



## **Developing and Validating a Pedagogical Content Knowledge (PCK) Questionnaire for Iranian EFL Teacher Education Programs: A Glocal Approach**

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### **Abstract**

Pedagogical Content Knowledge (PCK) is both decisive—as it helps to formulate and present subject matters—and glocally relative as it is prone to the specificity of curricula of varying socio-cultural contexts. This study developed and validated a PCK questionnaire by focusing on data obtained from Iranian English as a Foreign Language (EFL) teacher-education programs. PCK questionnaire items were extracted out of an in-depth literature review (globally) and interviews with 80 student-teachers (locally) and 120 student-teachers attending the pilot phase. Then, 180 other student-teachers completed a glocalised Likert-scale PCK questionnaire. Next, the final questionnaire, which was supposed to accommodate glocal aspects and subjected to both expert judgments as well psychometric measures like reliability estimation and factor analyses, enjoyed acceptable reliability index and validity measures including those of content and construct validity. The valid measure characterized as a 39-item is ultimately represented by nine factors including: *Teaching Language Skills, Language Teaching Strategies, Classroom Management, Curriculum Designing and Materials Development, Assessment Literacy and Abilities, Course book Evaluation, Language Teachers' Technological Knowledge, Language Teachers' Professional Development, and Internship effect on Practical Teaching*. The results underscore the significance of PCK in shaping effective teaching practices and provides the scholars with both instruments and context-sensitive practical model of EFL program evaluation.

**Keywords:** Iranian EFL setting, pedagogical content knowledge (PCK), student-teachers, teacher education program

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## **Introduction**

Any teacher education program must undergo evaluation and refinement, particularly when it comes to pedagogical programs (Khatib et al., 2011). Educators generally assume that a teacher's content knowledge (CK) and Pedagogical Content Knowledge (PCK) are instrumental in guiding their actions and conscious decisions during the teaching process (Kavanoz et al., 2015; Kullman, 2019). On a global scale, discussions about instructors' content knowledge revolve around their depth of knowledge and how effectively it is structured (Van Driel & Berry, 2020). But, globally speaking, we may refer to the blending of global and local perspectives and approaches, which suggests the need to balance universal educational concepts with the unique needs and cultural contexts of a specific region.

In the study of PCK in EFL teacher training, a global approach would involve considering both the global principles and the local, context-specific factors that influence the development and assessment of PCK. Furthermore, PCK encompasses a teacher's understanding of subject matter, educational techniques, technology, teaching principles, and practicum (Depaepe et al., 2015). Depaepe et al. (2015) identify two critical components of PCK: instructional strategy knowledge and the ability to comprehend learners' misconceptions. PCK can be approached from various perspectives and modeled in different ways. One notable PCK model is Shulman's (1986) functional model, which focuses on knowledge of instructional strategies and understanding students' difficulties in grasping subject matter.

Locally speaking, in Iran, the EFL teacher training program spans four years and is administered by several universities, including State universities, Islamic Azad universities, and Farhangiyān Teacher Education University. Farhangiyān University, in particular, places emphasis not only on developing CK but also on fostering a scientifically supported understanding of PCK. The curriculum covers the four language skills and language components, introducing student-teachers to both theoretical and practical aspects including psychology, general education and high school apprenticeships course (Alavi Moghadam et al., 2014). Notably, the university recruits professors who primarily hold TEFL Ph.D. degree with teaching experience in Iranian high schools (Maghsoudi & Khodamoradi, 2020).

Similarly, State and Islamic Azad universities offer a TEFL program at the B.A. level, which shares similarities with Farhangiyān University's program but lacks apprenticeship opportunities and specific courses mandated by the Iranian Ministry of Education, such as those related to educational regulations and ethics in teaching. Additionally, these universities provide two other EFL-oriented disciplines: English Literature and English Translation Studies at the B.A. level, although most graduates from these disciplines often find

While there are both commonalities and differences in content, the curriculum, syllabi, and course implementation at Farhangiyān University differ somewhat from those at State and Islamic Azad universities. In terms of PCK courses, all three universities offer similar courses related to reviewing high school English course books, evaluation and assessment, and the integration of technology in the English classroom. However, Farhangiyān Teacher Education University's curriculum

includes distinctive courses like Educational Measurement, General Issues in English Education, Educational Planning in ELT, Professional Development, Final Research Project, and a sequence of four continuous courses in Internship. It is worth noting that while the PCK courses at Farhangian University are more teacher-education oriented, the PCK programs at State and Islamic Azad Universities have different assumptions, not primarily aligned with the needs of the Ministry of Education but also taking into account English teaching in institutes. In contrast, State and Islamic Azad Universities propose two courses entitled Operational Teaching 1 and 2.

