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RESEARCH PAPER

Assessing Teachers' TPACK Readiness for Blended Learning at the Higher Education Level

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ABSTRACT

Today's world is a global village where almost everything is being operated with the use of technology. People of today are more technologically smart, advanced and much aware than those of the past. Technological advancement has made our lives easier and education nowadays is quite different from what it was in the past. Keeping in view the significance of technological literacy in today's world, this study was designed to analyze teachers' readiness for blended learning at the higher education level in the Islamabad region. This study followed a quantitative approach, with a sample of 520 university teachers selected through proportionate stratified sampling, ensuring equal sampling proportion from each subgroup by taking 10% from each group. A "Knowledge of Teaching and Technology" questionnaire based on the seven domains of Technological, Pedagogical, and Content Knowledge (TPACK) by Schmidt et al. (2009) was adapted to analyze blended learning readiness. Data was statistically analyzed using Cronbach's Alpha reliability, correlation, and mean. The findings, with a mean score of 4.06, showed that university teachers were highly ready to implement blended learning. The results reflected strong technological and pedagogical preparedness among the faculty. Considering these results, it is suggested that university teachers may be provided with more opportunities to explore new technologies on local and international platforms that are integrated into the teaching and learning process worldwide by keeping their knowledge updated on innovative pedagogies to ensure a conducive learning environment holistically.

KEYWORDS Teachers' Readiness, Blended Learning, TPACK

Introduction

During COVID-19 the whole world shifted to online mode and hybrid mode for communication and staying in touch with their family and acquaintances. This also called the education sector to shift to online and hybrid mode of teaching. Similarly, the education sector has been transformed in the past few years due to the sudden paradigm shift to integrate technology. The pedagogical methods have also evolved in this regard. Blended Learning is a new trend in the field of education that reflects the needs of today's learners. Blended Learning is a mixture of traditional learning and E-Learning. In this approach face to face teaching and online learning both are incorporated (Oztürk et al., 2023). Blend of online learning and face to face teaching has made learning more interesting and convenient. Students can now access the study material at home which makes learning handier. Teachers can now stay in touch with their students via emails, moodles and social networking sites which also keeps the students aware of homework, assignments and learning material. Blended learning has also given a platform to students and teachers where they can easily float new researches, exchange ideas and study material (Ginting et al., 2021).

Technological Pedagogical and Content Knowledge (TPACK) framework is the expansion of Shulman‟s (1986) Pedagogical Content Knowledge (PCK) framework which is based on teacher‟s pedagogical knowledge, content knowledge and technological

knowledge. Mishra and Koehler (2006) designed TPACK framework which describes the effective way of blending teaching with technology and content knowledge. TPACK gives an intensive view of how teaching methodology can be supported by technology with related content knowledge. Multitasking is the new charge for teachers of 21st Century where teachers are required to incorporate technology, new researches, and content knowledge with their pedagogical knowledge. TPACK framework supports the use of ICT in teaching which complements the current trends of education. To use technology in teaching practice, teachers have to update their digital knowledge for operating digital technology in the classroom. After the outburst of COVID-19 the technological knowledge and pedagogical knowledge are another aspect that is highly required to implement blended learning, which has become the latest demand of the education sector. Teaching job has now become more demanding due to the technological integration. Teachers need to update their knowledge with the current advancement in technology. Students are more involved into technology and electronic gadgets. Cyber socialization is the latest trend for people nowadays. Every work is imagined to be done with the use of technology. Education has also gone through transformation where now different pedagogical methods are used by teachers to integrate and blend teaching with technology. Blended learning is one of the rising teaching pedagogies that fits in the demands of today's learner and society as a whole. Teachers are considered to be a change agent and teachers have to play a vital role in acceptance and adjustment of new teaching methodologies in the field of education. Teachers can bring changes in the society and if teachers are not competent enough to accept and implement the changes, then students and society as a whole can never adopt the changes of the modern world (Kuenga, 2023).

