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A Study of the Practices of Trainees Regarding the Use of Technology in Teacher Education Program at University Level

Vagiha Naz[1], Khalid Khurshid[2]

[1]PhD Scholar, Department of Education, Bahauddin Zakariya University, Multan
[2]Professor, Department of Education, Bahauddin Zakariya University, Multan
Correspondence: wajeehanaz79@gmail.com[1]

ABSTRACT

The use of technology has changed the style of teaching and learning. The use of technology in teacher-education program provides an effective teaching-learning environment which is encouraging for both the teachers and trainees in which they interact actively to achieve their goals. For this study Constructivist theory was used as a framework. Finding out how trainees use technology during the teaching-learning process in the classroom was the main goal of this study. This research study was both quantitative and qualitative in approach. Twelve (12) public universities of Punjab were selected to complete this study. For quantitative data, a sample of three hundred and sixty two (362) trainees was selected by using stratified random sampling technique. For collection of data a 5-point Likert type Rating Scale was prepared and administered to trainees. Frequencies, percentages, mean scores, t-tests, and correlation were used to assess numerical data, while thematic analysis techniques were used to analyse qualitative data. The results of the study showed that majority of the trainees were agreed that they have perception of technology and they do practices of technology and have some problems in practice like infrastructure, training, availability of resources etc in the use of technology during teaching-learning process. Although the value of connection between perception and practice was found to be low, it demonstrated that there was a favourable association between trainees' perceptions and actual use of technology during the teaching-learning process in the classroom. At the end, in the light of the findings and conclusion the researcher also gave few practical recommendations which are useful for higher Education Institution, teachers and trainees of pre-service teacher education program to facilitate technology supported instruction in their respective departments at university level to increase the standard of education.

Keywords: Perceptions, Practices, Problems, Trainees, Technology, Teacher Education Department, Pakistan.

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Introduction

In today's world of globalization where technology has adopted an incredible position in all fields of life there education is one of them. Technology has totally changed the teaching-learning environment and it has become an important part of our education system (Jin, 2016). Due to the increasing role of technology in life, it is necessary to change the teaching style too. Students are now motivated towards learning due to innovative method of teaching. The use of technology in classroom teaching-learning process make the lesson interesting and more elaborated. In short, the use of technology in classroom made it possible the understanding and retaining of knowledge easy because it provides ease in teaching-learning process (Bhakta and Dutta, 2016). The students feel motivation in study with the use of digital technology in classroom. In the classrooms of 21st century technology have a positive impact on the achievement of students and it also gave relief to teachers from their laborious and repetitious work (Chen, 2010).

Moreover, perception of pre-service teachers about educational technology always proves to be important in their use of technological devices during classroom teaching-learning process (Lau and Sim, 2008). They further found in their research that teachers produce constructive classroom environment and make their lecture interesting if they have the perception of different technological devices. They concluded that not only teachers feel that technology has positive effect on their teaching style but it also helped the students too in their learning either inside or outside the classroom. Beside this there are also some problems faced by the trainees in the effective use of technological devices in their teaching-learning process.Among them, lack of training and skills, availability of technological tools, infrastructure, teacher and students' self belief and interest, electricity issues, weak internet signals, proficiency in the use of technology and lack of funding are the major problems (Kleiner et al., 2007).

Further, the use of advance and up-to-date teaching styles with the help of technology increases the quality of education. With the help of technology better management system is developed in education and there are reforms in education by improving learning environment (UNESCO, 2009). At higher education level university perform a major role to provide students the education with full of quality and further students uplift the role of society as a whole. The contribution of teacher training programs in universities is very important to uplift the quality of education in the form of future teachers because in these programs teacher-educators trained the trainee teachers in a way that in future they will give their best contribution to society. Furthermore, in the promotion of quality education, the perception and practice of trainees in the use of technology is very necessary and the problems that occur in the use of technology affect the classroom teaching-learning process. The present study is very important because it highlights some important factors like 'perception, practice, problems', in technology based classrooms in teacher education program. This topic is very important especially in Pakistani perspective that exposed the current attitude of pre-service teachers, their perception and practice and problems that they faced in the use of technology in their teaching-learning process.

Research Objectives

1. To assess the perceptions and practices of trainees regarding use of technology in classroom teaching-learning process.
2. To determine the relationship between trainees' scores on Perception-based and Practice-based scales.
3. To investigate the problems in the use of technological resources in classroom.

