

## Study to Explore the Availability and Acceptability of Computer in Secondary Schools: A Case from Pakistan

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### ABSTRACT

*The pivotal use of computer and computer related applications has been followed by the interest of schools in computer education. Computer Education is an important part of curriculum of school education in private and public sector. The purpose of this study was to determine the availability and acceptability of computers in public secondary schools in southern Punjab, Pakistan. The participants of the study were all secondary schools in Southern Punjab. Multistage sampling technique was used to select the sample of the study that includes 329 male students, 54 teachers and 12 head teachers of secondary schools of Southern Punjab. Self-developed questionnaire and an interview schedule were used to collect the data about availability and acceptability of computer in secondary schools. Questionnaire was comprised 18 items and is validated by expert opinion. Collected data was analyzed through percentages and frequencies. Thematic analysis was used to analyze the qualitative data. It was found that the computers were available to urban and rural students. But there was a significant residential difference in acceptability of computers, as urban students had higher acceptability of computers as compared to rural students. Qualitative data also showed that computers were available and acceptable for students. It is recommended that government should provide more facilities in rural areas to make the acceptability of computer equal to urban students.*

### KEYWORDS

Computer, computer education, availability, acceptability

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### INTRODUCTION

Information Communication Technology (ICT) was first introduced in the second part of the twentieth century, and it is now firmly established. It has made a significant contribution to the delivery of high-quality learning, professional development, and educational management (Alwani & Soomro, 2010).

Information and computer technology advancements have increased the use of computers not just in teaching, but also in research and curriculum creation (Hefzallah, 2004). Using Information Communication Technology, students often become teachers by their own choice while using the processes of peer tutoring or mentoring. Information Communication Technology suggests the realization of the advantages of Information Communication. In the classroom and other educational institutions, technology is used. Students' critical reflection and assessment abilities improve as a result of the advantages of information communication technology. There is a deficit of literature and factual data on Information Communication Technology (ICT) utilization and productivity in Pakistan (Qadir et al., 2014). That is why literature and facts in this study are more in context of other countries as compared to Pakistan.

Focus of this study was two dimensions of Information Communication Technology. The first dimension is availability and the second one is acceptability of computer. Availability of computer includes: accessibility of properly installed computers as per student requirement in sufficient bulk with the access of internet according to a schedule for using at school. On the other hand acceptability depends on: ease in computer learning and use without any fear or threat in an exciting and enjoyable manner. It also includes giving importance to computer by considering it as a need for educational purpose to get good marks.

Every human being has a right to gain education without any distinction of culture, locality, racial group, gender and belief. Education without computers may be incomplete. Computers have become an almost obligatory part of every teaching learning place (Irum et al., 2011).

Teachers and students both are in need of computers and information technology for the enlargement of process of teaching learning. The use of computers in the educational process is well-known, and it has an impact on both the teacher and the student. Computer teachers teach pupils the knowledge, skills, and procedures that are required for them to enhance their technical literacy. Because the computer makes teaching skills more updated, it is becoming an important element of classroom instruction (Isik, 2009).



Computer laboratories and computers are not the only demand of teachers for good teaching but they also expect their school to be equipped with Information Communication Technology services and tools (Valentine et al., 2005). Many studies were conducted in recent years to gather data on schools that are increasing their capacity to integrate Information Communication Technology into studying, instructing, and management activities. The research shows that the number of computers and other technological instruments has steadily increased over the years, with most institutions meeting the baseline computer-to-pupil ratio objectives. Another research on the efficacy, use, and usability of digital technology at the secondary level found that instructors confront a number of challenges in the teaching since their software is knowledge and pedagogical material is part of the program. There are still concerns that instructors will be unable to use computers and other devices (Kerski, 2003).

Availability of computers in schools is also a primacy in developed countries. In Macedonia and Australia computer is available for each child at school. The school children use computer in their daily tasks, the tasks include word processing, using charts, searching on internet, graphs, pictures and educational software (Kent & Facer, 2004).

In America in 1989, there's only one computer for every 37 pupils. In 1999, this was raised. The ratio was just to seven at the time (Technology Counts, 1999). Even in America, the optimum computer-to-student ratio (1:1) is still missing. So, the scenario exposed that the number of students lessened in comparison of computers (Flores, 2000).