This study aims to explore the readiness level of teachers for blended learning on the Technological Pedagogical and Content Knowledge (TPACK) Scale at higher education. Blended Learning is the new pedagogical method for using Information and Communications Technology (ICT) knowledge in teaching. Blended learning cannot be practiced and implemented in its true sense until teachers are fully aware and ready to accept this transformation in their pedagogical knowledge. Online learning needs ICT competence whereas face to face learning requires pedagogical knowledge and content knowledge (TPACK). Teaching of 21st century demands teachers to blend technology with their content knowledge and pedagogies, hence the research focused on exploring the readiness of teachers for blended learning at the higher education level. TPACK framework by Mishra and Koehler (2006) depicts the professional way of incorporating three basic domains, Pedagogical Knowledge (PK), Content Knowledge (CK) and Technological Knowledge (TK) that are the basic requirement for Blended Learning. Research has confirmed the need of updating teachers‟ ICT knowledge for effective learning. Teachers' are in routine of socializing via different social networking sites but that's just not enough, now a day‟s teachers are required to understand and update their knowledge about the use of different technology and electronic gadgets that are frequently being used for learning (Ginting, Sipayung, & Sihombing, 2021).

Technological Pedagogical and Content Knowledge (TPACK) is considered as a diverse frame of work which serves for many purposes just like exploring the readiness and the use of technological knowledge of teachers that blends technology with content related pedagogical strategies to foster 21st Century skills in students (voogt et al., 2013). The significance of inculcating Information and Communications Technology (ICT) skills in teachers have been reported by many studies which also highlighted the need of demonstrating ICT skills with related content knowledge and provide teachers with opportunities, encouragement and a good working environment where teachers can professionally flourish technological skills in their pedagogical methods (Setkhumbong, 2023). There are certain aspects that can influence the readiness level of teachers and among them the most common are ICT competence, workload, time management, computer skills and computer knowledge (Brown, 2022). Higher education is consistent in research which is not possible without the implementation of current trends of the 21st

Century. University teachers are required to enhance their understanding about blended learning. Therefore it is important to conduct a research to explore the readiness of teachers‟ for Blended Learning at higher education level within the Pakistani cultural context. Readiness for blended learning will highlight the necessity of incorporating new trends like blended learning in Pakistan. The new paradigm shift of technology in education throughout the world has also emerged the teaching practices. There is a need to conduct a research on the latest trends of teaching methods being introduced with respect to technology. Blended learning is the pedagogy of blending technology with traditional way of teaching. The problem under investigation was to assess the readiness of teachers‟ for blended learning at higher education level. Therefore the research was designed by keeping in view the significance of current trends of blending technology with pedagogical methods for university teachers in reference to the cultural and social background of the country, Pakistan. Additionally it was based on the readiness for blended learning of university teachers‟ on the basis of sector, gender, age and study programme with reference to their Technology Pedagogical and Content Knowledge (TPACK). This study would be significant in supporting the future of Blended Learning integration in universities of Islamabad and Pakistan in general. It has assessed the readiness level of teachers' readiness on Technological Pedagogical and Content Knowledge (TPACK) scale which provided with useful information about the areas in which teachers need improvements for competently integrating online and face to face learning. This study would be quite beneficial for not only teachers but also administrators, curriculum planners, universities, students and society as a whole because the study provides a picture of university teachers' readiness for blended learning that is the new upcoming pedagogical trend of 21st Century after COVID-19. This study has also shown to be beneficial in highlighting the areas of development for teachers that will contribute in improving teachers' pedagogical competency as a whole.

Literature Review

As cited by Carman (2005) blended learning theory by Keller, Gagne, Bloom, Merrill, Clark and Grey recognized basic five elements for developing a blended learning environment (see Figure 2.) . Blended learning theory is based on three theories: Cognitivism, Constructivism and Performance support as cited by (Carman, 2005). A blend of learning theory focuses in blending the use of cognition with knowledge construction theory with performance support; performance support system is computer software that accelerates its user performance or routine tasks (Carman, 2005). The multimedia modern design theory is based on three principles: 1. The Multimedia Principle works on graphics related to content theme, 2. The Contiguity Principle which works on the principle of placing the graphics near related text may improve learning and 3. The Modality Principle works on the principle of providing graphics with audio (Clark, 2002).

