

Uptake of Modern Technology and its Integration Barriers in Teacher Education Institutions of Pakistan

*Sumera Irum¹, Dr. Tarique Bhutti², Dr. Muhammad Rafique Daudpoto³, Dr. Noor Mohammad⁴ and Dr. Muhammad Dilshad⁵

-Department of Distance Continuing and Computer Education, Faculty of Education, University of Sindh, Elsa Kazi. Faculty of Education University of Sindh, Elsa Kazi Campus, Hyderabad-71000, Sindh, Pakistan.

Lecturer, Department of Statistics, Faculty of Natural Sciences, University of Sindh, Jamshoro, Sindh, Pakistan.

Dr. Noor Mohammad, Faculty of Education, Lasbela University of Agriculture, Water and Marine Sciences.

Dr. Muhammad Dilshad, Govt. Degree College Paretabad, Hyderabad, Sindh, Pakistan.

Summary

In this modern time, the utilization of technology in the classroom teaching offers a great challenge to make teaching and learning practices effective and long-lasting. The one objective of the study was to explore the barriers and challenges faced by teachers and students in using technology, in the public sector universities that are offering teacher education programs (B.Ed. Hons.) in Sindh province. Mix-method approach was used for data collection. The data was collected through questionnaires from teachers and students, semi-structured interviews from teachers and Head of the departments, and classroom observation of teachers. The analyzed data through qualitative and quantitative approaches provided varying and correlated ideas which makes us understand the status of technology in the educational institutions in Sindh province. It was also found that students and teachers faced many problems in implementing technology because of the shortage of resources, lack of technical skills and unavailability of electronic and power facilities.

Key words:

Technology Integration, Barrier, Modern Technology, Teacher Education, Teachers, and Students

1. Introduction

Major use of ICT in education is to discover the information through research as ICT promoted the ability to dynamic learning. Literature signifies technology as a tool to develop technical skills of teaching and learning, it helps in education practice, strengthens the professionals, promotes economic feasibility, aid to schools up-gradation and unite the schools with the real world. Proper application of ICT has a strong influence on learning by creating coordination and collaboration Integration of technology in education is a very complex process. For implementing technologies institutions have to face many obstacles. These obstacles are identified as a “barrier”. Schoepp defined a barrier as any condition that makes progress or attainment of an objective difficult.[1] According to Ertmer, barriers are such as inadequate lab, shortage of computers, lack of power supply, no Internet

connectivity, low bandwidth, shortage of training, and non-availability of technical staff.[2]

The major barrier in the utilization of technology in the teaching-learning process in Pakistan is a deficiency of teachers Techno-Pedagogical Knowledge and skills. Most of the teachers felt that they have no skill to use technology in their pedagogies. Teachers need to know what technology can offer and how to utilize it effectively in teaching-learning [3]. Brenner & Brill investigated that teachers need to control two kinds of obstacles in utilizing technology: first one is a firm belief for the importance of using technology and second is access to the resource. The availability of resources to use technology in the teaching-learning process remains a problem around the globe, especially in developing countries. Several surveys carried out in different countries and explore first-order barriers and found that; unavailability of the Computer Lab, an insufficient number of the computer, a ratio of a computer to students remain high, lack of computers in working condition, the absence of the internet, or low or poor internet connection, lack of software, technical support, computer teachers and computer network were barriers that are common and found frequently in many educational institutions in Pakistan [4][5].

The use of the internet is also spreading extensively. Now a day it is very difficult to integrate technology, without the use of the internet. But developing countries have to face many obstacles in the frequency and fast supply of the Internet. Jones viewed that, without constant access to the Internet, many of the resources that allow transformational learning with computers cannot be realized. The majority of teachers face problems in finding relevant software. Teachers possessed low technological skills; therefore they could not search-relevant software. So, this is also a hurdle in using technology in the classrooms the use of the Software during the class depends upon the availability of that software and relevancy of that software with the content for teaching. [6]