According to Irum et al., (2010), just 17 percent of Pakistani schools have computer lab, while 83 percent of schools did not. Initially Information Communication Technology usage depends on the availability of modern technological instruments, but only the availability is not sufficient for the usefulness of Information Communication Technology. The second important element after availability of technology is acceptance of Information Communication Technology. This component boosts performance and achievement of technology handler and also makes the use of technology easy and convenient.

Gaining meaningful and acceptable learning for the students' learning cycle is critical. It is not essential to obtain information directly from mentors; rather, what is vital nowadays is to identify reality via the use of technology in a fun and enjoyable manner. Technology is responsible for stress free and exciting learning. Students get the main role in their learning by accepting the technology and getting good exam results (Efuwape & Aremu, 2013). Acceptance of computers is also important in assisting students in their learning process by making it easier and more fun for them to study. Learners also consider that it is easy to use computer technology for meaningful learning, higher order thinking, and creativity (Usun, 2004).

The acceptance is important for the growth of any society and nation, which is normally determined by its expansion in science and technology (Lemo, 2004). There is a model for acceptance of technology and research has proved Technology Acceptance Model (TAM) as utmost prominent model of acceptance of Information Technology and got countless attention because of the psychological connection of a user with Information Technology literature has gotten a lot of attention recently (Isik, 2009). The Technology Acceptance Model was established by Davis in 1989 (TAM). In this modal, Davis had used his scale to measure two variables. The ratings on these two subscales, Perceived Comfort of Use and Perceived Usefulness, are linked to technology use. In two separate investigations, both of these constructs were shown to have a Cronbach's Alpha reliability of better than 0.90 (Taber, 2018).

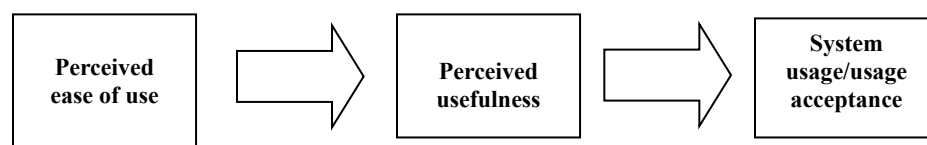


Figure 1: Technology adoption model with causal direction (Liu, 2010)

### PERCEIVED EASE OF USE AND PERCEIVED USEFULNESS

Perceived ease of use refers to how easy a system is to use, whereas perceived usefulness refers to how much it improves a person's performance (Susanto & Aljoza, 2015). These two factors were important in both direct (Perceived Usefulness) and indirect (Perceived Ease of Use) outcomes on digital technology use, according to a study of previous computer acceptance and use of technology studies (Legris et al., 2003). These findings from some researchers have demonstrated why some instrument designers consider these two critical elements in the creation of computer attitude surveys (Teo & Noyes, 2008). So, the Technology Acceptance Concept (TAM) is a model that states that if consumers believe technology is simple to use, they would most likely acquire a favorable attitude and acceptance toward it.

In their research, Ngai et al., (2007) found that students' attitudes toward technology usage are influenced by two key factors: Perceived Ease of Use (PEU) and Perceived Usefulness (PU). According to Teo et al., (2008), Perceived Ease of Use (PEU) and Perceived Usefulness (PU) are key predictors of pre-service student intent to utilize technology in Singapore and Malaysia, based on comparative research.

It is evident in literature that in rural areas, computer use and its services are limited due to many reasons likewise

deficiency of: Trained employees (or any personnel), Space for appropriate reference sources and appropriate sources to respond to the request. Due to a lack of funds, personnel, space, and training, village zones do not place a high value on applied ways to delivering reference and computer services. Another concern for remote public computer libraries is enough staff training (Standerfer, 2006). Students of city secondary schools showed better results and more positions in examination of 2007 than rural secondary schools in the Punjab Pakistan. The subject of computer is also including in curriculum and offered at the secondary level. So, it is concluded there is a variance in Pakistan rural and urban secondary schools regarding teaching and learning of all subjects and computer (Aziz, 2010).

