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## Use of Information Communication Technologies (ICTs) and Academic Achievement of University Students: A Correlational Investigation

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ARTICLE DETAILS	ABSTRACT
<p><b>History</b> Revised format: Feb 2021 Available Online: Mar 2021</p> <p><b>Keywords</b> Information and Communication Technologies (ICTs), Academic achievement, University students.</p> <p><b>JEL Classification:</b> M11, M12</p>	<p><b>Purpose:</b> This study was conducted to explore the relationship between the use of ICTs and the academic achievement of students at public and private level universities. The objectives of the study were to study the relationship between the use of ICTs and academic achievement of masters' level students.</p> <p><b>Methodology:</b> The population of the study included all the students which are enrolled in master degree programs of all public and private sector universities of the Punjab province. The sample of the study comprised 400 students including 243 females and 157 males. The data was collected by a self-developed questionnaire which was based on the students' opinions related to the use of ICT. All the 400 students gave their responses on six point likert type questionnaire that had 30 items. A pilot study was conducted for the validation of instrument. The reliability index (Cronbach's Alpha) was 0.89, which was statistically significant. Data were collected personally from students (both male and female) of two public and two private sector universities. The data gathered from the students were analyzed on SPSS version 22. Pearson correlation coefficient, t-test, ANOVA, mean scores, standard deviation were calculated to find the major results.</p> <p><b>Findings:</b> The study found the benefits and uses of ICT in education sector and also explored different ways which may help in teaching learning process using resources of ICTs.</p> <p><b>Implications:</b> The policy makers should make such policies which ensure the use of ICT resources in all public and private sector educational institutions.</p>



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## **Introduction**

Information and Communication Technologies (ICTs) have brought significant modifications in this modern era. ICTs are already being used in education, particularly, in secondary schools and higher education institutes. These technologies make use of electronic resources for transmitting, controlling and saving of data (Onyia, 2013). ICTs is a big terminology that involves any instrument of communication including television, radio, mobile phones, computers and networking hard wares, satellite systems etc. It also includes different applications and services such as distance learning and video conferencing (Abe &Adu, 2007).

Information and Communication Technologies (ICTs) have made the world a global village in which people stay in contact with all the other people who actually not belong to their native country. Because of this, ICTs are frequently studied with this view that how much our societies have got affected by the modern information and communication technologies. These technologies can offer a collection of strong tools that may help in changing the current inaccessible teacher-centered and text-bound classrooms into well off, student focused, interactive and informational surroundings. It may help to improve the awareness and understanding of the students. ICTs can be helpful in planning the new world economy and labour force for the information society (Onyia, 2013).

Information and Communication Technologies have a great effect on education sector, on institutions and on teaching-learning methodologies. However, there are significantly different expenditure levels in between the countries as well as in between the organizations within countries. In many countries schools have entranced as a part of curriculum and displays lofty levels of useful and suitable use to maintain teaching learning across a broad choice of subject areas. The utilization of ICTs in the teaching learning methodologies have turn into an essential element for the meaningful learning (Aristovnik, 2012).

It is not a new trend to use computers in education. Its supporters demanded that it would alter and promote education (Anstine& Skidmore, 2005). In the era of 1980's there is an increasing uplift in computer incorporation which focuses the curriculum but not the instrument. The supporters of the ICTs believe that students would study new capabilities if they want to make computer work for them. Now we can say that computer could be sighted more as an associate rather than an entrant and could be treated in a more usual manner (Amutha, 2014).In 1990's there was a sharped focus in rising the utilization of computer skills in the classroom. Not only the departments of education but also the parents and the business sector emphasize that computer technology must be the part of education. The most important feature of the digital age is internet which is significant in Education.