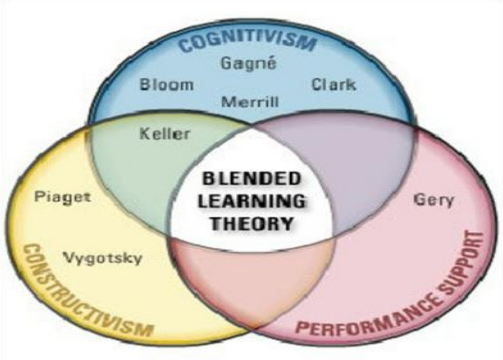

Figure 1. A blend of learning theories (Carman, 2005).

Soomro et al., (2018) conducted a mixed study on TPACK adaptation among the faculty members of information technology and education in university of Sindh, Pakistan. Quantitatively TPACK survey was used and for qualitative data interviews and walk in observations were conducted, it was explored that teachers were already incorporating technology in their classes regardless of the availability of technology, internet access and technological tools. From the interview it was explored that teachers at higher education level in university of Sindh were integrating technology in their teaching and due to the lack of technological gadgets teachers are using their own electronic gadgets to facilitate the learning process (Soomro et al., 2018). Koh and Sing (2011) assessed pre service teachers‟ TPACK and explored the relation of TPACK constructs with demographic factors. In Singapore pre service teachers‟ perception about TPACK was examined through multiple linear regressions and it was found that age and gender had no impact on teachers‟ TPACK perception (Koh and Singh, 2011). Aalayar et al (2012) conducted an experimental study in Kuwait to explore the role of blended learning in development of pre service science teachers TPACK knowledge. The first group was taught completely through ICT support where as the second group was taught through blended learning support where students had an access to online and face to face teaching (Koh and Singh, 2012).

Koh and Singh (2012) highlighted that the pre service teachers‟ had an increased score in their Technological Knowledge (TK) and Technological Pedagogical Knowledge (TPK) and concluded that a blended learning environment increases and supports in the development of TPACK among teachers. Pedagogical and Content Knowledge (PCK) can accelerate the development of TPACK for blended learning environment at higher education level (Aguinaldo, 2016). Hosseini and Kamal (2013) through the lens of TPACK model explored in service and pre service teachers‟ perception of Technological Pedagogical Content Knowledge (TPCK). Results indicated that there was no difference between the TPCK and age and gender where as the field of study and teaching experience had a significant impact on teachers‟ TPCK (Hosseini & Kamal, 2013). Many studies have been reported on the readiness of blended learning in different context and areas. It can be concluded that TPACK model is used to explore the TPACK knowledge of teachers and TPACK model serves best to describe teacher’s knowledge for blended learning which can help in understanding the blended learning readiness of teachers.

Theoretical Framework

This study was based on the theoretical framework of The Technological Pedagogical and Content Knowledge (TPACK) Framework given by Mishra & Koehler (2006). The theoretical framework of TPACK gives a comprehensive view about the required knowledge of teachers for useful blend of technology, pedagogy and content knowledge. TPACK is a complete package for teachers‟ that is being used for research and professional development of teachers. TPACK Framework is an extension of Shulman‟s (1986) Pedagogical Content Knowledge (PCK) pattern explains the integration of appropriate pedagogical method for teaching specific content and skills required to merge the three dimensions in teaching. TPACK Framework is based on fundamental three dimensions of Content Knowledge (CK), Pedagogical Knowledge (PK) and Technological Knowledge (TK) and four constructs of Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK) and the Technological Pedagogical and Content Knowledge (TPACK). The role of TK, PK and CK is explored as a separate entity and then the relation with one another for effective learning is catered in TPACK framework. TPACK framework has proved to be a promising approach that has all the potential in improving knowledge of teachers in different domains that are prerequisite for 21st century learning.

