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Determining the Relationship between Teachers' Technological Competencies and their Performance at University Level

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Abstract

The aim of this research was to analyze the teachers' technological competencies and their performance at higher education. The teachers' technological competencies were measured in six elements of technology naming perceptions of teachers about using technology, technological knowledge of teachers, perceived ease of use of technology, perceived usefulness of technology and skills of teachers in using technology. The performance of teachers for using technology in teaching and learning process was also determined. The study consisted of two samples one form the teachers of the six social sciences departments of the six public universities of the southern Punjab and other sample was the students of 6th, 7th and 8th semesters of the six social sciences departments of the six public universities of southern Punjab, Pakistan. The samples size consisted of 497 teachers and 611 students. The samples were selected by using the stratified random sampling technique. Two questionnaires one for teachers and other for students were adopted form the literature to collect the data from the samples. The collected data was analysed by using SPSS-25. Frequency distribution,

descriptive statistics and correlation analysis was done to find the results of the study. The finds of the study indicated that most of the teachers of the social sciences departments of the public universities of southern Punjab have lack of technological competencies and their performance was not so much good. The results also indicated a low positive correlation between teachers' technological competencies and their performance at higher education level. Some serious steps are required to improve the technological competencies and performance of teachers at higher education level.

Key Words: Teachers, Technological Competencies, Performance, Higher Education Level

Introduction

Teachers play a crucial role in incorporating technology at all educational levels including higher education. So, their values and points of view must be completely grasped before any action is taken. Technology integration is a complicated process consisting several aspects such as an individual's perception about technology, technological knowledge, ease of use of technology, usefulness of technology, and technological skills. The availability of technology does not guarantee the success of technology integration. However, it must be observed from the teachers' skills and capabilities in selecting and successfully employing technology that is suitable with learning content and methodology (Abbasi et al., 2022).

The technological competency of a teacher is a significant element for using technology in teaching. Technological competence is a comprehensive concept that includes not just abilities but also perception, knowledge, and attitudes toward technology use. In this regard, technological competence entails the successful application of technology to gather, assess, store, generate, present, share information, interact over the internet, and engage in collaborative networks (Altun, 2019). Hourcade et al. (2018) pointed out that technological

competence should be viewed as the capacity to integrate context based knowledge, abilities and skills.

Many teachers face difficulties in applying the suitable technological tools according to the requirements of the learners in the globe including Pakistan at higher education level (Akram et al., 2021). Some of the teachers don't want to apply due to the anxiety of not right execution of the applied technological tool. Some teachers have no much technological knowledge and skills that how to integrate the technological tools in the teaching and learning process and some have strange perceptions about using technology in teaching and learning (Minamatov, 2021).

Statement of the Problem

Technological competency is one of the key element for the implementation and execution of technology at all educational levels. University is the most higher place of learning skills for the students. Applying the right and suitable technological tool is the esteem requirement of the learners at higher education level. Qureshi et al. (2012) stated that awareness about right technological tools is the most crucial problems for the Pakistani teachers at higher education level. Further, Akram et al. (2021) concluded in their research that most of the faculty members of universities lacked sound skills in using technology. More recently, Thaheem et al. (2022) directed a comparative research to explore the challenges in using technological tools in Pakistan and Indonesia. They resulted that the teachers from both countries faced the technological and pedagogical challenges. So, in the light of above studies, there is a need of time to conduct more research on the technological competencies of teachers and their performance at university level in Pakistan.

Objectives of the Study

This study was conducted to determine the following objectives:

1. To determine the perceptions of teachers about using technology at higher education level.

2. To identify the technological knowledge of teachers at higher education level.

3. To find perceived ease of use and perceived usefulness in technology of teachers at higher education level.

4. To determine the skills of teachers in technology at higher education level.

5. To determine the students' perceptions about their teacher's performance in using technology at higher education level.

6. To find the relationship between technological competencies of teachers and their performance at higher education level.

Review of the Literature

Technology has become the heart of any country's economic and social development. It covers all areas of life including business management, medical sciences, engineering and education. In the current scenario, technology has greatly changed the teaching and learning environments within and outside the classroom (Tondeur et al., 2020). With the advancement of modern computing technologies, different technological devices and tools are now available that are being used in various teaching and learning settings to improve the efficiency and productivity of education sector and for the betterment of the learners (Admiraal et al., 2017).

Likewise, Pakistan has also acknowledged the value of technology in education system, and the recent educational policies demonstrate that the stakeholders are particularly anxious about incorporating technology into teaching-learning methods in order to meet international requirements (Pakistan Ministry of Education, 2018). However, there are numerous issues in developing countries, such as Pakistan, that negatively impact the operative usage of technological tools in education system. These factors include deficiency of technical structure (Akram et al., 2021), lack of expertise in using technological

tools and knowledge (Asad et al., 2020), internet and login problems (Akram et al., 2022) and a lack of teachers' training in universities (Abbasi et al., 2022).

Theoretical Framework of the Study

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was adopted as the theoretical foundations for this study. TAM addresses challenges related to the adoption and usage of technology based on their perceived ease of use and perceived usefulness. Venkatesh and Davis (2000) stated that behavioral intention to utilize a system was positively correlated with perceived usefulness. The two cognitive views that support the theory on actual use by individual behavioral intention to utilize a technology system are perceived ease of use and perceived usefulness. Davis (1989) indicated that the usage of a technological structure is impacted indirectly or directly by the operator's behavior intention, perceived usefulness and perceived ease of use. The theoretical framework is presented in figure 1.
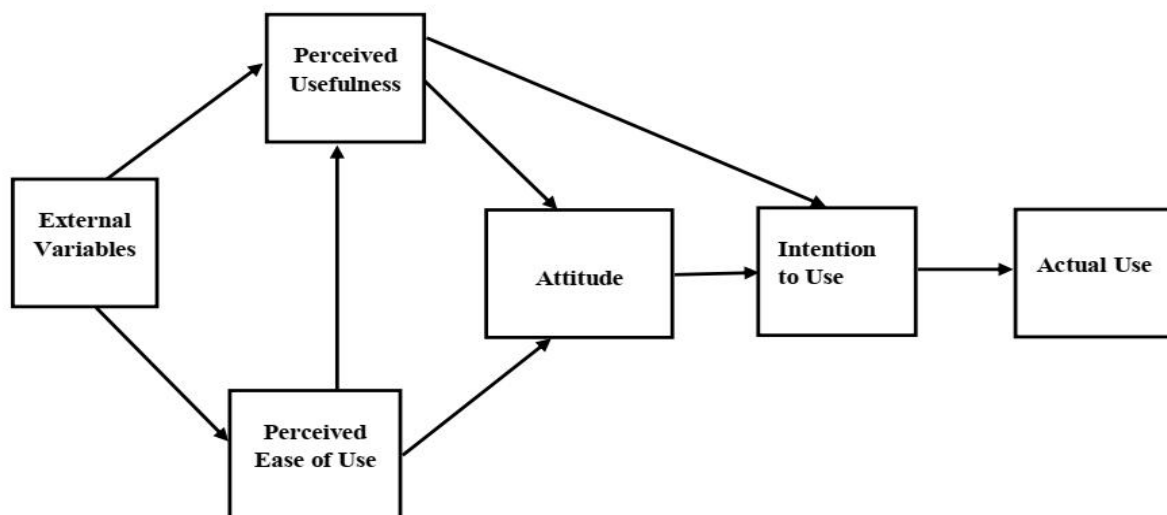

