Role of ICT in Distance Education in Pakistan

(A Case Study of Allama Iqbal Open University)

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SUPERVISOR’S STATEMENT

This is certified that the work contained in this thesis entitled:
“Role of ICT in Distance Education in Pakistan (A Case Study of Allama Iqbal Open University)” has been carried out under my supervision by Babar Hussain Shah and is approved for submission in fulfillment of the requirement for the award of the degree of Doctor of Media Studies.

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Examiner

Day_______ Month_______ Year_________
DEDICATON

I dedicate this humble effort to my late father Hussain Shah. His unending and blissful love has been the greater source of inspiration for me. He was with me, is with me and will remain with me till my last breath.
In the name of Allah, most gracious, most merciful
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ABSTRACT

This research examines the Role of ICT in Distance Education (A Case Study of AIOU). It is a universally admitted fact that use of ICT in distance education has enhanced learning process in all aspects of academic and administrative elements of an education system. This research was theoretically supported by two important theories of Mass Communication: Theory of Uses and Gratification and Knowledge Gap Hypothesis.

The researcher used probability sampling method and respondents were chosen from all four faculties of Allama Iqbal Open University. Cluster sampling technique was used to collect data from respondents. There were four clusters of sample comprising of Faculty of Social Sciences & Humanities, Faculty of Science, Faculty of Education, and Faculty of Arabic and Islamic Studies. Out of 367, a majority 334 (91%) questionnaire were completely filled in and returned by the respondents.

Results of the research indicate that majority of the respondents belong to faculty of Social Sciences and Humanities (36.8%). While the lowest number of respondents were Faculty of Arabic and Islamic Studies (15.3%). Results show that respondents have different ICT devices from Desktop to Scanner. But majority of respondents owned laptop (63.8%). It was revealed that (52.1%) of the respondents were using mobile internet. Being a part of distance education majority of respondents (73.8%) used home network as a place of internet use. It was also encouraging that most of the students (74.9%) were using computer for educational purposes. As far as purpose of internet usage is concerned it was found there was greater diversity in internet usage but most of the respondents (83.5%) were found using internet for education related purposes. While analysing the task related to ICT usage of AIOU website most of respondents were found (70.4%).

Results from the inferential statistics, Levene’s Test and Independent Sample T-Test used for hypotheses testing revealed that rural students find ICT more helpful than urban ones.
with the mean value for urban 3.5 and rural 3.7. It was also found that students with rural background had more reliance (3.4828 mean value) on ICT than the urban (3.4085). It was found that urban students find ICT more relevant (mean value 3.5179) for their studies as compared with the rural students (mean value 3.4842). Students with urban background found greater interest in ICT (3.5 mean value) than their rural fellows (mean value 3.4). Urban students experienced more limitations (3.31 mean value) with ICT usage than the students with the rural background (mean value 3.30). It was further pointed out that the students of urban areas are more gratified (3.43 mean value) with ICT usage than the rural students (3.25 mean value). It was analysed that Students having urban background are more motivated in ICT usage than rural ones. It was shown that contrary to urban Students having rural background were making more use of ICT. When preference for ICT usage was checked it was found that urban students prefer using ICT more than rural ones. Overall differences were observed between rural and urban background students regarding ICT and its usage. There are some limitations of this study which are also insights for future research studies in the area of Role of ICT in Distance Education are also provided by this study.
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CHAPTER 1: INTRODUCTION

1.1. BACKGROUND

Education has an important and greater role in the development, progress and the prosperity of the society. None of the societies can prosper without educating its people properly, because route to progress and prosperity lies in education. Education serves as key to development of a country and nation and it provides baselines for the progress of a country. It is beyond any doubt that the central role of education in development is acknowledged internationally and worldly accepted.

In developing countries like Pakistan formal education is not possible for everyone due to poor economic conditions. Distance Education (DE), is, hence an alternative to formal education. Many educationist across the world are of the view that Distance education, in particular, is base and is fundamental to address the many challenges that are faced by the third world and developing countries (Perraton, 1988). This is important to note that distance education has gained greater importance as a topic of interest around the world; especially in developing countries like Pakistan. Pakistan is a country having limited sources. Hence it is the distance education which is a ray of hope for poor people due to its unique features like cost effectiveness and flexibility. The current age is the age of unprecedented changes: Globalization, brought on by supersonic air travel, Satellite Communication, Cable television, computer assisted communications, Internet (Web 3) and societal changes have led to revise the changes in distance education.

There are various definitions of distance education provided by various scholars in different ways. In the words of Simonson (2006) Distance education is an institutional based, formal education in which learning group is separated and in that education uses interactive
telecommunication systems for the sake of connecting learners, resources and instructors well.

Perraton (1988) defines Distance education as an educational process in which the significant proportion of teaching is usually performed by someone (educator) who is removed in space and/or time from the student. Rumble (1989) believes that the process of DE contains four main elements consisting of: Teacher(s), student(s), curriculum for which teacher must be capable of teaching and student(s) must have spirit of learning. He further opines that DE is a contract between the student(s) and teacher(s) and also the institution that employed the teacher. To him institution has a greater worth and importance in DE because it acknowledges the respective teaching-learning roles of student(s) and teacher(s).

From above different definitions it can be concluded that DE is a method of teaching in which learners and teachers are separated physically. It is type of education which may use different methodologies of teaching including its on form of education and also a small proportion of teaching may involve face to face interaction. It is believed that in DE teaching learning contract requires that students must be taught, assessed, provided guidance and must be prepared for the examination that would be conducted by the host institution. This must be accomplished by the two-way communication. It is also believed that learning may be taken place individually or in form of groups; in either case it is usually accomplished in the physical absence of the teacher. DE doesn’t always employ a teacher like other formal forms of education. To sum up about DE it is conclude that DE systems have the following salient characteristics

i. The students and teachers are separated in distance education in contrast with regular education.

ii. It involves an organization/institution which distinguishes it from private education.
iii. It involves use of any media whether its print or electronic that serves to unite or connect student-teacher.

iv. It also works for the provision of two way communication whether it is in form of student-tutor interaction or interactive communication by means of technology.

v. It also involves some occasional meeting between student and teacher.

The system of distance education can be enhanced by the use of computer and related information and communication technologies. Phenomenal developments with regards to information and communication technology domain are having significant impact on all areas of human activity especially education. Before going to explain about symbiotic relationship between education and technology, it is very important to have a good understanding of the term ICT. It is of vital importance to note that how the term “Information and Communication technologies” used first so that we may be able to understand the basic concept of ICT. According to William, “this term derives itself from the 17th century use of the word to describe ‘systematic study...or the terminology of a particular art’. With the gradual passage of time the word was greatly associated with practical arts’, finally leading to a ‘familiar modern distinction between knowledge (science) and its practical application (technology), within the selected field.”

Like all other fields, ICT has various types of definitions. ICT is generally defined as the use of different technologies to process and to transfer information within different contexts i.e. social, economic, political and educational etc. (Ogunsula, 2005). Gumton, (1993, p10) defined as “ICTs are the electronic technologies that are used for the purpose of collecting, storing, processing, and communicating information. These technologies can be further classified into two categories: (i) those which process information, such as computer systems and (ii) those which spreads information, such as the telecommunication systems.
1.2. ICT IN DISTANCE EDUCATION

Application of Information and Communication Technologies in Distance Education, in particular transmission of information and telecommunications over electronic networks using the Internet has revolutionized the concept of distance education. Now, the students are connected with their universities through internet via computer. A large number of teachers who traditionally regard themselves as the sole source of information and communication are shifting their views from the self-concept of education and teaching. Now, they do not consider themselves as sole owners and dispensers of information and now, are shifting both their self-concept and their practice, placing greater emphasis on their role and their expertise as facilitators of learning. They strongly believe in important role of ICT to facilitate students and teachers in the process of learning. Arrival of ICT in DE has reshaped the basic concept and has revolutionized DE by introducing new trends. Once considered DE as single process with a close and contained environment, now is seen as an Open System. When we look at the distance education system of developing countries it is observed that printed matter is commonly used in the third world countries and along with it radio and television are being used as well. Audio video cassettes are being used as supplements. Similarly telephone and fax are used for tutorial support (Lawry Trevor-Deutsch and Lyndsay Green, 2002).

Use of ICT in DE; especially at higher education level is considered a major milestone in instructional design of DE. Arrival of Web. 3 has made internet more interactive with the growing social interactive media platforms like YouTube, skype and other interactive apps available on android phones. Now students can enjoy massive open online courses (MOOCs) by the use of ICT. ICT has created increased and improved access to information for students, and it has further created enabling environment for its students that enable them to work more effectively thus creating wider participation in studies on students.
end. (Laurillard, 2000; Koller 2012). ICT has supported collaborative learning and thus supported leaner centered approach to teaching as well. (Sellinger. M, 2003). When we look at international scenario regarding use of ICT for educational purposes we feel that usage of ICT for educational purposes has become an international phenomenon. (Heinze and Procter 2012; Francois 2013; Rafferty et al., 2013; McKenney and Reeves, 2013).

According to Stephenson, (2001) the following are the reasons of using ICT in distance Education:

i. It provides access to variety of information sources.
ii. It provides access to a variety of information forms and types.
iii. It helps in creating and fostering Student-centered learning setting which are s based on information access and inquiry.
iv. It creates learning environments which are based on problem-centered and inquiry-based activities.
v. ICT is helpful to provide authentic settings and provision of examples.
vi. ICT facilitate the teachers to play their roles as coaches and mentors rather than content experts.
vii. ICT is helpful in provision of access to different sources of information. Without access to information no studies can be done efficiently. Education totally depends on availability of information and hence, ICT provides a channel to have access to different sources of information. Now, most of the information resources are available online and to access online resources ICT is basic tool.
viii. ICT is helpful to have an easy access to different types and forms of information. It can help a student or researcher to benefit from different types and forms of information. In fact information is available in different types and forms and it is ICT
which helps students which form or type of information to access. There is a variety of databases and search engines which help students to look for desired information.

ix. ICT helps the students to facilitate in their studies by providing a conducive learning environment. Different tools of ICT like Computer, laptop, smart phones, tablets and internet connection have revolutionized education and proved helpful for the students to continue their studies in a smooth and uninterrupted way. And when it comes of distance education ICT is doing miracles for the students as it has squeezed the physical distances. Through internet students are connected with the whole world and so they can have an easy access to their study matters, tutors, supervisors and teachers.

x. ICT has the qualities to provide the students an environment which is student’s centered environment. It provides multiple learning opportunities through its different gadgets. It further creates an environment which helps the students to enhance and polish their learning abilities. It provides array of learning opportunities to the students. The students who are attached with distance learning can benefit from ICT more effectively

xi. ICT provides a platform to students to avail multiple sources of information in their research and studies. They can surf through internet variety of information sources at their own pace and speed. They can access their study material through online resources and even in the form of CDs as well.

xii. The arrival of Web 3.0 has made internet more interactive and participatory and through it two way communications is more conveniently possible. The students now have more opportunities to seek online information in interactive and participatory way.
So far as, teachers are concerned ICT has also triggered their ability to deliver required information to students more eloquently and more effectively. It has allowed teachers to use multiple tools of information delivery to communicate with their students. They enjoy freedom of liberating themselves from typical lecture delivery system. It has made communication for teachers more interactive and participatory.

ICT supports collaborative learning for students.

It allows study to look for high quality multimedia material as well as it encourages them to look for multiple sources of information.

ICT has encouraged independent learning of the students and they can work without any stress or pressure from their peers, teachers and tutors even.

ICT and distance education are highly interlinked and both have a direct coherence. In present age, Distance education is almost impossible without the proper implication of ICT. Arrival of internet especially has increased the importance of ICT in distance education manifolds.

1.3. **NEED AND IMPORTANCE OF DISTANCE EDUCATION IN PAKISTAN**

Pakistan is a country where literacy rate is low even in comparison with the other third world countries of the world. Majority of the country’s population is living in rural areas with less privileges and basic amenities of life. Population of Pakistan was 182.2 million in 2013 of which almost 38.6 population is urban. There is a huge rise in population by every year. Pakistan is at 6th number among the most populated countries of the world (World Bank, 2015). In order to meet the educational needs of this rapidly growing population only formal educational institutions are not enough. There must be some supporting institutions that must help and facilitate students in enhancing their education. Under such circumstances, distance
education is seen is ray of hope for the students which provides them an opportunity to continue their education uninterruptedly. Another big issue in Pakistan is that of unemployment as a result on one person whole family unit depends. One has to struggle hard to meet financial need for survival. Another big issue in Pakistan is there is great density of population is rural areas is greater as compared with that of urban.

In the light of above given facts and figures it is quite clear that there is greater mass of population is unemployed and situation is more worsening in rural context. Those people who are employed they can continue their studies through DE to run the wheel of life. The DE is really helpful for employed teaching professionals because it provides them an opportunity to enhance their professional qualification to excel in their profession without facing any disturbance or hindrance in their job. Statistics of Pakistan Bureau of Statistics reveal that a major proportion of the country is residing in rural areas where education opportunities are lesser as compared with urban. In this situation DE can fill the gap by crossing the barriers of geography. At present there are two main universities which are offering Distance education courses in Pakistan. These include Virtual University of Pakistan and Allama Iqbal Open University. Below is description of these two universities. In this situation AIOU is a ray of hope for such people to continue their studies along with their job and other social responsibilities.

AIOU has an important role in the development and prosperity of the country and it has played its role very efficiently since its inception. AIOU has played its leading role in open and distance learning in Pakistan. It is the pioneer university in Pakistan that offers a variety of programs ranging from Matric to PhD which is its distinction. The university has aided in increasing literacy rate of the country as well. This university has provided an opportunity to marginalized segments of the society who are unable to attend any regular
institution. The university has leading role in providing education in far flung areas of the country. It has reached the students of mountainous areas like Kashmir, Gilgit Baltistan, Baluchistan and hilly areas of KPK. The university has played its significant role in educating women who have completed their education staying in their homes at their doorsteps. It has also provided an opportunity to the students who are working in overseas.

Virtual University of Pakistan is perhaps the pioneer university that is making effective use of ICT in delivering best possible education to students living in Pakistan including remote areas and even the Pakistani diaspora as well. The President of the Islamic Republic of Pakistan is the Chancellor of the Virtual University of Pakistan. Chief Executive and Chief Academic Officer of the University is Rector. The University has a flexible mood of teaching and has convenience to access course contents by making use of ICT including TV channels, DVDs and internet. The University was established in 2002 and has made progress at rapid pace and has reached one hundred cities of the country. The university offers a variety of academic programs ranging from Bachelor to PhD. The university is making effective use of ICT including audio/video tutorials, video lectures, reading material and online interaction through e-class rooms. Lectures are delivered to students through university’s unique Learning Management System and its four free to air TV channels (VTV1-4) which is its distinction. The university has more than 170 campuses across Pakistan that are providing greater opportunities to students to enhance their qualification. The slogan of university is “World Class Education at your door step.” The following faculties are existing in the university: Faculty of Arts, Faculty of Computer Science and Information Technology, Faculty of Education, Faculty of Management, and Faculty of Science and Technology.
1.4. GOVERNMENT INITIATIVES REGARDING ICT AND DISTANCE EDUCATION IN PAKISTAN

There is an emerging shift in the world of today which has stronger connection with the usage and application of ICT in all aspects of our lives. According to planning commission of Pakistan, the Vision 2025 attaches lots of importance on Knowledge Economy, innovation and creativity, hence providing a very close alignment with the shift of paradigm from traditional to technology based. The ICT ensures accelerated and speedy economic growth based on innovation and creativity. It is now well understood that ICT is considered as precondition for entrepreneurship, job creation and other economic activities. Different collaborative technologies like video/ web conferencing, social media (interactive by nature), video calls, conference calls are playing an important role to set next stage for human development. All these technologies are basically a part of ICT Pakistan Bureau of Statistics, 2014). The Government of Pakistan is playing its effective role in dissemination and development of ICT. In Pakistan, Telecommunication sector has been undergoing an outstanding and tremendous growth during the last one and half decade and has reached tele-density of 75.1% as of March, 2015 (Pakistan Telecommunication Authority). By the auctioning of 3G/4G/LTE licenses the telecom sector enabled itself to move with the world of technology with the rapid pace. There is a great increase in users of mobile broadband which has increased to 15.6 million by March 2015 from 4.7 million in June, 2014. Some major projects that were executed during 2014-15 include:

i. Initiating National ICT Scholarship Program for students of non-metropolitan areas for providing access to quality IT and Computer Science Education in the country.

ii. Machine Readable Passport/ Machine Readable Visa Project - Phase-II.

iii. Automation of Central Directorate of National Savings (CDNS) project

iv. Establishment National Information Technology Board
1.5. **PAKISTANI GOVERNMENT PLANS TO PROMOTE EDUCATION**

Planning Commission of Pakistan has set a vision which is named as Vision 2030 that aims at looking to promote learning environment in Pakistan. The main goal of this vision are: one curriculum and examination system for all students of Pakistan. The different goals set by Vision are:

1. To increase expenditure on education and skill generation from 2.7% of GDP to 5% by 2010 and 7% by 2015
2. Reintroducing vocational and technical stream in the last two years of secondary schools.
3. Gradual increase in technical and vocational education number to 25-30 percent of all secondary enrolment by 2015 and 50 percent by 2030.
4. To enhance the quality of quality and scale of education in general and technical/scientific education in particular.
5. Increasing public expenditure on education and skills generation from existing 2.7 per cent of GDP to 5 per cent by 2010, then 7 percent by 2015.
6. Application of One curriculum, one national examination under the supervision of the government. The aim of this goal is the abolition of disparities existing between private and public sector. Hope so it will also be helpful in diminishing social divide as well. (GoP, 2013, Pakistan Economic Survey 2012-13)

Vision 2025 is also aimed at promoting higher education and it aims to double Pakistan Higher Education coverage. Moreover, it is focused on improving quality of higher education, research and development and creating strong linkage between academia and industry. It also focuses on improvement in field of Science and technology with particular emphasis on natural sciences, mathematics and ICT. It has been decided that by 2025 every university and college will be digitalized and computerized. Partnership will be developed between
academic institutes and industries so that passed out graduates of university may get practical training from industries (Ministry of Planning Development & Reform, 2015).