Every student has not accessed on computers at home, Students belong to the different socioeconomic background and therefore, access to a computer by individuals remains a problem. Sometimes they share common devices at home, therefore, teachers were not given an assignment on the computer at home; students claim we don't have access to devices. [7] Rutherford concluded that only infrastructure support is not enough for effective use of technology by teachers, continuous leadership support required for teachers so they cannot resist incorporating technology, technical support is also mandatory for teachers to enhance the utilization of technology in classrooms. [8]

Mostly English Language used at the university level as the medium of instruction. It is assumed that they should increase students' performance in Science and technological subjects if teachers and students can communicate fluently in English and understand language. But it is a problem for students having English as a secondary language. Makgato found that students face difficulties' in understanding, teaching-learning materials available in English. A good deal of research studies shows that students and teachers faced the problem of time to use technology in classrooms. Teachers said they already have notes, teaching material, and teaching strategies' through the traditional method and they have a practice, planning through ICT requires time to re-plan the lesson and it will be a time-consuming activity for them.[9]

Kumutha & Hamidah found that most teachers said that they were too busy to mark the homework and examination papers of students, they were also forced to complete the school's syllabus within a prescribed period. Using technology in teaching-learning is time-consuming and they cannot finish the prescribed syllabus in school. The integration of technology into the classroom is a burden for them. [10] Teachers are required guidance for the proper integration of technology. Zgheib studied to investigate the reasons behind the lack of technology integration and found the lack of a strategic plan was the main reason for not using technology in the classroom by the teachers. [11]

Many research studies carried out on this issue found that due to long power failure students could not use technology in their teaching-learning. Teachers and students have agreed that power failure is a very severe obstacle in using technology in classroom settings. Although the generator's facility is available in all universities, computer labs were not functional during a power failure; this is a very crucial problem in developing countries, especially in Pakistan. [12][13]

2. Research Question

What are the main barriers faced by teachers and students in the use of technology in the teaching-learning process?

3. Research Design

The study was mixed-method based on Convergent Parallel design approach was followed. Conceptual framework of research used for the study (see Figure 1).

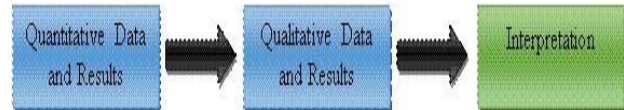


Fig. 1 Conceptual framework of research

Close-ended questionnaires were used to collect quantitative data. Questionnaires were developed with the help of literature. Each questionnaire consisted of ten statements with three-point Likert-scale response options. (Not a barrier, minor barriers, and severe barrier.) The reliability of the questionnaires was determined through the Alpha Chronbach technique that came out to be (8.8) and (7.8) respectively. Statistical analyses were performed using the Statistical Package for the Social Sciences (IBM SPSS Statistics, Version 20.0-.16). The quantitative data were analyzed through percentages and mean square. Semi-structured interviews were used as a tool to collect qualitative data. The validity of the interview tool was determined through expert opinion. Thematic analysis was used to analyze qualitative data.

The target population for the study included all faculty members of four public sector universities of Sindh, Pakistan offering B.Ed (Hons) Elementary Program. This population would have consisted of 33 faculty members. So Census sampling technique was used to collect quantitative data from teachers. A convenient sampling technique was used to select (13) teachers from the population. There were total (462) students enrolled in B.Ed. (Hons.) Elementary programs in 2015 therefore (N=211) students were selected randomly as sample for the study.

4. Data Analysis

4.1 Quantitative Analysis:

For finding the barriers or problems faced by Teachers while incorporating technology in teaching, teachers have to select one option from the three options (1) barrier, (2) minor barriers, and (3) sever barrier.

a. Barriers Faced by Teachers

The Figure 2 shows that most frequent Sever barrier that faced by Teachers were (73%)Power failure, (61%) were lack of skill to use technology, (52%) were lack of student’s skill to understand English, (55%) lack of time management to use technology, (48%) were Internet problems , (48%) were Lack of Technological support to use technology and (48%) were lack of Techno-pedagogical support. The following item shows that teachers opined that they had not faced any barrier such as; (58%) access to relevant software, (58%) access to computer by students at home and (64%) resources required to use technology.