### **Literature Review**

PCK is a universal and global concept, holding significant importance in terms of both its development and assessment. Various models and assessment mechanisms have been devised to study it (Park & Oliver, 2008); (Mavhunga & Rollnick, 2011); (Fernandez, 2014); (Kind, 2015), among others). Nevertheless, due to the contextual, cultural, societal, and purpose-specific attributes of educational programs in general, and EFL programs in particular, PCK can be regarded as a local, contextual, cultural, and social concept. Hence, there appears to be a gap in the literature in terms of developing local mechanisms for both its development and assessment, with a focus on a glocal approach.

In defining PCK, both content knowledge and general knowledge take significance. Hence, PCK would carry the traits of both of these categories of knowledge and that is why different scholars have focused on PCK from these two perspectives giving value to both of them. Of course, in some cases one of these two has been given priority over the other one. While some scholars (e.g., (Gudmundsdottir & Shulman, 1987); (Shulman, 1986, 1987) have highlighted the instructional potential of PCK, others have highlighted the importance of content knowledge (Cochran et al., 1991, 1993).

A lot of studies have been carried out in response to teaching in different subjects like English (Grossman, 1990), Chemistry teacher education in Germany (Goes et al., 2020), mathematics (Lee et al., 2007), science (Abell, 2007; Henze et al., 2008; Magnusson et al., 1999), and physical education (You, 2011). Accordingly, the literature review on PCK shows the most widely accepted PCK as presentation of knowledge, knowledge of instruction, content knowledge, the knowledge that students need, and finally, the curriculum knowledge (Van Driel & Berry, 2020). However, PCK has been so much focused that various models have been suggested to conceptualize it. Teacher Language Awareness (TLA), as proposed by Fernandez (2014), can be considered to be one of the vital notions of PCK a language teacher requires. Nevertheless, TLA overlaps with other components of PCK, such as cognition of subject matter and learner knowledge. This, in itself, might be the source of some confusion and may lead to misuse of PCK in teaching practices. Consequently, some scholars have made the distinction between the content knowledge, pedagogy knowledge, and PCK (Lee et al., 2007; Magnusson et al., 1999; Shulman, 1987).

Rollnick and Mavhunga (2015) explored PCK concerns in the South African educational context and identified classroom management, internship experiences,

and lesson planning as key needs for EFL teachers. Similarly, Mavhunga (2020) concentrated on topic-specific PCK and the potential interactions among its different components, concluding that PCK should be regarded as a subject-specific concept. Andrews (2003) identified the positive and significant influence of Teacher Language Awareness (TLA) and professional knowledge on the success of L2 teachers. Similarly, Franklin et al. (2018) explored how teachers' personal Content Knowledge (PCK) affected their instruction of mathematics and science to immigrant and refugee students learning English as a new language.

Iranian teacher education system has been waiting for systematic research on PCK, especially in the EFL teacher education domain. In the Iranian context, (Mahmoodi et al., 2019) evaluated the in-service teacher training program in Iran based on Focus on the Kirkpatrick model and through an English language teachers' knowledge base questionnaire, students' questionnaire, interviews, and observations found that in-service teacher training classes had a beneficial role in teachers' reaction, learning, and behavior. Moreover, they found positive results ensued from the program implemented as the students of the teachers taking part in the study and its in-service training module could improve well in their L2 development practices. Additionally, the results highlighted the insufficient knowledge of the EFL teacher participants in terms of technological PCK and CK. Najjari et al. (2021), in their research, centered on evaluating Iranian EFL teachers' technological pedagogical content knowledge (TPCK). They concluded that intervention resulted in the development of both TPCK literacy and the perceptions towards the role of intervention.

Safari and Rashidi (2015) delved into the difficulties faced by Iranian English instructors and the possibilities available to them. They found that a change in the teachers' belief toward PCK plays a significant role in this regard. Maghsudi (2021) studied the undergraduate TEFL teacher education program of Farhangian University and found that from the TPCK perspective the program needs modifications. Another study in the Iranian EFL context proved the significant impact of continuing PD strategies relying on PCK development on the success of EFL teachers (Tabatabaee-Yazdi et al., 2018). In addition, Khanjani et al. (2017) attempted to question Iranian EFL teacher education ability in promoting trainees' pedagogical content knowledge. They found that the TEFL teacher education in Iran enhances PCK of EFL teacher trainees.

Contrary to the extensive studies on PCK both nationally and internationally, context-based and locally-laden approaches and mechanism to assessing PCK seem to be among the intact and controversial issues. Therefore, this study aims an attempt to investigate the development and implementing a valid and reliable measure of the Iranian EFL university teachers for the purpose of assessing the contributions of the Iranian and similar ESL/EFL teacher education programs to the development of the expected pedagogical content knowledge. More specifically, this study aimed at addressing the extent to which the glocally developed and validated measure (i.e., the PCK Questionnaire) enjoys expected validity and reliability indices.