There is no doubt that a flowery language has been used in the vision 2025 and 2030 but it requires sincerity of efforts on the part of all stakeholders. Alone for the formal education institutions it is not possible to achieve MDGs and EFA for education. This vision can be obtained only if equal education opportunities are provided to all citizens of the county. Alone formal education institutes cannot do it all alone. Definitely they will need help and support from non-formal institutions too and AIOU can contribute very well in this stream.

1.6. ALLAMA IQBAL OPEN UNIVERSITY: A PIONEER UNIVERSITY IN DISTANCE EDUCATION

1.6.1. Introduction

The Allama Iqbal Open University was established in May 1974 under Act No. XXXIX passed by the Parliament of Pakistan with the aims to provide education facilities who cannot continue regular education due to job or some other constraints. Allama Iqbal Open University, Islamabad is the first university who caters the educational needs of almost 1.3 million students. It is the only institution that enables students to learn at their own pace, place and convenience. The university goes to the doorsteps of students crossing the barriers of distance. This university is open for all age group of its students which is its distinction. The university has four faculties which include; faculty of Social Sciences and Humanities; faculty of Education; faculty of Arabic and Islamic Studies and faculty of Sciences. This university followed the model of UK Open University which was established in 1969.

According to University Act 1974, the main objectives of the university are:

i. Providing educational facilities to those who are unable to leave their jobs or homes due to some issues.
ii. Provision of educational facilities to common people of the society for their educational enhancement as it may determine.

iii. Providing educational facilities for the training of teachers in such a manner as it may determine.

iv. Provision of educational facilities in such a manner that may are helpful in their learning.

v. Final and foremost purpose is examinations and awarding and conferring degrees, diplomas, certificates.

1.6.2. Organization

Like other federal universities of Pakistan the Chancellor of the Allama Iqbal Open University is the President of the Islamic Republic of Pakistan. The Federal Minister for Education is the Pro-Chancellor and the Vice-Chancellor of the University is its principal executive and academic officers. The main structure of AIOU consists of Academic Departments, Servicing Departments and Academic Departments. The University is a wide regional network which spread across the whole country. More than 40 regional campuses and centers of the university across Pakistan. Further, the university also facilitates students living abroad.

1.6.3. Teaching Methodology

The university follows the rules set by the Ministry of Education and Higher Education Commission. Curricula of University are also prepared under the guidelines and instructions as laid by Ministry of Education and HEC Pakistan. Being a non-formal and distance education university follows the non-formal method of correspondence, radio and television broadcasts, special textbooks and reading materials prepared on self-learning basis, part-time
teachers (tutors) engaged nearest to the student's residences. The university also has introduced the idea of study centers for teaching programs like CT, PTC, B.Ed. and M.Ed. and more recently program of Business Administration is also run through approved study centers.

1.6.4. Tutorials, assignments and Workshops

The university has a system of tutorials, assignments and workshops for its students. For each course student is allotted a tutor who arranges meetings for students. The students are provided with book and other ICT allied material like CD which helps them to write their assignments. Workshops for teaching courses are also arranged for students. Similarly for Masters, M. Phil and Ph. D student’s workshops are mandatory components. During the workshop component competent resource persons teach students different contents course to university students.

1.6.5. Radio and Television Programs

The traditional method of teaching involving tutors through correspondence has been supplemented by radio and television programs. Through establishment of Institute of Educational Technology the university is able to produce quality programs of radio and television. These programs are regularly one aired through university FM radio which is FM91.6. PTV world also telecast daily one hour transmission for AIOU. Along with IET another department namely Centre for Instructional Design has also been developed in the main campus which produces written material of different courses in multimedia /CD format which enable students to have better understanding of different course of AIOU.
1.6.6. Use of ICT

The university is making extensive use of ICT. Now students don’t bother to come to varsity to inquire about their admission, examination etc. An online tracking system has been developed through which students can know about their admission, tutors, delivery of books, examination and even the status of their degrees. The university is making effective use of Video Conferencing to deliver lecture from main campus to other regional campuses and students of other regions are attending their workshops in their respective regions through video link. Even oral examinations of students are conducted through video conferencing/Skype. University is even facilitating its faculty abroad who cannot show their physical appearance for promotion interviews/selection boards. The university has started dispatching books to students in soft form to encourage paper free society. There is department in university who is regularly working on developing soft contents of different courses of AIOU.

1.6.7. Examination

At the end of every semester a written exam is conducted in different examination centers is conducted to evaluate students’ performance in their respective subjects.

1.6.8. AIOU and Women Education

The role of AIOU in educating women is commendable and undoubtedly it has helped women to enhance their academic qualification. AIOU has crossed a landmark of 1.7 million enrolment and among those enrolled 64 percent are females and in Punjab enrolment of female students is 67 percent. This statistics support the hypothesis that how AIOU is playing its pivotal role in educating women. It goes to the students beyond their age limit and thus results in increased literacy rate of the country. (Arshad, A, 2016)
1.6.9. AIOU and Teacher Education

Another area in which AIOU is playing its significant role is teachers training and their education and AIOU has a leading role in this aspect too. It is offering program which are unique and diverse providing an opportunity to graduates to pursue their teachers’ training degree from AIOU which varies from basic level PTC degree to PhD in teacher education. All teachers training programs are in line with the policy of HEC Pakistan. The university now, has offered four years B. Ed Program for teachers training and also introduced Associate Diploma in Education which are really very good initiatives. In this way, AIOU has aided in increasing in literacy rate of Pakistan as a whole.

1.6.10. AIOU and Student Support System

Student support system of the university is providing financial assistance to poor, talented and needy students so they may continue their studies uninterrupted. This scheme is for low income students. Students can avail up to maximum 03 semesters assistance can be provided with the condition of income filtration by the Regional Committee. (The News, 2016)

The role of AIOU in the field of Humanities, Arts, Islamic Learning, Education and Science is also commendable. The University is producing good researchers which are contributing very effectively in the development of society. It has state of the art Science laboratories which are heaven for the scientists. The university is providing research based environment to all those who have quest to learn.

No doubt AIOU is providing best education to students in their home at their own base but one thing which needs more improvement is its maximum dependency on print matter. In order to meet the new challenges of the modern it must definitely make effective
use of best available ICT but keeping in the mind that this technology is made available to its students as well.

1.7. RESEARCH PROBLEM

ICTs are helpful in creating students’ interest in studies and providing helpfulness to them in distance education. But optimum use of ICTs in distance education is a big issue. This issue is created due to various reasons including students’ access to different tools of ICT; inability to properly use gadgets of ICT; high cost and indifferent attitude towards ICT. The problem hindering the utilization of ICTs in distance education remains under-studied and uncovered from various aspects. Allama Iqbal Open University, Islamabad is pioneering university in distance education which caters the educational needs of more than one million students. As a pioneer and leading university in distance education it is of vital importance to understand the usage and importance of ICT in it. It is very much important to know the significance of ICT in distance education. This importance and significance needs to be highlighted and critically analyzed as well. It is also of vital importance to know about implication of ICT and its use among AIOU students. Still another significant area regarding AIOU is that there is a difference of use and utilization of ICT among urban and rural students.

Above mentioned issues related to use of ICT also prevails in this university which need to be addressed properly which is possible through a case study research approach. This situation creates the need of a research study in order to solve this problem.

1.8. RESEARCH OBJECTIVES

The researcher critically analyzed the research problem being faced right now and framed the following objectives of the study:
i. This study aims to explore that how ICTs are used in Distance Education System of Pakistan.

ii. It would focus on different benefits of ICT usage among university students in distance education system.

iii. It aims at identifying the need and importance of ICTs in Distance Education System of a developing country like Pakistan.

iv. This study would help to explore the relevance of ICT in distance education.

v. This research is also aimed at knowing how much ICT gratifies academic needs of AIOU students.

vi. It would also explore different motivation factors behind the use of ICT among AIOU students.

vii. This study would particularly focus on AIOU which has an enrolment of 1.4 million students across Pakistan.

viii. This research would be helpful to dig out the factors that limit the usage of ICT among AIOU students.

ix. The main and overall focus of the research will be on examining digital divide which is result of rural-urban divide. The researcher will focus on examining different objectives of the research keeping rural urban divide in mind.

1.9. RESEARCH QUESTIONS

To achieve the objectives set by this study after analyzing research problem, the researcher formulated the following research questions:

i. Whether and to what extent facilities of ICTs are available to AIOU students?

ii. Whether and to what extent the students of AIOU are benefitting from ICTs?
iii. What is the difference in use of ICTs between AIOU students of rural areas and students of urban areas?

iv. What is the extent of students’ reliance on ICT?

v. Whether and to what extent ICT is helpful for AIOU students?

vi. Whether and to what extent ICT is relevant for the students of AIOU?

vii. What are the limitations of using ICT for university students?

viii. Whether and to what extent ICT create interest in their studies for students?

ix. Whether and to what extent ICT satisfies different needs of AIOU students?

1.10. SIGNIFICANCE OF THE STUDY

Education is backbone for development and no country can make sustainable development without educating its people properly. Fact also remains there that formal education is time consuming and involves investment as well. In a poor country like Pakistan it is distance education which serves as a ray of hope for poor people. It is cost effective and students don’t need to attend classes regularly. Hence they can continue their jobs without any hurdles or interruptions. Importance of ICT can never be undermined in Distance Education System of any country. Allama Iqbal Open University is leading and the pioneer university in Distance Education in Asia which is making effective use of ICTs to facilitate its students. Furthermore, AIOU has ICT department which is producing ICTs related matter for its students. This study will be helpful to observe and analyze the role, importance and impact of ICTs in Distance Education. It will also serve as a pioneer study to help Distance Education Universities to formulate policies regarding use of ICTs in distance Education.

The following are major benefits of the study:

i. It would help governments to make policies relating to use of Education in ICT with reference to rural and urban spread.
ii. It would help educational institutions in designing suitable distance education programs.

iii. It would help educational institutions to develop curriculum development according to the spread of rural and urban students.

iv. It would help teachers in effectively using ICT in education.

v. It would help students in effectively using ICT in education.

vi. This research will also provide baseline to the other universities to dig out important prospects related to ICT application in distance education.

1.11. DELIMITATIONS

Due to constraints of time and resources, researcher has delimited this study to the following aspects stated as under:

i. Only Islamabad city was selected.

ii. To manage the data collection, only Allama Iqbal Open University, Islamabad was selected as a case study.

iii. To manage the data collection, only MS/MPhil and PhD students were selected.

iv. To manage the time, only students enrolled in Autumn 2014, Spring 2015, Autumn 2015 and Spring 2016 were selected.

v. To manage the time and easiness of the respondents, only multiple-choice items were included in measurement scales instead of open-ended questions for the variables.
CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

The first chapter of this research provided background; motivated research problem and stated objectives of the study are related to the ICT usage among the students of AIOU. This research is aimed at investigating the role of ICT in DE by taking AIOU as a case study. The key concepts which will help to explore the role of ICT in AIOU are:

1. AIOU’s Students Reliance on ICT
2. Frequency of ICT usage among AIOU students
3. Helpfulness factor of ICT for AIOU Students
4. Relevance of ICT usage among Open University Students
5. Interest of ICT usage in students for their studies
6. Gratification with ICT Usage
7. Preference for ICT usage
8. Motivation for ICT Usage
9. Limitations of ICT Usage for AIOU Students

This research will mainly focus on exploring the differences of ICT usage among the students with urban and rural background keeping the Digital Divide in mind. This study will focus on AIOU as a reference point because it is limited to AIOU only as a case study. As this study is basically focused on ICT and distance education with particular emphasis on digital divide the main focus shall remain on exploring difference of ICT usage in distance education keeping in mind the background of the students of AIOU.

2.2 INFORMATION AND COMMUNICATION TECHNOLOGIES

In ever-changing and dynamic world of today changes are occurring at a rapid pace crossing the barriers of time and space. The world has squeezed into a global village as a
result of technological advancement. Just imagine for a moment if we have no mobile, no internet, no laptop, no computer then what would we be doing without these ICT gadgets. ICT has become an integral part of our lives and as a result reliance on ICT has increased manifolds; we rely on ICT even for our daily life like reserving seats online, doing shopping online, and even connecting with friends and relatives is never possible without the use of ICT. ICT is all around us; in our homes, in offices, even outside homes and offices. We are connected with the world through the use of ICT. Different gadgets of ICT like mobiles, computers, printers, scanners, and different storage devices like CDs, DVDs, USBs and even online clouds have revolutionized the information management system. Similarly different softwares have caused great convenience in our lives. Websites even have opened the window to explore the world. One can find anything through browsing through surfing websites and browsing internet. ICT has made it possible to access the world staying at home. Different applications softwares like word-processors, spread sheets, multimedia softwares and video-editing softwares have caused great ease and convenience for users. It has helped in our lived and has helped to introduce paper free society to greater extent. Now piles of documents can be shared and saved with the help of internet.

Usage of digital computers and networking has revolutionized the concept of the economy with no space and time. It has helped and enabled millions of transactions daily happening in fast and easy way. ICT has helped us to improve our quality of life because it can be used as learning and educational media thus creating awareness in people about health and education through usage of traditional media aided by social media. Application of ICT in education has helped to enhance the effectiveness of learning by adding interest in students and enhancing motivation of learning in them that was not possible previously.

The term ICT stands for Information and Communication Technologies and it can be defined generally as a “ICT includes diverse set of technological tools and resources that are used to
communicate, and to create, disseminate, store, and manage information” (Blurton C, 1999). Usually ICT include computer, internet, broadcasting technologies comprising radio, television and telephony. In the past few years there has been greater focus on computer and internet usage to improve quality, efficiency and effectiveness of education both at formal and informal level. But as technology revolution has taken place so ICTs are more than above mentioned technologies of computer, internet, broadcasting and telephony. But it is also irony of the developing and even developed countries that print media still remains the cheapest and most accessible mode of information because of high cost involved in technology. Moreover, different technologies are used in combination with traditional mode of conveying information. So, usually in developing countries like India, Pakistan and Sri Lanka ICT are used as additional tools of sharing information. For example, the Kothmale Community Radio Internet uses effectively radio broadcasts, computer and internet technologies for the purpose of information sharing and providing educational opportunities in rural community of Sri Lanka. Likewise Indira Gandhi Open University of India combines usage of print, broadcast, audio visual media including audioconferencing technologies.

There are various definitions of ICT since its inception in DE. All definitions differ but all have one focus for all scholars which ICT entails. Boer, (2005) says, “ICT includes all technologies that are used for the manipulation and communication of Information and their use in any environment or domain such as education, management etc.” In the words of Collis, (1996, 26) “ICT refers to the new technologies that have resulted from the convergence of Telecommunication networks and personal computer technology.” William, (1983, p315) states that ICT is associated with practical arts and it is the practical application of Science.

According to the current definition of the Association for Educational Communications and Technology (AECT) Instructional Technology can be defined as “...the
theory and practice of design, development, utilization, management and evaluation of processes and resources for learning" (Seels & Richey, 1994).

According to Loveless and Dore (2002) and Pelgrum (2001) Loveless and Dore (2002), and Pelgrum (2008) “ICT is the using the electronic information that is handled through a wide range of applications of *inter alia* computer equipment, multimedia productions, digital resources, mobile devices, digital video disks (DVDs), tutorial soft wares, general software, data logging, simulations, smart boards, learning management systems (LMS), the Internet, email, modems, television, and other high-tech laboratory equipment.”

UNESCO, (2002) defines ICT, “the combination of Informatics technology with other, related technologies, specifically communication technology”

Statistics Canada, (2008) describes that ICT is a field of study that deals with the things which include technologies like desktop and laptop computers, soft wares, peripherals, and connections to the internet and all these are aimed at fulfilling information processing and different communication functions.

From above definitions it is very clearly evident that primary focus of ICT is on some specific attributes as provision and access to information through wires and wireless network. Over all focus of ICT is basically on Information whether it is the provision of information or access to information. ICT is seemed as a tool that facilitates communication dissemination through its various gadgets like computers, mobiles and other digital devices that provide information. But, in the ever changing and converging world of today ICT has underwent a significant change by intertwining itself with communication, photography, communication with information access, with the help of software and real time technology. This the miracle of ICT that students have increased access to different information sources as well. The usage and application of ICT in different fields is increasing day by day. This can be well
understood with ever increasing number of hand held devices that can access internet through different telecommunication network. The study of Biscaye and Anderson, (2016) referred to the report of International Telecommunication Union, (2009) there are “4,100 million mobile cellular subscribers compared to the 1,267 million fixed telephone subscribers and the 1,542 million Internet users in 2008.”

Trucana (2005) strongly agrees that there is widespread accepted belief that application of ICT in DE will empower both the teachers and students for increased learning gains and definitely it will transform teaching learning process from teacher dominated to student centred and hence will allow opportunities for learners to develop their creativities, abilities to solve their problems, information seeking skills and many other higher order thinking skills.