In Pakistan the teachers in rural areas were not using Information Technology Laboratories even teachers of urban schools were in contact with computers because they had their own computers in their homes. So, there is a residential difference (area) which affects not only the students' use of computers, but also teachers' use of computer (Qadir et al., 2014). Mikre (2011) concluded in their study that, there was a significant variation with respect to area in teachers' proficiencies and capabilities of computer use. It was also viewed that mathematics teachers are not aware about websites and journals of mathematics either in Urdu or English. This was also witnessed that the teachers are unable to do internet searching. Information Technology use is clearly affected by area of school; schools in industrial and urban areas are more active and facilitated in terms of technology as compared to villages. School location is affecting students, teachers, management and learning processes (Alwani & Somro, 2010).

### OBJECTIVES OF THE STUDY

The objectives of the study were to:

1. explore the availability of computer to the students perceived by students and teachers
2. explore the computer acceptability as perceived by the students and teachers
3. investigate the residential differences in the availability, acceptability

### HYPOTHESIS FOR STUDY

Following null hypotheses were formulated to achieve the objectives of the study:

- Ho1: There was no significant difference between the perception of rural and urban students regarding the availability of computers to students in boys' schools of southern Punjab.
- Ho2: There was no significant difference between the perception of rural and urban students regarding the acceptability of computers to students in boys' schools of southern Punjab.
- Ho3: There was no significant difference between the perception of rural and urban teachers regarding the availability of computers to students in boys schools of southern Punjab.
- Ho4: There was no significant difference between the perception of rural and urban teachers regarding the acceptability of computers to students in boys schools of southern Punjab.

### RESEARCH METHODOLOGY

All students, teachers, and head teachers from government boys' secondary schools in Southern Punjab, Pakistan, were included in the research. Multistage sampling technique was used to select the sample size of 395. At the first phase three districts (D.G Khan, Bahawalpur, and Multan) were selected randomly from Southern Punjab. At the second stage (18) schools were selected, (6) from each district (3) rural and (3) urban purposively. At the third stage all computer students of class 9th and 10th were selected from selected schools universally and (3) teachers from each school of selected sample were selected conveniently while (12) head teachers were selected conveniently as 4 from each district (2) urban (2) rural. Objectives of the study demand both types of data (qualitative and quantitative). As both qualitative and quantitative data were collected and analyzed simultaneously, followed by the integration of their results, convergent mixed methods research design was considered best fit for this study. Two research instruments were used. Questionnaire and interview schedule. The information was gathered from students and teachers through a questionnaire, as well as from head teachers and through an interview schedule.

### ANALYSIS OF THE DATA

Researcher used frequencies, percentages, and independent sample t-test to analyze the quantitative data by using SPSS version 21 whereas thematic method was used to analyze qualitative data.

Table 1: Students' perceptions about 'availability of computers' in government boys' secondary schools of southern Punjab

S.N	Statement	S.D	DA	S.D+DA	N	A	S.A	A+S.A
1	Our school has a computer laboratory fully operational	2.7	0	2.7	1.9	31.9	63.5	95.4
2	Students have easy access to computers in their school	0.3	0.9	1.2	4.6	54.7	39.5	94.2
3	Students use computers in school	0.6	0.6	1.2	11.2	59.0	28.6	87.6

4	Sufficient number of computers in working condition in computer laboratory	3.0	7.3	10.3	6.4	30.7	52.6	83.3
5	Computer is available when students need to use it	0.9	1.5	2.4	17.3	45.6	34.7	80.3
6	Computers have the necessary software installed for educational use	1.5	0.6	2.1	8.8	48.3	40.7	89.0
7	Students have internet access in their computer laboratory	1.5	7.3	8.8	17.9	52.0	21.3	73.3
8	Students have a proper time schedule to use computers in computer laboratory	1.8	2.1	3.9	21.3	50.8	24.0	74.8
Total		1.58	2.53	4.0	11.17	64.6	38.11	84.74

All values are in percentag

Table shows that about 85% students were agreed about availability of computers in their schools. Only 4% students disagreed about availability of computers in their schools. And 11% students remained neutral about availability of computers in their schools.