## Method

### Participants

In the process of questionnaire development and its subsequent pilot testing, we enlisted the participation of 40 male and female student-teachers selected 80 student-teachers of both genders 40 from State/ Islamic Azad universities and 40 from Farhangian University. These participants were actively engaged in responding to interview questions, which was meticulously constructed based on insights drawn from the prevailing global literature. This initial phase aimed to gain deeper insights into their Pedagogical Content Knowledge (PCK) development experiences within the unique pedagogical contexts of Farhangian University and State/Islamic Azad Universities. However, the data saturation occurred, when the 25th student teacher was interviewed. Subsequently, in the piloting phase, 263 student-teachers, randomly selected from the population of EFL student-teachers at Farhangian University (n=117) and State/Islamic Azad Universities (n=146), actively participated by completing a structured questionnaire. This questionnaire aimed to explore the perceptions of EFL student-teachers regarding PCK within the Iranian educational framework. For a comprehensive overview of the study participants, please consult Table 1, which provides detailed descriptive statistics.

**Table 1**

*Descriptive Statistics: Information of Study Participants*

Phase	Student-Teachers	University	
		FRU	S/A U
Interview	80*	40	40
Open-ended Questionnaire	120	60	60
PCK Questionnaire (Piloting)	180	100	80
Min Study: PCK Questionnaire	263	117	146

\*10 student-teachers from each academic year

### Materials and Instruments

#### *Interview*

A semi-structured interview was developed in line with the notions derived out of a thorough literature review and consulting with then informed experts. The questions for the interview guide were developed by the researchers and the items were reexamined by two language experts who were TEFL PhD holders and experienced in teacher education in terms of language and content. Hence, the interview guide's content and construct validities were confirmed through expert judgment validity criteria (Creswell & Clark, 2017), expert judgment validity (EJV) criteria were used to verify the interview guide's content.

Following Mackey and Gass (2016) and Dornyei's (2007) instructions serving as the basis for the structure, we used to conduct the interview. The interview had 11 items pertained to the courses which the interviewees thought could help them develop their PCK courses. The interview was done with at least 10 student-teachers from each academic year in Farhangian, Islamic Azad, and State universities (No= 80). The trustworthiness dimensions (i.e., credibility, transferability, confirmability and dependability) of the data collected qualitatively through the interviews were touched upon on the basis of the research and scholarly guidelines in the course of the main study.

### ***Pedagogical content knowledge (PCK) questionnaire***

For the global section of the research approach, thorough literature review data were integrated with the results of the interviews, and the outcome of the open-ended PCK questionnaire; leading to 56 initial Likert scale items representing PCK program of TEFL teacher education in the Iranian universities. The initial version of the scale was approved by a panel of experts consisting of three applied linguists in terms of content validity. The high agreement index among the panel members indicated that the glocalized scale enjoyed high level of content validity.

### **Procedure**

The study was undertaken in different steps. First, a comprehensive literature review was conducted to establish a solid theoretical foundation. This was followed by semi-structured interviews with 25 participants, who were selected through theoretical sampling to ensure diverse perspectives. The interview data were thematically analyzed, and the identified themes were transformed into statements for questionnaire items.

To assess content validity, a panel of experts in the field evaluated the initial questionnaire for relevance, clarity, and appropriateness. Subsequently, a pilot test was administered to 263 student teachers to gather data on the quality of the items. Items with loading factors below 0.4 in the pilot test were excluded from the questionnaire. The remaining 39 items were then subjected to an Exploratory Factor Analysis (EFA) using the varimax method. Items that demonstrated strong factor loadings and alignment with identified factors were retained in the final questionnaire. The refined questionnaire, validated through this rigorous process, was used for data collection in the main study. This approach ensured the questionnaire's quality and effectiveness in measuring the intended constructs

## **Results**

### **Qualitative findings**

The literature review was integrated with the interviews with the participants and they were content analyzed using thematic analysis. The themes reported by more than five participants were kept and in sum, 56 open codes were extracted, which were categorized under 9 axial themes. Each theme is explained and exemplified as follows:

### ***Teaching Language Skills***

Student-teachers emphasized the importance of focusing on the development of all language skills, including listening, speaking, reading, and writing. They recognized the need for a balanced approach to language teaching. This theme consists of 6 subcategories. The following quotations exemplify this theme:

Student Teacher (ST) 1: "I believe that giving students assignments that require them to practice specific language skills not only reinforces their learning but also makes the learning process engaging and effective." Student Teacher 2 also stated: "I encourage my students to take charge of their language learning journey. Self-practice is key. ...." Similarly, ST 3: ".....we're giving them the chance to practice language skills in an interactive and contemporary way."