### 2.3 TYPES OF ICTS

ICT tools used for educational purposes can be grouped into three broader categories which are Input source, Output source and others as shown in the following figure:

**INPUT SOURCES**
- Application Software,
- Visualizers, Student Response System,
- PC/Laptop, Mobile

**OUTPUT SOURCES**
- Projector, Interactive Whiteboard, Displays (Monitor, LED, LCD, TV etc.)

**OTHERS**
- Digital Recorder, Switchers, Other Peripherals

Input source comprises of visualizer/ scanner, student response system, personal computer, different application soft-wares, slate and tablets.

Output source includes projector, interactive white boards, display like monitor, TV etc. The list of others consists of digital cameras, digital recorders, smart phones and other related technologies.
2.4 E-LEARNING

E-learning is the concept that is most appropriately related to the usage of ICT in the process of learning. E-learning at both formal and informal level of education uses an information network comprising of the internet, intranet LAN or extranet WLAN and all this is used for the purpose of course delivery, interaction, facilitation and evaluation. Other related terms are Web-based learning and e-learning. In fact Web-based learning is a part of e-learning and it mainly refers to learning using internet by using internet browser like chrome, internet explorer or Firefox.

2.5 BLENDED LEARNING

Blended learning is a learning model in which traditional classroom practice is combined with e-learning solutions. For example in traditional classroom students can be assigned to submit their course assignments both in hard and soft forms. The main theme behind blended learning is that all learning is not best possibly achieved through electronically mediated environment and hence it is accomplished by the help of live instructor.

2.6 ICT AS A CATALYST FOR LIFELONG LEARNING

After worldwide research it has been proven that ICT has resulted in improved learning among students and better teaching methods among teachers. A report compiled by the National Institute of Multimedia Education in Japan, supports that increased exposure to ICT has resulted a significant and positive impact on students’ learning and academic achievements; especially in terms of “Knowledge, comprehension, practical and presentation skill” in subjects like Mathematics, Science and Social Studies.

ICTs are looked as powerful tools for extensive educational opportunities and lifelong learning. ICTs are helpful for all segments of the society including the groups that are
excluded from education due to cultural or social barriers like ethnic minorities, persons having disabilities, girls and women and some other elderly persons who due to constraints of geography, time or cost are unable to enrol themselves on the campus.

One of the fruits of ICT is that they are anytime anywhere helpful crossing the barriers of time and space and makes possible asynchronous learning possible. ICTs are helpful to communicate information to geographically dispersed and separated communities by using teleconferencing technologies. ICTs have made learning easier and convenient through remote learning resources. Now, students and teachers don’t have to rely totally on books and other tangible materials available in libraries. With the arrival World Wide Web a greater wealth of learning material is available online almost on each and every subject. ICT is helpful to facilitate the students to access experts of their subjects across the globe. This is particularly helpful for the students of developing countries who have lesser subject experts in their own countries. So they can contact researchers, scholars, professionals and experts anywhere in the world.

One of the benefits of ICT is active learning because it facilitates learners to when and where to do learning. ICT-enhanced learning promotes increased learner engagement because it is helpful for them to do just-in-time leaning because learners are able to learn what they want to learn and when they want to learn. One of the miracles of ICT is that it also enhances collaborative learning because it helps to encourage interaction and cooperation among teachers, students, and subject experts being there in any part of the world. Apart from real world learning ICT is helpful for increasing opportunities to work together crossing the barriers of geography. It brings people together from different cultural backgrounds thus creating global awareness enabling them to have effective communication. Thus this collaborative learning results in lifelong learning by enabling people of different cultures closer together. Contrary to static, print/text based technologies, ICT-enhanced learning recognizes that there are different conduits and
dimensions of knowledge. ICT-enhanced learning environment allows the learners to explore rather just to listen and remember.

2.7 DISTANCE EDUCATION AND ITS EVOLUTION

Distance Education is seemed as a new idea in the history of education for the most of the educators but case is not like that, it has a long history since it took a start. The concept of Distance Education is almost more than a century is old. It can be traced back to 1833 when an advertisement in Swedish newspaper stated the opportunity to study “Composition through the medium of the Post.” In 1840, England penny post allowed Isaac Pitman to offer shorthand instruction through correspondence. Charles Toussaint and Gustav Langenscheidt were the first teachers in the history of DE who taught language in Berlin, Germany through correspondence (Holmberg, 1995). The Chautauqua College of Liberal Arts, New York is the first college who during 1883 to 1891 authorized the academic degrees to the students who were completers of summer institutes and correspondence courses.

Schlosser and Anderson, (1994) explained that the idea of correspondence accolated the growth of DE in Britain with the founding corresponding institutions like Skerry’s College in Edinburgh in 1878 and University Correspondence College in London in 1887. During the same era University extension movement in US and England helped to promote the method of correspondence. During the same time, the university extension movement in the United States and England encouraged the correspondence method. Illinois Wesleyan in 1877 and the University Extension Department of the University of Chicago in 1892 were the pioneer in this regard. After that many universities in United States started correspondence programs which include: University of Chicago and University of Wisconsin.

The arrival of electronic communication expedited DE in Unites States, especially. During 1920, at least 176 radio stations were established at different educational institutions of United States. Even in early 1930s, University of Iowa, Purdue University, and Kansas
State College were producing experimental television teaching programs. Sunrise Semester was a well-known television series of college courses offered by New York University on CBS from 1957 to 1982. The first state educational satellite system, Learn/Alaska, was created in 1980. This satellite was offering daily six hours instructional television daily to 100 villages. After greater technological revolution the idea of DE University was first floated in South Africa; the 1962’s decision was that University of South Africa would become a Distance-teaching university. But real credit goes to United Kingdom where first regular Open University of the world was established in 1971 with the name of Open University of United Kingdom. This university was offering programs ranging from full-fledged degrees to certificate courses by making innovative and effective use of media (Holmberg, 1986). Establishment of first world open university opened new windows of DE institutes across the world and countries like Japan, Germany, Canada, Sri Lanka and Pakistan established open universities.

Need and importance of DE In the developing countries like Pakistan cannot be undermined at all. In fact it is the DE that is a ray of hope for those segments of the society who cannot regularly attend educational institution due to different reasons. It is the Distance education which provides a set of teaching and learning strategies that can be used for overcoming spatial and temporal separation between students and teachers. Distance Education makes use of such strategies that help the learners to seek knowledge from educators beyond geographic boundaries and physical presence. In the mode of DE students and teachers are separated by time and/or space, and communication takes place through use of communication of curriculum takes through unconventional methods of teaching like correspondence, tutorial supports and making use of media and ICT as well. Many countries in the world, and especially developing countries when faced with the problem of students’
access to conventional institutions are opting for Open and DE along with the traditional system of education (Yousuf, 2007).

Scholars across the world offer variety of definitions of DE. Every educationist has looked at DE from his/her own perspective. A handful of different definitions of ICT will be helpful to clarify the core concept of DE. Simonson, (2006) defines that DE is an institution based formal education where the learning group (students) are separated, and where different telecommunication systems are used for the sake of connecting learners, and instructors. This definition of ICT helps to separate DE from self-study because this definition includes the core concept of institution. So, it clearly elaborates that DE is institution based (Threlkeld and Brzoska, 1994).

In the words of Hilary Perraton (1988), distance education is an educational process in which a substantial proportion of the teaching is conducted by someone removed in space and/or time from the learner. This someone is in fact a tutor who conducts teaching either through correspondence or through any other mean. According to The U.S. Department of Education’s Office of Educational Research DE is defined as “the application of telecommunications and electronic gadgets which enable students and learners to receive instruction that stems from some distant location.”

Grevillea Rumble, (1989) has also offered a definition of DE. According to him in DE there must: be a teacher; one or more students; curriculum that the teacher must be capable of teaching and the learner/students is trying to learn; and there must a contact whether implicit or explicit, between the learner and educator or the institution that employ the teacher, and that acknowledge their respective teaching learning roles. He also opined that in DE is a method of teaching in which student is physically separated from teacher. In the same way
the learners are also physically separated from their institution which sponsors them instructions.

Shale (1988), argues that distance education is not a different field of education. He opines that the process of education is same whether students and teacher are face-to-face or students and teachers are at a distance. He believes that the teaching /learning agreement requires that the learner must be taught, checked or assessed, provided guidance and it is also necessary that the learner be prepared for examination as well. The whole process must be accomplished by two way of communication between teacher and learner.

Michael Moore, (1994) defined Distance Teaching contains Instructional Methods that execute teaching behaviours apart from learning behaviour, creating such a situation in which communication between students and teacher should be sponsored by Print, electronic, mechanical or some other devices.

For Otto Peters, (1988) DE is a method of teaching /learning that is helpful in imparting knowledge, attitudes and skills. It implies the application of division of labour and some basic organizational principles too by making extensive use of media technology aiming at producing state of the art teaching material that would ultimately help to teach and instruct greater number of the learners at the same time wherever they are. He further concludes about DE by commenting it as industrialized form of teaching and learning.

By analysing different definitions of DE Keegan (1986) conclude the following five main elements of DE.

i. He observed that there is a perpetual separation between the educator and learner throughout the whole span of learning process. And this characteristic of DE makes it different from conventional methods of education.
ii. There is great influence of educational institution in all phases of education starting from planning and preparation of the learning matter. The role of organization is even prominent and dominant in students support services even.

iii. This method makes effective use of media like print, audio, video and computer for the purpose of uniting and connecting the student and teacher.

iv. Provision of two way communication to initiate dialogue which distinguishes it from other uses of technology in education.

v. It indicates permanent absence of learning group in the whole learning activity as people are taught individually and not in groups with the possibility of occasional meetings.

Garrison and Shale (1987) critically analysed above five elements of Keegan’s definition and have concluded that after technological revolution and advances Keegan’s definition was too narrow to meet and correspond the existing advances in technologies and communication. They were of the view that his definition was not enough to meet future possibilities and challenges of DE. They offered a criteria with the following three points on which DE can be best described to match the future challenges in the field.

i. In Distance education lots of educational communication between educator and teacher occurs non-contiguously.

ii. In the process of DE communication between student(s) and teacher(s) will be two way communication that will be aimed at helping and facilitating the educational process.

iii. In DE technology is meant for the purpose of mediating two way communication between the educator(s) and learner(s).

From above discussion it is concluded that DE involves: communication between educator(s) and learner(s) through use and mediation of technology. When we look at the DE
in contemporary era lots of changes are observed and it is quite obvious that technological revolution has taken place and the world we are living today is just like a global village which is witnessing unprecedented changes at a quicker and rapid pace. The arrival and application of ICT in DE has triggered us to reshape the phenomenon of DE. The following may be included in ICT:

i. The Internet

ii. Transmission whether it is one way or two way and usually it is carried out through open broadcast, closed circuit, cable, fibre optics, broadband lines, satellite or even wireless communication devices like mobile, tablets and laptops and palmtops.

iii. Audio/Video conferencing

iv. Audio and Video cassettes, CDs, DVDs, USBs and other technologies which are used to facilitate the students.

In the wake of above new and advanced technological devices it can be well said about the distance education

“Education that uses one or more technologies to deliver instruction to students who are separated from the instructor and to support regular and substantive interaction between the students and the instructor synchronously or asynchronously.”

Definition above provides a deep insight in establishing relation between DE and technology. However, terms synchronous and synchronous used in definition are very much important in the context of ICT and it is also important to have better understanding of them. Asynchronous is communication between people who are separated by time; be in the form of minutes, hours, or even days. Email is the best example of it. Opposite of it is
synchronous communication which may include video, audio call / video, audio conferencing or even online chat.

2.8 RELATIONSHIP BETWEEN ICT AND DISTANCE EDUCATION

The world in which we are spending our lives is constantly evolving digital world that has a greater impact on all dimensions of our lives- from learning to playing and working to socializing. The current digital age has transformed the way people communicate, socialize, and learn; especially the way young people communicate and access information. The younger people are accessing information through using various tools of ICT like computers, TV, mobiles and internet. As technology has deeply seeped into our lives so it is inevitable that learners should be provided with most relevant and appropriate experiences by successfully engaging them in adept usage of technology. ICT can be motivational factors in process of learning enhancing collaborative learning among students. The current digital age has transformed the way our younger generation communicate, seek help, and access information. Now they are equipped with variety of means such as TV, computers and cell phones. (Gonzales, S, Rosemarie, 2015).

Application of Information and Communication Technologies in Distance Education, in particular transmission of information and telecommunications over electronic networks using the Internet has revolutionized the concept of distance education. It has provided open access to information for students. Now they are connected with their universities through internet via computer. Economics has also driven the greater revolution. At the same time as the cost of electronic processing, storing and transmitting information has been falling, the cost of traditional education and training is rising to levels that are particularly unsustainable in emerging economies. A large number of educators, people and experts who once traditionally regarded themselves as the foremost owners and dispensers of information are shifting their self-concepts and their practice are now placing greater emphasis on their roles
as facilitators of the subjects by using different tools of ICT. Contrary to the idea of education as a single process within such a closed and contained environment, under the new concept education is seen as an Open System. When we look at the distance education system of developing countries it is observed that printed matter is commonly used in the third world countries and along with it radio and television are being used as well. Audio video cassettes are being used as supplements. Similarly telephone and fax are used for tutorial support (Lawry Trevor-Deutsch and Lyndsay Green, 2002).

From above statement it is quite evident that there is much room for ICTs in distance education system of developing countries and this technology can prove more cost effective. The increasing importance of ICT in the global information society both creates new challenges and provides solutions to old educational problems. Arrival, usage and application of ICT in the Distance Education, especially spread of information and telecommunications over electronic networks by using the Internet has revolutionized and revitalized the basic concept of distance education. It has provided an opportunity and open access to information and knowledge for students. Now they can be connected with their universities through internet via computer. They have now open access to their institutes as well.

To conclude it can be said that ICT and distance education are highly interlinked and both have a direct coherence. In present age, Distance education is almost impossible without the proper implication of ICT.

2.9 EDUCATION SYSTEM OF PAKISTAN

Pakistan achieved independence from British rulers after a period of almost ninety years. The colonial period did not witness any such progress in this period of oppression and tyranny. The region that we got very much backward in education and more than 85 percent population was illiterate. (Bengali, 1999). It was realized that uphill task of nation building
would not be achieved if we don’t have skilled and educated manpower. Foreseeing the need and importance of education first national education conference was held in the same year of independence, 1947. The conference was held from November 27th 1947 to December 1st 1947, almost three months after Pakistan achieved independence. The conference was a high level gathering that invited high level office bearers as well as individuals. The conference had forty-eight participants excluding nine officers from education division (Of that time’s Ministry of Interior). During that conference, Interior Minister, Mr. Fazal- Ur- Rahman, read out written message of Quaid-e-Azam and also delivered a speech that reflects the base line for education in Pakistan. This conference recommended Urdu as a lingua franca (common language). It was further recommended that both English and Urdu be used as medium of instruction in all the provinces. (GoP, 1947)

At the end of this conference educational ideology was summed in three points (Siddiqui, S., 2016)

i. Basis of education should be laid on the Islamic concept of universal brotherhood of man, social justice and social democracy.

ii. Learning basic principles of religion should be compulsory for the students.

iii. Spiritual, social and vocational elements in education should be properly integrated.

First Commission on National Education was appointed by resolution adopted by the Government of Pakistan on December 30, 1958. This commission started its work after it was inaugurated by the then president, Field Marshal Muhammad Ayub Khan who also addressed the Commission on January 5, 1959. This commission was a milestone in educational planning history of Pakistan. The Commission sent out a questionnaire about different aspects and levels of education and was published in press. The Commission also held meetings with educationists and also visited various institutions. Report of the Commission
was prepared with economic and technical assistance of foreigners. Among the experts two out of four were foreigners namely: Dr. Herman B. Wells, President of Indiana University, Bloomington, USA, and Dr. John C. Warner, President Carnegie Institute of Technology Pittsburgh, USA. The other two local experts from Pakistan were also involved in teaching in foreign universities, Dr. I. H. Qureshi and Dr. Abdus Salam were also engaged in teaching in foreign universities – Dr. Qureshi was at Columbia University, New York and Dr. Salam was teaching at Imperial College London. This shows that from the start of policies experts involved were foreigners. (Wells, 1980).

In order to promote education in Pakistan different plans were made Bengali, (1999) which are as:

i. First Five Years plan 1955-60

ii. Second Five Years plan 1960-65

iii. Third Five Years plan 1965-70

iv. Fourth Five Years Plan 1970-75

v. Fifth Five years Plan 1978-83

vi. Sixth Five Years Plans 1983-88

vii. Seventh Five Years Plans 1988-93

viii. Eighth Five Years Plan 1993-98

Along with the five years plans educational policies were also introduces which are:

The New Educational Policy, 1970, The Educational Policy 1972, National Education Policy and Implementation Program ,1979, National Educational Policy 1992, National Educational Policy 1998 and Education Policy 2009. (Bengali, 199) All these plans and policies were aimed at promoting enrolment and literacy in the country. Since the creation of Pakistan by beginning with National Education Conference, 1947, seven education policies, eight five years plans and a handful of other schemes have been launched and many workshops,
conferences and seminars have been held. Keeping all these efforts in mind it revealed that targets were set in one policy/plan which were not achieved and in the new policy/plan new targets were set with unqualified optimism resulting trash. The results of policies and plans show a lack of commitment and dedication on the part of different governments be they are civil or military.

Education in Pakistan is administered by Federal Ministry of Education along with the provincial governments. Provinces are involved in the development of national education policies and plans. The provinces usually develop their own plans according to their situations an environment and execute these plans in accordance with national educational policies. The main responsibility of federal government is to assist in curriculum development, accreditation and provision of financial assistance in research and development.

