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# The Impact of ICT on Students' Academic Performance in Public Private Sector Universities of Pakistan

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***Abstract:*** ***In all aspects of life, the use of information and communication technology (ICT), including education, has become common and increasingly important for students. This paper attempts to identify the different effects of ICT on tertiary education. In the study, relation between the use of ICT with students and their academic achievement in public and private academia in Pakistan, investigated. The research proposed the following goals: To find out why students have been given access to ICT services, To explore how many students use ICT and for how long, To describe the connection among the use and academic performance of ICT in students. The study was performed on 300 students using questionnaire and in order to see the rate and find out if there is any association among ICT and students' academic achievements, Pearson correlation coefficient, and descriptive statistics, used. The results showed that most students had laptops, personal computers, and in universities, they have Internet access. Many students stated, they used ICTs in order to improve their essential skills and to carry out their learning effectively with much involvement. It has also been established that the productive use of ICTs has had a substantial significant impact on the students.***

***Keywords: ICT, Tertiary Education, Academic Performance, Public Private University, University Students***

## I. INTRODUCTION

ICT is the acronym "information and communication technology" which means those technologies thatoffer the users to get the required information via telecommunications. It is far just like Information Technology (IT) however emphases on the whole on communication tools. It consists internet, Wi-Fi, cell telephones, and other mediums of communication". Consisting computers and vital company software, storage, audio-visible structures, middleware that allows customers to contact, shop, transfer, and manage data"(Shamim Talukder, 2015).

ICT has a vitalpart in establishing the new international economic system to provide fast changes in the world. In preceding era, at all these speeds, the ICT advanced and developed that the developing nations were unable to catch the transition anymore and were left behind and as a result of their interaction with the developed countries lagged behind. ICT offers the impetus for the present world so that know-how and essential concepts of this technology are seen as an important factor of learning (UNESCO, 2002).

It enables the learner to understand the difficult things in a very simple way presented through simulations when it is added to real situations. Hence, it plays the role of dynamic learning oriented facilitator that foster the learner to develop and enhance higher order thinking (Alexander, 1999). The main prerequisite for learners to get assistance from this innovation but it depends on the level of accomplishment and understanding of these vital technologies and realizing essential technological skills (Trpkovska, 2010). For increasing the academic achievement of pupils, conventional teaching methods are required to be up-to-date. Computer-Assisted Instruction (CAI) is the way that ICT technology is used for time-independent learning and teaching, making it easy for students to go through the system at home or on their computer. CAI increases learning levels as novices can learn more by offering the same length of time as classically taught learners. In addition, ICT standards keep learning easier for students (Hussain, Suleman, Din & Shafique, 2017).

The influence and practices of ICT have become anevolving area of argument in the area IT in all the divisions especially in education. Educational institutions are adopting the methods of teaching which consists of ICT and its offering into associated educational programs (Shamim Talukder, 2015). This technology enables the students to accomplish familiarity, how they interconnect and recognize with each other. For addition, high-tech classrooms and facilities, including projectors, TV and radio transmitting / receiving devices, smart communication panels / screens and teleconferencing systems, can be expected to be the consequence of extensive use of ICTs (KURSUN).

The use of ICTs in education field has also emphasized by the National Education Policy 1998-2010 According to NEP 1998-2010 ICTs can be employed creatively to help instructors and learners with a broad array of skills and from diverse social and economic backgrounds. The quality of instruction and managing of educational activities can be enhanced by the ICTs use (Shaheen and Khatoon, 2017). New advancements which are taking place all over the world have changed this world into a well-connected global village. Learners of this 21st century are more creative and interested in technology driven tasks.

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The influence and practices of ICT have become a growing area of discussion in the area of IT in all the divisions especially in education. Instructors, using ICT to adapt the pedagogical techniques in order to growth performance of the pupils. Instructive institutions are adopting ICT based teaching technique and its related instructional programs for the students to teach. Students are availing the ICT services using some smart devices and the internet.

So it is needed to measure the students' behavior towards ICT services usage and also its effects on the performance of pupils' teaching(Shamim Talukder, 2015). Therefore the current study is proposed to see the influence of the use of ICTs on the educational performance of students in universities.

## II. OBJECTIVES OF THE STUDY

The key outcome of the study was to recognize the association between the use of ICT and academic performance of public and private academia pupils in Lahore, Punjab.

To achieve this objective following subsidiary objectives will be framed:

- **i.** Availability of ICT facilities at home and university.
- **ii.** To identify the reasons why students access the ICT services.
- **iii.** To know the usage frequency of ICT by students.
- **iv.** Identify the relationship between students' use of ICT and their academic performance.