### ***Language Teaching Strategies***

The student-teachers discussed various teaching strategies which entailed 8 sub-categories encompassing the language teaching strategies employed by the student-teachers. For instance, ST stated:

Teacher 1: "In my teaching approach, I incorporate various strategies. I use different websites for grammar, reading, and writing exercises. .... In class, I use elaborated input techniques such as repetition, paraphrasing, and slower speech with redundant information to ensure all students grasp the concepts. Above all, I strive to create a friendly classroom atmosphere ....."

### ***Classroom Management***

Student-teachers shared strategies for maintaining a positive classroom environment and addressing behavioral issues. This theme consists of 6 sub-themes. For instance, ST5 stated,

"In my teaching approach, I believe that using body language effectively helps control the classroom environment. It's not just about words; gestures, eye contact, and body posture play a crucial role in maintaining discipline."

### ***Curriculum Designing and Materials Development***

Many student teachers expressed interest in creating their own teaching materials and designing curriculum units that align with students' needs and abilities. One of the participants stated,

"In my experience, teaching in large and diverse EFL classes requires careful planning and resourcefulness. .... A key strategy I employ is the utilization of existing materials, which I adapt to suit the EFL classroom context. ...., I incorporate extracurricular materials that challenge and engage them, .... I find that integrating short stories and songs into the classroom is an excellent way to captivate students' interest and facilitate language acquisition".

### ***Assessment Literacy and Abilities***

Student teachers recognized the significance of assessment in gauging students' progress. They discussed the importance of creating fair and valid

assessments and using assessment results to inform instruction. The following quotations, exemplify this theme:

I've realized the importance of ensuring the reliability and validity of the tests and assessments I create. This involves a meticulous process of test construction and validation, where I consider factors like clarity, fairness, and alignment with learning objectives. ....I can confidently assess my students' language skills and provide them with meaningful feedback."(ST10)

Similarly, ST 12 stated, "In my teaching practice, I find value in both creating custom assessments and utilizing readymade tests and tasks. While designing tailored assessments allows me to address specific learning goals, readymade materials often offer a well-structured and validated approach. This flexibility allows me to adapt my assessment strategies based on the needs of my students and the learning context."

### ***Course book Evaluation***

Several student teachers discussed the strengths and weaknesses of commonly used course books. They highlighted the need for adapting materials to suit specific teaching contexts. This theme consists of 8 open codes. ST 8 stated, "As a student teacher, I've come to realize the importance of thoroughly analyzing the content clarity of the existing high school course books."

ST 16 also stated "Incorporating learners' interests into the analysis of high school course books is a practice I've found to be beneficial. ....It's important to evaluate how well the course books align with students' interests to enhance their overall engagement with the content."

ST 19 similarly stated "During my teaching practice, I've focused on reviewing the cultural points presented in high school course books. Analyzing how different cultures are portrayed and represented is essential for promoting cultural sensitivity and understanding among students."

### ***Language Teachers' Technological Knowledge***

The integration of technology into language teaching was a recurring theme. Student teachers acknowledged the importance of staying updated with technological advancements to enhance their teaching methods. This theme consists of 5 related sub-themes. As an example, ST19 stated, "Incorporating technology into the classroom has been a game-changer for me as a student teacher. I've developed online questionnaires using Google Forms, allowing for easy data collection and assessment."

ST 20 also stated, "Utilizing various multimedia tools like PowerPoints, animations, and films has greatly enhanced my classroom teaching. .... Additionally, I've integrated helpful speaking and listening websites into my lessons, providing valuable resources for language practice."



### ***Language Teachers' Professional Development***

Any student teachers expressed a strong commitment to continuous professional development. They discussed attending workshops, conferences, and pursuing further qualifications. This theme consists of 5 sub-categories. ST 22 also stated, "Professional development is a continuous journey for educators. During my student teaching experience, I've realized the importance of in-service training courses and being an active member of professional teacher communities. These opportunities have expanded my knowledge and teaching techniques, enabling me to stay up-to-date with the latest educational trends and research."

### ***Internship Effect on Practical Teaching***

Student-teachers recognized that their internship experiences had a significant impact on their practical teaching skills. They mentioned the value of hands-on experience in real classrooms. To exemplify this theme, ST 23 stated, "Designing comprehensive lesson plans and effectively managing classroom activities have been pivotal in ensuring productive teaching."

Similarly, ST 19 stated, "Developing strong teacher-learner relationships has been a priority for me. It's essential for creating a positive learning environment."