The educational level/structure in Pakistan can be grouped into six categories namely:

i. Pre-schools (From 3 to 6 years of age)

ii. Primary (Includes grade 1 to 5)

iii. Elementary/Middle (grade 6 to 8)

iv. Secondary (grade 9 to 10)

v. Higher Secondary (grade 11 to 12)

vi. Higher Education (Includes graduation, Masters and then MPhil and PhD)

In Pakistan, examination from 1 to 12th grade is the responsibility of Provinces/district governments. There is no such existence of national curriculum test at primary, elementary levels in the three provinces, AJK, FATA and even FANA. According to Examination Reforms (2002) terminal exam is conducted by Punjab Examination Commission. There is a compulsory examination at the end of grade 9, 10, 11 and 12 which is conducted by autonomous bodies called as Board of Intermediate and Secondary Education. These boards award students certificates at the successful passing out of the
examination. In order to maintain uniformity across boards there is an Inter-Board Committee of Chairmen (IBCC) at Islamabad. All boards almost follow same grades from A-1 to F (Fail). At higher education level different universities at Provincial and federal government levels conduct exams and award degrees. (Khattak, 2012).

The system of education is comprised of the all institutions that are involved in delivery of formal education whether they are public and private, for-profit and nonprofit purposes. This system also includes their faculties, students, physical infrastructure, resources and rules. In a broader definition all those institutions are included that are directly involved in financing, managing, operating or regulating such institutions (like government ministries and regulatory bodies, central testing organizations, textbook boards and accreditation boards).

The education system of Pakistan includes 260,903 institutions and is facilitating 41,018,384 students by the help of 1,535,461 teachers. Approximately 180,846 public institutions and 80,057 private institutions are included in the system. So the 31% educational institutes are run by private sector while 69% are public institutes (Ministry of Federal Education and Professional Training, 2015). The 18th Amendment in Constitution of Pakistan enshrines education as a fundamental human right in the constitution Education is basic right of every citizen and article 25-A of Pakistan constitution makes it compulsory for the state to provide free and compulsory education to all children five to sixteen years of age. The NEP 2009 states that “all children, boys and girls, shall be brought inside schools by the year 2015(Mustafa, 2012). Education is the only window that makes it possible for individuals to make their contribution in the progress, prosperity and development of the society. Education is considered as enabler of civilization to achieve the noble goals of economic, social and cultural development (Janjua, H. 2013).
2.10 ALLAMA IQBAL OPEN UNIVERSITY

2.11 THE CASE STUDY

2.11.1 Introduction

As discussed in chapter 1, Allama Iqbal Open University is a public sector university established under the Act of XXXIX of 1974 to provide education facilities for the masses who cannot continue regular education due to job or some other constraints. It has four faculties which include; faculty of Social Sciences and Humanities; faculty of Education; faculty of Arabic and Islamic Studies and faculty of Sciences. This university followed the model of UK Open University which was established in 1969. The main objectives of the university include; provision of educational facilities to the masses at large especially for those who cannot leave their jobs or homes; providing training facilities for teachers; and awarding degrees, diplomas, and certificates. The President of the Islamic Republic of Pakistan is the Chancellor of the university and The Federal Minister for Education is the Pro-Chancellor while the Vice-Chancellor of the University, the principal executive and academic officer is selected by HEC Search Committee. The main structure of AIOU consists of Academic Departments, Servicing Departments and Academic Departments. Whereas the University is a wide regional network which spread across the whole country comprising of more than 40 regional campuses and centers across the country.

2.11.2 FACULTIES

Allama Iqbal Open University caters the educational needs of all the students which are spread across far flung areas of the country. The university’s motto is Education for all. The university has following four faculties

i. Faculty of Social Sciences and Humanities

ii. Faculty of Sciences

iii. Faculty of Education
iv. Faculty of Arabic and Islamic Studies

Below is given the details of above four faculties

A. Faculty of Social Sciences and Humanities

Being the largest faculty of the university this faculty has following departments.

i. Department of Urdu

ii. Department of Mass Communication

iii. Department of Iqbal Studies

iv. Department of Pakistani Languages

v. Department of English Language and Applied Linguistics

vi. Department of Pakistan Studies

vii. Department of History

viii. Department of Economics

ix. Department of French

x. Department of Business Administration

xi. Gender and Women Studies

xii. Department of Commerce


B. Faculty of Sciences

This faculty offers programs in the following departments

i. Department of Physics

ii. Department of Chemistry

iii. Department of Biology

iv. Department of Mathematics

v. Department of Statistic
vi. Department of Computer Science

vii. Department of Environmental Sciences

viii. Department of Home and Health Sciences

C. Faculty of Education

This faculty comprises of the following departments

i. Department of Distance, Non-formal Education and Continuing Education

ii. Department of Early Childhood Education and Elementary Teacher Education

iii. Department of Educational Planning, Policy Studies and Leadership

iv. Department of Special Education

v. Department of Science Education

D. Faculty of Arabic and Islamic Studies

This faculty is composed of the following Departments

i. Department of Fiqh and Islamic Law

ii. Department of Hadith and Seerah

iii. Department of Islamic Thought, History and Culture

iv. Department of Arabic

v. Department of Quran and Tafseer

Apart from given the University has two institutes which are named as:

i. Institution of Educational Technology

ii. Institute of Mass Education

The University is also equipped with the Centre for Instructional Design.

This Centre is working to develop online course materials which are also available in CD format as well. The staff at instructional design is working hard to develop course
materials to make it available instantly to all the students of the university. This centre is in infancy stage yet it has successfully developed course materials in soft form for the students starting from SSC to BA. Work is also in progress to develop course material of Masters, MPhil and PhD programs as well.

2.11.3 Programs

The university offers following academic programs

i. Matric

ii. Inter

iii. BA General

iv. Bachelor of Library and Information Sciences

v. B. Com

vi. BS Four Years Programs

vii. Masters

viii. MPhil/ MS

ix. PhD

x. Short Term Educational Programs/ Functional non-credit and Certificate Courses

As the population of this research is based on MPhil and PhD students of the university so it is of vital importance to provide the details of MPhil/ MS and PhD programs being offered by the university.

a) MPhil/ MS and PhD programs of Faculty of Social Sciences

The following Departments of faculty are offering MPhil/ MS and PhD programs

i. MPhil Iqbal Studies

ii. PhD Iqbal Studies

iii. MPhil Urdu
iv. PhD Urdu
v. MPhil Mass Communication
vi. PhD Mass Communication
vii. MPhil Economics
viii. MPhil Pakistani Languages
ix. PhD Pakistani Languages
x. MPhil History
xi. MPhil Pakistan Studies
xii. MS Management Sciences

b) MPhil/ MS and PhD programs of Faculty of Sciences

This faculty offers MPhil/ MS and PhD programs in the following subjects

i. MPhil Mathematics
ii. MPhil Statistics
iii. PhD Statistics
iv. MPhil Physics
v. PhD Physics
vi. MPhil Chemistry
vii. PhD Chemistry
viii. MPhil Food and Nutrition
ix. MS Computer Sciences
x. PhD Computer Sciences
xi. MS Environmental Design
xii. MPhil Based PhD Agricultural Extension
c) MPhil/ MS and PhD programs of Faculty of Education

Below is given brief list of MPhil/ MS and PhD programs of Faculty of Education

i. MPhil Education
ii. PhD Special Education
iii. MPhil Special Education

d) MPhil/ MS and PhD programs of Faculty of Faculty of Arabic and Islamic Studies

This faculty offers MPhil/ MS and PhD programs in the subjects provided below

i. MPhil Islamic Studies
ii. PhD Islamic Studies
iii. MS Sharia
iv. PhD Sharia
v. MPhil Arabic

2.11.4 Teaching Methodology

The university follows the rules set by the Ministry of Education and Higher Education Commission. Curricula of University are also prepared under the guidelines and instructions as laid by Ministry of Education and HEC Pakistan. Being a non-formal and distance education university follows the non-formal method of correspondence, radio and television broadcasts, special textbooks and reading materials prepared on self-learning basis, part-time teachers (tutors) engaged nearest to the student's residences. The university also has introduced the idea of study centers for teaching programs like CT, PTC, B.Ed and M.Ed and more recently program of Business Administration is also run through approved study centers. The university has a system of tutorials, assignments and workshops for its students. For each course student is allotted a tutor who arranges meetings for students. The students
are provided with book and other ICT allied material like CD which helps them to write their assignments. Workshops for teaching courses are also arranged for students. Similarly for Masters, M. Phil and Ph. D student’s workshops are mandatory components. During the workshop component competent resource persons teach students different contents course to university students.

Teaching methodology of all above mentioned programs consists of the following components:

i. **Study Material**

   Study Material is usually provided to students at home after studying which they are able to write assignments. This study material usually consists of related books and suggested readings as well. Course Assignments are also usually included in this package.

ii. **Assignment Writing**

   After reading suggested books students are expected to write assignments. There are two assignments for half credit course and full credit course consists of four assignments. Half credit course consists of three credit hours and full credit course consists of six credit hours.

iii. **Tutorial Support**

   All students are provides tutorial support as well. Tutors are appointed for each course. During the appointment of tutors their expertise in subject is given prime importance. Students consult with their tutors for seeking guidelines and expert opinion. Tutors for MPhil and PhD programs are directly appointed by the concerned Departments.
iv. Workshop Classes

For three credit hour course there are forty two hours of workshop classes. These classes are attended by students in the main campus under the supervision of concerned Chairman. These workshop classes are greater source of learning for students. During the session of classes Subjects’ experts are invited to address the students. These classes are always interactive and participatory. Students after attending lectures also make presentations which are presented by them during the class.

v. Examinations

At the end of each semester there is written examination which is held across Pakistan in different examination centres of the country to evaluate students’ performance in their respective subjects. It is mandatory for students to pass the assignments before appearing in final examination.

2.11.5 ICT Usage in MPhil and PhD Programs

It is also important to note that AIOU is making effective use of all ICT related gadgets to facilitate its students. Students are usually informed through texts for attending course workshops. Similarly the University is now sending books to the students in soft form. Students can also submit their assignments in soft form as well. Hence, the students don’t bother to come to university to inquire about their admission, examination etc. An online tracking system has been developed through which students can know about their admission, tutors, delivery of books, examination and even the status of their degrees.

The university is making effective use of Video Conferencing to deliver lecture from main campus to other regional campuses and students of other regions are attending their workshops in their respective regions through video link. Even oral examinations of students are conducted through video conferencing/ Skype. University is even facilitating its faculty
abroad who cannot show their physical appearance for promotion interviews/ selection boards. The university has started dispatching books to students in soft form to encourage paper free society. There is department in university who is regularly working on developing soft contents of different courses of AIOU.

AIOU has augmented its traditional method of teaching that involves tutors through correspondence by supplementing radio and television programs. Through establishment of Institute of Educational Technology the university is able to produce quality programs of radio and television. These programs are regularly one aired through university FM radio which is FM91.6. PTV world also telecast daily one hour transmission for AIOU. Along with IET another department namely Centre for Instructional Design has also been developed in the main campus which produces written material of different courses in multimedia /CD format which enable students to have better understanding of different course of AIOU.

2.11.6 Role of AIOU in Country’s Development

AIOU has an important role in the development and prosperity of the country and it has played its role very efficiently since its inception. AIOU has played its leading role in open and distance learning in Pakistan. It is the pioneer university in Pakistan that offers a variety of programs ranging from Matric to PhD which is its distinction. The university has aided in increasing literacy rate of the country as well. This university has provided an opportunity to marginalized segments of the society who are unable to attend any regular institution. The university has leading role in providing education in far flung areas of the country. It has reached the students of mountainous areas like Kashmir, Gilgit Baltistan, Baluchistan and hilly areas of KPK. The university has played its significant role in educating women who have completed their education staying in their homes at their doorsteps. It has also provided an opportunity to the students who are working in overseas.
2.12 HELPFULESS OF ICT IN DISTANCE EDUCATION

Information and Communication Technologies are helpful in education. ICTs help in enhancing teachers’ effectiveness and delivering lectures (Fisser, 2001; Kennewell, 2001; Yusuf, 2005) and enhancing students’ learning (Cornu, 1995; Cuban, 2001). Hence, the researcher perceives that Information and Communication Technology provides helpfulness in education especially in distance education which is evident in the literature cited hereunder, where students and teachers have no face-to-face interaction. Use of information and communication technologies in education is playing a revolutionary role for the students in all aspects of education ranging from reading to evaluation of examination (Leidner and Jarvenpaa, 1995). Use of ICT has helped students to enhance learning. Educational media, thus, has been creating awareness in people about health and education through usage of traditional media aided by social media. Application of ICT in education has helped to enhance the effectiveness of learning by adding interest in students and enhancing motivation of learning in them that was not possible previously (Ramsden, 2003). He argues that the use of ICT in education add value in teaching and learning, by enhancing the effectiveness of learning and teaching as well. He further argues that ICT can be a motivational factors in process of learning thus enhancing collaborative learning among students.

This digital age has transformed the way our younger generation communicate, seek help, and access information. Now they are equipped with variety of means such as TV, computers and cell phones (Gonzalez-Aller, 2015) which is also helpful in students’ performance and motivation. His studies indicate that ICTs are most powerful tools for extensive educational opportunities and lifelong learning. ICTs are helpful for all segments of the society including the groups that are traditionally excluded from education due to cultural or social barriers like ethnic minorities, persons having disabilities, girls and women and some other elderly persons who due to constraints of time or cost are unable to enrol.
themselves on the campus. ICTs have made learning easier and convenient through remote learning resources. Now, students and teachers don’t have to rely totally on books and other tangible materials available in libraries.

Oliver, R. (2002) research work on “The role of ICT in higher education for the 21st century: ICT as a change agent for education” deals with impact of ICT on higher education and it also explores future developments in ICT. The author argues in his research seeks the ways how future programs will be offered in the universities keeping the rapid pace of ICT in mind. It is the ICT that has revolutionized different aspects of life including Medicine, Science, Tourism, Engineering, Travel, Business and all other aspects of life and has been accelerated in the previous two or three decades. But when we have a look at education there is uncanny progress about ICT. Many factors account for impeding of ICT in education across all sectors of education. These factors include financial constraints like lack of funding to buy ICT equipment, lack of training of teachers, and it further includes lack of motivation; especially among teachers to adopt ICT as teaching tool in their teaching practices. (Starr, 2001). This is optimistic to note that different factors have emerged which are encouraging to use ICT in learning and class room activities. While talking about impact of ICT it is observed that contemporary settings are extremely helpful for promoting competency and performance among students. As both students and teachers are gaining greater access to higher bandwidth there is more direct form of communication among teachers and students and they are gaining access to sharable resources.

A greater rise and increase in information literacy has been observed. It is defined as “the capacity to identify and issue and then to identify, locate and evaluate relevant information in order to engage with it or to solve a problem arising from it” (McCausland, Wache & Berk, 1999, p.2). Ever-growing use of different tools of ICT in everyday life has also caused a greater use of ICT in education as well. ICT has also impact on how students
learn and it has resulted in approach of student-centred as compared with teacher-centred. Technology-supported settings have made students more responsible and they encourage the students to take their responsibilities at their own. According to the researcher ICT resulted in student-centred learning approach because ICT tools by nature encourage independent learning and in this way more and more students are motivated to use computers/internet in their learning (Reeves & Jonassen, 1996).

Emergence of ICT as tools and technologies of learning has also resulted with increasing awareness with alternative theories of learning. Most of these theories are based on constructivist principles (Cunningham, D., & Duffy, T. 1996). These theories propose that learning is the outcome of the active construction of knowledge which in turn is supported by various perspective within meaningful contexts. In the light of these theories social interactions play a vital role in learning and cognition process (Vygotsky, 1978). Usage and application of ICT is following constructivism where learning is done through social interaction by enabling them to interact through different gadgets of ICT. Oliver, R. (2002) further proposes that ICT has helped to cross the barriers of “When and Where to learn” and this has proven helpful for learners and educators the both. He introduced the concept of anytime and anyplace learning. He argued that:

1. Usually in traditional mode of teaching students are required to have access to academic institutions at a particular place and locality. As ICT arrived it has caused cost effectiveness for students by saving travel expenses and thus caused convenience for them.

2. It is the miracle of modern technologies that many courses are offered by external institutions can be learnt at home by enrolling the students at their own homes. The students are connected through networking which provide opportunities for students of diverse cultures to interact with each other's.
iii. ICT promises freedom of choice for far off distant students and they are free to choose from variety of courses offered by handful of universities.

iv. It is the greater advantage of ICT that it has facilitated anytime learning and it has helped the students to seek online classes at their own pace and time.

v. Mobile technologies have further created more opportunities for students and teachers anytime learning and both of them can be intact through these portable devices.

At the end of his research Oliver, R. (2002) have discussed different issues that have emerged by the uptake of modern technology. He enlisted these emerging issues as the expanding of pool of teachers with new responsibilities to cope up with the challenges of modern technology. He emphasises on new responsibilities of teachers which not only teaching but also expertise in effective usage of modern technologies. Along the same he also stressed upon the expanding pools of students too. He argued that in past only those students had access to education who belonged to mainstream of society. But arrival of ICT has changed the whole scenario and pool of students is continuing to be changed and will also continue at a rapid pace. Through flexibility provided by ICT those students can also avail education facilities who due to geographical barriers couldn’t attend regular classes. It was also found that cost of technology was relatively high in virtual universities and compared to traditional teaching cost of technology is high in technology-assisted universities. It was suggested that ICT will have greater influence on students, teachers, stakeholders, employers and government. It was argued that with the passage of time the impact of ICT will be manifolds as it is now.