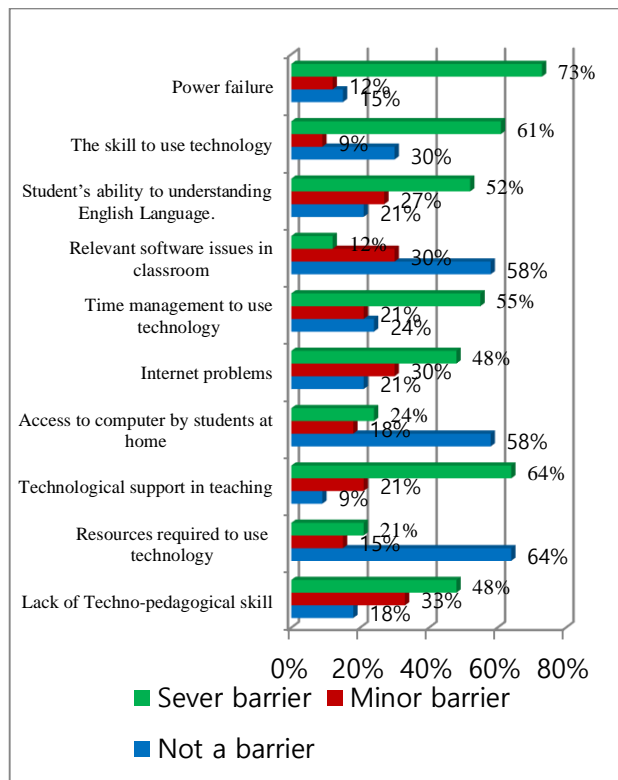


Fig. 2 Barriers Faced by Teachers

b. Barriers Faced by Students

The Figure 3 shows that most frequent sever barrier that faced by Students (60%) were Power failure and (52%) were lack of skill to use technology, (50%) lack of student’s skills to understand English. (48%) were time Management issues,(42%) were internet problems,(44%) students had not access of computer at home.(49%) were lack of technological support, (45%) Students cannot afford the high price of technological gadgets .Students (54%) opined that they had not problem in getting software. (41%) students were opined that some time they didn’t had resources to use technology.

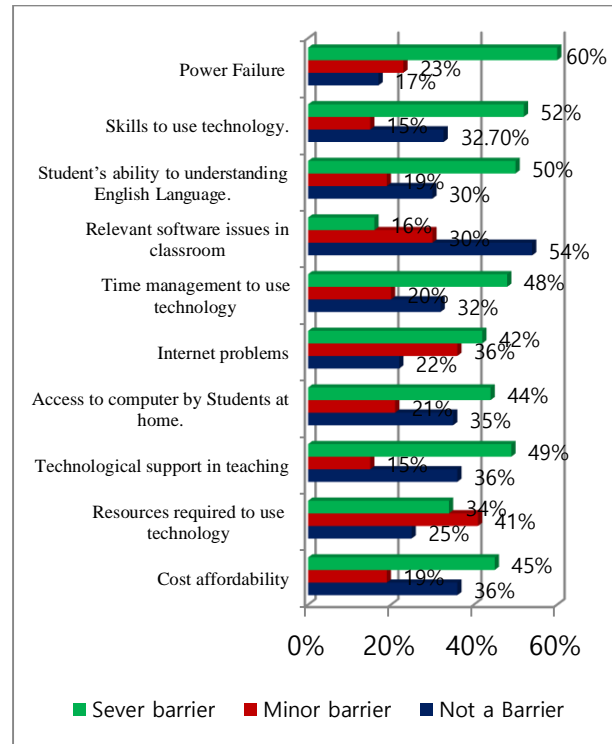


Fig. 3 Barriers Faced by Students

4.2 Comparative Analysis of Teachers and Students responses.

Comparative analysis of teachers and students opinion in Table 1 below showed that majority of the respondents were facing problems like electricity failures, skills to use technology, English language understanding deficiency, management of time to use technology, and high bandwidth internet access