Figure.1: Technology Acceptance Model (Davis, 1989)

Conceptual Framework of the Study

Modified Technology Acceptance Model (MTAM)

A conceptual framework demonstrates how the variables in the research should be related. It outlines how the appropriate research process and goals fit together to provide meaningful results. The main objective of this research was to analyze the teachers' technological competencies and their performance at higher education level. The TAM was modified according to the current study and defined as the technological competency is the combination of perceptions about using technology, technological knowledge, perceived ease of use, perceived usefulness, and skills in using technology. All these elements determine the competency and performance of teachers in technology. The modified technology acceptance model (MTAM) formulated for current research is presented in figure 2.
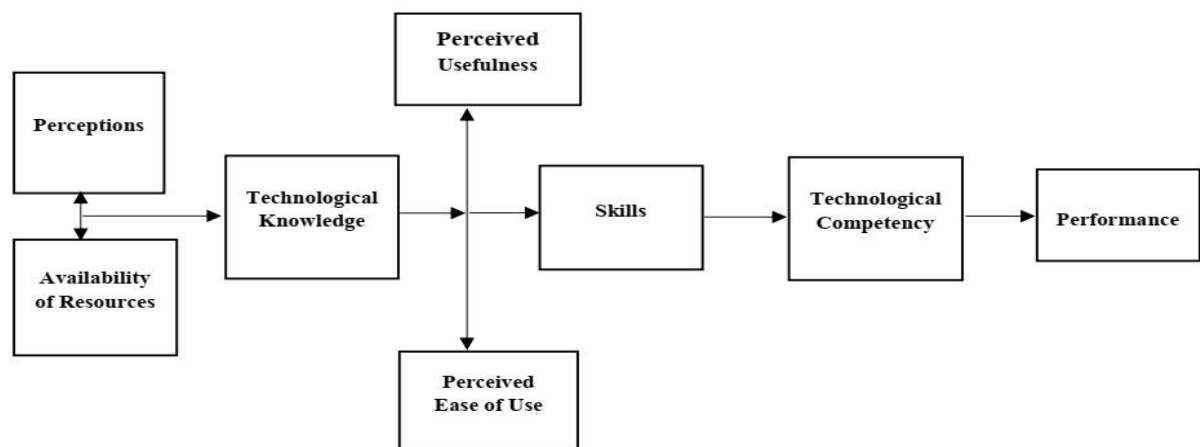

Figure.2: Modified Technology Acceptance Model (MTAM)

In modified technology acceptance model (MTAM), perceptions, availability of resources and technological knowledge as taken as external factors. Perceived ease of use and usefulness are the two interconnected factors in which perceived usefulness effects on perceived ease of use. Skills are obtained if an individual have positive perceptions, technological knowledge and perceived technology as the ease of use and perceived usefulness. Finally, the technological competency is the combination of the perceptions about technology, technological knowledge,

perceived ease of use, perceived usefulness and skills in using technology. Further, performance is the result of technological competency.

Elements of Teachers' Technological Competency

Teachers' Perceptions about Using Technology in Teaching

Teachers' perceptions are often regarded as the most important element influencing classroom technology adoption. Teachers' perceptions are essential because they influence how teachers use or do not use technology in their classrooms (Herro et al., 2021). Teachers' perspectives are critical in influencing if and how much technology is utilized in the classroom. These impressions can effect whether or not a teacher's trusts an educational technology tool is suitable for the content being taught (Iriani & Andjarwati, 2020).

Mertala (2019) stated that the way instructors perceive the usage of technology in the classroom has a big impact. Abel et al. (2022) further stressed that teachers' perceptions about employing technology are effected by their own views on the benefits of technology. Similarly, Katemba (2020) noted that essential elements influencing successful technology integration in the classroom are related with instructors, such as teachers' perceptions and behaviors. Edannur and Marie (2017) also agreed that teachers' backgrounds, including their confidence levels, technological interests, and openness to try new things, are significant components that can inspire technology integration in the classroom.

Technological Knowledge

Teachers must first identify technologies and their intended instructional functions in order to fully comprehend them. Teachers can employ a wide range of contemporary technology tools to improve their lesson plans and student participation. For example, social networking offers a lot of potential as a digital teaching tool if handled wisely and intelligently (Udayana et al., 2022). Students who use technology tools in educational settings must exercise critical thinking, be able to integrate and analyze real-world events, and have genuine learning

abilities. Although there are numerous issues with these technologies, contemporary students are already using them both inside and outside of the classroom (Simonson, 2017).

Technology knowledge cannot be as simply categorized and codified as scientific information due to the connection with a particular activity. When knowledge and expertise are particularly applied to certain technological activities, technology is best portrayed (Kimm et al., 2020). Kalinga and Ndibalema (2023) stated that there are no universals, or, to put it another way, regular patterns of technical thought. The use of technology necessitates the fusion of several diverse components that are both multichanneled and multileveled, and certain fields of technology influence particular forms of thought. In other words, technology draws on formal knowledge, but its usage is multidisciplinary and tailored to individual tasks.

Perceived Ease of Use of Technology

The degree to which someone thinks utilizing a specific technology will be easy is known as perceived ease of use (Davis, 1989). According to Baek and Sung (2020), something that is liked or sought as the foundation of something that is deemed beneficial or has components of usefulness may be regarded as being easy to use. However, consumers' perception of how simple it is to understand technology is also a measure of ease of use (Elisa et al., 2022). Users believe that the simplicity of use of information technology systems will provide them a sense of the system's utility, which will make them feel more at ease while working. A system that is difficult to regulate will deliver a poor level of convenience even if the opposite is true (Hong et al., 2021). One of the elements influencing the degree of positive attitudes toward usage is perceived ease of use (Ramayah & Ignatius, 2005).

Systems that are used more frequently indicate that their users are more familiar with, knowledgeable about, and proficient with the system. A number of factors affect how easy technology is for users to use, including reputation for the

technology acquired by the user (Salsabila & Usman, 2021), user experience with similar technology, and the use of technology that is clear and easy to understand, easy to control, flexible, and easy to become skilled with (Bregashtian & Herdinata, 2021). A positive reputation that consumers will notice will boost users' trust in how simple it is to utilize the technology.

Perceived Usefulness

Perceived Usefulness is the user's belief that using a particular system will provide improvements to their work performance (Henderson & Divett, 2003). Furthermore, Perceived Usefulness is a belief about the decision-making process (Hong et al., 2021). Teachers' perceived usefulness is an advantage that leads to their faith in the system utilized in particular applications. Perceived usefulness is the forecast of technological acceptability in society. It acts as a mechanism for instructors to believe in educational institution performance, is one of the most essential things that teachers acquire from the usage of innovation connected to the usability value of technology. In general, a person is more likely to utilize an application if it can support and facilitate the task being done (Lai & Zainal, 2015). A system's perceived usefulness impacts its adoption and user behavior. A technology is considered successful if it gives the utility value that people demand. System users will use it if the system is advantageous, regardless of how basic or sophisticated the system is. Usman et al. (2020) stated that perceived usefulness is the degree to which a person believes that using a certain system would improve its performance. Udayana et al. (2022) also supported that perceived usefulness has a favorable impact on attitude and intention to adopt technology.