### **Scale Validation**

The extracted themes were carefully worded to 56 statements measured by a five-point Likert scale. In teaching practices, Farhangian student-teachers were more familiar with practical teaching (internship) compared to the students of other universities. In this respect, "participating in teaching and learning activities during the semester" and "independent implementation of activities under the supervision of the school teacher") had the highest frequencies. The questionnaire included 56 items measuring nine constructs as follows; Teaching Language Skills (items 1-6), Language Teaching Strategies (items 7-14), Classroom Management (items 15-20), Curriculum Designing and Materials Development (items 21-26), Assessment Literacy and Abilities (items 27-32), Course book Evaluation (items 33-40), Language Teachers' Technological Knowledge (items 41-45), Language Teachers' Professional Development (items 46-50), and Internship effect on Practical Teaching (items 51-56). The initial scale was submitted to a panel consisting of three applied linguists to assess the relevance and readability of each item. The agreement index for each item exceeded 0.95 indicating that the developed scale enjoyed content validity. The construct validity of the PCKQ was explored at two steps. The first analysis extracted 18 factors (see Table 2). Items 3-5-9-12-14-18-22-23-27-30-36-37-39-43-47-54, and 55 which did not load under a specific factor, were dropped out for the final analysis (See Table 3, for the questionnaire and the items it encompasses).

**Table 2**

*Rotated Factor Matrix of Preliminary Analysis*

	Factor																	
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Q16	.73																	
Q15	.72																	
Q17	.69																	
Q19	.67																	
Q20	.67																	
Q8	.75																	
Q11	.74																	
Q7	.73																	
Q13	.66																	
Q10	.60																	
Q38		.72																
Q34		.70																
Q33		.68																
Q35		.65																
Q40		.64																
Q31			.78															
Q28			.62															
Q29			.60															
Q32			.58															
Q24				.77														
Q25				.76														
Q21				.72														
Q26				.58														
Q1					.77													
Q4					.76													
Q2					.65													
Q6					.63													

Q48		.72					
Q49		.70					
Q46		.67					
Q50		.55					.48
Q18		-.31					
Q53			.73				
Q51			.73				
Q52			.64				
Q56			.63				
Q41				.75			
Q44				.67			
Q45				.66			
Q42				.54			
Q36				.65			
Q9				.30	.44		.31
Q47					.42		
Q37							
Q14					.55		
Q12					-.31		
Q54							
Q3						-	
Q55						.	
Q27						.67	
Q23		.5					.56
Q43							
Q22							.39
Q30							
Q39							
Q5							.54

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**Table 3**

*Pedagogical Content Knowledge Questionnaire (Initial Version)*

<b>Items</b>	<b>Descriptors</b>
1	Presenting the efficient assignments which make students practice a special language skill.
2	Helping learners practice more effectively to learn the four skills through self-practices
3	Helping learners find their problems in language skills
4	Teaching different skills (speaking, reading, listening, translation, writing) to students
5	Helping learners practice language skills through using websites
6	Increasing learners' understanding of the subject matter
7	Providing corrective feedback though implicit, explicit, immediate, and delayed CF when grammar or pronunciation errors are made
8	Using different websites to learn grammar, reading, and writing
9	Using podcasts and interactive websites to improve listening and speaking
10	Focusing on learners' interests and values
11	Focusing on the relationship between learning techniques and culture
12	Respecting multicultural background of learners
13	Using elaborated input by means of repetition, paraphrasing, slower speech contains redundant information, and teacher talk
14	Making the classroom a welcoming place for students
15	Using body language to control the classroom
16	Being disciplined and making students get used to it
17	Asking questions at the middle of teaching to aware the students who are not focused
18	Asking students to answer the questions and get involved in the classroom activities
19	Behaving in justice and respecting all learners equally
20	Involving learners through tasks and practices throughout the class time
21	Designing programs for big and heterogeneous classes
22	Designing specific models to teach language skills
23	Using the existing materials through adopting them for the EFL classroom

24	Adapting materials to be used in the EFL classroom
25	Using extracurricular materials for the highly proficient learners
26	Making use of short stories and songs in the classroom
27	Calculating reliability and validity of the tests constructed
28	Making use of readymade tests and tasks
29	Describing scoring rubrics to the students when grading students' performance.
30	Teaching learners how to use peer assessment in assessing language skills
31	Making use of different assessment types such as formative, summative, dynamic, peer, and self-assessment
32	Discussing the result of exams with colleagues
33	Analyzing the content clarity of the existing course books of high schools
34	Analyzing the existing course books of high schools with regard to learners' interests
35	Reviewing the cultural points in the school books
36	Analyzing authenticity of the existing course books of high schools
37	Analyzing the existing course books of high schools
38	Analyzing the existing course books of high schools with regard to their appropriate balance of skills and sub skills for the target group/course.
39	Analyzing the appearance, attractiveness, and face validity of the existing course books of high schools
40	Analyzing the linguistic and psychological aspects of the course books
41	Developing an online questionnaire in Google form (Google forms) ( <a href="https://www.google.com/forms/about/">https://www.google.com/forms/about/</a> )
42	Making use of PowerPoints, simple animations, and films in the classroom
43	Using helpful speaking and listening websites in the class
44	Using technology to develop tests
45	Using the internet to adopt /adapt teaching materials
46	Teacher's mastery over using technology
47	Using narrative, action, and lesson research in classroom research
48	Increasing Professional Development through taking part in in-service training courses
49	Increasing Professional Development through being active as a member of professional communities of teachers.