Research Questions

1. What is the perception and what practices trainees do regarding the use of technology in classroom teaching-learning process?
2. What is the relationship between trainees' perception and practices towards the use of technology?
3. What are the problems faced by the trainees in the use of technological resources in classroom?

Literature Review

By studying ontological and epistemological beliefs, constructivist theoretical framework was adopted for the applicability and suitability of the study. According to the constructivist theory the students are motivated and encouraged to participate actively in their learning activities and are encouraged to make suggestion for their learning improvements in future and they are motivated to develop their own effective learning concepts (Zuber-Skerritt and Roche, 2004). However experts agree that to bring change in pre service teacher's efficiency, it is necessary to provide them opportunities of learning and studying and there must be in-depth examination of theories and practices in light of their beliefs, perception and experiences. If the teachers have to help learners they must develop proper conceptual understanding of the content and to check their self belief system. If they are using traditional teaching methods or teacher-centered approach during instruction, they must come out from their old approach as teacher-centered to student-centered in their teaching and learning process. Constructivist education requires learning opportunities that encourage critical thinking, reflection, dialogue and understanding of context between teacher and students. The re-conceptualization of education requires the creation of strategies to give the proper understanding of the teaching on one hand and learning on the other hand, where teachers help learners to interact with the environment so that effective teaching and learning can take place (Park, 2007).

Conceptual framework This study's work is based on a thorough analysis of the literature on how technology is perceived and used in classroom education, as well as the issues trainers encounter while integrating technology into their teaching-learning process. Technology in education helps teachers and students and creates new methods of teaching and learning. Education is an important means of interaction and learning process therefore is regarded the important activities of education system and it largely depend on the competence of teachers and their pedagogical knowledge. Therefore the learning process requires teachers' effective techniques of teaching, their way of delivering the content and learners efforts. It largely depends on teachers' perception what they think what is better for the students. If the perceptions of teachers about the learning process are not worthwhile then the effectiveness of the instructional outcomes will not be achieved since this perception will be translated into the actual classroom teaching practices. Therefore the teacher's perception of using technology remains so vital in classroom instruction because it influences curriculum implementation and the process of its effectiveness (Kalin and Zuljan, 2007). The researcher therefore planned a conceptual framework keeping in view the constructivist theory by using the variables such as perception, practices and problems in the use of technology as an independent construct that mediate the technology based practices of pre-service teachers in their classroom teaching-learning process.

Many researchers e.g., (Royer, 2002 and Sawyer, 2017) in their studies investigated the problems that teachers and students face during classroom teaching-learning process. They reported that professional skills of teachers are needed for proper use of instructional technology in classroom. They concluded that if pre-service teachers at the time of their training use instructional technology in classroom then it will bring good attainment in them and they will get its benefits in their future actual classrooms. Ertmer (2005) was of the view that in using technology in classrooms of teacher education program with perfection and to get good results, the teachers first should focus on their own technical skills. If they feel technological skills are not necessary in these programs then what they impart in their trainees. They further stated that if teachers are interested to use instructional technology and wanted that their students should also use instructional technology at the time of their model lesson they must first develop their knowledge about the use of technology then they motivate students to do so. Some other researchers like Sawyer (2017) and Wang (2002) did research on training and technological skills and reported that those teachers who have knowledge about technology they use it in their classroom more willingly. So, it is important for trainees in pre-service program that they get training about how to use technology so that they can give better performance in future. Further, these authors concluded that if teachers are in classroom without innovative technology they look like traditional teachers and classroom look like teacher-centered not like student centered and active. They also concluded that use of technology in classrooms e.g., projectors, video lectures, email etc give confidence to teachers.

However, some other researchers Zameer et al., (2020) concluded in their studies that some other factors linked with teachers while using technology successfully in classrooms e.g. availability of technological tools and supporting

environment too, its applicability and suitability etc. Further they recommended that good teaching-learning environment should be provided to students because Pakistani institutions are not in good condition to meet international standards. Due to growing demand of technology, Pakistani government is trying to put into practice the use of technological devices in schools and trying to engage teaching-learning process with the help of technology. To achieve this target, it is necessary to implement technology first in teacher education program during teaching-learning process because in these programs teachers train the trainees who have to further work in schools. If they teach them with the help of technological devices then they will go in schools and give the same attempt (Munir and Khan, 2015). There are also noticed some challenges too that are resistance in the use of technology in classroom teaching-learning process. Among them some challenges are extrinsic in nature and some are intrinsic. The extrinsic challenges are access to resources, training, and support in the use of technology etc. and intrinsic challenges are belief, attitude, knowledge as well as skills of teachers in the use of technology in classroom teaching-learning process. Therefore, in teacher education program at the time of lesson planning and teaching practice, there is extensive need of the use of technology (Qazi et al., 2012).