Skills in Using Technology in Teaching

Technological skills are the knowledge and abilities needed to operate computer-based technologies and carry out technological tasks. Due to the fact that they are frequently learned through formal education, practice, and training, technology skills are regarded as hard skills. These abilities are useful for handling

technological, scientific, mechanical, and mathematical challenges. In addition to general abilities, technological skills appear to be key to people's future life happiness in today's information society. Age, income, and the crucial 21st century skills of critical thinking, problem-solving, communication, and technology were found to favorably influence life satisfaction (Manco-Chavez et al., 2020).

Teachers must be equipped with the necessary skills, abilities, perspectives, and information to fully utilize technology in the classroom if effective technology integration is to occur. The integration of technology into teaching and learning is a challenging, dynamic process. If classroom teachers cannot better integrate technology integration development, effective technological integration in education cannot be achieved. The acquisition of competencies, abilities, and knowledge about the use of contemporary technology integration within the process of their professional improvement and growth is a crucial element of training programs for teachers (Hanshaw & Hanson, 2019).

Research Questions

Following research questions were addressed in this research study:

1. What are the perceptions of teachers about using technology?

2. Do the teachers have technological knowledge at higher education level?

3. How much teachers feel ease in using technology?

4. How much teachers feel technology as usefulness?

5. Do teachers have skills in using technology at higher education level?

6. What are the perceptions of students about the performance of their teachers in technology?

7. What is the relationship between technological competencies of teachers and their performance at higher education level?

Research Methodology

Design of the Study

A research design outlines the strategy for the investigation to ascertain the causal connection between both dependent and independent variables. It is a strategy for seeking solutions to the research questions. To address the questions mentioned in this study, the survey research design was employed. The data was gathered using a survey approach. Typically, a sizable sample of respondents is chosen from the known population for surveys (Kelly, 2016). The most notable characteristic of survey design is that it increases the proportion of individuals who participate. This lays the way for adaptable, dependable, and somewhat objective analysis (Lam & Ducreux, 2013). As the population of study was large, the survey approach was employed to collect the data.

Population of the Study

For this research study, two groups of population comprised of teachers and students of six social sciences departments of six public universities naming Ghazi University (GU), Bahauddin Zakariya University (BZU), Islamia University of Bahawalpur (IUB), Khawaja Fareed University of Engineering and Information Technology (KFUEIT), Emerson University (EU) and University of Layyah (UL) situated in south Punjab were selected. All the teachers who are teaching and the students studying in 6th, 7th and 8th semesters of six social sciences departments including Education, Psychology, Sociology, Business Administration, Political Science and Economics were selected as the population of the study. The department wise population of teachers and students of six social sciences departments of public universities of southern Punjab are shown in table 1.

Table 1: Population of Teachers and Students of Public Universities of Southern Punjab

Sr. No	University Name	Department	Teachers Male	Female	Total	Students Male	Female	Total
1	BZU	Education	18	13	31	296	156	452
		Psychology	12	25	37	204	240	444
		Political Science	17	10	27	280	144	424
		Economics	18	11	29	282	138	420
		Sociology	13	11	24	242	170	412
		Management Sciences	51	34	85	762	578	1340
2	GU	Education	11	4	15	212	98	310
		Political Science	11	6	17	114	28	142
		Economics	10	5	15	222	84	306
		Sociology	9	7	16	172	108	280
		Management Sciences	21	14	35	246	164	410
3	IUB	Education	32	30	62	736	544	1280
		Psychology	14	22	36	162	252	414
		Political Science	17	10	27	234	138	372
		Economics	19	13	32	234	138	372
		Sociology	13	15	28	172	174	346
		Management Sciences	44	34	78	662	522	1184
4	KFUEIT	Education	13	10	23	212	134	346

		Management Sciences	21	18	39	280	142	422
5	EU	Education	13	3	16	178	80	258
		Psychology	10	8	18	142	136	278
		Political Science	11	3	14	166	76	242
		Sociology	10	3	13	166	82	248
		Economics	11	6	17	198	56	254
6	UL	Education	11	6	17	160	152	312
		Psychology	9	10	19	156	160	316
		Sociology	7	9	16	178	122	300
		Economics	11	7	18	200	78	278
		Management Sciences	16	13	29	228	126	354
Total			473	360	833	7674	5020	12694

(Source: Universities prospectus 2022-2023)

Table 1 shows that there were total 833 teachers including 473 male teachers and 360 female teachers teaching in the selected social sciences departments of the selected six general public universities of southern Punjab and taken as the population of the study. Table 1 also indicates the department wise population of students of selected social sciences departments of the selected general public universities of the southern Punjab. Table shows that there were studying 12694 students including 7674 male students and 5020 female students in 6th, 7th and 8th semesters of selected social sciences departments of selected general universities of southern Punjab were taken as the population of the study.

Sampling Technique and Sample Size

A sampling technique is a statistical approach that entails carefully analyzing the information acquired about the population and choosing a suitable sample based

on that information. For the current study, stratified random sampling technique was used to select the appropriate sample as the population consisted of different strata's (University, Department, Male and Female). The stratified random sampling technique is used when different subgroups have been identified in the population. The process of choosing a sample that includes members of defined subgroups in the proportion that they make up the population is known as stratified random sampling.

Table 2: Sample Size of Teachers and Students of Public Universities of Southern Punjab

Sr. No	University	Department	Teachers		Total	Students		Total
			Male	Female		Male	Female	
1	BZU	Education	12	8	20	15	7	22
		Psychology	7	15	22	10	12	22
		Political Science	9	6	15	14	7	21
		Economics	11	6	17	14	6	20
		Sociology	8	6	14	12	9	21
		Management Sciences	37	22	59	37	28	65
2	GU	Education	7	2	9	11	4	15
		Political Science	6	3	9	11	3	14
		Economics	5	3	8	8	3	11
		Sociology	5	5	10	9	6	15
		Management Sciences	11	9	20	12	5	17
3	IUB	Education	20	18	38	36	26	62
		Psychology	9	15	24	8	12	20

		Political Science	10	6	16	11	5	16
		Economics	12	9	21	11	6	17
		Sociology	9	10	19	8	8	16
		Management Sciences	32	22	54	32	35	67
4	KFUEIT	Education	6	5	11	10	5	15
		Management Sciences	9	8	17	13	5	18
5	EU	Education	7	2	9	9	3	12
		Psychology	4	5	9	8	5	13
		Political Science	7	2	9	9	3	12
		Sociology	6	2	8	9	3	12
		Economics	5	3	8	9	3	12
6	UL	Education	4	3	7	9	7	15
		Psychology	5	4	9	7	8	15
		Sociology	3	4	7	8	5	13
		Economics	5	3	8	11	3	14
		Management Sciences	6	4	10	11	6	17
	Total		284	213	497	377	234	611

Table 2 shows the sample size of the teachers and students of six social sciences departments of six general public universities of the southern Punjab. The sample was identified with stratified random sampling technique and calculated by using online calculator. A sample of 497 teachers from which 284 male teachers and 213 female teachers was selected for the study. Similarly, a sample size of 611 students including 377 male students and 234 female students was also selected by

following the stratified random sampling technique and calculated by online calculator.