The effect of electronic learning on the students' academic performance is inaccessible from the nature of ICT communication. The use of information and communication technology in this highly globalized world has brought about remarkable changes in the teaching learning methodologies and in the academic achievement of students in all the subjects and faculties (Zameni, Nasimi, Rezayirad&Ghanbarpoor, 2011).Moreover, Balanskat, Blamire, and Kefala (2006) reviewed several studies on the impact of ICT on schools in Europe. They concluded that the evidence was scarce and comparability was limited. Each study employs a different methodology and approach, and comparisons between countries must be made cautiously. In addition, in several other studies (Jayson, 2008; Shaikh&Khoja,2011; Yusuf &Afolabi, 2010), it is argued that ICTs help to improve the quality of learning and educational outcomes. Some other studies reflect that, in order to be successful, a country should improve its education system by implementing effective and robust ICT policies (Amutha, 20014; Khan & Shah, 2004; Iqbal& Ahmed, 2010).

## **ICTs Encourage Teaching and Learning**

Numerous teachers apply ICTs to sustain usual learning technique, for example, all those students who become the efficient maker instead of passive learners while the recovery of information. In an article having the title of teaching and learning with ICT, Galea(2002) explains how Information and

Communication Technology can encourage teaching and learning. According to the author there are two main causes in rising the use of ICT in education in UK. Firstly, lessons' rapidity can be changed by ICT: For taking the benefits from the latest opportunity that ICT propose, the students from the advanced culture require to establish adequate abilities. Secondly, educational scholars in UK have a keen interest in determining how technological skills can enhance the eminence of teaching and learning in schools, and so facilitate the students to attain improve results. UNESCO (2008) stated in its report that ICT gives a constructive effect on students' knowledge and performance when it develops into an incorporated component in the teaching learning methodologies.

### **Learning Theories and ICT**

Attention to learning theories in the last two decades resulted in a shift from instructional approaches such as behaviourism, cognitivism and humanism to learner-centred approaches promoted by constructivism. This is because the latter theory promotes active learning through knowledge construction (Gagne, Briggs & Wager, 1992). The critical issue of including learning theories in ICT application design for teaching and learning has consistently been reported in literature (Niyazazari & Hosseini ,2012; Shaikh & Khoja, 2011; Koohang and Durante 2003). The literature has also consistently pointed out that constructivist learning theory is an appropriate match for ICT application design in teaching and learning in higher education (Khan & Shah, 2015; Amutha, 2014; Anstine & Skidmore, 2005).

### **Objectives of the Study**

The study was conducted to achieve the following objectives:

To study the relationship between use of ICTs and academic achievement of masters level students.

To find out the difference between male and female university students regarding use of ICTs and their academic achievement.

To find out the difference regarding the use of internet per hour by the university students.

To investigate the difference between public and private universities regarding use of ICTs and academic achievement of university students.

### **Methodology**

Following section will discuss the procedures of the study.

### **Population**

According to the information provided by official website of Higher Education Commission, there are 27 public and 24 private sector universities in Punjab. Population of the study consisted of all students enrolled in Master's degree programs of public and private sector universities in Punjab.

### **Sampling Technique**

Sample of the study had three levels:

Level 1: Universities

Level 2: Departments

Level 3: Students

The sample was selected through multi stage random sampling technique. First of all, two public and two private sector universities were selected randomly. From all the faculties of each university, 10% departments were selected randomly. For the proportionate selection of respondents, 10% students were selected randomly from each selected department.

### Research Instrument

A self-developed questionnaire on six points likert type scale was used to elicit responses from students of two public and two private universities. These universities included The University of the Punjab, Lahore, University of Education, Lahore (public sector), University of Management and Technology, Lahore, University of Central Punjab, Lahore (private sector). "A six point Likert scale is an brilliant source for the achievement of sentiments and feeling of respondents as it provides six choices to participants to respond" (Anderson, 1990).

The questionnaire for students consisted of two parts, first part contained the demographic information including institution, program, department, semester, gender, age, parents' qualification, use and availability of ICTs. Part two consisted of 30 statements on the use of ICTs by university students on six point Likert type scale ranging from strongly disagree to strongly agree.