Table 1: Comparative Analysis of Teachers and Students responses

Statements	Teachers			Students		
	Not a barrier	Minor barrier	Severe barrier	Not a barrier	Minor barrier	Severe barrier
Power failures	5 15%	4 12%	24 73%	36 17%	48 23%	127 60%
Skills to use technology	10 30%	3 9%	20 61%	69 32.70%	32 15%	110 52%
Students' ability to understand English language.	7 21%	9 27%	17 52%	64 30%	41 19%	106 50%
Availability and use of relevant software issues in classroom	19 58%	10 30%	4 12%	114 54%	63 30%	34 16%
Time management to use technology	8 24%	7 21%	18 55%	67 32%	42 20%	102 48%
Internet problems	7 21%	10 30%	16 48%	47 22%	75 36%	89 42%
Access to computer by students at home	19 58%	6 18%	8 24%	74 35%	45 21%	92 44%
Technological support in teaching	3 9%	9 21%	21 64%	76 36%	32 15%	103 49%
Availability of required resources to use technology	21 64%	5 15%	7 21%	52 25%	87 41%	72 34%

However, difference in opinion of teachers and students were found regarding two statements; access to computer for students at home, and availability of required resources for teachers to use technology. Majority of teachers were of the view that students had access to computer at home so it's not barrier whereas students regard it minor barrier which they face sometimes. Majority of teachers viewed that required resources for teachers to use technology were available whereas students viewed that required resources to use technology for them were not available.

4.3. Qualitative Analysis

a. a. Barrier Faced by Teacher

In response to the question regarding problems faced by teachers in implementing technology during teaching-learning process, different teachers discussed different problems, such as; shortage of time to integrate technology, no support from administration, lack of appreciation, Power failure, logistical support, lack of technical support, sometime inadequate skills of teachers to use technology as one teacher stated that:

“We have not enough time to integrate technology; we face silly barriers such as in my class, teachers are used to keep multimedia”

“We have no technical staff to arrange multimedia, or adjust its lenses and focus according to my need and demand;

administration does not provide logistic support to use technology.”

For lack of motivation, one respondent replied:

“We have smartboards installed in our two classrooms. But, no support is provided by my university so I can use it. Although, I have learned by myself through the internet, but it required time and effort, and why I should put my efforts on that, I know I will not any acknowledgment of that.”

In the same context, another teacher viewed that:

“It's human nature they always need appreciation, but my university didn't appreciate me on my pedagogical skills or use of innovative teaching strategies. I didn't get any appreciation letter from my HOD or Dean on my achievements on the teaching and technology side, so why I would bother to use technology in my class? Even, our promotions are based on research publications only.

The above statement shows that for the utilization of technology by teachers, motivation is required. Another teacher stated:

“Several times I have planned to teach in lab with hands-on activity, but whenever I reached in the lab, I face power failures; so I have to face embarrassment. Moreover, there may be some alternatives, but abundant time and energies are wasted in this situation.”

Another participant mentioned that:

“I try to assign different tasks to students that can be done through the websites, but I observed that it becomes very difficult for all students to do the task through the use of

websites and the internet because students have different skill levels. Some students are experts in the use of technology and some are not. Moreover, the use of technology becomes difficult in the above case and teachers are bound to use traditional modes. Though at present technology has become very common and popular. But, in our system, its use and accessibility it not still so common among the majority of students.”

Participant No. 02 states as:

“Sometimes we asked from students that watch that video and solved this rubric, students complain that video has very hard English, and we are not able to understand it.”

The above discussion revealed that understanding the English language is an obstacle in using technology by students because students were coming from all backgrounds, they are weak in understanding the English language and all available materials are in English, therefore, they faced a problem and not use technology for teaching-learning. However, many other problems shared by different teachers such as:

Participant No. 09 mentioned as:

“I face a few challenges during the use of technology in my class, i.e. insufficient time, lack of computer labs, lack of smooth availability of internet, etc.”