Development of Data Collection Instruments

In this research two questionnaires (one for teachers and other for students) were adapted from the research studies conducted by (Afari & Achampong, 2010; Kahveci, Mollaei & Riasati, 2013; Samuel et al., 2018; Mills & Gay, 2019). The questionnaire of teachers was comprised of five elements including perceptions of teachers about using technology, technological knowledge, perceived ease of use of technology, perceived usefulness and skills in using technology. The items of standardized questionnaires were slightly modified in the light of pilot testing results as well as in the light of expert opinion along with the help of supervisor. Both the questionnaires were based on the five point Likert scale having options of strongly disagree, disagree, neutral, agree and strongly agree. Teachers' questionnaire consisted of 34 items including five elements to determine the teachers' technological competency and students' questionnaire was comprised of 18 items to find the teachers performance in technology usage in teaching and learning process.

Validity of Data Collection Instruments

Expert Opinion

Data collection instruments were sent to the 3 subject experts who were PhD in Education to get their suggestions and opinions on the data collection instruments. The data collection instruments were then improved and modified according to their opinions and suggestions.

Pilot Testing

Both data collection instruments were also administered for pilot testing. For teachers' questionnaire, 30 teachers including 20 males and 10 females were selected (which were not included in actual sampling) for pilot testing. On the basis of results of the pilot testing, a few modifications were made to the

questionnaire of teachers. Similarly, for students' questionnaire, 40 students including 20 males and 20 females were selected (that were not included in the actual sampling) for pilot testing. Then a few changes were made on the basis of results of pilot testing.

Reliability of Data Collection Instruments

Reliability of Students' Data Collection Instrument

The reliability of student's data collection instrument was determined on the basis of the responses obtained through the pilot testing of the student's questionnaire. The students' data collection tool was used to determine the performance of teachers in technology. Student's data collection instrument was comprised of 18 items. The Cronbach's alpha test was used to determine the reliability coefficient through SPSS version 25. The reliability coefficient (α) for students' data collection instrument was obtained as 0.870. Konting et al. (2009) proposed that value of reliability coefficient (α) 0.870 is good for conducting the research. The value of α is shown in table 3.

Table 3: Reliability Coefficient (α) of Students Data Collection Instrument

Respondents	Items	Cronbach Alpha (α)
Students	18	0.870

Reliability of Teachers' Data Collection Instrument

The reliability coefficient for teachers' data collection instrument was determined on the basis of the responses obtained through the pilot testing of the teachers' questionnaire. Teachers' data collection tool was comprised of 35 items. The internal consistency reliability coefficient (α) was calculated by using Cronbach's Alpha test through SPSS version 25. The overall reliability coefficient (α) for teachers' data collection tool was 0.846. According to Konting et al. (2009), the value of reliability coefficient (α) 0.846 is good for conducting the research. The overall and factor wise reliability coefficient (α) of teachers' data collection tool is shown in table 4.

Table 4: Element Wise and Overall Reliability Coefficient of Teachers' Data Collection Instrument

Sr. No.	Elements of Teachers' Technological Competencies	No. of Items	Cronbach's Alpha (α) value
1	Perception	9	0.765
2	Technological Knowledge	7	0.863
3	Perceived Ease of Use	8	0.879
4	Perceived Usefulness	5	0.891
5	Skills in Using Technology	5	0.796
6	Overall	34	0.846

Analysis of Data

The collected data from the teachers and students through questionnaire was analysed by using the SPSS-25. The data was analysed by applying frequency distribution, descriptive statistical and correlation tools to determine the teachers' technological competencies and their performance at higher education level.

Results

Frequency Distribution of Demographic Information of Teachers

Table 5 shows the frequency distribution of the teachers' demographics information. Table shows that from the total sample of 497 teachers, 284 were male teachers and 213 were female teachers. The percentage of male teachers was 57% and it was 43% for female teachers. The frequency distribution regarding academic qualifications of teachers showed from the total sample of 497 teachers, 188 teachers were M. Phil qualified, 309 teachers were Ph. D qualified and no teachers have post-doctorate qualification. The percentage of M.Phil. qualified teachers was 38% and the percentage of Ph. D qualified teachers was 62%. The frequency distribution regarding the department wise shows that from the total sample size of 497 teachers, 96 teachers were form education department, 67 teachers were from psychology department, 161 teachers were from management

sciences department, 64 teachers were from economics department, 60 teachers were from sociology department and 49 teachers were from political science department. The percentage of teachers from education department was 19.3%, from psychology department 13.5%, from management sciences department 32.4%, from economics department 12.9%, from sociology department 12.1% and the percentage of teachers from political science department was 9.9%. The frequency distribution regarding the university wise sample shows that form the total sample of 497 teachers, 56 teachers were from GU, 147 teachers were from BZU, 172 teachers were from IUB, 28 teachers were from KFUEIT, 49 teachers were from EU and 45 teachers were from UL. The percentage of teachers from GU was 11.3%, from BZU 29.6%, from IUB 34.6%, from KFUEIT 5.6%, from EU 9.9% and the percentage of teachers from UL was 9.1%.

Table 5: Frequency Distribution of Demographic Information of Teachers

Variable	Frequency	Percentage (%)
Gender		
Male	284	57%
Female	213	43%
Total	497	100%
Academic Qualifications of Teachers		
M. Phil	188	38%
Ph.D	309	62%
Post-Doctorate	0	0%
Total	**497**	**100%**
Department Wise Teachers		
Education	96	19.3%
Psychology	67	13.5%
Management Sciences	161	32.4%

Economics	64	12.9%
Sociology	60	12.1%
Political Science	49	9.9%
Total	**497**	**100%**
University Wise Teachers		
Ghazi University	56	11.3%
BZU	147	29.6%
IUB	172	34.6%
KFUEIT	28	5.6%
Emerson University	49	9.9%
University of Layyah	45	9.1%
Total	**497**	**100%**

Frequency Distribution of Demographic Information of Students

Table 6 shows the frequency distribution of the students' demographics information. Table shows that from the total sample of 611 students, 377 were male students and 234 were female students. The percentage of male students was 62% and it was 38% for female students. The frequency distribution regarding the semester wise students shows that from the total sample of 611 students, 201 students were from 6th semester, 205 students were from 7th semester and 205 students were from 8th semester. The percentage of 6th semester students was 32.9%, 7th semester it was 33.6% and 33.6% students were from 8th semester. The department wise frequency distribution shows that 143 students were from education department, 69 students were from psychology department, 181 students were from management sciences department, 77 students were from economics department, 79 students were from sociology department and 62 students were from political science department. The percentage of students from

education department was 23.4%, 69% students from psychology department, 29.6% students from management sciences department, 12.6% students from economics department, 12.9% students from sociology department and 10.1% students were from political science department. The university wise frequency distribution of students shows that 76 students were from GU, 173 students were from BZU, 193 students were from IUB, 35 students were from KFUEIT, 59 students were from EU and 75 students were from UL. The percentage of students from GU was 12.4%, 28.3% students were from BZU, 31.6% students were from IUB, 5.7% students were from KFUEIT, 9.7% students were from Emerson university and 12.3% students were from university of Layyah.