50	Improving teachers' knowledge through participating in disciplinary conferences
51	Designing lesson plans and managing classroom activities
52	Identifying and practicing teaching principles and methods
53	Teaching language skills components
54	Building good relationship with learners
55	Managing classroom and students well
56	Assessing learners' performances

After dropping out the items which did not load under the constructs, the factor analysis was carried out for the second time using the 39 items. Before discussing the results, it should be noted that the assumptions related to exploratory factor analysis were retained. Table 4 displays the Kaiser–Meyer–Olkin (KMO) test which is an index of sampling adequacy and Bartlett’s test of sphericity. The KMO index of .832 indicated that the sample size of 180 was “meritorious”, following Field's (2017) classification of KMO indices, for running the EFA. The significant results of the Bartlett’s test ( $\chi^2 (741) = 3041.94, p < .05$ ) indicated that the correlation matrix was appropriate for running the factor analysis.

**Table 4**

*KMO and Bartlett's Test*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.83
	Approx. Chi-Square	3041.94
Bartlett's Test of Sphericity	df	74
	Sig.	.00

Table 5 displays the number of factors extracted total variance explained by the EFA model. The SPSS extracted nine factors which accounted for 54.01 percent of total variance.

**Table 5**

*Total Variance Explained Final Analysis*

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.73	22.39	22.39	8.28	21.23	21.23	2.78	7.12	7.12
2	2.48	6.36	28.76	2.03	5.22	26.45	2.77	7.11	14.24
3	2.33	5.99	34.75	1.86	4.78	31.24	2.55	6.54	20.78
4	2.18	5.59	40.34	1.76	4.51	35.75	2.34	6.01	26.80
5	2.17	5.57	45.91	1.73	4.44	40.19	2.29	5.89	32.69
6	1.89	4.84	50.76	1.44	3.69	43.89	2.12	5.43	38.13
7	1.87	4.81	55.58	1.41	3.62	47.52	2.10	5.38	43.52
8	1.78	4.58	60.16	1.35	3.46	50.98	2.06	5.29	48.81
9	1.65	4.23	64.40	1.18	3.03	54.01	2.02	5.19	54.01
10	.98	2.52	66.92						
11	.81	2.09	69.01						
12	.78	2.00	71.01						
13	.74	1.90	72.92						
14	.69	1.78	74.70						
15	.68	1.75	76.46						
16	.63	1.61	78.08						
17	.604	1.54	79.63						
18	.59	1.52	81.15						
19	.58	1.49	82.65						
20	.51	1.31	83.97						
21	.49	1.26	85.23						
22	.48	1.24	86.48						
23	.47	1.22	87.70						

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24	.43	1.10	88.80
25	.42	1.07	89.88
26	.39	1.01	90.90
27	.37	.97	91.87
28	.35	.91	92.78
29	.33	.86	93.65
30	.32	.83	94.48
31	.30	.77	95.26
32	.29	.75	96.01
33	.27	.71	96.72
34	.25	.65	97.38
35	.23	.60	97.98
36	.21	.56	98.54
37	.20	.52	99.07
38	.18	.47	99.55
39	.17	.45	100.00

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And finally, Table 6 displays the factor loadings of the 39 items under the nine factors. Before discussing the results, and in order to interpret the factor loadings; it should be mentioned that Filed (2018, p. 994) believed that, “the factor loading can be thought of as the Pearson correlation between a factor and a variable”. He suggested the following criteria for interpreting Pearson correlations; .10 = weak, .30 = moderate, .50 = large. The results displayed in Table 3.5 indicated that all factor loadings were large; i.e.  $\geq .50$ . The results showed that;

Items 7, 8, 10, 11 and 13 loaded under the first factor which can be labeled as “language teaching strategies” factor.

Items 15, 16, 17, 19 and 20 loaded under the second factor which can be labeled as “classroom management” factor.

Items 33, 34, 35, 38 and 40 loaded under the third factor which can be labeled as “course book evaluation” factor.

Items 21, 24, 25, and 26 loaded under the fourth factor which can be labeled as “curriculum design and material development” factor.

Items 1, 2, 4 and 6 loaded under the fifth factor which can be labeled as “teaching language skills” factor.



