instructor	----	1	12	43	44	4

Table 7 shows that all types of pedagogical content knowledge received the same median (Median = 4). Table 7 also indicates that the highest percentage (44%) for very much option was obtained by promoting full participation and understanding how to provide opportunities for students to interact with one another and instructor. Table 7 further highlights that participants of the study did not choose the options of very little and little for the following types of knowledge: providing multiple opportunities for communication and outlining materials and notifying students of changes, indicating the significance of these aspects of knowledge. The descriptive statistics of participants' views of TPACK are provided in Table 8.

Table 8

Percentages and Medians of Pre-Service Teachers' Technological Pedagogical Content Knowledge (TPACK)

Statements	Very Little	Little	Moderate	Much	Very Much	Median
1. Supporting time management skills	----	1	7	51	41	4
2. Observing conduct and academic honesty policies	1	1	14	52	32	4
3. Monitoring student interactions and communication	----	1	17	44	38	4
4. Balancing structure and flexibility	----	1	22	42	35	4
5. Promoting full participation	1	2	13	40	44	4

6. Providing online leadership in a manner that promotes student success through regular feedback, prompt response and clear expectations	----	4	15	47	34	4
7. Mastering of written communication	----	5	18	39	38	4
8. Participating in a field experience for online learning	----	2	19	46	33	4

As shown in Table 8, all types of TPCK received the same median (Median = 4). Table 8 also shows that the highest percentage (44%) for the option of 'very much' was received by 'promoting full participation', followed by 'supporting time management skills' (41%), whereas 'mastering of written communication' received the highest percentage for the option of little. In order to determine the difference among the seven frames of knowledge, the descriptive statistics and correlational analysis of the categories of knowledge were computed and reported in Table 9.

Table 9

Correlational Analysis and Descriptive Statistics of Seven Frames of Knowledge

Frames of Knowledge	1	2	3	4	5	6	7	*M*	*SD*
1. TK	-	.621**	.601**	.570**	.664**	.509**	.552**	4.12	.50
2. CK		-	.581**	.402**	.548**	.414**	.562**	4.35	.57
3. PK			-	.640**	.757**	.718**	.744**	4.26	.50
4. TCK				-	.752**	.693**	.648**	4.14	.60
5. TPK					-	.708**	.732**	4.21	.55
6. PCK						-	.778**	4.21	.54
7. TPACK							-	4.16	.55

**. p< .05 (2-tailed)

As shown in Table 9, the mean with the highest value was obtained by content knowledge (*M* = 4.35), whereas the mean with the lowest value was related to technological knowledge (*M* = 4.12). Table 9 further highlights that the responses of prospective teachers to the items of 'technological knowledge' and 'pedagogical knowledge' were the most homogeneous (*SD* = .50), while the ones to the items of 'technological content knowledge' were the most heterogeneous (*SD* = .60). As also indicated in Table 9, there was strong, positive correlation between all categories of frames of knowledge, except for CK and TCK (*r* = .402) and CK and PCK (*r* = .414), indicating moderate, positive correlation. Furthermore, the strongest correlation was found between PCK and TPACK (*r* = .778). Apart from the scales, the participants were given two open-ended questions to highlight more insights into their knowledge and skills for teaching online language courses. Although 9% of the participants had no further ideas to add, the other participants' responses to the first question, What knowledge is important for an EFL teacher to acquire in order to teach online language courses, are hierarchically presented as follows:

technological knowledge (78%), knowledge of language learning theories and their implementations (40%), content knowledge (38%), knowledge of how to integrate pedagogical knowledge and technological knowledge (26%), knowledge of language (21%), technological content knowledge (13%), TPACK (11%), knowledge of assessment (8%), knowledge of psychology (7%), and social knowledge (5%). Some examples of pre-service teachers' viewpoints about the above-mentioned themes are provided below:

a.Technological knowledge

•Average knowledge of using technology and digital literacy is needed to know how to deal with the students in a cyberspace, especially when there might be troubles with features in using technology, such as low speed and Internet disconnection during online classes.

b.Knowledge of language learning theories and their implementations

•The online teacher should be familiar with different online learning theories and use proper teaching methods according to the online course goals and the tools available.