According to Voogt, (2003) modern technology has resulted in transformation of traditional pedagogy into emerging pedagogy of information. The following advantages of technology in Emerging Pedagogy for the Information Society were observed
i. Activities determined by students/learners.

ii. Variety of activities

iii. Pace of study also determined by learners

iv. Heterogeneous groups with lots of activities

v. Innovativeness and solution of problems

vi. Interactivity between theory and practice

vii. Interactivity and interaction between and among subjects

It was concluded that usage of ICT was resulted in emerging pedagogy. This was also evident that as ICT in society was pervasive in society with greater pace so it was also challenge for new generation to equip itself with new technologies and skills of proper and effective utilization of it. So it was also proposed that new information society also required new skills as well. As ICT has resulted a significant shift in teaching and learning practices so it was proposed that policy makers and project leaders should consider into account such factors that could result into proper application in their respective societies

Smeets, E. (2005) conducted a study on the contribution of ICT in creating powerful learning environments. He states that benefit of ICT is active learning because it facilitates learners to when and where to do learning. Major benefit of ICT-enhanced learning is that it promotes increased learner engagement because it is helpful for the learners to do just-in-time leaning because they are able to learn what they want to learn and when they want to learn. One of the miracles of ICT is that it also enhances collaborative learning because it helps to encourage interaction and cooperation among teachers, students, and subject experts being there in any part of the world. Apart from real world learning ICT is helpful for increasing opportunities to work together crossing the barriers of geography. It brings people together from different cultural backgrounds thus creating global awareness enabling them to have effective communication.
Thus this collaborative learning results in lifelong learning by enabling people of different cultures closer together.

Kirkup, Gill and Kirkwood, Adrian (2005) have conducted their research on “Information and communications technologies (ICT) in Higher Education teaching”. The widespread adoption of information and communications technologies. According to them since mid-1990s ICT has not resulted revolutionary changes in teaching and learning as it was expected. To analyse the scale of changes they used in their study Activity theory and Rogers’s model of the adoption. This was a survey research based on a period of ten years with DE tutors at UK Open University. It was aimed on focusing that how over time different ICT applications as teaching tools resulted in revolutionary changes in DE. Their research was longitudinal, interval study of attitudes and use of ICT in teaching at the UK Open University. Surveys were based on access and use of ICT among staff of UKOU. The findings of the research revealed that tutors’ overall access to computers has increased considerably. It was found that most of the tutors have access to computers both at home and at work. A clear link was found between tutors’ computer access and the course they taught. In the mid-1990s there was a clear link between tutors’ computer access and the course they tutored. The lowest access was found among the tutors of Arts, Social Sciences and Education. The most recent survey of 2003 revealed that access to computer had almost become ubiquitous. Nearly all the tutors were using internet by this date. Only 4.3 percent indicated that they do not go online for UKOU work.

By the year 2000, almost 90 percent of the tutors had internet access and they were of the view that basic function of all Personal Computers was communication as being a part of network society (Castells, 2000). In UKOU usually students usually interact with their tutors through posts in which detailed comments of tutors provide a feedback to the students. There was a limited progress on the use of computer for interacting with the students. In 1988,
computer conferencing was incorporated as a course component, but it was also on optional basis.

The 1996 edition of the Supporting Open Learning handbook for tutors (Open University, 1996) had a brief section on computer use but it was only related to practical advice about tutor’s use of email and computer conferencing. By 2003 majority of tutors and students were using a variety of course based and university specific applications. When tutors were asked to rate the usefulness from five available methods of contacting with students (telephone, post, e-mail, conferencing and face-to-face) Email was the highest rates method to contact with students with 76 percent rated as very useful followed by face-to-face with 75 percent and telephone 62 percent. It was also found that the tutors found ICT useful to improve the quality of their work and it has improved their ability to interact with the students. Nearly 70 percent of the tutors felt that their quality to interact with the students has improved. Tutors also expressed their concerned that application of ICT has resulted in more time consumption than telephone. Overall research suggests that adoption of ICT depends on how well they function as tools in teaching activity as compared with the other tools of teaching. It has been found that in many cases ICT has been use to replace existing teaching practices or it has been used as additional element along with existing practices.

ICT usage in education is also helpful in promoting in the manipulation of existing information and thus resulting in creation of real-world products (Kalusopa, 2005). ICT-enhanced learning promotes integrative learning and it helps to eliminate artificial separation between various disciplines, and also between theory and practice which characterizes the traditional classroom approach. ICT-enhanced learning is student-oriented and student-directed and also diagnostic. Contrary to static, print/text based technologies.
The study of Matthew and Eliot Elfner, (2002) on "Analysing student satisfaction with instructional technology techniques" also provides an insight to how students are satisfied with the use of instructional technology. It is an admitted fact that higher education institutions and universities have been using information technology techniques and tools for years. Though huge investments have been made on usage and application of ICT in education but need is to check the efficacy of these instruments in education. The respondents were undergraduates in business classes in different colleges of US. In their study they defined IT as “Commonly used computer assisted learning tools that are used to augment traditional learning environment.” After survey the following commonly used tools and aids were found to be helpful in education:

i. Presentation Slides Soft wares

ii. Email and discussion list

iii. Word processing application

iv. Word wide web search engines

v. Online library catalogues

vi. Web page development applications

The respondents were also asked to rate the degree to which use of ICT has increased their class room behaviours which are strongly related to students learning. It was concluded that all of the behaviours were positively affected by use of IT. The most importantly two items stood above the others. They reported that IT has helped to increase the quality of students’ presentations. The amount of interaction with students, interaction with faculty and degree of course flexibility were positively related to time and frequency students spend with email. It was also found that increased email also helped to increase interaction among faculty and students. Time spent with word processing and frequency of word processing also
resulted in increased interaction between students and faculty. The frequency of word processing is also positively related to increased availability of information.

It was also found that time and frequency of using library online catalogue were both positively related to increased course flexibility and greater collaboration in class. Similarly the frequency of using library online catalogue is positively related to the information available. Contrary to expectations there is a negative relationship between time spent in web searches and respondents’ perception of information availability. Findings also revealed the more time students spend with in Web searches the less information is available which perhaps predict undirected browsing behaviour rather than focused researches. A clear relationship was found between email usages and students satisfaction and desired outcomes. It was concluded that maximising use of emails and discussions lists lead to greater students-students and students-teachers interaction and it will result with students satisfaction with educational experience.

Some studies (Cuban, 2000; Papanastasiou and Angeli, 2008) highlighted teachers’ role in integration of computers and ICT as of greater importance and in every reform efforts should be made to take into consideration teachers ‘knowledge, skills, beliefs, and attitudes. The sample of this study consisted 578 teachers who were teaching in different elementary schools of Cyprus during the academic session of 2003–2004. The results of this study show that the reliability evidence obtained from the responses was satisfactory. The construct validity evidence was also determined based on a factor. Some gender differences also appeared in the teachers’ responses on the various factors. The average age of respondents was 31.98 years, with a minimum age of 22 years and maximum age of 59 years. As far as computer usage and experience is concerned 96.2 percent indicated that they owned computers at their own home. In addition to this almost 70 percent teachers indicated
professional competency in computer usage by indicating that they had completed professional development

Some studies (Moore, 2002; Oliver, 2002) further propose that ICT has helped to cross the barriers of “When and Where to learn” and this has proven helpful for learners and educators the both. He introduced the concept of anytime and anyplace learning. He argued that:

vi. Usually in traditional mode of teaching students are required to have access to academic institutions at a particular place and locality. As ICT arrived it has caused cost effectiveness for students by saving travel expenses and thus caused convenience for them.

vii. It is the miracle of modern technologies that many courses are offered by external institutions can be learnt at home by enrolling the students at their own homes. The students are connected through networking which provide opportunities for students of diverse cultures to interact with each other’s.

viii. ICT promises freedom of choice for far off distant students and they are free to choose from variety of courses offered by handful of universities.

ix. It is the greater advantage of ICT that it has facilitated anytime learning and it has helped the students to seek online classes at their own pace and time.

x. Mobile technologies have further created more opportunities for students and teachers anytime learning and both of them can be intact through these portable devices.

A wide range of literature on arrival and application of ICT in education, especially in distance education reveals that ICTs have helped to increase interactivity. ICT has proven helpful; especially even has proven helpful in the developing countries.
Andersson, A., & Hatakka, M. (2010) in their research Increasing Interactivity in Distance Educations: Case Studies Bangladesh and Sri Lanka argue that ICT has helped to increase interactivity. Both researchers are of the view that application of ICT has replaced traditional teaching methodology to interactive creation of knowledge. This research is a case study of DE of two countries using different technologies for the implementation of interactivity; including internet and computers in one case and video and mobile phones in the other case. This research was not interested in analysing difference in scores or performances rather it was interested in knowing difference in learning practices. The main area of interest was to identify the change in teachers’ and students’ beliefs and also values when they are provided with more interactivity. This research was based on Structuration Theory, (Halperin, 2005; Halperin & Backhouse, 2007) which aims to seek how technology can be used in DE for the purpose of increasing interactivity. This research was based on extensive observations and interviews. The researchers have been engaged in these two case studies as external e learning experts, evaluators, educators and even researchers. Informants for this study were selected on the basis of different roles. The list of informants comprised of content developers, teachers and students because all of them ICT interactivity from their viewpoint and standing. Empirical material for this research consisted of documents, questionnaires, interviews and observations. From observation it was evident that though knowledge is created through interactions and collaborations, but many students still preferred traditional class rooms and enactment of traditional structure was quite evident from how students returned to learning centres for lectures. There were same conflicts in norms and interpretative schemes but the means to solve these conflicts differed. As on one hand Sri Lanka solution was to use technology to tempt students with a variety of learning materials and activities online, while Bangladesh solution was to adjust the technology for the sake of resembling physical features of a class room. It showed that technology could be used
to bridge a shift in structure in two different and distinct ways. Furthermore, it was also found that technology could take time to transform to interactive structure. Although Bangladesh case was strictly designed for interactivity, it was found that due to novelty of changes actors depicted more signs of traditional structure than the case of Sri Lanka. In the case of Sri Lanka it was found the students from Sri Lanka were more responsible for their learning and interaction with their teachers and peers.

Mikre. F, (2011) conducted an important study in the context of helpfulness of ICTs in education. He structured his study as a meta-analysis by reviewing different articles by researcher the following major aspects of helpfulness of ICT usage in distance education were found:

i. ICT offers opportunity for more students centred teaching

ii. It was observed that ICT helps in facilitating teacher-to-teacher and student-to-student communication.

iii. It provides the greater exposure to students for their vocational training and professional development.

iv. ICT was a proven source to provide new information and updated knowledge to the teachers

v. ICT was found helpful for preparing students for real world.

vi. ICT was specifically found helpful for distance learners who could seek study material online through variety of sources.

vii. ICT helped to produce citizens who are capable to face challenges in new economies and it also helped the ICT learners to cope with the new challenges emanating from ICT and related developments.

viii. ICT helped to improve efficacy and efficiency of educational administration.
ix. ICT helped to have access to quality education resulting in improved educational standards in developing countries.

Knowledge Gap Hypothesis Theory (1970) suggests that there is a difference of knowledge according to difference in the socio-economic status of people. The theory further argues that the people with low income have lesser access to ICTs facilities due to the costs linked with their availability. The rural population of Pakistan belong to the poor socio-economic class (Khan et al., 2015; Alkire and Robles, 2016). Hence, they have lesser ICT facilities. So, by reviewing the literature available regarding helpfulness of ICT in distance education, the poverty statistics of rural areas of Pakistan and digital divide of the population, the researcher develops the following research hypothesis:

2.12.1 Hypothesis 1

Students of urban areas find ICT more helpful in their studies than the students of rural areas.

2.13 RELIANCE ON ICT IN DISTANCE EDUCATION

Bahk, C. M. (2008) worked to explore the relationships between various socio-psychological variables and the level of involvement in the Internet. The basic construct of internet involvement was considered as an index of internet usage. That study introduced the construct of Internet involvement as an index of Internet usage. Internet involvement could be conceptually defined as the extent to which an individual gets involved in the usage of the Internet in their daily lives. This research tried to know about the following

i. Difference in internet involvement between males and females

ii. Age related differences

iii. To know about disparities in internet involvement between whites and non-whites.

iv. Marital status and internet involvement

v. Computer ownership and internet involvement
Bahk, C. M. (2008) surveyed Two hundred thirty-four college students from undergraduate classes from West Coast University. The mean age of the respondents was 24.5 with (SD = 7.5) with 66 percent females, 96 percent were US citizens, nine percent were married and among 55 percent were identified as male. The mean age was 24.5 (SD = 7.5); 66% were female, 96% were US citizens, 9% were married, and 55% identified themselves as White. A self-administered questionnaire was responded that was aimed to measure internet involvement, internet usage and demographic variables. Most of the respondents (92.6%) indicated that they had access to computer/ internet at home or in school, and 216 of them had their own computer. Reported use of internet per day in students was 85.4 minutes with (SD = 86.6). From the results of independent samples t-test and ANOVA no statistical difference were found in computer ownership and usage of internet based on gender, race and marital status. According to the results of t-test no significant differences between males and females were found in any of three dimension of reliance, immersion and enjoyment. From results it was also found that except for age and computer ownership sociodemographic variable consisting of gender, race and marital status were not correlated with any of three dimensions of internet involvement. It was also obvious from results whether the subject own his or her computer, the computer ownership and face to face anxiety were positive indication of Reliance.

Overall findings of the research reveal that those who have their own computer they were slightly more independent on computer and internet and it was supported that the greater the dependence on computer/internet the greater would be the level of face to face interaction anxiety. Other variables like gender, age, marital status and whiteness were found non-significant predictors of this dimension. Findings also revealed that the older the person is and that the greater the level of face to face interaction anxiety, the greater the level of immersion in internet. As far as enjoyment dimension of internet involvement is concerned
no was found to be a significant predictor and it was found that enjoyment aspect of internet involvement was not affected by sex, age, marital status, whiteness, face to face anxiety and computer ownership.

Different research studies suggest that heavy internet users usually are faced with the highest social anxiety and shyness (Caplan, 2007). It has also been found that socially fearful and anxious individuals were found to benefit from internet for interaction. (Campbell, Cumming, & Hughes, 2006; Madell & Muncer, 2006).

Many other scholars have admitted the role of ICT in education (Pigato, 2001; Fisser, 2001) and reliance of students on ICT in distance education too (Rumble, 2001). All the studies in the context of reliance on ICT in distance education can be concluded ICTs as trust, dependence or need of information and communication technology in accomplishment of academic tasks of the students enrolled in distance learning programs. Various studies (Kirkwood, 2000; Usun, 2004) has revealed that the students heavily rely on ICTs regarding their admissions, regarding their classes (Peralta, and Costata, 2007), interaction with teachers and fellow students (Kennewell, 2001), preparing assignments & making presentations (Seymour, and Fourie, 2004), attempting quizzes and exercises (Usun, 2004), and looking for course updates and results (Bissell, and Williams, 2008).

A study of 150 distance education programs reveals that rural students rely more on traditional, paper-based means of distance learning than ICT based (online and Web-based) methods of learning (Leary & Berge, 2006; Mukahy and Barbour, 2010). The students with urban background have more ICT facilities, more access to ICTs due to their socio-economic conditions than the students with rural background. The students with rural background have lesser access to ICTs facilities, hence, they have lesser reliance on ICT in their studies than the students with urban background. This argument is based on the finding of various research studies (Alkire and Robles, 2016; Khan et al., 2015) and Knowledge Gap
Hypothesis Theory (1970) which argues that there is a difference of knowledge according to difference in the socio-economic status of people due to lesser access to ICTs facilities. The rural population of Pakistan belong to the poor socio-economic class (Alkire and Robles, 2016; Khan et al., 2015). Hence, they have lesser ICT facilities. So, by reviewing the literature available reliance of ICT in distance education, the poverty statistics of rural areas of Pakistan and digital divide of the population, the researcher develops the following research hypothesis:

2.13.1 Hypothesis 2

Students with urban background have more reliance on ICT than the students with rural background.

2.14 LIMITATIONS OF USING ICT IN DISTANCE EDUCATION

Use of Information and Communication Technology in education may also have some limitations as well (Bingimlas, K. A., 2009; Cox et al., 2000). There are various reasons for such limitations including over-reliance and over-use (Pelgrum, W. J., 2001). For operational definition and construct development, limitations of Information and Communication Technology in distance education includes over-reliance, ever-use, inappropriate use, and plagiarism. Such limitations were found by Mikre. F, (2011) who discussed the limitation and challenges of ICT integration in distance education system of developing countries. He believed that usage of ICT in education encourages interactive learning and constructivist learning as well but active role of ICT in learning limits the role of teacher according to his opinion. He also observed a greater interest in people in knowing about the application and usage of internet in education as there is a shift in theories to explain the learning process. He opined that ICT resulted in increased innovativeness in schools and access of all community members towards literacy and adult education. According to him many people thinks of ICT as panacea to many to schools’ problems for their improvement. But despite of that fact there
still exist many limitations towards usage and application of ICT. These limitations can be
categorized as Teachers’ related limitations, students’ related limitations, and technology
related limitations. As far as teachers’ attitude towards ICT is concerned it is of vital
importance and cannot be denied. Many observations revealed that many teachers didn’t have
clarity that how ICT can improve students learning and how much it could be beneficial and
facilitative for students. As observed by Brosnan (2001), “attitude, motivation, computer
anxiety and computer self-efficacy are factors which are affecting teachers’ use of computers
in their lessons. Lack of enthusiasm and teachers’ resistance could also be another factor.
Furthermore, teachers’ lack of awareness with ICT could also be a factor. ICT in education
can be a disadvantage unless educators develop ICT skills and ready to experiment ICT with
students.

Arrival and application of ICT in DE has helped to increase interactivity. ICT has
proven helpful; especially even has proven helpful in the developing countries.