## III. LITERATURE REVIEW

Within the past two decades, ICT has earned prolonged importance. The accessibility of a massive extent of facts, resources via internet, improvements of technology in the field of ICT and a prolonged pliability in organizations and corporations has intensified the knowledge boom and information worldwide (Hasan &Sajid, 2013). Consistent with the words of Daniels (2002) ICT has turned out to be inside a totally brief time as one of the fundamental pillars of present day society. ICT is considered as to be a source of learning simple competencies, skills and concepts by many of the countries as well as the concepts of ICT integrated with education, alongside analyzing, writing and numeracy. But, a fallacy is that ICT usually denotes to 'computer systems and computing associated sports'. This is luckily not like that, even though computers and their softwares play an extensive position in cutting-edge data control, other technology and/or structures also contain of the phenomenon this is normally seemed as ICTs. The Radio Assisted Instructions (RAI), Internet Assisted Instructions (IAI), CAI, TV Assisted Instructions (TAI) are some of the ICT-assisted instructions in some areas (UNESCO, 2014).

**Advantages of ICT:**

Education arena of society that has been influenced by ICTs and absolutely influenced teaching and learning as well as the research. A splendid deal of the studies tested the advantages of quality of education and mentioned that;

1. ICTs have the ability to originate, boost up, improve, and deepen abilities, to encourage and interact with students, so that they could be able to utilize their skills in practical fields, generate financial capability for future personnel and enhance the teaching and learning experiences (Okoro&Ekpo, 2016).
2. According to Khan, et al (2015) ICTs have extended rise of attention of the students. ICTs has brought about revolutionary changes and totally changed the scope of education in the last few years. Most of the countries in Europe, ICT and its use has attained top level importance in education during the last decade.
3. ICT is used by teachers to guide old-fashioned learning strategies, for example, in getting information where college students are 'submissive" of information as opposed to 'active producers capable to take part within the gaining knowledge of technique.
4. It is entitled how ICT can encourage and improve the educational process. In UK ICTs use in education is emphasized due to two primary objectives.

a. First, ICT can alternate the lesson s' speed: they specified that kids want to broaden adequate capacities and talents from the new potentials provided by the use of ICTs.

b. Secondly, a huge number of students are there in UK who has the interest to contribute in research and want to learn how to operate new technologies that can expand quality of teaching and learning at educational environment so this might help the inexperienced persons to attain higher results"(Lawsent& Vincent, 1995).

5. By the wide ranged use of the ICTs It has great impact on students' academic performance. ICTs assist them to get increase in education, make stronger the implementation of education to the progressively virtual place of work, and raise instructional best.
6. The practice of presenting ICTs in the classroom and other academic situations everywhere in all over the world a long time indicates the potential and effective utilization of ICTs in education (Valasidou&Bousiou, 2005).

To get the best and maximum rate of return (ROI) is the investment on the youth of the country to build the forthcoming of the nation (HEC, Pakistan, 2016). Institutes of the Higher Education have been spending huge amount of budget in ICTs for more than 20 years (Youssef &Dahmani, 2008) as an incorporation of ICT in higher education that leads to the social and economic development of the higher education institutes (Balasubramanian et al., 2009). A course or objectives on basics skills of computing in education have included by many Asian countries because these skills are the basic requirements for all-time learning (UNESCO, 2014). Ali et al, (2014) reported that IT is becoming a necessity in Pakistan, Students of Universities frequently use libraries equipped with technology like internet, etc. The Government of Pakistan is providing guide and drive the use of ICTs it in education setups. In this regard millions of dollars are being in it, and bulk of the amount is being invested on theimprovement of human aid as well as the facilitation of the infrastructure. The Government of Pakistan is trying hard tobring technology revolution in the country in order to enhancing infrastructure, human resource, improvement and incorporating it in thepublic and private sector.

ICT is not yet integrated with the education and is in its preliminary stages(Balasubramanian et al., 2009).In less developed countries, there are multiple challenges are faced in integration of ICT, where huge amount of capital is required to build an institute equipped with ICT systems as associated to industrialized nations.

The foremost problems were the excessive price of attaining, connecting, working, sustaining, and swapping the system of ICT, using non-licensed applications, old-fashioned hardware & software systems and deficiency of methodological support of the systems (Balasubramanian et al., 2009). In Pakistan ICT in education is a big contest as infrastructure is deserted, predominantly in its rural areas (UNESCO, 2014).

## IV. METHODOLOGY

This research was conducted to measure the impact of ICT on the quality of university students. The students in Lahore City, capital of the Province of Punjab, Pakistan were a demographic sample of the higher education of public and private universities. This thesis consisted of a quantitative research survey and randomly selected a group of 302 students from five universities in Lahore District (2 public and 3 private sectors).The frequency of respondent by gender and by sector was shown in **Table 1.**and**Table 2.** respectively.