Table 2: Students' perceptions about "acceptability of computers" in government boys secondary schools of southern Punjab

S.N	Statement	S.D	DA	S.D+DA	N	A	S.A	A+S.A
9	It takes too long to learn how to use the computer	2.4	22.2	24.6	17.3	36.8	21.3	58.1
10	Students are planning to use computer for learning in future	0.9	3.6	4.5	15.8	49.8	29.8	79.6
11	Student use computer without any fear of making mistakes	1.5	7.3	8.8	19.8	42.6	28.9	71.5
12	Computer makes students feel pleasure	0.6	1.2	1.8	8.2	42.2	47.7	89.9
13	It is important to students to be good in computer skills	0.9	0.9	1.8	12.5	49.2	36.5	85.7
14	Management is really keen to see that people are happy with using computers	2.4	0.9	3.3	28.9	39.5	28.3	67.8
15	Computer is somewhat threatening to student	14.3	10.3	24.6	21.0	32.8	21.6	54.4
16	Computer used by students for educational purposes	2.4	6.1	8.5	14.3	43.2	34.0	77.2
17	Computer helps the students for getting good marks	6.7	6.7	13.4	10.3	34.7	41.6	76.3
18	Computer use as a wastage of time	27.1	16.4	43.5	7.9	24.3	24.3	48.6
Total		5.92	7.56	13.48	15.6	39.5	31.4	70.91

All values are in percentage

Table reveals that 70.91% students agree about acceptability of computers in their schools. 13.48% students disagreed about acceptability of computers in their schools. Only 15.6% students remain neutral about the acceptability of computers in their schools.

Table 3 Comparison of mean scores of residential difference in availability (students perspective)

Variable	N	M	S.D	df	t	P
Rural	206	9.58	3.11	327	1.34	0.182
Urban	123	9.0	4.43			

Table 3 reveals that the  $p$  value=0.182 shows there were no residential differences of availability of computers to the urban and rural areas students. There was no significant difference between the responses of rural ( $M=9.58$ ,  $SD=3.11$ ) and urban students ( $M=9.0$ ,  $SD=4.43$ ),  $t(327) = 1.34$ ,  $p=0.182$  regarding the availability of computers. So, the null hypothesis “There was no significant difference between the responses of rural and urban students regarding the availability of computers to students in boys schools of southern Punjab” has been failed to reject. This means that both rural and urban students had same availability of computer in secondary schools.

Table 4 Comparison of mean scores of residential difference in acceptability (students perspective)

Variable	N	M	S.D	df	t	P
Urban	206	8.8	4.38			
Rural				327	2.76	.006
	123	7.4	4.42			

Table 4 reveals that responses have significant differences of rural ( $M=8.8$ ,  $SD=4.38$ ) and urban students ( $M=7.4$ ,  $SD=4.42$ ),  $t(327) = 2.76$ ,  $p=0.006$  regarding computer acceptability. So the null hypothesis “There was no significant difference between the responses of rural and urban students regarding the acceptability of computers in students of boys schools of southern Punjab” has been rejected. It means that urban students had higher acceptability of computer as compare to rural students of secondary schools. The magnitude of difference in means was very small ( $\eta^2=0.022$ )

Table 5 Teachers’ perceptions about “availability of computers” in Government boys secondary schools of southern Punjab

S.	Statement	S.D	DA	S.D+DA	N	A	S.A	A+S.A
1	My school has a computer laboratory	0	0	0	2.4	23.8	73.8	97.6
2	Students have easy access to computers in their school	0	0	0	0	28.6	71.4	100
3	Students use computers in school	0	0	0	0	33.3	66.7	100
4	There is a sufficient number of computers in working condition in computer laboratory	2.4	4.8	7.2	0	47.6	45.2	92.8
5	Computer is available when students need to use it	7.1	14.3	21.4	7.1	33.3	38.1	71.4
6	Computers have the necessary software installed for educational use	0	7.1	7.1	2.4	40.5	50.0	90.5
7	Students have internet access in their computer laboratory	0	0	0	26.2	57.1	16.7	73.8
8	Students have a proper time schedule to use computers in computer laboratory	7.1	14.3	21.4	11.9	28.6	38.1	66.7
	Total	2.0	5.06	7.13	6.25	36.6	50	86.6

All values are in percentage

Table shows that about 87% teachers were agreed about availability of computers in their schools. Only 7.13% teachers disagreed about availability of computers in their schools. And 6.25% teachers remained neutral about availability of computers in boys’ schools.