Rajesh (2003) has studied the problems related to ICT adoption in developing countries
in the backdrop of DE. According to him ICT is not playing a vibrant role in democratization
of education in developed countries but also it has a key role in developing countries as well.
He studied the problems that were associated with the growth of ICT in developing countries
and these problems were listed as economic, cultural, political and technological factors.
Usun, (2004) has worked on “Factors Affecting the Application of Information and
Communication Technologies (ICT) In Distance Education (A Case Study of Turkey)”. His
research was aimed at determining the factors and problems which were associated with the
application of ICT in developing countries with a particular emphasis and focus on DE
system of Turkey. He enlisted the following factors which were impeding to the growth of
ICT in Turkey: cultural factors, technological factors, economic factors, and political factors.
All these factors usually account for the underdevelopment of developing countries. The
researcher offered little suggestion that could be helpful to cope with these sorts of problems. His suggestions include:

i. According to him in integration and adoption of ICT role of government should be based on proactive approach and it must fund in providing training opportunities in the field of ICT.

ii. Turkish should strive for new ways to make cost effective use of new technology.

iii. In DE system of Turkey government must try to seek new and alternate financial resources like sponsors’ funds

iv. He opined that DE institutions should least look for novelty of ICT and they must work in line with the political policies of the existing government. He believes that would help to generate funds from government for ICT in DE.

v. For the purpose of enhancing interaction he advised for making effective use of instructional strategies and interactive technologies like telecommunication.

vi. He is of the view that media selection is of prime importance in DE. He suggested that while selecting media for DE the following factors must be taken into account: Accessibility, cost, socio-political stability, flexibility, interactivity, motivational value and most importantly effectiveness.

Mahajan, S.L. (2002) research work on Information Communication Technology in Distance Education in India: A Challenge. There exist many challenges regarding usage and applications of ICT in India. There are many educational institutions in India that are using without any networking among them. Due to falling prices of ICT the Indian universities are experiencing revolutionary changes in their way they transmit and impart knowledge to their students. It has been found that India has been using ICT for educational purposes since 1975 by the usage of Satellite for the purpose of educating students and Satellite Instructional Television Experiment (SITE) was introduced in 1975 to broadcast educational programs in
rural areas. Indra Gandhi National Open University IGNOU is making effective use of National Network to access its students that are across the whole India. In IGNOU there is talk back terminal available in Satellite Communication which is a sort of phone call or audio channel is available through which students at the class room and teachers in studios can interact with each other. This is more interesting to note that nine state open universities are using it. It is also saddening to note that a sort scepticism exist among educators of India that usage of ICT may lead towards elitism by creating communication gap between haves and have-nots. There is also another problem that government cannot make technology available to all students in every nook and corner of the country. In this some additional factors were suggested that prevent proper application of ICT in education by the policy makers of India. These factors include the following:

i. There is lack of teachers’ participation of course wares because mostly teachers are never consulted. There exist a greater difference between course ware and software because courseware consists of all teaching material that store information like print, radio and television programs. Further, there exists a lack of variety in the development of course. The reason for is that most of courses are developed keeping developed countries as a role model in mind.

ii. Students’ greater dependency on course books and traditional lectures keep them away from ICT.

iii. Teachers/educators/tutors prefer using technology in teaching because they look it at as problem solving for them. They also believe that ICT can help to improve quality of teaching and instruction.

Mahajan, S.L, (2002) found that there are some barriers which hinder proper application and usage of ICT in India. These obstacles consist of Socio Political factors, Technological barriers, educational factors. He has concluded that only networking of
universities will not be useful because he thinks that geographically closed universities can be networked but the idea of networking the whole universities will not be effective. He suggests that only that technology must be brought into use that is feasible, cost effective and easily accessible for locality. He further suggested alongside the ICT teacher-student contact is to be given priority through Personal Contact Program (PCP). He is of the view that usage and application of ICT in DE cannot be avoided but technology should be used as a tool to strengthen teacher-student relationship but it should not be considered as a substitute of teacher. He emphasises on usage of ICT in customer-friendly and clientele friendly as well.

As far as limitation of ICT usage in education by students is concerned appropriate use of computer and internet might have positive effects on students’ attitudes and achievements. Another serious issue regarding the use of ICT is concerned is that students spend much of time in leisure seeking activities like online gaming, chatting and use less it for studies. Leisure activities like face book, online gaming, chat rooms, and other communication channels limit use of ICT for study purposes because they detract students from actual target of studies and hence their time is wasted. (Youssef, A., & Dahmani, M. 2008). It can be concluded that the impact of ICT on students is strongly dependent on its usage among students. If it is not used properly then disadvantage take the place of advantage. Few of observed limitations of ICT are following

i. Over-reliance on ICT limits students ‘critical thinking and analytical skills

ii. Computer based studies might have negative effects on learners’ physical health like students excessively using computer may face vision problems.

iii. Another issue that was observed was that ICT could distract students from their studies by involving other activities like online gaming, chatting, using you tube and face book for entertainment purposes.
iv. Students become too much dependent on computer forgetting other sources of learning like books and teachers.

v. It was also observed that excessive use of it may result in students’ poor handwriting as a result of being away from routine writing on papers.

vi. It was further observed that using ICT for weaker students was difficult and they had depend on other students, and they would have to look for more support from their teachers too. As a result students’ independent learning will be suffered.

The other limitations that were observed were related to technology usage. The high cost of ICT related equipment, greater expenses on maintenance, electric supply shortages, fear of virus attacks were some of technology related limitations.

2.14.1 Hypothesis 3

Students with urban background experience more limitations than the students with rural background.

2.15 RELEVANCE OF ICT IN DISTANCE EDUCATION

In order to understand the relevance of Information and Communication Technology (ICT) in Education, we have to understand the extent to which ICT is relevant for enhancing learning in education. Information and Communication Technology (ICT) is relevant to the educational use and for enhancing students’ learning (Yusuf, 2005; Unwin, 2009; Cornu, 1995) and relates to each and every aspect of education (Cuban, 2001). Hence, it is agreed upon fact that ICT makes educational process more relevant and more meaningful. ICTs are relevant in distance education in the sense that they are relevant in obtaining information related to admission, study materials, preparation of assignments, presentations, examination, and results. These facts were found in the studies such as Kirkwood, (2000) and Usun, (2004) who found ICT relevant in admissions of the students, Peralta, and Costata, (2007) who found relevancy of ICTs and classes, interaction with teachers and fellow students
(Kennewell, 2001), assignments & presentations (Seymour, and Fourie, 2004), quizzes and exercises (Usun, 2004), and results of the students (Bissell, and Williams, 2008). Hence, the researcher concludes that the ICTs are relevant to the various component of the academic programs of the students enrolled in distance education.

The students with urban background have more access and availability of ICT gadgets & devices (Qureshi et al., 2014). More ICT facilities are available to urban students than the rural students of Pakistan which means that they have more expertise in their usage as well which will motivate them to use these devices more than the students with the rural background. So, they are smart users of the ICT devices and they find ICT more relevant in their studies. In the context of Knowledge gap hypothesis it is well understood that people with higher socio-economic status have more access to information and communication technologies than the people with lower socio-economic status.

2.15.1 Hypothesis 4
Students with urban background have more reliance on ICT than the students with rural background.

2.16 IMPACT OF ICT ON STUDENTS’ MOTIVATION

In the backdrop of this research it is of greater to know the impact of ICT in higher education as the whole sample of population consist of students studying at higher level of education (M. Phil and Ph. D and students). There is a general consensus that both students and teachers are motivated to ICT usage in their studies and teaching. It has been found that the students who own computers and use them at home also make excessive use of computers outside home and schools, colleges, universities as well. The rationale behind their usage is their familiarity with ICT gadgets and this familiarity motivates them to use ICT devices in their studies. So more the familiarity with the ICT devices and more the knowledge of
computers the more is motivation of using these devices. Another factor which motivates students in ICT usage is the expertise in ICT related skills. The pupils who have more expertise in ICT related skills are more motivated towards ICT usage than the non-experts or less experts. Another factor that motivates students in ICT usage is the sense of learner autonomy.

Youssef and Dahmani, (2008) found that there positive and indirect effects of ICT on students’ performance. They also argue that ICT equipment and uses are growing at very faster pace but the adoption of complementary organisational designs is extremely slow and differs from one institution to another and it also accounts for observed differences in students’ performance. It has been include that ICT seems to have greater impact on learning process in higher education because it offers new possibilities and dimensions for educators and learners. It was concluded that these possibilities can have greater impact on students’ performance.

Valasidou and Bousiou-Makridou (2011) found a positive relationship between the use of ICT and students’ performance in terms of marks. From the results of the study it was revealed that male students were more favourable towards ICT usage and they also scored higher at the module “Introduction to Computers” and males were more likely to be convinced that ICT was more helpful in their studies in various ways. It was also recommended that university’s academic and administrative staff should motivate students for developing positive attitude towards ICT usage.

There are some certain factors which motivate students and teachers to use Information and Communication Technology in education (Cox et al., 2000). They conducted another study in the same year (2000) and found the factors which motivate the students to use ICT in their studies. They found that perceived ability to use IT; availability of resources,
satisfaction with ICT; attractions and enjoyable work conditions were the motivating factors. ICTs encourage students to engage in distance education with the help of interesting interfaces provided by ICTs. ICTs also motivate the students for their studies in distance education programs by providing them study materials, variety of information, and attractive interface.

E-learning has also an important role to play in students learning. A variety of factors account for successful e-learning among students. Rhema, A., & Miliszewska, I. (2014) have conducted their research to explore relationship between students’ attitudes towards e-learning and their demographic characteristics, their access to technology, usage of technology for learning purpose, and their access to technology. It is beyond doubt that e-learning is rapidly prevailing and pervading in developing countries. (Omidinia, Masrom, & Selamat, 2011). But still challenges are prevailing in developing countries. In those countries still old and traditional methods are used lacking interactive and participatory involvement from students’ end. The following factors affect the students’ use of ICT: Demographic factors, students’ access to technology, technology use including expertise in skills, and students’ satisfaction with ICT. (Bertea, 2009; Cheng, 2006; Chen and Huang 2012; Felton, 2006; Gulati 2008; Paris, 2004; Pelgrum, 1993; Roca, Chiu, & Martinez, 2006).

Rhema, A., & Miliszewska, I. (2014) collected their data from students through survey research. The software of analysis named as Statistical Package for the Social Sciences (SPSS) was used to analyse and summarise the data collected from respondents. To measure the relationship between the variables Pearson Product Moment Correlations were used that were measured on interval scale. Students’ attitude towards technology was dependent variable while independent variables consisted of: gender location (rural/regional), age, years of study, use of technology, skills in technologies and finally satisfaction with the technologies. Age and years of study were added to control for probable confounding
influence of these variables. Two universities from which sample was selected included the is in centre of Libya’s capital and University of Al-Jabal Al-Gharbi that is 100km away from Tripoli. Sample consisted of 348 students from Electrical and Petroleum Engineering at each of the universities. Students from both the universities were further categorized into group A and B, C and D according to their universities and departments respectively as: The students from University of Tripoli were grouped into A (Mechanical) and B (Petroleum) and students from regional university; University of Al-Jabal Al-Gharbi were grouped into C (Mechanical) and D (Petroleum).

The key concepts that were aimed to be analysed were:

i. Students’ attitude towards technology

ii. Differences in attitude towards technology between male and females students.

iii. Differences in attitude towards technology between urban and regional students.

iv. Relationship between students’ attitude towards technology and their access to, use, skill, and satisfaction with technology.

Results of the research indicated that all the students had positive attitude towards ICT and e-learning and they were feeling confident in computer usage, they enjoyed using ICT in the studies, had stronger belief in benefits of e-learning and they expressed their interest in studying courses that used ICT. The students also strongly believed that that e-learning would give them opportunity for acquiring new knowledge and in enhancing their experiences. Overall results indicated that both male and female students had positive attitude towards technology. However, in urban group females were found to hold more positive attitudes than males. However, in urban groups A and B, female students were more likely to hold positive attitudes than male students. Students in group B depicted slightly positive attitude towards technology; rural group C students expressed lower level of all. Descriptive analysis also
indicate that less difference were found between male and female students; and urban and regional students in their attitude towards technology. Student attitudes were analysed against their levels of access to technology, skill, and satisfaction for the purpose of seeking possible relationships. A moderate relationship (r = 0.45, p < 0.01) was found between student attitudes/beliefs towards ICT and e-learning and their levels of skills in technology-based tools. In the light of results a moderate positive correlation was found between student attitudes/beliefs and their levels of access to various technologies (r = 0.30, p < 0.01). There was a positive relationship (r = 0.56, p < 0.01) between student level of skill in technology-based tools and their level of access to a range of technologies. To seek the relationship between student’s attitudes and their characteristics consisting gender, age, study group, year level, level of access to technology, usage of technology for learning, level of skill in technology, and satisfaction with technology statistical technique of multiple regression analysis was used. Results revealed that only level of skill was statistically significant (t = 2.822; p = 0.007).

Various studies thus showed that urban students were more motivated to use ICT in their studies and ICT based (online and Web-based) methods of learning than the rural students who relied more on traditional, paper-based means of distance learning (Khan et al., 2012; Leary & Berge, 2006; Mulcahy and Barbour, 2010). Hence, the researcher develops the hypothesis relating to the literature as follows:

2.16.1 Hypothesis 5
Students having urban background are more motivated in ICT usage than the rural ones.

2.17 USE OF ICT AND STUDENTS’ INTEREST
Information and Communication technology creates interest in education by providing ease of use and availability of information (Garrison and Kanuka 2004). ICTs have made
educational process interesting by providing attractive interface, help wizard, and presentation of materials in an attractive manner. ICT has made the distance learning very easy and accessible for all the students which has enhanced the interest of the students in ICTs and education as well. The interest for the students in their studies through distance education may be created by the provision of unique features of ICT. ICTs make educational process interesting by providing those unique features such as attractive interface, help wizard, and presentation of materials in an attractive manner etc. It is a well-established fact that the students with urban background have more interest in using ICT in their education. This is supported by the various comparative studies done to compare the interest of using ICT in distance education among the urban students and rural students (Khan et al., 2012; Leary & Berge, 2006; Mulcahy and Barbour, 2010). Hence, the researcher develops the hypothesis relating to the literature as follows:

2.17.1 Hypothesis 6

Students with urban background take greater interest in ICT usage than rural students.

2.18 USE OF ICT AND GRATIFICATION APPROACH

Use of ICT in education gratifies various educational needs of the students (Kubala, T., 1998). In this way, ICT provides gratification to the users i.e. the students. Educational needs of the students include the foremost purpose of understanding the course contents of different programs in which students are enrolled (Turnbull, A. P., 1995). The researcher concludes from the literature that gratification means that information and communication technology fulfills student needs of subject understanding, positive interaction with class mates, positive interaction with teachers, instant access to relevant and authentic academic information.

Matthew H. Roy and Eliot Elfner, (2002) work on "Analyzing student satisfaction with instructional technology techniques" also provides an insight to how students are satisfied
with the use of instructional technology. It is an admitted fact that higher education institutions and universities have been using information technology techniques and tools for years. Though huge investments have been made on usage and application of ICT in education but need is to check the efficacy of these instruments in education. In this research 215 respondents were surveyed about uses and effectiveness of IT tools. The sample was male dominated with 68 percent males and 32 percent females. The age of sample was ranging from 19 to 26 years. These respondents were undergraduates in business classes in different colleges of US. In their study they defined IT as “Commonly used computer assisted learning tools that are used to augment traditional learning environment.” For the purpose of knowing about commonly used IT tools the researchers surveyed their colleagues informally and also studied different research journals. After survey the following commonly used tools and aids were concluded: Presentation Slides Soft wares, email and discussion list, Word processing application, word wide web search engines, online library catalogues and web page development applications. The research question that was posed in this study was aimed at exploring relationship between usages of different kinds of IT used to the degree of satisfaction reported by students. Seven point Likert scale was used by the researchers to know about the degree of satisfaction with commonly used IT aids/tools. The respondents chose from seven points scales ranging from 1= Very unsatisfied to 7= Very satisfied. Results illustrated that respondents rated the use of computer to search the library holdings slightly negatively. The tools that were closer to neutral included Library links to Literature Searches, EBSCOHOST. On the other hand searching web, word processing and email were positively viewed.

The respondents were also asked to rate the degree to which use of ICT has increased their class room behaviours which are strongly related to students learning. It was concluded that all of the behaviours were positively affected by use of IT. The most importantly two
items stood above the others. They reported that IT has helped to increase the quality of students’ presentations.

The amount of interaction with students, interaction with faculty and degree of course flexibility were positively related to time and frequency students spend with email. It was also found that increased email also helped to increase interaction among faculty and students. Time spent with word processing and frequency of word processing also resulted in increased interaction between students and faculty. The frequency of word processing is also positively related to increased availability of information. It was also found that time and frequency of using library online catalogue were both positively related to increased course flexibility and greater collaboration in class. Similarly the frequency of using library online catalogue is positively related to the information available. Contrary to expectations there is a negative relationship between time spent in web searches and respondents’ perception of information availability. Findings also revealed the more time students spend with in Web searches the less information is available which perhaps predict undirected browsing behaviour rather than focused researches. A clear relationship was found between email usages and students satisfaction and desired outcomes. It was concluded that maximising use of emails and discussions lists lead to greater students-students and students-teachers interaction and it will result with students satisfaction with educational experience.