In conclusion, training programmes for teachers serve as a foundation for students. The use of technology in the teaching-learning process in the classroom must be practised in order to recruit qualified candidates for teaching positions. There aren't many studies in this area evaluating how trainees actually use technology during classroom teaching and learning, particularly in Pakistan at the university level. A neglected issue in teacher education programmes, particularly in the context of Pakistan, is the study of trainees' use of technology throughout the teaching-learning process in the classroom. Many recent researches are conducted in Pakistan about technology but they were focused to explore use of internet by the students generally (Bashir, Mahmood and Shafique, 2016), highlight the social use of internet by teachers & students (Arif & Kanwal, 2016) and digital practices and experience in the use of ICT (Abu-Shanab, 2013). There is a gap in literature b/w the researchers about the topic of technology generally and specifically in the program of teacher education. So, the researcher decided to investigate the practices of pre-service teachers about the integration of technology in classroom teaching-learning process in teacher education program at university level. The researcher also tried to find out the problems in the effective use of technology.

Methodology

Research Design: The present study was multi-method research and it was quantitative and qualitative in nature. The researcher collected the data with the help of open and close ended questionnaire. Basically it was co-relational study in quantitative manner and in qualitative manner the researcher asked some open ended questions from the trainees.

Population and Sample: The population under study was trainees of the faculty of Education of twelve (12) public sector universities of Punjab, Pakistan. The researcher tried to select at least one university from each division of Punjab, Pakistan by using accessible sampling technique. The population of the trainees of faculty of Education in these universities was three hundred and sixty two (362) trainees; among them one hundred sixty one (161) were male and two hundred and one (201) were female trainees.

Sampling Technique: The sample of trainees was selected with the help of Stratified random sampling technique. As per accessible population out of five thousand two hundred and three (5203), three hundred and sixty two (362) trainees were selected by using stratified random sampling technique.

Table 1: *University-wise distribution of sample size*

Division	Name of University	Male	Female
Multan	Bahauddin Zakariya University Multan	18	15
	The Women University Multan	0	14
Lahore	University of Education Lahore	17	18
	Punjab University Lahore	35	41
D.G.Khan	Ghazi University D G Khan	6	9
Bahawalpur	Islamia University Bahawalpur	26	20

Faisalabad	Govt. College University Faisalabad	11	11
	Govt. College Women University Faisalabad	0	33
Sargodha	The University of Sargodha	26	10
Sahiwal	University of Okara	19	9
Rawalpindi	Fatima University	0	15
Gujwanwala	University of Gujrat	3	6
Total		**161**	**201**

Data Collection Tool: The researchers selected the trainees by using the formula of proportional allocation (Birrell, 2020). A Likert-type research questionnaire based on 35 close ended statements in which 18 statements were based on strongly agree to strongly disagree (5-1) and 17 statements were based on always to never (5-1).The researcher also used 03 open ended statements for trainees. The tool was self-developed after reviewing the extensive literature regarding the perception and practices of trainees in the use of technology, along with pilot testing and after having the consultation with field experts as well as with the help of supervisor.

Data Analysis: The researcher administered the tool personally. Numerical data was analyzed by using frequencies, percentages, mean scores, t-test and correlation and qualitative data was analyzed by using coding technique e.g., making themes and sub-themes. The data was analyzed with the help of SPSS v-20 and by using NVIVO.

Results and Interpretation (Quantitative analysis)