**Table 6**

*Rotated Factor Matrix*

	<b>Factor</b>								
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>Q8</b>	.78								
<b>Q7</b>	.71								
<b>Q11</b>	.68								
<b>Q13</b>	.64								
<b>Q10</b>	.63								
<b>Q16</b>		.73							
<b>Q15</b>		.73							
<b>Q19</b>		.66							
<b>Q17</b>		.66							
<b>Q20</b>		.65							
<b>Q38</b>			.72						
<b>Q34</b>			.71						
<b>Q33</b>			.66						
<b>Q40</b>			.64						
<b>Q35</b>			.62						
<b>Q25</b>				.77					
<b>Q24</b>				.76					
<b>Q21</b>				.69					
<b>Q26</b>				.58					
<b>Q1</b>					.79				
<b>Q4</b>					.74				
<b>Q2</b>					.63				
<b>Q6</b>					.61				
<b>Q51</b>						.70			
<b>Q52</b>						.68			

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<b>Q56</b>	.66	
<b>Q53</b>	.65	
<b>Q48</b>	.75	
<b>Q49</b>	.70	
<b>Q46</b>	.64	
<b>Q50</b>	.54	
<b>Q41</b>		.74
<b>Q44</b>		.67
<b>Q45</b>		.63
<b>Q42</b>		.53
<b>Q31</b>		.71
<b>Q29</b>		.64
<b>Q28</b>		.63
<b>Q32</b>		.56

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Items 51, 52, 53 and 56 loaded under the sixth factor which can be labeled as “internship effect on practical teaching” factor.

Items 46, 48, 49 and 50 loaded under the seventh factor which can be labeled as “language teachers’ professional development” factor.

Items 41, 42, 44 and 45 loaded under the eighth factor which can be labeled as “language teachers’ technological knowledge” factor; and

Items 28, 29, 31 and 32 loaded under the ninth factor which can be labeled as “assessment literacy and ability” factor.

### **Reliability Indices**

Cronbach's alpha reliability indices for the PCK questionnaire and its nine subscales are presented in Table 7 ensued from the pilot study. The overall questionnaire enjoyed a reliability index of .90. The reliability indices for the nine components were as follows; Teaching Language Skills ( $\alpha=.82$ ), Language Teaching Strategies ( $\alpha=.82$ ), Classroom Management ( $\alpha=.82$ ), Curriculum Designing and Materials Development ( $\alpha=.84$ ), Assessment Literacy and Abilities ( $\alpha=.77$ ), Course book Evaluation ( $\alpha=.78$ ), Language Teachers' Technological Knowledge ( $\alpha=.75$ ), Language Teachers' Professional Development ( $\alpha=.76$ ), and Internship effect on Practical Teaching ( $\alpha=.80$ ). These reliability indices were higher than the minimum index of .70 as proposed by Tseng et al. (2006) and Dörnyei and Taguchi (2009).

**Table 7**

*Reliability Statistics: Piloting Phase*

	<b>Cronbach's Alpha</b>	<b>N of Items</b>
<b>Teaching Language Skills</b>	.82	4
<b>Language Teaching Strategies</b>	.82	5
<b>Classroom Management</b>	.82	5
<b>Curriculum Designing and Materials Development</b>	.84	4
<b>Assessment Literacy and Abilities</b>	.77	4
<b>Course Book Evaluation</b>	.78	5
<b>Language Teachers' Technological Knowledge</b>	.75	4
<b>Language Teachers' Professional Development</b>	.76	4
<b>Internship Effect on Practical Teaching</b>	.80	4
<b>Total</b>	.90	39

As displayed in Table 8, the PCK questionnaire's Cronbach's alpha reliability shows a value of  $\alpha=.955$ . It should be noted that Tseng et al. (2006), Dörnyei and Taguchi (2009) believe that .70 is an adequate Cronbach's alpha reliability index for an instrument. Based on this criterion it can be concluded the scale enjoyed appropriate reliability index. George and Mallery (2020) believe that, "there is no set interpretation as to what is an acceptable alpha value. A rule of thumb that applies to most situations is; .9 = excellent, .8 = good, .7 = acceptable, .6 = questionable, .5 = poor and .5 = unacceptable" (p. 244). Based on these criteria, it can be concluded that the instrument developed in this study enjoyed an "excellent" reliability index.