Technological Knowledge (TK): Technological Knowledge (TK) refers to all the past and present technologies, digital gadgets, ICT applications such as MS word, Power point etc that help in making learning easier.

Content Knowledge (CK): Content Knowledge (CK) explains the knowledge which is required to teach a subject. CK is exploring teachers‟ competence about command on subject knowledge and sequencing the content according to the level of students.

Pedagogical Knowledge (PK): Pedagogical Knowledge (PK) is about all the teaching methodologies, strategies and techniques that aids in effective learning. The rest of the four constructs of TPACK framework reflect how TK, PK and CK can be supported and blended together for effective teaching and learning.

Pedagogical Content Knowledge (PCK): Pedagogical Content Knowledge (PCK) is discussed by Shulman (1986) as the ability of a teacher to mix the subject matter knowledge with suitable teaching method according to the demand and need of the learners.

Technological Content Knowledge (TCK): Technological Content Knowledge (TCK) addresses how technology can be incorporated in teaching a specific content. TCK delivers mutual relationship between technology and content. First the content knowledge is defined and then relevant technology is integrated to support the material being taught.

Technological Pedagogical Knowledge (TPK): Technological Pedagogical Knowledge (TPK) is about considering the use of technology its pros and cons, barriers, usability and convenience in reference to a particular chosen pedagogical method.

Technological Pedagogical and Content Knowledge (TPACK): Technological Pedagogical and Content Knowledge (TPACK) explains a framework for blending technology, pedagogy, content together to make learning more interesting and convenient. TPACK delivers knowledge about each component and integrating all components together for effective learning. TPACK gives an understanding to pre-service teachers about the efficient use of knowledge for technology, pedagogy and content. It is an emergent Framework which reflect the needs of today's learner of 21st Century.The model is further represented in Figure.2

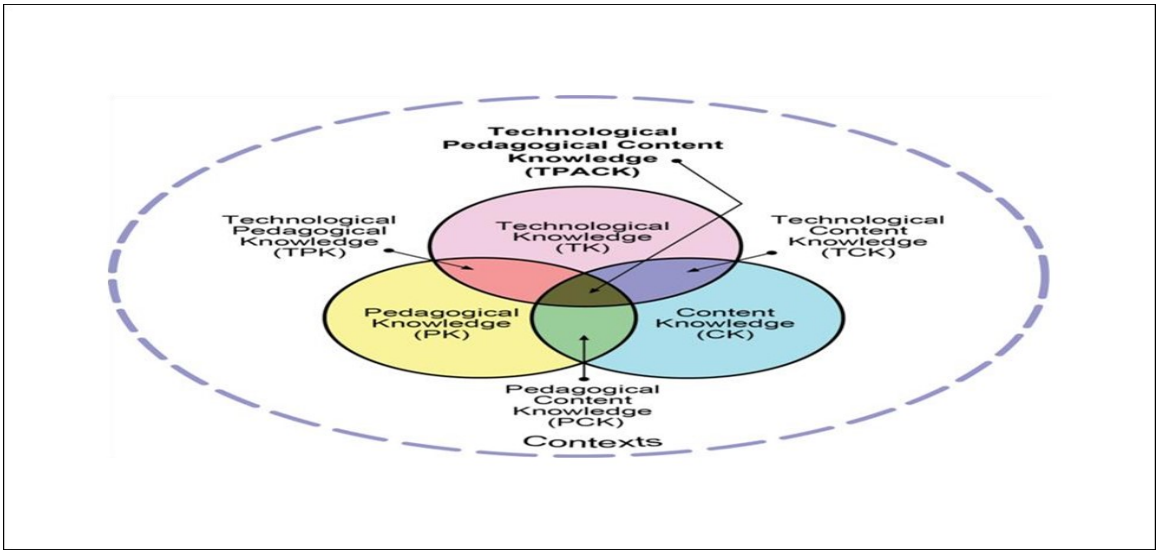

Figure 2. Technological Pedagogical Content Knowledge Model (TPACK) (Mishra & Koehler 2006)