Table 2: *Perception of trainees*

Sr. No.	Theme	SA	A	U	DA	SDA	Mean	SD
1	Technology makes teaching and learning lively	116 32%	230 63.5%	11 3%	4 1.1%	1 0.2%	4.26	0.59
2	Technology is a great support in classroom teaching and learning	90 24.8%	225 62.1%	30 8.2%	13 3.5%	4 1.1%	4.06	0.76
3	An effective teacher integrates technology with teaching-learning process	180 49.7%	165 45.5%	11 3%	6 1.6%	0 0	4.43	0.64
4	Technology promotes an active learning experience for the student	106 29.2%	213 58.8%	38 10.4%	4 1.1%	1 0.2%	4.16	0.66
5	Use of technology has changed my teaching style	187 51.6%	158 43.6%	13 3.5%	3 0.8%	1 0.2%	4.46	0.63
6	Technology helps me to prepare good lesson plan	168 46.4%	176 48.6%	13 3.5%	3 0.8%	2 0.5%	4.40	0.65
7	Technology provides support to trainees during their teaching practices	147 40.6%	185 51.1%	23 6.3%	7 1.9%	0 0	4.30	0.67
8	Trainees who use technology are delivering better lecture than those who do not	145 40%	187 4.9%	19 5.2%	9 2.4%	2 0.5%	4.28	0.72
9	Technological skills are essential to my success in studies	146 40.3%	195 53.8%	15 4.1%	5 1.3%	1 0.2%	4.33	0.65

10	Technology enhance my professional development	166 45.8%	161 44.4%	26 7.1%	7 1.9%	2 0.5%	4.33	0.74

In table number 2, on ten themes the perceptions of trainees about the integration of technology in classroom teaching and learning was calculated. In all ten themes the mean score was highly positive as it is found above than 4.00. It means that trainees of faculty of education in universities have good perception about technology.

Table 3: *Information Technology knowledge of trainees*

Sr. No.	Themes	SA	A	U	DA	SDA	Mean	SD
11	I have knowledge about technology	82 22.6%	132 36.4%	43 11.8%	82 22.6%	23 6.3%	3.46	1.24
12	I critically think about the way to use technology in classroom	171 47.2%	161 44.4%	19 5.2%	9 2.4%	2 0.5%	4.35	0.74
13	I know the ways to integrate technology with the Curriculum	164 45.3%	172 47.5%	18 4.9%	3 0.8%	5 1.3%	4.35	0.74
14	I help my students in searching different topics on websites	37 10.2%	114 31.4%	36 9.9%	125 34.5%	50 13.8%	2.90	1.27
15	I can use multimedia easily to present my lecture	123 33.9%	197 54.4%	25 6.9%	15 4.1%	2 0.5%	4.17	0.77
16	I make group presentation with the help of IT	118 32.5%	161 44.4%	39 10.7%	33 9.1%	11 3%	3.94	1.03
17	I feel confident while teaching with the help of computer	157 43.3%	174 48.0%	14 3.8%	12 3.3%	5 1.3%	4.29	0.80

In table number 3, on seven themes the technological knowledge of trainees was calculated. While the mean score in one statement was negative below 3.00, the mean score in two themes was also positive over 3.00 and in four themes the mean score was highly positive and above 4.00. Overall, in six themes the mean score was positive while in one theme the mean score was negative which indicated that trainees were good in technological knowledge.

Table 4: *Practices of trainees*

Sr. No.	Themes	A	O	S	R	N	Mean	SD
18	I start my lesson when technological devices are available in classroom	40 11%	73 20.1%	65 17.9%	126 34.8%	58 16%	2.75	1.25
19	I use those technological devices that increase the worth of my content	175 48.3%	150 41.4%	26 7.1%	8 2.2%	3 0.8%	4.34	0.78
20	I find supportive content for my topic with the help of technology	173 47.7%	110 30.3%	63 17.4%	15 4.1%	1 0.2%	4.21	0.89
21	I prepare and save my lesson plans in computer	219 60.4%	90 24.8%	37 10.2%	15 4.1%	1 0.2%	4.41	0.85

22	I am self motivated to teach with the help of technology	93 25.6%	79 21.8%	56 15.4%	88 24.3%	46 12.7%	3.23	1.39
23	I use computer for assessment purpose	24 6.6%	99 27.3%	36 9.9%	152 41.9%	51 14%	2.70	1.20
24	I deliver my lesson with the help of power-point presentations	90 24.8%	99 27.3%	50 13.8%	83 22.9%	40 11%	3.32	1.36
25	I develop creativity in class with the help of technology	59 16.2%	93 25.6%	107 29.5%	62 17.1%	41 11.3%	3.19	1.22
26	I use smart board during lecture	32 8.8%	97 26.7%	36 9.9%	139 38.3%	58 16%	2.74	1.26
27	I am interested to use innovative techniques during my lecture with the help of technology	82 22.6%	129 35.6%	75 20.7%	50 13.8%	26 7.1%	3.53	1.19

Table number 4 shows the trainees' usage of technology during the teaching-learning process in the classroom. Ten themes were examined, and among them, three had mean scores that were highly positive (above 4.00), four had mean scores that were positive (above 3.00), and three had mean scores that were negative (below 3.00). Overall, the mean score was positive across seven themes, while the mean score was negative across three themes, demonstrating that the trainees have a solid understanding of how to use technology effectively during the teaching-learning process in the classroom.