**Table 8**

*Cronbach's Alpha Reliability Index*

<b>PCK</b>	<b>Cronbach's Alpha</b>	<b>N of Items</b>
<b>Questionnaire</b>	.95	39

## **Discussion and Conclusion**

The primary purpose of the current study was to develop and validate a survey instrument for exploring the components of the Iranian EFL teachers' PCK and their perceptions towards PCK program. The primary goal of this research was to construct and test a survey instrument for investigating the facets of PCK and attitudes regarding PCK among Iranian EFL educators. The research found that the PCK framework could be accurately reproduced using a 39-item, nine-factor instrument. The nine factors of *Teaching Language Skills*, *Language Teaching Strategies*, *Classroom Management*, *Curriculum Designing and Materials Development*, *Assessment Literacy and Abilities*, *Course book Evaluation*, *Language Teachers' Technological Knowledge*, *Language Teachers' Professional Development*, and *Internship effect on Practical Teaching* were considered as the components of PCK questionnaire. With respect to the significance of these factors, it can be argued that the present study findings support the results of those studies which emphasize the necessity of PCK in the teacher education programs such as Fernandez (2014), Goes et al. (2020), and Mavhunga (2020).

With respect to the capability of teacher-educators in preparing student-teachers for their future job, the findings can support the notion of teacher educator professionalism and Professional Development (PD) of ESL practitioners (Abeywickrama, 2021; Ravandpour, 2019; Tabatabaee-Yazdi et al., 2018). Therefore, successful classroom and constant PD among EFL teachers are bound to the teachers' efforts in terms of enhancing their CK and PCK (Maghsudi, 2021).

The results, likewise, showed clear differences in the PCK held by previous studies: Four parts make up Grossman's (1990) PCK model: "conceived of purposes for teaching subject matter," "knowledge of students' comprehension," "curriculum knowledge," and "knowledge of instructional tactics" (p. 17). A PCK model for TESOL educators has been established by Andrews (2003). While this model does a good function of elucidating the individual components of ESL teachers' PCK, it falls short in demonstrating the connections between them. The importance of teachers having linguistic awareness is emphasized by Andrews. From an integrated perspective, Magnusson et al. (1999) developed a PCK component model for science education which accommodates "orientation to teaching science," "knowledge of the science curriculum," "knowledge of students' understanding of the science," "knowledge of instructional strategy," and "knowledge of assessment of scientific literacy."

Enriched by the views of student-teachers from Islamic Azad, state, and Frahangiyani universities, the present study came to know about nine substantial factors affecting the PCK of student-teachers in the Iranian TEFL teacher education context. Accordingly, the present study findings have expanded the PCK and the perspective it accompanies for language teacher education.

Three main categories of PCK conceptualizations emerge from the review and analysis of the relevant literature. Initially, Shulman's (1987) central principle regarding the comprehension and transformation of subject matter information for instructional purposes serves as the conceptual backbone of PCK. Preparing

resources, representing the ideas in various formats, instructional selections of teaching methods, and customizing and tailoring instruction to specific learners and context are all steps in the process of subject matter knowledge transformation (Shulman, 1987). This intricacy of classroom instruction is reflected in PCK's multi-part structure. Second, PCK studies have isolated PCK's constituent parts and view PCK as the sum of its parts. In PCK component research, both the domain-general and content-specific components are investigated and classified according to a variety of topics or points of view. Many studies not only detail the parts, but also attest to their interdependence (Henze et al., 2008; Mohr & Townsend, 2002). Finally, PCK models are developed to demonstrate the interplay between PCK elements and to illustrate PCK components in certain subjects.

The purpose of developing a dynamic and integrative PCK model for TEFL teacher education is to better clarify the interplay between the various PCK components and to flag PCK growth as it occurs. The interdependence of PCK parts suggested that progress in one area would stimulate growth in adjacent areas, and so on until the complete PCK had advanced. There has to be more in-depth study of the PCK of TEFL teacher education program so that it can be used to better effect in the classroom. In a similar vein, to Shulman's (1986) argument that teachers require PCK since mere subject knowledge is likely to be as useless pedagogically as content-free skill in teaching practice, the heart of PCK rests in the application of teacher knowledge to specific class instruction. This perspective suggests that PCK, as opposed to topic knowledge or pedagogical knowledge, is more useful and practical for improving classroom performance. TEFL teachers require pedagogical content knowledge (PCK) to effectively communicate their pedagogical stance to their student body.

The study does have certain limitations that should be acknowledged. First, the research focused on a specific set of universities in Iran. Expanding the sample to include a more diverse range of institutions and regions could provide a broader perspective. Second, the study relied on self-reported data from student teachers, which might introduce social desirability bias and not always reflect actual practices. Combining self-report data with more objective measures, such as classroom observations, could enhance data validity. Third, the study utilized a cross-sectional design, offering a snapshot of teacher education programs at a particular moment. Future longitudinal research could offer insights into program changes and developments over time. Fourth, while the questionnaire was efficient for data collection, its quantitative nature may not fully capture the depth of certain aspects. Complementing quantitative data with qualitative research methods, like interviews or observations, could provide richer insights into the subject.

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### **Conflicts of interests**

The authors claim that they have no conflicts of interest.

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