Material and Methods

The study attempted to find out university teachers' readiness for blended learning in universities of Islamabad. It was a quantitative research study which was considered as appropriate to analyze the readiness for blended learning among university teachers. The descriptive comparative research design was used to compare the university teachers' readiness in public and private sector universities. The data for research was collected from 730 respondents which itself is a large amount of the data. By keeping this in mind the researcher decided to use quantitative approach which helped the researcher to easily handle the data to get clear results. The data collected was converted into numeric figures so that the data can be statistically analyzed in SPSS 20th Edition for making the conclusions and recommendations of the study

Population

The population of the study included 7294 teachers working in public and private sector universities of Islamabad. A complete list of both public and private universities residing in Islamabad was accessed from the official website of Higher Education Commission (see Appendix I). Total 18 universities were reported in the list recognized by HEC out of which 14 were public universities and 4 private universities.

Sample

To calculate a population as a whole it is necessary for a researcher to choose the appropriate sampling technique which will statistically represent the sub set of participants from the selected population. The population of this study comprised the university teachers of both public and private sector of Islamabad. Stratified sampling technique is preferred because this study is a descriptive comparative study where the researcher is going to compare the results of public and private sector university teachers' readiness for blended learning. Proportionate stratified sampling technique was used as it provides same sampling proportion to each subgroup. 10% from each group was extracted from each subgroup of the selected population (Krejcie & Morgan, 1970).

According to the 10% of the total (7294) population a total of (730) university teachers were considered as the sample of the study. The total number of participants in this study was unequal (public 6119 and private 1175) so it was important to divide the population into two strata both representing the equal proportion in the sample.

Sample Size

The population of this research study was divided into two major strata of public and private sector university teachers. 730 participants were considered from the entire population of university teachers. Total 18 universities were recognized by Higher Education Commission out of which 14 were public and 4 were from private sector. The total number of working faculty members in Islamabad universities was obtained from the universities statistics section available at the official website of Higher Education Commission (HEC). Out of 730 participants of the study 118 participants were considered from private sector whereas 612 participants belonged to Public Sector.

Tool Construction

Description of the Instrument

A questionnaire was adapted as a data collection tool for this study. Questionnaire is a blend of different questions that is designed on pre set objectives which is used to collect data in order to understand different point of views of the respondents of the study. Survey of Pre-service teachers' knowledge of teaching and technology questionnaire developed by Schmidt et al., (2009) was adapted in Pakistani context as a instrument of the study. The questionnaire was based on the theoretical framework of Technological Pedagogical And Content Knowledge (TPACK) presented by Mishra and Koehler (2006). The questionnaire had a total of 41 items with one demographics section and seven sub domains of Technological Pedagogical and Content Knowledge (TPACK). The Research instrument is appended as APPENDIX II. The 5 point Likert scale was used for the expression of the responses discussed below

1. Strongly Disagree (SD)
2. Disagree (D)
3. Neither Agree or Disagree (N)
4. Agree (A)
5. Strongly Agree (SA)

Demographic Information Domain

The Demographic Information Domain included the demography of the respondents‟ with Email ID (optional), age, gender, sector, teaching experience and study programme.

Technological Pedagogical And Content Knowledge (TPACK)

There were 41 items in Technological Pedagogical And Content Knowledge (TPACK) Domain based on total based on 7sub domains discussed as under

1. Technological Knowledge (TK)
2. Content Knowledge (CK)
3. Pedagogical Knowledge (PK)
4. Pedagogical Content Knowledge (PCK)
5. Technological Content Knowledge (TCK)
6. Technological Pedagogical Knowledge (TPK)
7. Technological Pedagogical And Content Knowledge (TPACK)

In the TK section there were total 6 items, CK section consisted of 12 items, PK section had 7items, PCK section included 4 items, TCK section had a total of 4items, TPK section consisted of total 9 items, TPACK section consisted of 4 items (see Table No. 3.3)