Table 5: *Problems in the use of technology*

Sr. No.	**Themes**	**A**	**O**	**S**	**R**	**N**	**Mean**	**SD**
28	I am in habit to submit my assignment via using email	170 46.9%	131 36.1%	48 13.2%	11 3%	2 0.5%	4.26	0.84
29	Lack of information about nature and quality of technology is a problem in its use in classroom	199 54.9%	112 30.9%	43 11.8%	5 1.3%	3 0.8%	4.38	0.81
30	I feel difficulty in the use of innovative technology	190 52.4%	119 32.8%	40 11%	9 2.4%	4 1.1%	4.33	0.85
31	I always provided technical support if I face difficulty while using technology	23 63%	75 20.7%	61 16.8%	113 31.2%	90 24.8%	2.52	1.24
32	My classroom environment is connected to internet	27 7.4%	83 22.9%	61 16.8%	110 30.3%	81 22.3%	2.63	1.26
33	I use smart boards in class	32 8.8%	96 26.5%	70 19.3%	92 25.4%	72 19.8%	2.79	1.27
34	Computers in my institution are out-dated	63 17.4%	108 29.8%	64 17.6%	84 23.2%	43 11.8%	3.18	1.29
35	In my institution internet facility is easily accessible to me	24 6.6%	82 22.6%	63 17.4%	110 30.3%	83 22.9%	2.60	1.25

The trainees' issues with using technology in the teaching-learning process in the classroom were noted in table number 5. Eight themes were included under the variable of problem, and the mean scores for three of the themes were highly positive over 4.00, one theme had a mean score that was positive above 3.00,

and four themes had a mean score that was negative below 3.00. Over all in four themes the mean score was positive and in four themes the mean score was negative. All these findings showed that trainees were having the ability in the use of technology but they have little problems too in its use.

Table 6: *Correlation b/w the scores of perception and practice*

	Perceptions Scores	Practices Scores
Scores on Perception	1	0.238** (0.000)
Scores on Practices	0.238** (0.000)	1

The value of Coefficient of Correlation between the score on perception and practice was calculated by using the method of Product-Movement with the help of software SPSS. The value of "r" was calculated 0.238 which is positive and it concluded that the relationship between perception and practices of trainees in the use of technology was positive though little low. From above calculation it was inferred that trainees have perception about technology and they have practice to use it in classroom teaching-learning process.

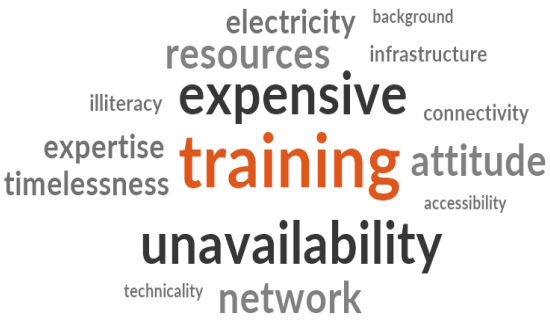
Table 7: *T-test for practice between male and female*

Gender								
Male			**Female**					
M	SD	n	M	SD	N	t-statistic	df	Sig.
35.61	4.600	161	33.49	4.483	201	4.434	360	0.426

The usage of technology by male and female trainees is not statistically different at the 5% level of significance, according to the t-statistic obtained in the table above. It demonstrated that both male and female trainees used technology in the same way during the teaching and learning process in the classroom.

Qualitative analysis

Question 1: which type of problems you face in teaching-learning with the help of technology?



According to the word clouds above, trainees face a number of issues that are major roadblocks to using technology in the teaching-learning process in the classroom, including a lack of training programmes, a lack of technological resources, a high cost of technological resources, a lack of expertise, a lack of internet access, a lack of teacher attitude, issues with electricity, and accessibility issues. In conclusion, the majority of trainees indicated that a key obstacle to integrating technology into the teaching-learning process in the classroom is a lack of training programmes.

Question 2: How is teaching and learning with the help of technology?

According to the word clouds above, trainees believed that using technology to teach and learn was simple, creative, intriguing, helpful, time-saving, active, focused, entertaining, supportive, efficient, quick, and beneficial. While some other trainees believed that using technology to educate and learn is unfocused. In conclusion, the majority of trainees said that using technology to educate and learn is simple and engaging.