Table 6: Frequency Distribution of Demographic Information of Students

Variable	Frequency	Percentage (%)
Gender		
Male	377	62%
Female	234	38%
Total	611	100%
Semester Wise Students		
6th	201	32.9%
7th	205	33.6%
8th	205	33.6%
Total	611	100%
Department Wise Students		
Education	143	23.4%
Psychology	69	11.3%
Management Sciences	181	29.6%
Economics	77	12.6%
Sociology	79	12.9%

Political Science	62	10.1%
Total	**611**	**100%**
University Wise Students		
Ghazi University	76	12.4%
BZU	173	28.3%
IUB	193	31.6%
KFUEIT	35	5.7%
Emerson University	59	9.7%
University of Layyah	75	12.3%
Total	**611**	**100%**

Descriptive Statistical Analysis of Elements of Teachers' Technological Competencies

Perceptions of Teachers about Using Technology

The first objective of this research study was "To determine the perceptions of teachers about using technology at higher education level" and the research question regarding this objective was "What are the perceptions of the teachers about using technology?". To determine the perception of teachers about using technology descriptive statistical analysis was done. The results of descriptive statistical analysis are presented in table 7.

Table 7: Perceptions of Teachers about Using Technology

Sr. No	Statement	M	SD
1	I think technology makes me more professional in teaching	3.21	0.862
2	I believe that using technology changes the learning climate of classroom	3.42	0.791
3	Efficient use of technology creates a positive relationship	3.19	0.721

between teachers and students

4	I feel that using technology makes my teaching more effective	3.37	0.740
5	Technology satisfies the learning requirements of the learners	3.51	0.729
6	Using technology helps me in preparation of my teaching materials	3.61	0.634
7	I feel more confident by using technology in teaching	3.22	0.880
8	I think that integration of technology greatly influences on teaching styles	3.29	0.651
	Overall	3.29	0.751

Table 7 shows the results of the descriptive statistical analysis of perceptions of teachers about using technology at higher education level for each statement and overall. The mean value (M) for statement that I think technology makes me more professional in teaching was 3.21 and the standard deviation (SD) was 0.862 for this statement. As the value of mean for this statement is more than 3 So, most of the teachers think that technology make them more professional in teaching. The M value for the statement that I believe that using technology changes the learning climate of classroom was 3.42 and the value of SD was 0.791. As the mean value for this statement is more than 3 so, most of the teachers believe that using technology changes the learning climate of classroom. The mean value for the statement that efficient use of technology creates a positive relationship between teachers and students was 3.19 and the value of SD 0.721. As the mean value for this statement is more than 3 so, most of the teachers think that efficient use of technology creates a positive relationship between teachers and students. The M value for the statement that I feel that using technology makes my teaching more effective was 3.37 and value of SD was 0.740. As the mean value is more than 3 so, most of the teachers think that technology make their teaching more effective. The M value for the statement that technology satisfies the learning requirements of the learners was 3.51 and the value of SD was 0.729. As the mean value is more

than 3 so, most of the teachers think that technology satisfies the learning requirements of the learners. The M value for the statement that Using technology helps me in preparation of my teaching materials was 3.61 and the value of SD was 0.634. As the mean value is more than 3 so, most of the teachers think that using technology help them in preparation of their teaching materials. The M value for the statement that I feel more confident by using technology in teaching was 3.22 and the value of SD was 0.880. As the mean value is more than 3 so, most of the teachers feel more confident by using technology in teaching. The M value for the statement that I think that integration of technology greatly influences on teaching styles was 3.29 and the value of SD was 0.651. As the mean value is more than 3 so, most of the teachers think that integration of technology greatly influences on their teaching styles. The overall mean value of the perceptions of teachers about using technology in higher education was 3.29 and the SD value was 0.751. As the overall mean value is more than 3 so, most of the teachers have positive perceptions about the using of technology in higher education.

Technological Knowledge

The second objective of this research study was "To identify the technological knowledge of teachers at higher education level and the research question regarding this objective was "Do the teachers have technological knowledge at higher education level?" The results of descriptive analysis of technological knowledge of teachers are shown in table 8.

Table 8: Technological Knowledge of Teachers

Sr. No	Statement	M	SD
1	I know how to solve my technical problems	2.78	0.887
2	I have enough knowledge about how to use the technological tools in teaching	2.67	0.782
3	I know the recent developments of technology used in	2.92	0.887

	teaching and learning		
4	I have enough knowledge about technology to get my teaching job done	2.97	0.714
5	I have enough knowledge to teach technology related courses proficiently	2.73	0.792
6	I have enough knowledge about how to deliver online lecture by using different technological tools	3.11	0.872
7	I know how to use different websites for preparing teaching materials	2.99	0.654
	Overall	**2.79**	**0.798**

Table 8 shows the results of the descriptive statistical analysis of technological knowledge of teachers for each statement and overall. The mean value (M) for the statement that I know how to solve my technical problems was 2.78 and the value of standard deviation (SD) was 0.887. As the mean value was less than 3 so, most of the teachers don't know how to solve their technical problems. The M value for the statement that I have enough knowledge about how to use the technological tools in teaching was 2.67 and the value of SD was 0.782. As the mean value is less than 3 so, most of the teachers don't have enough knowledge about how to use the technological tools in teaching. The M value for the statement that I know the recent developments of technology used in teaching and learning was 2.82 and the value of SD was 0.887. As the mean value is less than 3 so, most of the teachers don't know the recent developments of technology used in teaching and learning. The M value for the statement that I have enough knowledge about technology to get my teaching job done was 2.97 and the value of SD was 0.714. As the mean value is less than 3 so, most of the teachers don't have enough knowledge about technology to get their teaching job done. The M value for the statement that I have enough knowledge to teach technology related courses proficiently was 2.73 and the value of SD was 0.792. As the mean value is less than 3 so, most of the

teachers don't have enough knowledge to teach technology related courses proficiently. The mean value for the statement that I have enough knowledge about how to deliver online lecture by using different technological tools was 3.11 and value of SD was 0.872. As the mean value is more than 3 so, most of the teachers have enough knowledge about how to deliver online lecture by using different technological tools. The value of M for the statement that I know how to use different websites for preparing teaching materials was 2.99 and the value of SD was 0.654. As the value of mean is less than 3 so, most of the teachers don't know how to use different websites for preparing teaching materials. The overall mean value was 2.79 and the value of SD was 0.798. As the overall mean value is less than 3 so, the results of the descriptive statistical analysis showed that most of the teachers don't have technological knowledge in social sciences departments at higher education level.

Perceived Ease of Use of Technology

The third objective of this research study was "To find perceived ease of use and perceived usefulness in technology of teachers at higher education level and the research question regarding this objective was "How much teachers feel ease in using technology?" To achieve this attended objective and to find the answer of the research question, descriptive analysis was applied. The results of descriptive analysis are shown in table 9.