**Table 1. Gender of Respondent**

| | Frequency | Percent |
|---|---|---|
| Male | 190 | 62.9 |
| Female | 112 | 37.1 |
| Total | 302 | 100 |

**Table 2. University by Sector**

| | Frequency | Percent |
|---|---|---|
| Public | 184 | 60.9 |
| Private | 118 | 39.1 |
| Total | 302 | 100 |

The respondents belonged to different departments like: Computer Science (35.8%), Management (32.5%), Social Sciences (27.2%) and others were (4.5%). The majority of students from BS level, which was 79.1%, whereas 7.3% and 11.6% for MSc and MBA respectively. Only 2.0% respondents of MS/MPhil participated in this survey. The age range of the respondents was between under 20 to above 30 in which about 76.8% participants were in the age range of 20-25.

To measure the availability of ICT facilities, reason for using ICT, usage frequency of ICT and impacts of ICT on the academic performance of pupils, a three (03) Likert scale was used as a tool of study. A questionnaire was categorized in four (04) blocks: in the first block of the questionnaire, students were obligatory to respond with yes or no to check the availability of ICT facilities for students at home and at university. In the second block of the questionnaire, to identify the reasons of accessing the ICT facilities by the students was measured by the scale of agreed, neutral and disagree. In the third block, usage frequency was measured by the students for how they accessed ICT facilities and how much time they used it by the scale of rarely, never and often. In the final block of the questionnaire, impact of ICT was measured to see either it hada positive or negative impact on academic performance of students and it was measured by implementing the scale of agreed, neutral and disagreed.The data was examined by descriptive statistics, which included frequencies, percentages and correlation.

## V. RESULTS AND DISCUSSIONS

### Availability of ICT facilities for the students of Higher Education

The students are presented with a rundown of the ICT facilities available in their home and university setting. Students have been asked to answer yes or no. Table 3 shows the results on access to ICT facilities.

**Table 3. Availability of ICT resources among respondents at Home and at Universities Frequencies**

| Facilities | At Home | | At University | |
|---|---|---|---|---|
| | Responses | % | Responses | % |
| Availability of ICT at Home-Laptop | 269 | 92.40% | 126 | 43.20% |
| Availability of ICT at Home-Computer | 202 | 69.40% | 245 | 83.90% |
| Availability of ICT at Home-Internet | 267 | 91.80% | 276 | 94.50% |
| Availability of ICT at Home-Printer | 89 | 30.60% | 184 | 63.00% |
| Availability of ICT at Home-Scanner | 55 | 18.90% | 149 | 51.00% |

**Table 3.**shows that the mainstream of respondents had Laptops, computer and internet services at their homes and universities.(92.4%) which is the majority of the students had laptops and (91.8%) internet services at home. Whereas, printer and scanner services were not available to the students at homes, rather these services might be used at universities. According to the university section given in table 3, majority of students (94.5%) had internet facilities and (83.9%) students had computer facilities in their university.

### Reasons for using ICT facilities for the students of Higher Education

Likert scale was provided to identify the reasons of accessing the ICT facilities by the students and it was measured by the scale of agreed, neutral and disagreed and the frequencies of using ICT and percentages were given in **Table 4.**

**Table 4. Reason for Using ICT**

| Reason for Using ICT Frequencies | f | % |
|---|---|---|
| Use educational software to learn some lessons | 260 | 86.40% |
| Use MS Office / Open Office, etc. for making assignments / presentations / calculations. | 251 | 83.40% |
| Make/design things on the computer (like posters, invites) | 189 | 62.80% |
| To send and receive emails for communication | 239 | 79.40% |
| Browse the Internet for Entertainment. | 201 | 66.80% |
| Browse the Internet for Social Media. | 214 | 71.10% |
| Shop on the Internet | 148 | 49.20% |
| Easy and Continuous access to Academic Resources | 215 | 71.40% |
| Due to its cost effectiveness | 150 | 49.80% |

**Table 4** showedthe results that the mainstream of respondents used educational software's to learn their lessons and usedMicrosoft office related applications to make their assignments, to prepare their presentations and to do calculations. The majority of the students (86.4%) used educational software's for learning lessons and (83.4%) used Microsoft office and open office to make their documents for study purpose. Whereas, email was the source of communication to send or receive messages through the internet and according to study (79.4%) students used email for communications. According to table 4, only (71.1%) students used social media for their entertainment and only (71.4%) said that they had easy and continuous access to academic resources. Whereas, less participants (49.2%) liked to do shopping on the internet.