•Pedagogical knowledge of online language teaching is needed to be sufficient for the level of students participating in an online class. It is also necessary for the instructors to know how to implement the four language skills in online language classes.

c.Content knowledge

•I suppose that an online teacher should have the knowledge of content more than the knowledge of technology and should be able to deliver learning materials effectively to students.

d.Knowledge of how to integrate technological and pedagogical knowledge

•An online teacher should be aware of teaching and learning theories, have the knowledge of digital world, be capable of using the Internet and pedagogical tools, have the knowledge of course/syllabus design, which are applicable in an online classroom and also have quite good knowledge of online teaching environment.

•Pedagogical and technological knowledge along with knowing how to integrate these two into the online course make an online teacher effective.

E.Knowledge of language

•Since the language required to use nearly most of the technological tools is English and the students are going to learn English in an online classroom, it is crucial for the online teacher to have good English language proficiency.

f.Technological content knowledge

•An online teacher should know how to arrange the technological tools and content in a way that help students learn about the course content and materials more effectively in an online language classroom.

g.TPACK

•All types of knowledge are related to each other; therefore, it is essential to have a standard online course with positive outcomes and I think TPACK could cover all the knowledge for the online teachers.

h.Knowledge of assessment

•An online teacher needs to know how to constantly assess students' achievement in an online class and how to monitor students' online performance and collaboration in pair or group work activities.

i.Knowledge of psychology

•Knowledge of students, their personality and, more importantly, their learning styles and differences are of major importance for an online teacher.

j.Social knowledge

•The teacher should know how to communicate effectively with students and even encourage them to have positive meaningful interactions and collaborations with each other in an online course.
•An online teacher should know how to build an online community with maximum participations and collaborations among students.

The second open-ended question, What skills does an online teacher require to teach online language courses, was also administered to the participants. Six percent of teachers had no further ideas to add to the scale. Other teachers' responses were respectively ranked as follows: effective online communication skills (24%), effective content delivery (24%), technological skills and effective use of technology (22%), effective evaluation and assessment skills (21%), engaging students in learning (19%), online teaching skills and familiarity with online teaching (17%), online classroom management skills (15%), time management skills in online courses (14%), up-to-date knowledge of pedagogical technology (13%), mastering technology to deliver content (10%), designing collaborative and interactive activities (10%), course/syllabus design (9%), familiarity with online learners' needs, styles, and differences (8%), keeping students motivated (8%), having technical skills (6%), being creative (6%), having patience in teaching online (2%), and being flexible in teaching (2%). Examples of teachers' viewpoints about each theme are provided below:

a.Effective online communication skills
•An online teacher should use different strategies to interact with their students to involve them in interaction with other peers about the class topics.
b.Effective content delivery
•The online teacher requires to have the ability to show the main points of each lesson and to choose essential materials for effective online teaching.
c.Technological skills and effective use of technology
•An online teacher should be skilled in basic uses of technology, have the capability of dealing with limitations of different tools and software, and be familiar with the interfaces, where the instruction takes place.
•The teacher should have the ability of how to use PowerPoint files, pictures, clips, applications, and pedagogical websites.
d.Effective evaluation and assessment skills
•An online teacher should be capable of using a multitude of assessment strategies, evaluating and monitoring students' achievement, and providing timely meaningful feedback.
e.Engaging students in learning
•The online teacher should have the skills to encourage effective student participations and try to engage students in learning using appropriate tools and tasks.
•The online teacher should have sufficient online teaching skills and be familiar with various online teaching methods in order to have an effective online course.
f.Online classroom management skills
•An online teacher should clearly express his/her expectations to students before going through the course.
•An online teacher should have the skill of managing tools and activities in a way that makes the students self-regulated in their own learning.
g.Time management skills in online courses
•Because there are so many issues to check simultaneously in an online course, the teacher requires to possess efficient time management skills to be able to cover all the materials of the course.