Here, the researcher, utilized Uses and Gratification Theory and other related studies to theorize the hypothesis. By the use of Information and Communication Technology in education, various types of educational needs of the students are gratified such as understanding the course contents, positive interaction with class mates, positive interaction with teachers, instant access to relevant and authentic academic information, preparing assignments, preparing presentations, and examinations(Kubala, T., 1998; Turnbull, A. P., 1995). However, the rural and urban differences are major in this regard which was
considered in many studies. Those studies showed a difference regarding gratification of needs in urban students and rural students with respect to understanding the course contents, positive interaction with classmates, positive interaction with teachers, instant access to relevant and authentic academic information, preparing assignments, preparing presentations, and examinations (Gulati, 2008; Mulcahy, 2010; Salman and Hasim, 2009; Stavropoulos, 2013). Hence, the researcher develops the following research hypothesis in his study:

2.18.1 Hypothesis 7

Students with urban background are more satisfied with the ICT usage than rural students.

2.19 FREQUENCY OF ICT USAGE

“Evaluating the Use of ICT in Education: Psychometric Properties of the Survey of Factors Affecting Teachers Teaching with Technology (SFA-T3)” was conducted by Papanastasiou, E. C., & Angeli, C. (2008). It was aimed to determine the psychometric properties of the survey of factors affecting teachers teaching with technology (SFA-T3). The sample of this study consisted of 578 teachers who were teaching in different elementary schools of Cyprus during the academic session of 2003–2004. The results of this study show that the reliability evidence obtained from the responses to the questionnaire was satisfactory. Some gender differences also appeared in the teachers’ responses on the various factors. The average age of respondents was 31.98 years, with a minimum age of 22 years and maximum age of 59 years. While talking about computer usage and experience 96.2 percent indicated that they owned computers at their own home. In addition to this almost 70 percent teachers indicated professional competency in computer usage by indicating that they had completed professional development.

In terms of computer usage and experience, 96.2% of the teachers in the sample indicated that they had a completed professional courses related to basic computer skills. The
questionnaire designed consisted of seven sections. The first section included demographic data and the other six sections were used to obtain information related to:

i. Knowledge of teachers about soft wares.

ii. Teachers’ frequency of software usages for their personal purposes

iii. Attitudes of teachers towards integrating ICT in teaching and learning process.

iv. Self-confidence of teachers in integrating ICT

v. Teachers’ frequency of using ICT for instructional purposes, and

vi. School climate and support

In the first step of analyses descriptive statistics were used for each variable of the questionnaire to determine whether there were floor or ceiling effects in the questionnaire. The majority of the items on the questionnaire performed well on this test. In one section of questionnaire that was dealing with the frequency of specific software use in specific content areas had very stronger floor effects as a result having small variance. However, one section of the questionnaire, the one dealing with the frequency of specific software use in specific content areas, had very strong floor effects, and therefore, very small variance. This was because of the very low frequency with which different software programs are actually used in various schools of Cyprus. The average amount of use per week ranged from 0 to 0.86. This could also due to limited number of computers that existed in Public elementary schools of Cyprus. Because of the floor effects a new it was thought more appropriate through combining new items with the low means.

The one category of new items included the total frequency with which any type of software was used in specific content areas (e.g. how many times computers were being used in mathematics per week?). The other category of new items included the total frequency of specific software uses for all content areas altogether (e.g. how frequently Word was being used each week?). The examination of items means was now acceptable. In order to
determine the construct validity an exploratory factor analysis was performed with SPSS 12.0. Factor analysis was performed for each section of questionnaire. The first factor analysis performed consisted 14 items to ask teachers to self-report their knowledge about various computer software programs. The analysis produced two factors that explained 58.07 of the variance of these 14 items. The first factor that explained 31.98 percent of the variance is composed of six items that measure teachers’ self-reported ability to use common-use software applications. The second factor analysis which was performed examined 15 items that measured the frequency of computer software usage for personal purposes and it was reported by teachers themselves. This factor resulted two factors which explained 48.86% of this section’s variance.

The first factor that was composed of eight items accounted for 25.11% of the total variance. This factor included email, the Internet, education related CDs, Word, etc. The second factor comprised seven items and accounted for 23.74% of the variance of this particular section of the questionnaire. This factor which was named as “use of specialized applications,” consisted the use of more specialized applications like Stage cast Creator, FrontPage, Kidspiration, Model-It, etc. The other factors further included: confidence in using ICT, encouragement with colleagues, anxiety factor, beliefs about the value of computer. The fifth factor was technology infrastructure and the last factor was labelled as “The computer as agent for change”

The inter-correlations of the ten factors included in questionnaire were also examined. According to the results of analysis with the exception of seven pairs of factors the remaining factors of the pairs were highly correlated. The highest correlation between the pairs of factors was of common applications” with the factor of “knowledge of common applications” (r = 0.789). The technology infrastructure in school was correlated with very few factors. It was analysed with the factor of encouragement from colleagues (r = 0.561), with computer
confidence \((r = 0.182)\), with computer anxiety \((r = 0.141)\) and correlated with teachers’ beliefs about the value of the computer \((r = 0.085)\). Computer anxiety was the factor that was significantly correlated with all of the remaining factors. Similarly, the factor of computer confidence was significantly correlated with all of the other factors.

Kala. S, Shareeni, (2013) has worked on “ICT education in Fiji, issues and challenges faced by Tertiary education sector: an empirical survey.” Her study is basically focused on various issues and challenges that are usually faced by education sector while conducting ICT education on tertiary level of education. This research was survey based and sample was selected from three universities of Fiji with Fiji National University with 50 percent students’ participation; 24 percent participation from University of South Pacific and University of Fiji accounted for 26 percent participation. This survey was conducted from students in Arts, Science and Humanities. There was 46 percent male participation and 54 percent male participation. The results of the survey indicated that almost 64 percent of the students owned laptop/ personal computers while 21 percent students responded that they would need to visit University to use computers, and among others there were 8 percent students who didn’t have access, own a computer/ laptop or faced difficulty in finding computer. Results show variations in how students responded to the Self Directed Hours spent in campus related work. Most of the students belong to 1-10 category hours where 76 percent students responded positively. For the students who spend more than twenty hours only 8 percent responded positively. No such variation was found in gender with 52 percent females and 48 percent males who respondent their engagement in ICT. According to the results of survey it was concluded that use of ICT in studies has positive impact on their studies and can improve their study habits. Highlights from activities of students indicated that 83 percent of the students use computer daily to facilitate their learning and in preparing their course assignments.
As far as performance is concerned it is significantly to the amount of the students who are using internet. ICT is evaluated best means of communication through use of emails and internet for 70 percent, research 44 percent, E-Commerce of 39 percent, and entertainment, travel, billing etc. 7 percent. (Mbah, 2010). Up to 83 percent of students agreed that internet has made life easier. Most of the students agreed that they preferred to use computer home (66 percent) with the comparison of 21 percent who preferred using university computers. Majority of the students with percentage of 88 agreed that social networking sites are helpful for them to work on ICT.

At the end of research it was concluded that

i. There must be a stronger linkage between ICT policies in education with the other policies that would be helpful for generating and allocating funds for ICT.

ii. There must be professional training for teachers at primary, secondary and tertiary level. Public-private partnership should be encouraged.

iii. A stronger ICT infrastructure should be established keeping in mind material, networking, technical support and electricity.

It was also proposed that new trends in ICT like e-learning, m-learning should be adopted to meet the challenges of education in global village.

Adesoji, F. (2011) argues that the frequency of Information and Communication technology usage in education differs in the students of rural and urban area. Student use ICT for fulfilling their educational needs. However, students with urban background have more frequency of using ICT in their education especially distance education (Leary & Berge, 2006). Hence, the researcher develops the hypothesis relating to the literature as follows:

2.19.1 Hypothesis 8

Students with urban background have more frequency of using ICT than rural students.
2.20 PREFERENCE OF ICT USAGE

Various studies showed that there was a difference in the preference of using ICT in studies for the students of rural areas and urban areas. Khan et al., (2012) found a difference in the rural and urban spread of students relating to preference of using ICT in distance education. They found urban students to be preferring the usage of ICT in education. Leary & Berge, (2006) found a strong tendency of urban students in using ICT in their studies than the students of rural areas. A much similar study of Mulcahy and Barbour, (2010) showed that there was a significant difference between the students of rural areas and urban areas regarding ICT preference as a teaching methodology. They found more preference of using ICT in education among the students of urban areas. Hence, the researcher develops the hypothesis relating to the literature as follows:

2.20.1 Hypothesis 9

Students with urban background have more preference of using ICT in education than the students with rural background.

2.21 THEORETICAL SUPPORT FOR THIS STUDY

This research is based on three theories of Mass Communication

i. Knowledge Gap Hypothesis

ii. Uses and Gratification

2.21.1 Theory of Knowledge Gap Hypothesis

It is beyond any doubt that information is a resource like other resources. It has greater worth and value in our lives, it let the people to do the things that they couldn’t do otherwise. There is an old aphorism which states that ‘Knowledge is power’, and this means that knowledge has the ability to give people capability to do the things. It also appears that knowledge like other kinds of wealth, knowledge is not equally distributed throughout the world and society. The people who are struggling in their lives with financial issues are often information-poor.
Financially talking, this world has people who are haves and have-nots in the similar way with regards to information the world is divided between haves and have-nots.

Childer and Post, (1975, p.56) in their book The Information-poor in America suggested a list of questions as typical information needs of the disadvantaged adult in the United States

How do I get my baby into day care centre?

Whom do I talk to get rid of rats?

Childer and Post, (1975, p.42) also suggested the following as Portrayal of disadvantaged American in his native information habitat.

He does not know which information channels to switch to solve his problems, or what particular programs that can be helpful for him.

He watches television for long hours, seldom goes for newspapers or magazines and never read books.

He does not see problems as information needs.

From above excerpts it can be concluded that

1. Information is important in a democratic society because a good democratic society greatly depends on well-informed citizens; Candidates are elected by seeking information about them and one must be fully informed about the vision of candidate to be selected.

2. Information is more important as we are in a technological age where many problems of our lives can be solved by just one touch or click of technology. It can create greater awareness in people in knowing about their actual issues.
2.22 THE ROLE OF MASS MEDIA

The attempt to improve people’s lives or to make democracy more strengthened by providing greater amount of information through use of mass media might not help or work the way the planners would expect from it. An undesired and unexpected effect of mass media is that it might have effects of increasing differences or gap in knowledge between members of the society and thus causing a digital divide. This term or phenomenon Knowledge Gap was first proposed first in 1970 in an article titled as “Mass Media Flow and Differential Growth in Knowledge” by Tichenor, Donohue, and Olien. All these three researchers were working in the University of Minnesota where they projected this hypothesis. Knowledge gap theory in was defined by them “as the infusion of mass media information into a social system increases higher socioeconomic status segments tend to acquire this information faster than lower socioeconomic status population segments so that gap in knowledge between the two tends to increase rather than decrease.”

In simple words we can say that economic status can also play a role in increasing and gaining knowledge bank and those who are financially stable have more access to knowledge sources due to their ability to buy and too access the technology. The effects of the new technologies are that they have created a sense of deprivation for those who are deprived of the technologies.

As the world of technology is expanding we are witnessing the greater effects of the new technologies but as our globe is becoming more focused on technology we find these technologies out of the reach and approach of poor ones that is creating inferiority complex in them. Resultantly knowledge gap is becoming more widened and the people belonging to higher socio economic class are in a position to gain the benefits more. If the Information services are not made available and provided on equal basis for the whole society then this gap between information rich and information poor will increase manifold over the years.
Tichenor, Donohue, and Olien hypnotized that knowledge gap hypothesis can be stated in the following ways

1. Over time, acquisition of knowledge for a highly publicized topic will proceed faster among well educated people than among less educated ones.

2. At a given point in time, there would be a higher correlation between acquisition of knowledge and education for the issues highly publicised in media in comparison with the less publicised.

Both of the hypotheses were also supported with supporting data as well.

2.23 PROBABLE REASONS FOR KNOWLEDGE GAP

Tichenor, Donohue, and Olien (1970) presented the following five reasons that might account for knowledge gap

1. They observed that there is a greater difference in communication skills between the people of low socio-economic status and high-economic status. It is because of difference in education between these two classes which results in creating difference between information processing tasks like reading, comprehending and then remembering.

2. There exists a difference in the amount of previously acquired or stored information. People with higher socio-economic status might know better about it through their previous media exposure.

3. People with higher socio-economic status might have more relevant social contacts and in this way they might have been exposed to the information through already existing contacts.

4. They also argued that selective exposure, acceptance, and retention might have also worked in creating knowledge gap. There might be the reason that the people with
lower socio-economic status might never have thought of science news compatible with their attitude, and they might not have found any interest in such type of news.

5. The nature of the mass media system itself is also geared towards the person of higher socio-economic status. For example, print media are tended towards the interests of persons with higher socio-economic status.

2.24 THE KNOWLEDGE GAP HYPOTHESIS AND NEW TECHNOLOGY

Communication technology is changing at such a rapid pace that people speak of ‘Communication revolution’ or ‘information explosion’. Technological changes are occurring very quickly that new technologies are replacing older technologies very quickly and rapidly. Now, for example CDs and DVDs have replaced floppies; VCRs have been replaced by sharp computers who can process at more faster and quicker pace. Theoretically, these new technologies can be used to benefit the people. As Parker and Dunn (1972) have noted,

“The greatest single potential of an information utility might be the opportunity to reduce the unit of cost of education to the point where the society could afford to provide open and equal access to learning opportunities for all members throughout their lives.” (p.1392)

It is unclear that what effects new technologies will have on levels of information held by the public. It is also fact that many of these technologies are expensive. Because of the costs involved these technologies may be availed by the well-to-dos of the society.

Parker and Dunn (1972) have further noted that these technologies are not universally available to all segments of the society. The result is that information rich will benefit more than information poor and as a result gap between these two segments of the society will continue widening.
2.25 Use of ICT and Gratification Approach

Most of the pioneer research studies in Mass Communication are concerned with the powerful effects of media where audience have been seen as passive, non-reactive, unresponsive at their own end and greatly depending on Media. But audience are not always passive and inactive and they can respond to the media messages. One classic study named as ‘Obstinate audience’ pointed out that audience is quite active. (Bauer, 1964). According to (Bryant & Street, 1988, p.162), “The notion of active communicator is rapidly preeminent status in the Communication discipline”. The Uses and Gratification is a shift from the purpose of the communicator to the purpose of receiver. This approach assumes that audience of mass media are not passive members of the society and they have the power over their media consumption and they have an active role in understanding, interpreting and integrating mass media in their lives.

The Uses and Gratification was first elaborated in article by Elihu Katz (1959) in which he was expressing a reaction to a claim by Bernard Berelson (1959) that field of Communication research appeared to be dead. Katz argued that the field was fading was the study of Mass Communication as Persuasion. He argued that only to save Mass Communication is to turn it by answering the question, “What do people do to media?”.

Blumler and McQuail (1969) used the Uses and Gratification as overall research strategy in the study of 1964 general election in Britain. The central idea behind their research was to “find out why people watch or avoid party broadcasts; what uses they wish to make of them; and what are their preferences are between alternative ways of presenting politicians on television”(pp.10-11). Blumler and McQuail started work on determining people’s motives for watching political broadcast by interviewing small samples with open ended questions. Upon the basis of the questions asked and responses received they developed a list of eight reasons for watching political broadcasts and that list was used in asking questions in larger
survey. The researcher also determined the frequency with which each reason was quoted. Then they selected the three most selected mentioned reasons for what they call “Surveillance of Political environment.”

A few year after, in a research paper summarizing work in the field in that time, Katz, Blumler, and Gurevitch (1974) pointed out that Uses and Gratification are primarily concerned with:

i. “The social and psychological origins of need, which generate

ii. expectations of

iii. the mass media or other sources, which lead to

iv. differential patterns of media exposure, resulting in

v. need gratification and

vi. Other consequences, perhaps mostly unintended once. (p. 20)”

From above discussion it is very obvious that media compete with other sources of information to gratify audience needs. Different scholars have categorized audience needs’ categories according to their own understanding and observation. Below are mentioned few categories of needs.

Mcquail, Blumler, And Brown (1972) categorized needs as follow:

i. Diversion: Here diversion means escape from daily problems; emotional release

ii. Personal relationships: Here personal relationships involve using media for social utility of information in conversation and media as a substitute for companionship

iii. Personal Identity: It involves value of reassurance/reinforcement; self-understanding; and reality exploration
iv. Surveillance function involves information and knowledge about the things that will be helpful for one in doing or accomplishing something.

Media was seen by Katz, Gurevitch and Haas (1973) as a means that help them to connect with others. They listed 35 needs after studying related literature and grouped them into five categories as:

i. Cognitive Needs: These are the needs which relate to acquiring information, knowledge and understanding

ii. Affective Needs: These needs involve emotional, pleasurable and aesthetic experience

iii. Personal Integrative Needs: These needs comprise strengthening of credibility, confidence, stability, and prominence including status

iv. Social Integrative Needs: Consist of making contacts strengthened with family and friends

v. Tension Release Needs: These type of needs are concerned with escape and diversion (pp.166-167)

2.26 A GLANCE AT OVER ALL ROLE OF ICT IN EDUCATION

ICT, beyond any doubt is profoundly considered as a tool of change and it has the ability to meet the challenges of new information world. Khan et al., (2011) have investigated on Use of ICT by Students as follows:

i. Purpose of internet use by the university students.

ii. Impact of ICT on their study

iii. To know about the level of students’ information retrieval skills

iv. Widely used research engines by the respondents

v. Data based used by them

vi. Time spent in online information seeking activities

vii. Problems faced by respondents during online information seeking activities
The researcher designed a comprehensive questionnaire after detailed literature review of related concepts. This was a survey research and 200 questionnaires were distributed among students belonging to University of Bahwalpur, Pakistan. Only 164 questionnaires were returned from respondents. According to data 95.7 percent respondents were between the ages of 20 to 25 years. Six percent were between the ages of 25 to 30 and only one percent students were between the age of 30 and 35. As far as gender distribution of data is concerned it consisted of 19.5 percent male and 80.5 percent male. It was revealed that majority of the students used internet and computer. The students responded that their teachers sometimes used ICT while teaching to them. As far as respondents’ knowledge about computer basic knowledge and used is concerned majority of them were confident of computer use. Regarding ICT use in learning majority of the respondents strongly agreed that ICT has greater impact on learning and they strongly agreed that ICT usage improves their CGPA.