5. Discussion and Recommendation

There are many problems faced by teachers and students in the use of technology in the teaching-learning process. The study revealed that power failures were found a big barrier in the use of technology. Although, generator facility was available in universities, but during load shedding hours computer labs were not found functional. Alternative power supply sources should be arranged such as a solar system or UPS. Many research studies carried out on this issue and found that due to long power failure students could not use technology in their teaching-learning.[12][13]

Many students belonged to rural and remote areas so understanding technology related content like books and other related material in English is a very serious problem for them though they were eager to learn, but due to the language barrier, they cannot learn properly. A zero semester should be offered to students to overcome their English language deficiency. Heads of the departments in the universities should ensure the effective and proper utilization of resources available on the campuses at maximum level. The head should provide technical and logistical support to teachers’ educators. Also, motivational strategies should be used for the proper adoption of technology. Inadequate infrastructures, shortage of computers, low bandwidth were some other important barriers that teachers and students were found facing.

It was also found that teachers were facing difficulty in integrating technology in their teaching because they did

not spare time to prepare themselves for technology integrated class. The teaching workload of teacher educators who were working on innovative technological pedagogical knowledge should be reduced. So that teacher educators could have more time for doing practices of technologically oriented classes. Along with proper facilities to use technology teachers should be encouraged and motivated to use technology by improving and enhancing incentives and reward structure. Universities and departmental leadership need to find ways to improve and enhance teacher educators’ capacities to integrate technology in their day to day teaching by providing training courses and guidance of technological pedagogical experts in the weak areas. Therefore, pedagogy-focused instruction should be forefront in teacher education programs. A technologically qualified technician should be appointed for helping teacher educators to use modern devices in the classroom. Teachers should be provided with easy access to digital libraries and extensive databases.

Some teachers talked about lack of technical support from the administration to use technology because there was not appointed any technical staff in their institutions. Proper qualified and expert lab technicians were appointed. Besides, the provision of hardware, software, and other required resources should be provided for effective utilization. Many researchers found that teachers in the universities in Pakistan face problems in the use of technology such as; poor infrastructure, lack of funds, inadequate facilities, non-supportive environment, unavailability of classroom projectors. [14][15][16][17][18]

6. Conclusion

The study concluded that the integration of technology in education is a very complicated process. Though at present technology has become very common and popular. But, in our system, its use and accessibility it not still so common. For implementing technologies, institutions have to face many barriers such as inadequate lab, shortage of computers, lack of power supply, internet connectivity, low bandwidth, shortage of training, and non-availability of technical staff. Only infrastructure support is not enough for the effective use of technology by teachers, continuous leadership support required for teachers to incorporate technology. Technical support is also mandatory for teachers to enhance the utilization of technology in classrooms. Language is also an important barrier because students face difficulties in understanding, teaching-learning materials in English. Some students in universities are experts in the use of technology and some are not. Due to those teachers are still using traditional modes for teaching in classrooms.

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Sumera Irum an Assistant Professor in the Department of Distance Continuing and Computer Education, Faculty of Education, University of Sindh, Jamshoro, Sindh, Pakistan. Her research interests are ICT in Education, Pedagogy, Computer Education and she published her researches in national and International HEC recognized journals.



Dr. Tarique Bhatti an Assistant Professor, Faculty of Education, University of Sindh, Jamshoro, Sindh, Pakistan. His research interests are ICT in Education, Pedagogy, Educational Management, Testing and Guidance and he published research in National and International recognized research HEC journals.

Dr. Muhammad Rafique Daudpoto, Lecturer, Department of Statistics, Faculty of Natural Sciences, University of Sindh, Jamshoro, Sindh, Pakistan. His research interests in Statistics, he published research in National and International recognized research journals.

Dr. Noor Mohammad an Assistant Professor at Faculty of Education, Lasbela University of Agriculture, Water and Marine Sciences. He has experience to work with National and International organizations of the repute. His research interests are ICT in Education and Classroom Assessment, Teacher Education, Educational Management and Leadership and he published his research in National and International recognized research journals.

Dr. Muhammad Dilshad, Assistant Professor, Govt. Degree College, Pratabad, Hyderabad, Sindh, Pakistan.