h.Up-to-date knowledge of pedagogical technology
•An online teacher should constantly develop their technological and content knowledge to catch up with the requirements of students in the online courses.
i.Mastering technology to deliver content
•The teacher should be acquainted with different pedagogical tools to be able to deliver the content of the course more effectively.
j.Designing activities that are collaborative and interactive
•Online teachers should design tasks, which are motivating, interactive, and collaborative to encourage students' involvement in the course.
k.Course/syllabus design
•An online teacher needs to have course design skills for online language teaching.
•The teacher should have a clear method and prior syllabus for teaching the course online.
l.Familiarity with online learners' needs, styles, and differences
•The teacher should consider online students' diverse learning styles and their goals of attending the online courses.
•Online teachers need to be familiar with their students' capabilities and needs and try to provide the materials and activities based on their personalities and learning styles.
m.Keeping students motivated
•An online teacher should enhance students' motivation and try to maintain their motivation throughout the course.
n.Having technical skills
•The teacher of an online course should have the skills and the ability of troubleshooting sudden technical problems.
o.Being creative
•An online teacher should be able to use technology creatively and use various ways for teaching each subject. They should also be able to use different games and activities for different exercises.
p.Having patience in teaching online
•An online teacher should be patient with students with different characteristics, needs, and problems.
q.Being flexible in teaching
•An online teacher should have flexibility in his/her teaching, the use of tools, and the time for each activity.

Discussion

With regard to quality of online teachers, EFL prospective teachers believed that an online teacher should be an organized mediator, a good communicator, and a problem solver as well as being highly energetic while they are receptive to new methods of teaching and passionate enough in the given field of practice. These results might be due to the fact that in online classes teachers and students do not have face-to-face interaction; therefore, communication is a substantial constituent in an online environment, which needs to be established by teachers. Additionally, teachers need to boost their energy level compared to face-to-face classes to be capable of engaging students in the content, motivating them to have participation in an online community of practice, and enhancing communication and interaction among students. Given the fact that online education is a novel medium and its requirements, strategies, and techniques are quite different from those of face-to-face classes, an online teacher

needs to be receptive to new online teaching methodologies and be familiar with new trends and strategies of online teaching to reach an optimum online teaching. These results are in line with those of Levinsen (2006), indicating that teachers are required to be capable of organizing pedagogical courses with respect to different conditions to fulfill their responsibilities in online environments. Similarly, the results are in agreement with those of Ferdig et al. (2009) who found that quality online teachers are required to be familiar with how learning happens online and what communication techniques should be used in an online environment.

The results of EFL pre-service teachers' views of the seven categories of TPACK revealed that they considered content knowledge and pedagogical knowledge the first and second most significant frames of knowledge for an online EFL teacher, respectively. Regarding content knowledge as the most significant knowledge frame, EFL prospective teachers held the view that having content and pedagogical knowledge and extending content and technological knowledge were highly important. This could be attributed to the fact that since technology has recently implemented in the Iranian educational system, and CALL courses are also lately introduced, online teachers do not have the required experience and even do not use technology as much as needed in the process of their own learning. Thus, pre-service teachers need to receive training courses to be efficiently prepared for online teaching, since the CALL courses offered are theoretical, and their technological and pedagogical knowledge is at low level. Consequently, apart from being proficient in English language and technological knowledge, online teachers willing to teach English language courses should be proficient and competent in the content going to be covered. With respect to pedagogical knowledge, online teachers should be competent in providing opportunities for communication with students to establish the content more efficiently and to engage students in conversation about content and non-content knowledge so that the students' misunderstanding could be overcome by immediate responses and the timely feedback given by the teachers. Therefore, in TPACK framework, online teachers should acquire time management skills, promote full participation, engage students in their own learning, and foster cognitive development. These findings confirm those of Hew and Brush (2006), Jang and Tsai (2012), and Sezer (2015) who associated technology use and knowledge of its integration with teachers' subject and content domains.

Regarding TK, prospective teachers held the view that being skilled with basic uses of technology and motivating students by clearly structuring and organizing content were significant. The obtained results could be due to the fact that prospective teachers need to be familiar with technology and be expert in technology use. They also have to be up-to-date regarding technology and diverse technological tools to be able to engage students in the content. However, the results indicated online teachers' ability to construct interactive web pages as the least significant, which is mainly due to the fact that online teachers should be familiar with online education platforms, including LMS, Adobe Connect, and BigBlueButton, and how to employ their diverse options and tools of each platform in Iranian context. For instance, online teachers need to be capable of using different tools of an LMS to upload the content and assignments. Owing to the prevalence of COVID-19, employing the educational platforms is essential for online teaching, since they provide practical options promoting the process of learning and developing communication and interactions among the students and between the teacher and students. Consequently, constructing web pages is not among the fundamental necessities and competencies of an online teacher, as quality online teaching can be achieved given that an online teacher is able to convey content successfully, establish communication effectively, reach optimum teaching and cognitive development, and employ the platforms efficiently. These findings are consistent with those of some researchers (e.g., Benson & Ward,

2013; Jang & Tsai, 2012; Lin et al., 2012), indicating that high degrees of technological knowledge do not necessarily guarantee TPACK.