**How and How much ICT facilities to be used for the students**

To identify, how respondents use ICT facilities and for how long time they use it. A Likert scale was used to identify that how participants access ICT facilities and for how much time they access it and it was measured by the scale of Never, Rarely, Often with its frequencies and percentages given in **Table 5.**

**Table 5. How and How much ICT Facilities to be used**

| ICT Facilities to be used frequencies | f | % |
|---|---|---|
| Usage of modern ICT at university (LED, Pointing Devices, Laptop, PDAs). | 82 | 40.00% |
| Use the internet to join with the others/team. | 67 | 32.70% |
| Use of multimedia device not the White/Black board. | 55 | 26.80% |
| Use of Internet for preparing projects&assignments except library or books. | 57 | 27.80% |
| Use of Wi-Fi in university. | 66 | 32.20% |
| Use of video lectures. | 71 | 34.60% |
| Online exams taking. | 121 | 59.00% |

**Table 5** showed that according to our study, only (59.0%) majority of respondents took online exams for their practices purpose because the less strength of the students knew about online practicing of exams. Traditionally, students used books or other resource material for making their assignments and project instead of using the internet, so we got only (27.8%) of the result. Internet facility was common in all the education sector, but easy wireless access was not available to every student in the universities and we got only (32.2%) result about the use of wireless communication in university. Video lectures were an alternate and best source of learning in the subjects, but only (34.6%) respondents found familiarity with the use of video lectures for their study.

**Impacts of ICT on Students' Academic Performance**

Finally, to identify the impacts of using ICT on students' academic performance, multiple tests applied like Independent sample T-test to measure whether there is the significant difference between the means in two unrelated groups.

**Table 6. Independent Sampling T-test**

| Variable | N | Mean | Std. Deviation | Significance | CI 95% | |
|---|---|---|---|---|---|---|
| Gender | | | | | Lower Bound | Upper Bound |
| Male | 190 | 17.41 | 3.45 | | | |
| Female | 112 | 18.8 | 4.4 | 0.004 | -0.356 | -0.441 |

Data in the above mentioned **Table 6.** indicated that there is statistically significant mean difference of academic performance among the students across gender of the students. Moreover, mean score reflects that academic performance is better among female students (M 18.8036 SD 4.40278) as compared to male students due to the usage of ICT.

**Table 7. ANOVA Test**

| Variable | N | Mean | Std. Deviation | F | Significance |
|---|---|---|---|---|---|
| Program | | | | | |
| BS | 239 | 18.06 | 3.9 | | |
| MSc | 22 | 19.77 | 4.16 | | |
| MPhil / MS | 6 | 17 | 2.9 | | |
| MBA | 35 | 16 | 2.96 | 4.93 | 0.002 |

Results of Anova test indicated in **Table 7.**that there are statistically significant mean differences between different categories of disciplines i.e. BS, MSc, MPhil/MS and MBA (F 4.93, Sig .002). However, the highest students' academic performance is among the students who are enrolled in the MSc program (M 19.77, SD 4.16).

**Table 8. Linear Regression**

| | R | R Square | Standardize Coefficient | Significance | 95.0% Confidence Interval for B | |
|---|---|---|---|---|---|---|
| | | | Beta | | Lower Bound | Upper Bound |
| Reasons to access ICT | .124[a] | 0.015 | 0.415 | 0 | 0.446 | 0.741 |

**Table 8** presents the results of simple linear regression analysis. Data indicated that the independent variable, i.e. reasons of access to ICT explained 12.4% variation in dependent variable, i.e. academic performance among the students who in both public and private universities located in Lahore. The standard coefficient beta value indicated that one unit standard deviation increase in reasons of access to ICT will increase (.415) standard deviation in academic performance among the students. In addition, reasons to access ICT is statistically significant predictors of students' academic performance (CI .446-741).

## VI. RECOMMENDATIONS

There are a few recommendations for educational institutions.

1. Students should have access to the internet with high bandwidth.
2. They should also have access to the online clouds.
3. Both faculty and administration should use ICT tools that can help students to achieve greater levels of academic performance.
4. Training sessions related to ICT should be taught in the curriculum at all levels as a general study and should be made compulsory.
5. ICT centers should be established at all levels of education and should be highly equipped with efficient infrastructure, functional systems and human resources in order to achieve a high level of results.

## VII. CONCLUSION

On the basis of result findings, it was concluded that most of the respondents hadsufficient availability of ICT tool, i.e. laptops, personal computers at their homes and computers at their universities, but the printing, scanning facilities were less available at homes but these facilities could be availed from the university. The majority of the students in claiming that they used ICT to perform different tasks, such as preparing assignments, classroom activities and plan their lessons more efficiently. The use of ICT improves students' competencies, computer based skills that might be very supportive in improving their organizational behaviors in practical fields. Furthermore, the effective ICT use integrated with teaching and learning practice add interest, encouragement and motivation among the students that helped the students to process information in a better way and increases their understanding and expands their memory. The results of the undergoing research, it was established that ICT had a significant and positive impact on students' academic performance.

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