Table 9: Perceived Ease of Use of Technology

Sr. No	Statement	M	SD
1	I can easily use technological tools/devices in teaching	2.56	0.887
2	It is easy for me to execute the using of technology in teaching	2.61	0.891
3	I face no trouble in remembering how to use technology for teaching related tasks	2.43	0.820

4	My interaction in using technology for teaching is understandable and clear	2.81	0.816
5	It is easy for me to become skillful for using technology in teaching	2.84	0.923
6	It is easy for me to find the teaching materials by using technology	2.81	0.682
7	It is easy for me to manipulate the technological tools during teaching	2.70	0.712
8	I can easily manage the troubleshoot problems related to technology	2.47	0.920
	Overall	2.65	0.831

Table 9 shows the results of the descriptive statistical analysis of the perceived ease of use of technology for each statement and overall. Table shows that the mean value(M) for the statement that I can easily use technological tools/devices in teaching was 2.56 and the value of standard deviation (SD) was 0.887. As the value of mean is less than 3 so, most of the teachers cannot easily use technological tools/devices in teaching. The M value for the statement that it is easy for me to execute the using of technology in teaching was 2.61 and the value of SD was 0.891. As the mean value is less than 3 so, it is not easy for most of the teachers to execute the using of technology in teaching. The M value for the statement that I face no trouble in remembering how to use technology for teaching related tasks was 2.43 and the value of SD was 0.820. As the mean value is less than 3 so, most of the teachers face troubles in remembering how to use technology for teaching related tasks. The M value for the statement that My interaction in using technology for teaching is understandable and clear was 2.81 and value of SD was 0.816. As the mean value is less than 3 so, most of the teachers don't have understandable and clear interactions in using technology for teaching. The M value for the statement that It is easy for me to find the teaching materials by

using technology was 2.81 and the value of SD was 0.682. As the mean value is less than 3 so, it was not easy for most of the teachers to find the teaching materials by using technology. The M value for the statement that It is easy for me to manipulate the technological tools during teaching was 2.70 and the value of SD was 0.712. As the mean value is less than 3 so, it was not easy for most of the teachers to manipulate the technological tools during teaching. The M value for the statement that I can easily manage the troubleshoot problems related to technology was 2.47 and the value of SD was 0.920. As the mean value is less than 3 so, most of the most was unable to easily manage the troubleshoot problems related to technology. The overall mean of the perceived ease of use of technology was 2.65 and the value of SD was 0.831. As the value of overall mean was less than 3 so, most of the teachers of social sciences departments perceived that they cannot easily use the technology in teaching at higher education level.

Perceived Usefulness

The third objective of this research was "To find perceived ease of use and perceived usefulness in technology of teachers at higher education level" and the research question regarding this objective was "How much teachers feel technology as usefulness?" To achieve this intended objective and to find the answer of the research question, descriptive analysis was applied. The results of descriptive analysis are shown in table 10.

Table 10: Perceived Usefulness of Technology

Sr. No	Statement	M	SD
1	Technology improved my teaching skills	3.11	0.772
2	Technology improved my work efficiency	3.19	0.784
3	Using technology enhanced the effectiveness of my teaching activities	3.34	0.809
4	Using technology improved my quality of teaching	3.23	0.784

5	Technology based teaching improved the productivity of my department/ faculty	3.59	0.813
6	Using technology enables me to accomplish teaching tasks more quickly	3.22	0.721
	Overall	3.28	0.780

Table 10 shows the results of the descriptive statistical analysis of the perceived usefulness of technology in teaching at higher education level. Table shows that the mean value (M) for the statement that Technology improved my teaching skills was 3.11 and the value of standard deviation (SD) was 0.772. As the value of mean was more than 3 so, most of the teachers perceived that technology improved their teaching skills. The M value for the statement that Technology improved my work efficiency was 3.19 and the value of SD was 0.784. As the mean value was more than 3 so, most of the teachers perceived that Technology improved their work efficiency. The M value for the statement that using technology enhanced the effectiveness of my teaching activities was 3.34 and the value of SD was 0.809. As the mean value was more than 3 so, most of the teachers perceived that using technology enhanced the effectiveness of their teaching activities. The M value for the statement that using technology improved my quality of teaching was 3.23 and the value of SD was 0.784. As the mean value was more than 3 so, most of the teachers perceived that using technology improved their quality of teaching. The M value for the statement that technology based teaching improved the productivity of my department/ faculty was 3.59 and the value of SD was 0.792. As the mean value was more than 3 so, most of the teachers perceived that technology based teaching improved the productivity of their departments/ faculties. The M value for the statement that using technology enables me to accomplish teaching tasks more quickly was 3.22 and the value of SD was 0.721. As the mean value is more than 3 so, most of the teachers perceived that using technology enable them to accomplish teaching tasks more quickly. The

overall mean value of the perceived usefulness of technology was 3.28 and the value of SD was 0.780. As the overall mean value was more than 3 so, most of the teachers of social sciences departments perceived technology as usefulness in teaching at higher education level.

Skills in Using Technology

The fourth objective of this research was "To determine the skills of teachers in technology at higher education level" and the research question related to this objective was "Do teachers have skills in using technology at higher education level? To achieve this intended objective and to find the answer of the research question, descriptive analysis was applied. The results of descriptive statistics are shown in table 11.

Table 11: Skills of Teachers in Using Technology

Sr. No	Statement	M	SD
1	I can complete a task using technology without calling someone to help me	2.44	0.885
2	I feel confident using technological tools for classroom interactions	2.34	0.935
3	I feel confident in using technology for teaching contents	2.22	0.763
4	I feel competent in using technology in teaching	2.18	0.601
5	I can use advanced technological tools like SPSS, Statistics etc. for research purposes	2.32	0.611
	Overall	2.67	0.752

Table 11 shows the results of the descriptive statistical analysis of the skills of teachers in using technology at higher education level. Table shows that the mean value (M) for the statement that I can complete a task using technology without calling someone to help me was 3.44 and the value of standard deviation (SD) was 0.885. As the mean value is less than 3 so, most of the teachers don't have the skills

to complete a task using technology without calling someone to help me. The M value for the statement that I feel confident using technological tools for classroom interactions was 2.34 and the value of SD was 0.935. As the mean value is less than 3 so, most of the teachers don't feel confident using technological tools for classroom interactions. The M value for the statement that I feel confident in using technology for teaching contents was 2.22 and the value of SD was 0.763. As the value of mean is less than 3 so, most of the teachers don't feel confident in using technology for teaching contents. The M value for the statement that I feel competent in using technology in teaching was 2.32 and the value of SD was 0.601. As the mean value is less than 3 so, most of the teachers don't feel competent in using technology in teaching. The M value for the statement that I can use advanced technological tools like SPSS, Statistics etc. for research purposes was 2.32 and the value of SD was 0.611. As the mean value is less than 3 so, most of the teachers don't have skills to use advanced technological tools like SPSS, Statistics etc. for research purposes. The overall mean value was 2.67 and the value of SD was 0.752. As the mean value was less than 3 so, most of the teachers of social science departments stated that they don't have skills of using technology in teaching at higher education level.