EFL prospective teachers further asserted that having enough technological skills, knowledge of language learning theories and their implementations, content knowledge as well as having effective online communication skills are essential to be capable of teaching online English language courses. This might be due to the fact that despite passing CALL courses, pre-service teachers have been studying only theoretical subjects of online teaching and do not have the chance of experiencing teaching online courses. In addition, since they are not acquaintance enough with the use of technology due to lack of having related courses, they feel the need to gain high technological knowledge to teach the courses online. The findings of the present study confirm those of Koehler and Mishra (2009) who theorized that education of pre-service teachers needs to concentrate on the technology use as well as examine how TK incorporates in PK and CK; hence, the intersection of TK, PK, and the CK results in creating effective instruction through technology. These findings, however, are incongruent with those of Erkem and Recep (2014) indicating that EFL pre-service teachers' awareness of TK is not yet desirable enough to achieve optimum quality teaching.

Conclusions

The objectives of this study were to explore EFL pre-service teachers' perspectives on online teacher quality and TPACK framework of teacher knowledge. The findings revealed that an online teacher should be an organized and highly energetic mediator, a good communicator, and problem solver along with being competent in the field of practice and receptive to new methods of teaching. It was also found that among the seven categories of the knowledge scale, CK and PK gained the highest significance, while TK and TCK received the lowest one. Contrary to the results of quantitative data, in the qualitative data analysis, the prospective teachers considered TK, knowledge of learning practices and theories, knowledge of how to integrate technology and pedagogy, and language knowledge as the most important knowledge types for an EFL teacher to be able to teach online language courses. Furthermore, given the skills required to teach online courses, the pre-service teachers perceived effective online communication skills, effective content delivery, technological skills, and effective evaluation and assessment skills as the most important skills for online teaching.

Teachers new to online teaching environment need to take into account the required knowledge and skills to teach online. However, they need preparation and support to explore their own means to transform and adapt the current pedagogies to online environments. Given the findings, since good uses of technology, clearly organized content, enhanced participation, and the students' engagement in conversation about content and non-content topics are significant types of knowledge, teacher educators should help pre-service teachers to be more skilled in these types of knowledge leading to effective online teaching. Teacher educators also need to make efforts to optimize training courses to help prospective teachers employ ICT and different options of educational platforms in teaching practices, get familiar with techniques and strategies to enhance participation and engagement more effectively, and be prepared substantially for online education through focusing and practicing different domains of TPACK framework and their required skills. Moreover, teacher educators need to raise pre-service teachers' awareness of the significance of communication and engagement of students resulting in higher level of language learning and cognitive development and to help them apply collaborative, highly interactive, and motivating activities while teaching the content in an online language course. In addition, to

enhance technology integration, as Mei et al. (2018) state, policy makers and teacher educators need to support the TPACK development within EFL teachers, especially before entering the online teaching environments. Thus, with the growing pace of technology integration into language teaching/learning, policy makers should give more opportunities to the parties involved in online instruction, from online teachers to online program developers, to design more effective materials and tasks for online learning and teaching. Institutions and colleges can also use the findings of the current study to assess the skills and knowledge of online teachers.

Future researchers can compare prospective and in-service teachers' views about online teacher quality, knowledge, and skills. Another comparison can also be done between English language teachers in face to face and online classrooms in terms of teacher quality. Holding workshops and training sessions on TPACK frames of knowledge and skills and then investigating the impact of such training on teachers' knowledge and practice is further encouraged for long term effects and possible change in online teaching quality. To gain more robust views of teachers and teacher educators about essential knowledge and skills for online teaching, multiple sources of data collection, such as group discussion, interview, individual journals, and self-report surveys are also recommended.

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