Table 1
Teachers' Knowledge of Teaching and Technology Questionnaire

S.No	Sections	Items	Total number of Items
1.	Technological Knowledge (TK)	1.2,3,4,5,6	06
2.	Content Knowledge(CK) Social studies, science, math and literacy.	7,8,9,10,11,12	06
3.	Pedagogical Knowledge (PK)	13,14,15,16,17,18,19,20	08
4.	Pedagogical Content Knowledge (PCK)	21,22,23,24	04

5.	Technological Content Knowledge (TCK)	25,26,27,28	04
6.	Technological Content Knowledge (TPK)	29,30,31,32,33,34,35,36,37	09
7.	Technological Pedagogical and Content Knowledge (TPACK)	38,39,40,41	04
8.	**Total**		**41 Items**

Validation of the Research Tool

The research tool after adapted in Pakistani context was then referred to the team of experts which belonged to the field of Education. The team of experts consisted of three PhD members serving in the field of Education. A copy of research survey questionnaire and a copy of validation Certificate were personally sent to each one of these experts by the researcher. The valuable suggestions of the experts were incorporated in the research questionnaire before the pilot testing procedure of the study

Pilot Testing

In order to determine the reliability of the research tool a pilot trial was conducted which aid in assessing the correlation between the individual items

and the sub section of the research tool i.e survey questionnaire. 50 questionnaires were distributed personally by the researcher out of which 40 were returned.

Reliability of the Research Tool

Reliability of a test may be defined as procedures that provide consistent results which reflect the intended outcomes. Cronbach‟s Alpha Coefficient was used to find out the internal consistency of the research tool. The Teachers' Knowledge of Teaching and Technology Questionnaire (TKTT) was found to be reliable at 0.89. by using Cronbach's Alpha thus the questionnaire was found to be reliable in reference to item-total relationship. There were total seven subsections that included Technological Knowledge (TK), Content Knowledge (CK), Pedagogical Knowledge (PK), Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK) and Technological Pedagogical and Content Knowledge (TPACK).

Table No. 2
Statistical Reliability Analysis- Pilot Testing

Sr.No	Tool	Reliability	No. of Items
01	Teachers' Knowledge of Teaching and Technology (TKTT)	0.892	41

Correlation

Item total correlation was computed by Statistical Package for Social Sciences (SPSS V 20) on a sample of 40 respondents. Inter section correlation depicts the sub sections in the research tool were significantly correlated with each other.

Table No.3
Item Total Correlation (N=41)

Item No	Correlation	Item No	Correlation	Item No	Correlation
TK1	0.526**	PK4	0.437**	TPK3	0.510**
TK2	0.502**	PK5	0.123	TPK4	0.434**
TK3	0.509**	PK6	0.324*	TPK5	0.382*
TK4	0.546**	PK7	0.96**	TPK6	0.612**
TK5	0.436**	PK8	0.583**	TPK7	0.321*
TK6	0.497**	PCK1	0.342*	TPK8	0.426**
CK1	0.445**	PCK2	0.456**	TPK9	0.374*
CK2	0.376*	PCK3	0.456**	TPACK1	0.194

CK3	0.357*	PCK4	0.388*	TPACK2	0.472**
CK4	0.514**	TCK1	0.509**	TPACK3	0.515**
CK5	0.518**	TCK2	0.369*	TPACK4	0.382*
CK6	0.510**	TCK3	0.373*		
PK1	0.456**	TCK4	0.523**		
PK2	0.600**	TPK1	0.568**		
PK3	0.468**	TPK2	0.497**		

*= Correlation is significant at the 0.05 level (2 tailed)

Table No. 3 depicts the item total correlation of the research tool. It was found that PK5 and TPACK 1 had lowest correlation that is less than 0.30. In this way PK5 and TPACK1 were redefined whereas the highest Item Correlation was found in PK7

Table No. 4
Inter Section Correlations-(N=41)

	TK	CK	PK	PCK	TCK	TPK	TPACK
	1						
TK							
CK	.585*	1					
PK	.552**	.454*	1				
PCK	.232**	.322**	.575*	1			
TCK	.536**	.535**	.631**	.661**	1		
TPK	.210**	.244**	.281**	.245**	.525**	1	
TPACK	.437	.338**	.595**	.528**	.577**	.395**	1

*= Correlation is significant at the 0.05 level (2 tailed)

*= Correlation is significant at the 0.01 level (2 tailed)

TK= Technological Knowledge, CK= Content Knowledge, PK= Pedagogical Knowledge, PCK= Pedagogical Content Knowledge, TCK= Technological Content Knowledge, TPK= Technological Pedagogical Knowledge and TPACK= Technological Pedagogical and Content Knowledge.