Descriptive Statistical Analysis of Performance of Teachers

Perceptions of Students about their Teachers' Performance in Technology

The fifth objective of this research was "To determine the students' perception about their teacher's performance in use of technology and the research question regarding this objective was "What are the perceptions of students about their teachers' performance in technology?" To achieve this intended objective and to find the answer of the research question, the descriptive statistical analysis was used. The results of statistical analysis are shown in table 12.

Table 12: Perceptions of Students about their Teachers' Performance in Technology

Sr. No	Statement	M	SD
1	My teacher knows much about technology	2.61	0.861
2	My teacher feels relax while using technology during lecture	2.50	0.965
3	My teacher solves the technical problems efficiently	2.35	1.032
4	My teacher has sufficient knowledge about how to use technological tools in teaching	2.44	0.972
5	My teacher knows the recent developments of technology used in teaching	2.36	1.092
6	My teacher has sufficient knowledge to teach the technology related courses effectively	2.33	1.092
7	My teacher has sufficient skills to use advanced technological tools like SPSS, Statistics etc. for research purpose	2.34	1.091
8	My teacher is competent in using technology	2.06	1.215
9	My teacher feels confident in using technology	2.62	0.823
10	My teacher has sufficient technological skills to improve the learning process	2.43	0.978
11	My teacher effectively performs the teaching related activities by using technology	2.66	0.801
12	My teacher has skills to search the up to date contents by using different websites	2.49	0.934
13	My teacher executes the application of technology into useful learning	2.59	0.849
14	My teacher knows how to deliver online lecture using technological tools like Microsoft teams, zoom meeting etc.	2.65	0.802
15	My teacher knows how to manage the technological tools	2.87	1.001

	during teaching		
16	My teacher has enough knowledge to give right direction to the students for using technological tools	2.40	0.979
17	My teacher has clear concepts and understanding about how to use the different technological tools	2.36	1.092
18	My teacher knows how to use the right tools according to the requirement of the subject matter	2.44	0.972
	Overall	**2.57**	**0.975**

Table 12 shows the descriptive statistical analysis of the perceptions of the students about their teachers' performance in technology using in teaching at higher education level. Table shows that the mean value (M) for the statement that my teacher knows much about technology was 2.61 and value of standard deviation (SD) was 0.861. As the value of mean is less than 3 so, most of the students perceive that their teachers don't know much about technology. The M value for the statement that my teacher feels relax while using technology during lecture was 2.50 and the value of SD was 0.965. As the value of mean is less than 3 so, most of the students perceive that their teachers don't feel relax while using technology during teaching. The M value for the statement that my teacher solves the technical problems efficiently was 2.35 and the value of SD was 1.032. As the mean value is less than 3 so, most of the students perceive that their teachers don't have the ability to solve the technical problems efficiently.

The M value for the statement that my teacher has sufficient knowledge about how to use technological tools in teaching was 2.44 and the value of SD was 0.972. As the mean value was less than 3 so, most of the students perceive that their teachers don't have sufficient knowledge about how to use technological tools in teaching. The M value for the statement that My teacher knows the recent developments of technology used in teaching was 2.36 and the value of SD was 1.092. As the mean value is less than 3 so, most of the students perceived that their

teachers don't know the recent developments of technology used in teaching. The M value for the statement that my teacher has sufficient knowledge to teach the technology related courses effectively was 2.33 and the value of SD was 1.092. As the mean value is less than 3 so, most of the students perceived that their teachers don't have sufficient knowledge to teach the technology related courses effectively. The M value for the statement that my teacher is competent in using technology was 2.06 and the value of SD was 1.215. As the mean value is less than 3 so, most of the students perceived that their teachers were not competent in using technology.

The M value for the statement that my teacher feels confident in using technology was 2.62 and the value of SD was 0.823. As the mean value is less than 3 so, most of the students perceived that their teachers don't feel confident in using technology. The M value for the statement that my teacher has sufficient technological skills to improve the learning process was 2.43 and the value of SD was 0.978. As the mean value is less than 3 so, most of the students perceived that their teachers don't have sufficient technological skills to improve the learning process. The M value for the statement that my teacher effectively performs the teaching related activities by using technology was 2.66 and the value of SD was 0.801. As the mean value is less than 3 so, most of the students perceived that their teachers don't effectively perform the teaching related activities by using technology. The M value for the statement that my teacher has skills to search the up to date contents by using different websites was 2.49 and the value of SD was 0.934. As the mean value is less than 3 so, most of the students perceived that their teachers don't have skills to search the up to date contents by using different websites. The M value for the statement that my teacher executes the application of technology into useful learning 2.59 and the value of SD was 0.849. As the mean value is less than 3 so, most of the students perceived that their teachers don't execute the application of technology into useful learning. The M value for the

statement that my teacher knows how to deliver online lecture using technological tools like Microsoft teams, zoom meeting etc. was 2.65 and the value of SD was 0.802. As the mean value was less than 3 so, most of the students perceived that their teachers don't know how to deliver online lecture using technological tools like Microsoft teams, zoom meeting etc. The M value for the statement that my teacher knows how to manage the technological tools during teaching was 2.87 and the value of SD was 1.001. As the mean value is less than 3 so, most of the students perceived that perceived that their teachers don't know how to manage the technological tools during teaching.

The M value for the statement that my teacher has enough knowledge to give right direction to the students for using technological tools was 2.40 and the value of SD was 0.979. As the mean value is less than 3 so, most of the students perceived that their teachers don't have enough knowledge to give right direction to the students for using technological tools. The M value for the statement that my teacher has clear concepts and understanding about how to use the different technological tools was 2.36 and the value of SD was 1.092. As the mean value was less than 3 so, most of the students perceived that their teachers don't have has clear concepts and understanding about how to use the different technological tools. The M value for the statement that my teacher knows how to use the right tools according to the requirement of the subject matter was 2.44 and the value of SD was 0.972. As the mean value is less than 3 so, most of the students perceived that their teachers don't know My teacher knows how to use the right tools according to the requirement of the subject matter. The overall mean of the perceptions of students about the performance of their teachers in technology was 2.57 and the value of SD was 0.975. As the overall mean value is less than 3 so, most of the teachers perceived that their teachers' of social sciences departments don't have good performance in technology using at higher education level.

Relationship Between Teachers' Technological Competencies and their Performance

The sixth objective of this research was "To find the relationship between technological competencies of teachers and their performance at higher education level" and the research question regarding this objective was "What is the relationship between the technological competencies of teachers and their performance at higher education level? To achieve this intended objective and to find the answer of this question, Pearson's correlation test was used. The results of Pearson's correlation test are presented in table 13.

Table 13: Relationship Between Teachers' Technological Competencies and Their Performance at Higher Education Level

Factors	TC	P	TK	PEU	PU	SUT	TP
Technological Competencies	1						
Perceptions	.792**	1					
Technological Knowledge	.183**	.030	1				
Perceived Ease of Use	.201**	.012	.053	1			
Perceived Usefulness	.633**	.032	.017	.078	1		
Skills in Using Technology	.223**	.078	.092	.045	.190**	1	
Teachers' Performance	.202**	.022	.101**	.069	.204**	.106**	1

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

Table 4.13 shows the results of Pearson correlation coefficient test that was applied to find the relationship between the teachers' technological competencies and their performance. The findings indicated that the value of Pearson correlation coefficient (r) between teachers' technological competencies and their performance was 0.202 that is low positive and showed significant relationship. In the same way, the value of "r" for perceptions was 0.792, for technological knowledge it was 0.183, for perceived ease of use, the value of "r" was 0.633 and

value of "r" for skills in using technology was 0.223. The values of "r" for all these elements were low positive and showed a significant relationship between teachers' technological competencies and their performance at higher education level.