### Data Analysis

The descriptive statistics were applied to analyze data by calculating Pearson correlation coefficient, Independent sample *t*-test and Analysis of Variance (ANOVA) depending on the nature of data and objectives. The analysis of data was presented accordingly, Pearson correlation was used to identify relationship between achievement scores of students and their opinions regarding use of ICT, Independent Sample *t*-test to identify mean difference in opinions of students regarding use of ICT on the basis of gender, to identify mean difference in achievement scores of male and female students, ANOVA to identify mean difference in opinions of students regarding use of ICT enrolled in different program.

### Analysis and Interpretations

The statistical analysis is presented as follows:

**Table 1: Descriptive Statistics of the Variables of the Study**

Variable	Category	Numbers	Total
Gender	Male	157	400
	Female	243	
Age range	18-30		
Program	M Sc. Psychology	30	400
	M Sc Mathematics	89	
	Islamic Studies	151	
	M. Com	70	
	M.B.A	30	
	M.Sc physics	30	

Table 1 shows the descriptive statistics of all the variables of the study in this research.

**Table 2: Pearson Correlation Coefficient to identify Relationship between Achievement Scores of Students and their Opinions regarding Use of ICT**

Variables	<i>N</i>	<i>r</i> -Value	Sig.
Achievement and use of ICT	400	.653	.000

Table 2 shows the results of Pearson Correlation Coefficient to identify relationship between achievement scores of students and their opinions regarding use of ICT. It is evident that Pearson Correlation Coefficient is statistically significant  $r = .65$ ,  $p < .05$ . It shows that there was considerable positive relationship between achievement scores of students and their opinions regarding use of ICT. So the research hypothesis that "There is significant correlation between achievement scores of students and their opinions regarding use of ICT" is accepted and it is concluded that students who believe that use of ICT contributes positively to their learning get higher achievement scores.

**Table 3: Independent Sample t-test to Identify Mean Difference in Opinions of Students regarding Use of ICT on the basis of Gender**

Variables	<i>N</i>	<i>Df</i>	<i>M</i>	<i>t</i> - value	Sig.
Male	157	398	122.49	.06	.95
Female	243		122.43		

Table 3 shows the results of independent sample *t*-test to identify mean difference in opinions of students regarding use of ICT on the basis of Gender. Table values depict that the mean difference in the opinions of Male ( $M = 122.49$ ) and Female ( $M = 122.43$ ) was not statistically significant  $t(398) = .06$ ,  $p = .95$ . So, on the basis of these results research hypothesis that "there is significant difference in opinions of students regarding use of ICT on the basis of gender" is rejected and it is concluded that male and female students have similar understanding regarding effect of using ICT on their learning.

**Table 4: Pearson Correlation Coefficient to identify Relationship between Achievement Scores of Students and use of ICT in Hours per Day**

Variables	<i>N</i>	<i>r</i> -value	Sig.
Achievement and use of ICT in hours per day	400	.157	.002

Table 4 shows the results of Pearson Correlation Coefficient to identify relationship between achievement scores of students and use of ICT by them in hours per day. It is evident that Pearson Correlation Coefficient is statistically significant  $r = .157$ ,  $p < .05$ . It shows that there was substantial positive relationship between achievement scores of students and the use of ICT by them in hours per day. So the research hypothesis that "There is significant correlation between achievement scores of students and use of ICT in hours per day" is accepted and it is concluded that students who believe that use of ICT resources per day.

**Table 5: Independent Sample t-test to Identify Mean Difference in Opinions of Students regarding Use of ICT on the basis of Public and Private Sector**

Variables	<i>N</i>	<i>Df</i>	<i>M</i>	<i>t</i> - value	Sig.
Public	200	398	122.29	.329	.743
Private	200		122.62		

Table 5 shows the results of Independent sample *t*-test to identify mean difference in opinions of students regarding use of ICT on the basis of their sector (public and private). Table values depict that the mean difference in the opinions of public ( $M = 122.29$ ) and private ( $M = 122.62$ ) sector was not statistically significant  $t(398) = .06$ ,  $p = .743$ . So, on the basis of these results research hypothesis that "there is significant difference in Opinions of Students regarding use of ICT on the basis of sector" is rejected and it is concluded that students in public and private sector use ICT resources in similar way.