Question 3: which are most usable technologies in your classrooms?

The above word clouds showed that majority of the trainees gave their views that they do not use any technological devices in their classroom teaching-learning process. While some of them responded that they use multimedia, computer, projectors, tablets, smart phones, laptops, LCDs in their classrooms during teaching-learning process. To summarize, majority of the trainees were of the view that they do not use any technological devices during classroom teaching-learning process.

Discussion

The habits of trainees in this area were discovered since the study focused on how trainees in Pakistani university-level teacher preparation programmes use technology to teach and learn in the classroom. According to the study's analysis, trainees use technology effectively in the teaching and learning process in the classroom. According to Hassan and Aziz's 2019 research, students have a good attitude about using technology and believe that it plays a crucial role in the teaching and learning process. They also believe that it is a useful tool. Furthermore, the findings of Ertmer's study from 2005 showed that when teachers employ technology in the teaching-learning process in the classroom, pupils achieve well academically and demonstrate a willingness to use technology in their learning. The findings of the present study demonstrated a favourable association between trainees' perceptions and actual use of technology during the teaching-learning process in the classroom. This outcome is consistent with that of Christensen and Knezek (2006). They stated in their investigations that there is a favourable relationship between the teachers' perception and self-efficacy and their use of technology. During their lesson, they discover that

students who have a high level of computer perception and self-efficacy use technology effectively. According to Baylor and Ritchie's (2002) research, instructors' attitudes completely influenced how they used technology in the classroom. According to Fraser and Wallberg's 2005 study, there is a significant link between students' learning outcomes and how they perceive technology. According to Koh and Frick's 2009 study, there is a direct correlation between teachers' computer literacy and the usage of technology in the classroom. The current study also highlighted a few issues with the use of technology in the teaching-learning process in the classroom, such as a lack of internet connectivity, a lack of training programmes, a lack of experience, a lack of resources, a lack of resources that are accessible, a lack of electricity, etc. Trainees must deal with all of these problems in order to successfully employ technology during the teaching and learning process in the classroom. According to research by Yildirim (2007), trainees encounter a number of challenges during the teaching-learning process in the classroom, including inadequate training, the wrong technical tools, unmotivated teachers, and limited access to and availability of technological tools. All of these issues have been shown to significantly limit students' usage of technology tools throughout the teaching and learning process in the classroom.

Conclusion

The study indicated that trainees' practises and perceptions regarding the use of technology in the teaching-learning process in the classroom were favourable. According to the findings of the current study's Coefficient of Correlation, there is a positive correlation between trainees' perception and practise. In light of this, it can be said that students have an understanding of technology and use it in their classroom teaching and learning. The study's findings also led to the conclusion that there were no significant differences between male and female trainees' levels of practise, indicating that the two sexes did not share the same levels of technology use during the teaching-learning process in the classroom. According to the results of the current study, trainees also identified a few minor issues with the use of technology in the teaching-learning process in the classroom, such as a lack of internet access, a lack of training programmes, a lack of resources, and accessibility issues. It is therefore concluded that the main issue is a lack of training programmes, which is a significant issue for trainees using technology. It is also concluded that from the results of the study that teaching and learning with the help of technology is easy. Further, some trainees also reported that they do not use any technological devices in their classroom teaching-learning process due to the problems faced by the trainees. To summarize it is concluded that trainees want to use technology during classroom teaching-learning process and whenever trainees have access of technology they try to use multimedia, projector, smart phones and LCD.

Recommendations of the Study

1- It is recommended that training should be provided to trainees about the use of technology in classroom teaching-learning process.

2- It is also recommended that there is a lack of seminars and workshops in teacher education program. More workshops and seminars should be conducted to train trainees and to develop capacities in them to integrate technology in their daily teaching-learning process.

3- Provision of electricity and internet facility should be ensured in the classrooms of teacher education program.

4- Expertise in trainees about the use of technology during classroom teaching-learning process should be developed.

5- Administration should be ensured that the department of teacher education have all facilities such as; digital library, provision of hardware and software devices and all other resources to trainees for effective use of technology during classroom teaching-learning process.

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Conflict of Interest

Authors have no conflict of interest.

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ORCID iDs

Vagiha Naz [1] https://orcid.org/0000-0003-0034-2257
Khalid Khurshid [2] https://orcid.org/0000-0003-2744-2389

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