Table 6 Teachers’ perceptions about “acceptability of computers” in Government boys secondary schools of southern Punjab

S.N	Statement	S.D	DA	S.D+DA	N	A	S.A	A+S.A
9	It takes too long to learn how to use the computer	11.9	4.8	16.7	0	69.0	14.3	83.3
10	Students are planning to use computer for learning in future	0	0	0	0	54.8	45.2	100
11	Student use computer without any fear of making mistakes	0	0	0	0	64.3	35.7	100

12	Computer makes students feel pleasure	0	0	0	2.4	45.2	52.4	97.6
13	It is important to students to be good in computer skills	0	0	0	4.8	47.6	47.6	95.2
14	Management is really keen to see that people are happy with using computers	0	26.2	26.2	7.1	23.8	42.9	66.7
15	Computer is somewhat threatening to student	23.8	16.7	40.5	4.8	42.9	11.9	54.8
16	Computer used by students for educational purposes	0	0	0	23.8	54.8	21.4	76.2
17	Computer helps the students for getting good marks	14.3	9.5	23.8	0	61.9	14.3	76.2
18	Computer use as a wastage of time	14.3	9.5	23.8	0	61.9	14.3	76.2
Total		6.43	6.67	13.1	4.29	52.62	30	82.62

All values are in percentage

Table reveals that about 83% teachers are agree about acceptability of computers in boys' schools. 13.1% teachers disagreed about acceptability of computers in boys schools. Only 4.29% teachers remain neutral about the acceptability of computers in their schools.

Table 7 Comparison of mean scores of residential difference in availability (teachers perspective)

Variable	N	M	S.D	df	t	P
Rural	19	9.48	3.48	40	-1.238	0.223
Urban	23	10.91	3.96			

Table 7 reveals that the p value=0.223 shows there were no residential differences of availability of computers to the urban and rural areas teachers. There was no significant difference between the responses of rural (M=9.48, SD=3.48) and urban teachers (M=10.91, SD=3.96),  $t(40) = -1.238$ ,  $p=0.223$  regarding the availability of computers. So, the null hypothesis "There was no significant difference between the responses of rural and urban teachers regarding the availability of computers to students in boys schools of southern Punjab" has been failed to reject. This means that both rural and urban students had same availability of computer in secondary schools.

Table 8: Comparison of mean scores of residential difference in acceptability (teachers perspective)

Variable	N	M	S.D	df	t	P
Rural	19	9.0	2.4	40	-1.328	0.192
Urban	23	7.6	3.7			

Table 8 indicates that the teachers perceive that both urban and rural students had same acceptability of computer in secondary schools. As p value (0.192) indicates the null hypothesis "There was no significant difference between the responses of rural and urban teachers regarding the acceptability of computers in students of boys' schools of southern Punjab" has been failed to reject. This means that both rural and urban students had same acceptability of computer in secondary schools.

- Thematic Analysis
- Availability of Computer
- Thematic analysis revealed that many head teachers responded that they had computer laboratory in their school with all facilities that are required for computer laboratory.

One head teacher responded that students had easy internet access and proper installation of software and hardware. They said that they almost had six to eight periods of computer in computer laboratory in a day to make use of computer convenient for all classes. They adjust 250-400 students of whole school (6th to 10th) and 20-110 secondary students of computer classes in their weekly schedule easily.

## ACCEPTABILITY OF COMPUTER

Thematic analysis revealed that the majority of head teachers responded that students in their schools were very keen to use computer, they had a very positive attitude and interest to learn computer, and students enjoy it and wait for the class of computer. Except for item 9, "Learning how to use the computer takes too long" and item 15, "Computer is somewhat scary to students," quantitative data revealed the same findings for all items (table no. 1 and 5).

## CONCLUSIONS AND RECOMMENDATION

It was concluded that majority of students and teachers supported that computer was available, acceptable and useful to majority of students in Government boys schools of southern Punjab. Similarly students' and teachers' perception also reflects that teaching support was available for students. Overall t-test results show that both rural and urban students had same availability and accessibility of computer in secondary schools (teachers' and students perspective). But in students perception urban students had higher acceptability of computer as compare to rural students of secondary schools. It is recommended that government should provide more facilities in rural areas to make the acceptability of computer equal to urban students.

## CREDIT AUTHOR STATEMENT

**Ms.Maimoona Naeem:** Conceptualization, Methodology, implementation, Data curation, Writing-Original draft  
**Javaid Iqbal.:** Methodology, Reviewing and Editing Muhammad Sarwar: Data curation, Supervision, Reviewing

## CONFLICT OF INTEREST STATEMENT:

It is declare that all authors don't have any conflict of interest. Furthermore, informed consent was obtained from all individual participants included in the study.

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