Discussion

The aim of this research study was to analyze the teachers' technological competencies and their performance at higher education level. It is evident from the results of the study that most of the teachers don't have the technological competencies and their performance was also not good at higher education level. The technological competencies were divided into six elements namely perceptions of teachers about using technology, technological knowledge, perceived ease of use technology, perceived usefulness of technology and skills of teachers in using technology in teaching. The teachers were analysed on each element of the technological competency and their performance was also determined on these technological competencies at higher education level.

The teachers' perceptions are regarded as an important element for the technology adoption in the classroom. Teachers' perceptions are essential because they influence how teachers use or do not use technology in their classrooms. More than 60 years of research on teacher's perceptions has provided good evidence for the premise that perceptions play a key role in determining teacher's behavior in the classroom. Teachers' perceptions are a prominent focus of research in the context of technology integration since they are assumed to impact how and why teachers may or may not modify their teaching to embrace a new curriculum, accept new instructional techniques, and implement new projects. Teachers perceptions seem to be a strong forecaster of technology integration (Baek et al., 2018). Buabeng-Andoh (2012) pointed out that teachers' decisions on using the technology in teaching are influenced by their own personal perceptions. Similarly, Sailer et al. (2021) stated that important aspects of successful technology

integration in the classroom are related to teachers' themselves, such as teachers' perceptions, technological knowledge, and skills. The findings of this study related to perceptions of teachers about using technology showed that most of the teachers have positive perceptions about the technology usage in teaching. The mean value for the perceptions of teachers about using technology in teaching was 3.29 showing that most of the teachers of social sciences departments of the public universities of south Punjab perceived technology as a useful helping phenomena to be used during teaching and learning process. So, the findings of this study is the evidence that perception is the most crucial element for the successful integration of technology in teaching as stated by the findings of the many studies including (Redmond & Lock, 2019; Baek & Sung, 2020).

Koyuncuoglu (2022) stated that technology integration in teaching and learning process heavily depends on the technological knowledge. It demonstrates how a teacher use technical expertise according to the subject matter and requirements of the students. A teacher who has more technological knowledge can create a conducive learning environment according to the requirements of the learners and subject matter and can use technological tools more effectively that is resulted to a useful learning. Technological knowledge is more than just a collection of facts, rules, theories, and general information that is imparted to pupils; it is more than that. Individuals struggle with the application of knowledge, whether it be conceptual, analytical, or manipulative, and technical knowledge is dynamic, with meaning being formed and reconstructed as they do so. When used in real-world situations, generalizations, ideas, principles, technical maxims, and processes gain significance. The findings of current study related to technological knowledge of teachers showed that most of the teachers don't have technological knowledge to be used in teaching. The mean value for the technological knowledge of teachers was 2.79 showing that most of the teachers of the social sciences departments of public universities of south Punjab don't have

technological knowledge to be used in teaching at higher education level. These findings are closely related to the studies conducted by (Adedokun-Shittu & Shittu, 2015; Singhavi & Basargekar, 2019).

A person's propensity to adopt and employ particular technology is thought to be favorably influenced by perceived ease of use. Shafira and Yasri (2021) suggested that teachers might find it simple to use technology when considering a variety of factors. In the evaluation of the adoption of technology, perceived ease of use has been the most significant and widely affected factor. A person's view of the procedure leading to the outcome is referred to as perceived ease of use. The findings of this study regarding the perceived ease of use indicated that most of the teachers perceived that they cannot easily use the technology in teaching and learning process. The mean value for the perceived ease of use of technology was 2.65 showing that most of the teachers of social sciences departments of public universities of south Punjab perceived that they cannot easily use technology in teaching and learning process.

Perceived usefulness is the key factor in user acceptance of a technology. The system's effectiveness, efficiency, and overall benefits in terms of improving user performance all have an impact on how useful people find it to be. Perceived usefulness plays a great role in helping educational institutions particularly those institutions who continuously introduce new technology to enhance the productivity of the individuals and the system (Pitafi et al., 2020). The findings of this study regarding the perceived usefulness indicated that most of the teachers perceived technology as useful in teaching and learning process. The mean value for the perceived usefulness of technology was 3.28 indicating that most of the teachers of social sciences departments of public universities of south Punjab perceived technology as useful for the teaching and learning process.

Manco-Chavez et al. (2020) proposed that technological skills are the knowledge and abilities needed to operate computer-based technologies and carry out

technological tasks. Due to the fact that they are frequently learned through formal education, practice, and training, technology skills are regarded as hard skills. These abilities are useful for handling technological, scientific, mechanical, and mathematical challenges. The findings of the current study regarding the skills of teachers in technology showed that most of the teachers don't have skills regarding the using of technology in teaching and learning process. The mean value for the skills of teachers in using technology was 2.67 indicating that most of the teachers of social sciences departments of public universities of south Punjab don't have skills for using technology in teaching and learning process.

The perceptions of students about their teachers' performance in technology using in teaching and learning process of social sciences departments of public universities of south Punjab was also determined. The findings of the study indicated that most of the students perceived that their teachers' performance is not good in using the technology in teaching and learning process. The mean value for the students' perceptions about their teachers' performance was 2.57 indicating that their teachers don't perform well in using technology during the teaching and learning process.

At the end, the relationship between teachers' technological competencies and their performance at higher education level was also determined. The Pearson correlation test was used to find the relationship between the teachers' technological competencies and their performance at higher education level. The findings of the study indicated that there was a low positive relationship found between the teachers' technological competencies and their performance at higher education level. The value of Pearson correlation coefficient (r) was found as low as .202 indicating a weak positive relationship between teachers' technological competencies and their performance at higher education level.

Implications and Future Research

The current research study is very important as it has practical implications. The results of the current study may be beneficial for the teachers and the students at higher education level to find their difficulties in implementing the available technological tools efficiently for the improvement of the teaching and learning process. The findings of this study are particularly important for the stake holders and policy makers and government officials to provide the necessary technological equipments and devices and conduct the regular training to the teachers for the improvement of their technological competencies at higher education level. The future research may be conducted on what are the challenges and difficulties the teachers of social sciences departments of the general public universities of south Punjab facing for not performing well at higher education level.

Conclusion

It was concluded that most of the teachers of the social sciences departments of the public universities of south Punjab don't have technological knowledge, don't perceived the ease of use of technology and also most of the teachers don't have the skills in using technology in teaching and learning process. Yet most of the teachers have positive perceptions about the using of technology and also most of the teachers perceived technology a useful phenomenon to be used in teaching and learning process. There was a low positive correlation found between the teachers' technological competencies and their performance at higher education level.

Conflict of Interest

Authors declared no conflict of interest.

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