Correlation between the sub domains of the scale were significantly correlated with each other whereas TPK and TK 0.210** were the lowest correlated and the highest correlation was found in TCK and PCK that is 0.661**

Revision of the Research Tool

The research tool was revised after the pilot trial and changes were incorporated accordingly. Items PK6 and TPACK1 had correlations less than 0.30 so these items were redesigned and added in the final research tool.

Data Collection

The researcher started the process of data collection by obtaining a reference letter from National University of Modern Languages (NUML) (See APPENDIX IV). The reference letter was then sent to different public and private universities of Islamabad in order to get permission for data collection. The researcher personally visited the universities and also sent the questionnaires via email. Three to four days were given to the respondents to fill and return the questionnaire. Out of 730 questionnaires the researcher did received 520 completely filled questionnaires.

Data Analysis

The collected data was then analyzed and coded through Statistical Package for Social Sciences V 20 software (SPSS) using mean and standard deviation.

Results and Discussion

Demographics of the Sample

Demographics of the study are divided in to five sections which include gender, age, sector, teaching experience and the programme of study taught by the respondents.

Table 5
Gender as demographic characteristic of the sample (N=520)

Demographics	Categories	N	%
Gender	Male	221	42.5
	Female	299	57.5
	Total	520	100

The population of the study consisted of university teachers of Islamabad region and the study included both public and private sector universities. The Table 5 indicates the total population consisted of 520 university teachers that included (42%) male respondents which makes a total of 221 male university teachers and (57%) female respondents which makes a total of 299 female university teachers out of 520 university teachers

Table 6
Age Distribution (N=520)

Demographics	**Categories**	**N**	**%**
Age	Less than 25	133	25.6
	26-35	194	37.3
	36-45	90	17.3
	45-55	78	15
	55+	25	4.8
	Total	**520**	**100**

Table 6 revealed that 25.6% of the university teachers included in the sample were less than 25 years of age, 37.3% of the university teachers were of age between 26-35 years, 17.3% of university teachers were of age between 36-45 years, 45-55 years were of 15% and only 4.8% of the university teachers were above 55 years of age

Table 7
Sector Distribution (N=520).

Demographics	**Categories**	**N**	**%**
Sector	Public	437	84
	Private	83	16
	Total	**520**	**100**

Table 7 demonstrated that in public sector the number of respondents were 437 that makes 87% of 520 university teachers whereas in private sector the number of respondents were 83 which means that 16% responses were retrieved from private sector.

Table 8
Teaching Experience (N=520).

Demographics	**Categories**	**N**	**%**
Teaching Experience	1-5 years	217	41.7

	6-10 years	128	24.6
	11-15 years	114	21.9
	More than 15 years	61	11.7
	Total	520	100

Table 8 revealed the teaching experience of the respondents. 41.7% (N=217) of the respondents were having 1-5 years of teaching experience, 24.6% (N=128) of the respondents had teaching experience of 6-10 years, 21.9% (N=114) of the respondents had 11-15 years' experience in teaching whereas only 11.7% (N=61) of the teachers had teaching experience of more than 15 years.

Table 9
Study Programmes Wise Distribution (N=520)

Demographics	Categories	N	%
Study Programmes	BA/BS(HONS)	241	46.3
	M.A/M.Sc	104	20.0
	M.phil/MS	108	20.8
	Ph.D	67	12.9
	Total	**520**	**100**

Table 9 explored the study programmes which were taught by the university teachers in public and private universities. 46.3% (N=241) of the respondents were teaching BA/BS(HONS) programme, 20% (N=104) of the respondents were teaching M.A/M.Sc programme, 20.8 % (N=108) were teaching M.phil/MS programme and only 12.9% (N=67) of the respondents were teaching Ph.D study programme.