## Discussion and Conclusion

The results of the study indicate that the use of ICTs in studies has a positive impact on the academic achievement of the university students. The several research studies also support the argument that ICT

resources are beneficial to the academic achievement of students and also contribute to the teaching learning methodologies. A significant correlation between achievement scores of students and their opinions regarding use of Information and Communication Technologies (ICTs) reflect that university students consider ICT resources beneficial to their academic achievement. The same is also reflected from their achievement scores which exhibit a significant correlation with their opinions about the use of ICT resources being useful in their academic uplift. The same is also evident from another major finding of the study that students who believe that use of ICTs contributes positively to their learning spend more time in using ICTs per day which is also consistent with another finding of the study where students believe that learning through ICT resources does not affect the time they spend daily on using these resources.

The study has also revealed that male and female university students have similar understanding regarding effect of using ICTs on their learning. It means that they are of the view that use of ICT resources is having positive effect on their learning which is also supported by another finding of the study that with the use of ICT resources, the male and female students are achieving same scores. No difference has also been found between male and female students regarding use of ICT resources in hours per day which gives the evidence that both male and female students spend almost same time per day on using ICT resources.

Another interesting finding of the study depicts that students from both public and private sector universities are using ICT resources in the similar way which means that they are having same opinions about use of ICT resources in their academic achievement. The same result is also consistent with another finding of the study that students enrolled in different programs of the universities have similar opinions regarding the use of ICTs and their effect on their learning which is also supported by another important finding that male and female students enrolled in different programs of the public and private sector universities spend equal time in using ICT resources per day which is reflective of the importance of ICT resources for all disciplines.

### **Recommendations**

The following recommendations are made on the basis of major findings:

1. One major finding of the study shows that university students who believe that use of ICT resources contribute positively to their learning get higher achievement scores. On the basis of this finding, it is recommended that students should be provided with more ICT resources on campus so that they might be able to show better performance in all types of examinations.
3. Students who believe that use of ICTs helps to improve their learning spend more time in using ICTs per day. On the basis of this result, the administrations of the universities should allocate more time in daily schedule to be spent in computer labs. In this way, students will get more opportunities to enrich their knowledge and information through making the best use of ICT resources.
4. The university students have opined that learning through ICT resources does not affect the time they spend daily on these resources. The teachers should instruct the students that how they can make the best use of their time being spent on learning through these ICT resources.
5. No significant difference has been found between the opinions of male and female university students about the effect of using ICT resources on their learning. On the basis of this findings, no difference should be made in the provision of ICTs facilities to male and female university students by the universities administration without any gender bias.
6. Another important finding of the study reveals that students of both public and private sector universities have similar opinions about the use of ICT resources for their academic achievement. It means that they are equally aware of the importance of ICT resources for progressing academically. Higher Education Commission Islamabad and Punjab Higher Education Commission Lahore should provide grants to both

public and private sector universities for establishing highly equipped ICT labs for the benefits of students from all sorts of socio economic background.

7. Information and Communication Technology (ICT) resources should be provided to all students enrolled in different disciplines and programs of all public and private sector universities for making them academically strong.
8. The faculty members of universities should plan their courses with maximum incorporation of ICT resources to enhance students' skills and to enable them to get advantages from these resources for better performance in academic achievement.
9. All university students should be encouraged to utilize ICT resources for their personal development so that they might be able to develop academically.
10. Information and Communication Technologies should be an integral part of the curricula.
11. The policy makers should make such policies which ensure the use of ICT resources in all public and private sector educational institutions.
12. Seminars and workshops should be conducted to make teachers aware of modern ICT resources.
13. Further research studies should be conducted on this topic with a larger sample using qualitative approach to derive more rigorous findings.

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