Table 10
Teachers' Readiness for Blended Learning

Dimensions	Mean	S.D
Technological Knowledge(TK)	3.87	0.615
Content Knowledge (CK)	4.18	0.536
Pedagogical Knowledge (PK)	4.13	0.493
Pedagogical Content Knowledge (PCK)	4.05	0.569
Technological Content Knowledge (TCK)	3.98	0.638
Technological Pedagogical Knowledge (TPK)	4.11	0.491
Technological Pedagogical And Content Knowledge (TPACK)	4.05	0.717
Teachers' Knowledge of Teaching and Technology (TKTT)	4.06	0.450

The table No. 10 points towards teachers' readiness for blended learning and the results indicated that teachers were moderate about their understanding of Technological

Knowledge (TK) (3.87) and Technological Content Knowledge (TCK) (3.98) respectively. Whereas Pedagogical Content Knowledge (PCK) (4.05), Technological Pedagogical Content Knowledge (TPACK) (4.05), Technological Pedagogical Knowledge (TPK) (4.11) and Pedagogical Knowledge (PK) (4.13) depicted that university teachers agreed on their readiness for blended learning. The overall results of table. No 4.10 showed that the university teachers were ready and aware of blended learning with a mean score 4.05 of Teachers' Knowledge of Teaching and Technology (TKTT).

To discuss the university teachers' readiness for blended learning Technological, Pedagogical And Content Knowledge framework (TPACK) by Koehlar and Mishra (2006) was used. The mean value (M) and standard deviation (SD) of seven sub domains of this model. It was found that teachers were ready and aware of using blended learning at higher education level. Average Technological Knowledge (TK) and Technological Content Knowledge were found amongst university teachers whereas teachers reported high level of Content Knowledge (CK), Pedagogical Knowledge (PK), Technological Pedagogical Knowledge (TCK), Pedagogical Content Knowledge (PCK) and Technological Pedagogical And Content Knowledge (TPACK). The results of the study were also supported by Soomro et al (2018) found that the Technological constructs of TPACK were high amongst university teachers of Education and ICT department. Another study by Liang (2013)

reported that in service teachers were quite at ease in using technology in their teaching learning process. Whereas Mahdum (2015) reported that English teachers in Indonesia had low understanding of Technological Knowledge (TK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK) and Technological Pedagogical And Content Knowledge (TPACK).

Conclusion

The research was designed to assess teachers' readiness for blended learning at higher education level. On the basis of findings of the research study following were the conclusions drawn that the university teachers' had high level of readiness for blended learning. They were aware of blending technology with their regular teaching practice. It was concluded that university teachers‟ had moderate understating of Technological Knowledge (TK) and Technological Content Knowledge (TCK).

Whereas university teachers were quite sure of their Content Knowledge (CK), Pedagogical Knowledge (PK), Technological Pedagogical Knowledge(TCK), Pedagogical Content Knowledge (PCK) and Technological Pedagogical And Content Knowledge (TPACK).

Recommendations

University teachers are aware of using technology in teaching, so university administrations may provide opportunities for them to explore tools like e-portfolios, video clips, video conferencing, tablets, iPods, Web 2.0 technologies, and online resource development to enhance their technological skills. A platform may be arranged where local and international university teachers can share knowledge on the latest trends, such as through symposiums on blended learning. The Higher Education Commission (HEC) may ensure the continuity and quality of professional development programs for teachers of all age groups. Since teachers are ready for blended learning, HEC and university administrations may provide the necessary funding and facilities to strengthen teachers' ICT and online teaching abilities. Faculty development programs specifically focused on blended learning may be introduced to help teachers manage their workload. Finally, the integration of ICT in teaching and learning, as outlined in the National Education Policy Draft 2017–2025, may be implemented by the government, stakeholders, administrators and teachers at all levels of education.

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