While exploring about Use of Internet by Respondents in learning their Subject it was revealed that respondents sometimes use internet for learning their subjects (Mean= 2.260). When respondents were asked about the extent of internet usage by purpose majority of them responded that they use internet for study. Data also shows that students’ information retrieval skill on internet is good with mean vale of 3.36. When respondents were asked about to rate the data base according to their preferences JSTOR was found at the top with 17 percent respondents. It was also found that majority of respondents used internet for browsing with 2.76 Mean followed by scanning journals with the mean of 2.63. When asked about the problems faced by them during ICT usage most of the students expressed their concern about slow PC, internet speed and viruses. The respondents further revealed that they were unaware of advance searching techniques like Boolean logic and formation of search query. It was also disclosed that available PCs were not adequate in university’s labs so it was
recommended to increase number of PCs in the computer labs. It was found that the students were not trained in use of electronic books and was suggested that such training sessions should be arranged which encourage and help students in reading electronic books.

Robinson, B. (2008) argues that the goal of “teacher quality for all” is proving extremely difficult to achieve and this is especially more difficult in rural areas. He opines that it is also an admitted fact that students’ participation rates and achievements levels are determined by teacher’s quality. This research especially focused that how distance education and ICT helped to improve access, equity, quality in the professional development of rural teachers in one of provinces of western China. This research particularly focused on

i. How can use of DE and ICT support goals of social justice in teacher education in remote (rural) and resource-poor areas? And;

ii. What kind of criteria should be used in judging their achievement?

In this paper the above questions in the context of European Union (EU) - China Gansu Basic Education Project were examined. The basic aim of the EU-China Gansu Basic Education Project (GBEP) was to improve quality in basic education in the poorest Gansu Province. This endeavour was funded jointly by European Union (€ 15 million) and the Chinese Government (€ two million). This project was implemented by Gansu Provincial Government from October 2001 until March 2007. In Gansu province of China rural-urban divide has widened. To counter this gap Chinese Government provided special funding for this province by using DE and ICT as strategies for achieving development goals. The central idea behind this project was focusing on human resource development of teachers, head-teachers, and administrators with strong emphasis on new national curriculum, new teaching methods, and use of ICT and, educational management. The largest component of this component was establishing a system of ICT-supported Teachers’ Learning Resource Centres (TLRCs) for professional development and training of more than 100,000 rural teachers and
head teachers. All TLRCs were equipped with latest gadgets of ICT from computers to printers; television satellite dishes and receiving soft wares as well. Model of Tomaševski (2003), using criteria of availability, access, acceptability, and adaptability was adopted to apply to teachers’ rights to continuing professional development. The EU-China GBEP provided a model that was successful in provision of opportunities for rural teachers’ development on professional scale. This model, with the support of ICT provided more inclusive access than previous arrangements. This model was successful in supply-driven provision to demand-initiated one and hence providing teachers, head teachers more ownership as well as professional development. It is beyond any doubt that education and ICT both are capable of large-scale delivery over huge distances.

Though distance education and ICT have the capacity for large-scale delivery over huge distances; the main benefit from was mobilization of teachers, generation of different activities at TLRC as well as local level. After professional development training at TLRC responses of teachers were very encouraging and they expressed more commitment with their professions and they very blatantly expressed that they started to understand the difference between profession and job; and teaching was a profession. It is beyond any doubt that ICT costs lots in its application in DE.

Hülsmann, T. (2004) worked on three theorems:

i. Education is good for development.

ii. Distance education can help.

iii. E-learning is extending the capabilities of traditional distance education.

While conducting research on above tree theorems the researcher has adopted devil’s advocate approach and has tried to cast some doubt on theorem number 1 and 2 respectively while intending to support the third theorem. He supports that education does not all always
guarantee economic benefits and he proved it through authentic evidence like “[T]he association of growth of educational capital and conventional measures of TFP [= Total Factor Productivity; TH] is large, strongly statistically significant, and negative” (Pritchett, 1999). Hülsmann, T is of the view that DE, in fact doesn’t promise interactivity between teacher and student which is a prerequisite for good quality education and he is of view that traditional pedagogues like Rumble, (2001) lament that DE lack interactivity. He concludes that e-learning is a vital element in the success and cost effectiveness of DE.
CHAPTER 3: RESEARCH METHODOLOGY

3.1. INTRODUCTION

This chapter provides a blueprint of how research is conducted by presenting research procedures used in the study. It also offers the rationale behind the decision to use a particular research design in the study. It further explains data gathering and analysis processes keeping in mind the objectives of the research.

While conducting research every researcher uses a specific research method to achieve the prime objectives of his research, to testify hypothesis developed and to answer the research questions posed. Methodology, in fact determines the quality of the data set generated. Research methodology refers to the design by explaining how design is executed and how research is carried out. It elaborates the type of data, sample of data and kind of statistics to be used in research. Research methodology is a systematic way to solve research problems which may be taken as a science of studying how research is done scientifically. In the process of research methodology researcher makes a snapshot of different steps involved in studying his research problem and also logic behind these steps. It is very much important for the researcher to understand the assumptions behind these techniques and procedures that will be applicable to certain problems and others will not. (Kumar & Ranjit, 2005).

Hence, the researcher concludes that there are four major components of research methodology of a study. They are as under:

1. The relationship that is established by the researcher with the participants in the research;
2. The choice of the setting, participants, time and places for data collection, and other sources of data like supporting documents
3. Methods of data collection and
4. The techniques that are to be used for analyzing data collected

3.2. RESEARCH DESIGN

This research intends to use quantitative research design by surveying the students of Allama Iqbal Open University, Islamabad. A closed-ended questionnaire was constructed by analyzing the results of different research studies related to the use of ICT.

Further, this is a case study which focused only on AIOU. Bryman (2008:52) describes a case study as one which “… entails the detailed and intensive analysis of a single case”. On the onset, the term “case “is tantamount with a particular location e.g. an organization. A case study design is concerned with the complexity and particular nature of the case in question (ibid.). The strategy of case studies helps the researcher in getting the deeper understanding of the phenomenon under observation. (Creswell, 2007).

3.3. POPULATION

It is very much important to describe the population before defining the population of this research. According to Wimmer, R. D., & Dominick, J. R. (1994), “Population is a group or class of subjects, variables, concept, or phenomenon.” As already discussed that this research study is based on AIOU as a case study so the population of this research is students enrolled in MPhil and PhD programs of AIOU in Autumn 2014, Spring 2015, Autumn 2015 and Spring 2016 semester.

3.4. SAMPLE

In most of the situations it is not possible to examine entire population due to constraints of time and resources and also studying every member of the population is also costly. It is also argued that large number of people often affect measurement quality.
Wimmer, R. D., & Dominick, J. R. (1994) define sampling as, “sample is a subset of the population that is representative of the entire population. It is also important to note that the sample which is not representative of the population, regardless of its size, is inadequate for testing purposes because the results of such sample cannot be generalized to the population from which sample is drawn.

As far as the enrolment of this university is concerned it consists of more than 1.3 million students so it was not possible to include every student. Keeping limitation of time and resources it was decided to sample students enrolled in MPhil and PhD programs of the university.

3.5. SAMPLING TECHNIQUE

There are variety of sampling methods and techniques available depending on purpose and type of research. Broadly speaking sampling can be grouped into two broader categories namely:

1. Probability sampling
2. Non-probability sampling

Probability sampling technique makes best use of mathematical guidelines in which chance of selection for each unit is known. On the other hand, non-probability sampling technique does not follow guidelines set by mathematical rules. This research study used probability sampling technique because of the following advantages it offers.

1. It strictly follows the mathematical rules which ensure accuracy and precision.
2. It has generalising ability and its results can be generalized to the whole population
3. Reducing of sampling error is the basic goal of any research technique; and probability sampling technique helps the researchers to calculate the amount of error if it is present in the study.
4. It ensures the high degree of representativeness.

It is also important to know about the various types of probability sampling which include: simple random sampling, systematic sampling, stratified sampling, and cluster sampling. After making clusters of the faculties, proportionate sample sizes were taken from those clusters. After that, simple random sampling technique was used in this research which is a type of probability sampling technique. This technique was used as the population members are same with their enrolment in MPhil and PhD programs.

3.6. SAMPLE SIZE DETERMINATION

The researcher used 95% confidence level and with a confidence interval of 5 while calculating sample size for the study. A sample size of 367 respondents was selected (Out of 367, a majority 334 questionnaire were completely filled in and returned by the respondents) by using the following statistical method:
This sample size was then matched with the sample provided by Krejcie and Morgan (1970) which was accurately similar to our calculated sample size. Cluster sampling technique was used to collect data from respondents. There were four clusters of sample comprising of Faculty of Social Sciences & Humanities, Faculty of Science, Faculty of Education, and Faculty of Arabic and Islamic Studies. Out of 367, a majority 334 (91%) questionnaire were completely filled in and returned by the respondents. Proportionate
samples were selected from each cluster according to their proportionate contribution as follows:

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Population</th>
<th>Percentage Contribution</th>
<th>No. of Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS&amp;H</td>
<td>2333</td>
<td>34.08</td>
<td>122.7042</td>
</tr>
<tr>
<td>Science</td>
<td>2305</td>
<td>33.6</td>
<td>122.5266</td>
</tr>
<tr>
<td>Education</td>
<td>1004</td>
<td>14.66</td>
<td>47.05733</td>
</tr>
<tr>
<td>Arabic and Islamic std.</td>
<td>1203</td>
<td>17.5</td>
<td>57.71182</td>
</tr>
<tr>
<td></td>
<td><strong>6845</strong></td>
<td><strong>100</strong></td>
<td><strong>367</strong></td>
</tr>
</tbody>
</table>

### 3.7. CONSTRUCTS

#### 3.7.1 Reliance

Reliance refers to the, “Dependence on or trust in someone or something” (Oxford Dictionary). Reliance is the situation where a person totally depends upon on some fact, material, person or source with reference to specific issue. In this process, the person fully trusts in something or someone due to their ability and credibility. Sometimes, reliance leads to the state of needing someone or something for help and support. Bahk, C. M. (2008) describes the reliance on Information and Communication Technology as the extent to which an individual is dependent on internet as a basic tool for his/ her daily life activities. Various scholars has admitted the role of ICT in education (Pigato, 2001; Fisser, 2001) and reliance of students on ICT in distance education too (Rumble, 2001).

For operational definition and construct development, Reliance on Information and Communication Technology in distance education, hence, means trust, dependence or need of information and communication technology in accomplishment of academic tasks of the
students. This definition of Reliance on Information and Communication Technology would be used for developing measurement scale, subsequent analysis and discussions.

3.7.2 Relevance

In order to understand the relevance of Information and Communication Technology (ICT) in Education, we have to understand the extent to which ICT is relevant for enhancing learning in education. Information and Communication Technology (ICT) is relevant to the educational use and for enhancing students’ learning (Yusuf, 2005; Unwin, 2009; Cornu, 1995) and relates to each and every aspect of education (Cuban, 2001). Hence, it is agreed upon fact that ICT makes educational process more relevant and more meaningful.

For operational definition and construct development, Relevance of Information and Communication Technology in distance education, hence, means that information and communication technology is relevant in obtaining information related to admission, study materials, preparation of assignments, presentations, examination, and results. This definition of Relevance of Information and Communication Technology in distance education would be used for developing measurement scale, subsequent analysis and discussions.

3.7.3 Helpfulness

Information and Communication Technology is helpful in enhancing teachers’ effectiveness and delivering lectures (Fisser, 2001; Kennewell, 2001; Yusuf, 2005) and enhancing students’ learning (Cornu, 1995; Cuban, 2001; Kennewell, 2001). Hence, we may conclude that Information and Communication Technology provides helpfulness in education especially in distance education where students and teachers have no face-to-face interaction.

For operational definition and construct development, Helpfulness of Information and Communication Technology in distance education, hence, means that information and
communication technology provides help in curricular and noncurricular elements of education. It is helpful in enhancing understanding of educational contents and developing interpersonal skills of the students through various tools provided by ICT. This definition of Helpfulness of Information and Communication Technology in distance education would be used for developing measurement scale, subsequent analysis and discussions.

3.7.4 Interest

Information and Communication Technology plays a vital role in education by creating interest in the learning process (Garrison and Kanuka 2004). The interest in studies may be created due to the features provided by ICT. For operational definition and construct development, interest in Information and Communication Technology in distance education, hence, means that information and communication technology makes educational process interesting by providing attractive interface, help wizard, and presentation of materials in an attractive manner. This definition of Interest would be used for developing measurement scale, subsequent analysis and discussions.

3.7.5 Gratification

Use of Information and Communication Technology in education gratify various educational needs of the students (Kubala, T., 1998). In this way, ICT provides gratification to the users i.e. the students. Educational needs of the students include the foremost purpose of understanding the course contents of different programs in which students are enrolled (Turnbull, A. P., 1995).

For operational definition and construct development, gratification of Information and Communication Technology in distance education, hence, means that information and communication technology fulfill student needs of subject understanding, positive interaction with classmates, positive interaction with teachers, instant access to relevant and authentic
academic information. This definition of gratification of Information and Communication Technology in distance education would be used for developing measurement scale, subsequent analysis and discussions.

3.7.6 Limitations

Use of Information and Communication Technology in education may also have some limitations as well (Bingimlas, K. A., 2009; Cox et al., 2000). There are various reasons for such limitations including over-reliance and over-use (Pelgrum, W. J., 2001). For operational definition and construct development, limitations of Information and Communication Technology in distance education includes over-reliance, ever-use, inappropriate use, and plagiarism. This definition of gratification of Information and Communication Technology in distance education would be used for developing measurement scale, subsequent analysis and discussions.

3.7.7 Motivation

There are some certain factors which motivate students and teachers to use Information and Communication Technology in education (Cox et al., 2000). They conducted another study in the same year (2000) and found the factors which motivate the students to use ICT in their studies. They found that perceived ability to use IT; availability of resources, satisfaction with ICT; attractions and enjoyable work conditions were the motivating factors.

For operational definition and construct development, motivation refers to the inducements which encourage the use of Information and Communication Technology in distance education. They include availability of study materials, variety of information and materials, and attractive interface available on ICT. This definition of gratification of Information and Communication Technology in distance education would be used for developing measurement scale, subsequent analysis and discussions.
3.8. DATA ANALYSIS SOFTWARE AND TECHNIQUES

The researcher has used Statistical Package for Social Sciences (SPSS) 16.0 for data management and analysis. Descriptive statistics and inferential statistics for mitigating objectives of the study.
CHAPTER 4: DATA ANALYSIS

4.1. FACULTY INFORMATION

Table 4.1: Faculty Information

<table>
<thead>
<tr>
<th>Faculty Details</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty of Sciences</td>
<td>113</td>
<td>33.8</td>
</tr>
<tr>
<td>Faculty of Education</td>
<td>47</td>
<td>14.1</td>
</tr>
<tr>
<td>Faculty of Social Sciences and Humanities</td>
<td>124</td>
<td>36.8</td>
</tr>
<tr>
<td>Faculty of Arabic and Islamic Studies</td>
<td>64</td>
<td>15.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>334</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table given above provides a detail about faculty information of the respondents. According to that table respondents were selected from all four faculties of Allama Iqbal Open University. From results of table it is quite obvious the larger number of respondents belong to faculty of Social Sciences and Humanities (36.8%). While the lowest number of respondents were Faculty of Arabic and Islamic Studies (15.3%).

4.2. KINDS OF ICT DEVICES

Table 4.2: Kind of ICT Devices Owned by Respondents

<table>
<thead>
<tr>
<th>Device</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop</td>
<td>120</td>
<td>35.9</td>
</tr>
<tr>
<td>Laptop</td>
<td>213</td>
<td>63.8</td>
</tr>
<tr>
<td>Smart phones</td>
<td>155</td>
<td>46.4</td>
</tr>
<tr>
<td>Printer</td>
<td>58</td>
<td>17.4</td>
</tr>
<tr>
<td>Scanner</td>
<td>27</td>
<td>8.1</td>
</tr>
<tr>
<td>Other devices</td>
<td>14</td>
<td>8.1</td>
</tr>
</tbody>
</table>
Above table provides details of ICT devices that are owned by the respondents. Overall sample of the study consists of 334 respondents out of which highest number of respondents have laptop 213(63.8) followed by 155 smartphones. The devices other than desktop, computer, laptop, smart phones, printers and scanner were (8.1%). In term of kind of ICT devices many respondents have more than one device in their use.

4.3. TYPES OF INTERNET CONNECTION

<table>
<thead>
<tr>
<th>Type of Internet Connection</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wired Broad band</td>
<td>115</td>
<td>34.4</td>
</tr>
<tr>
<td>Wireless Devices</td>
<td>124</td>
<td>37.1</td>
</tr>
<tr>
<td>Mobile Internet</td>
<td>174</td>
<td>52.1</td>
</tr>
<tr>
<td>Other</td>
<td>14</td>
<td>4.2</td>
</tr>
</tbody>
</table>

While analysing types of internet connection among AIOU students, 34.4% of the respondents have wired broadband internet connection, 37.1% have wireless devices, a majority 52.1% have mobile connections and only 4.2% respondents have other types of internet connection.

4.4. PLACE OF INTERNET ACCESS FOR AIOU STUDENTS

<table>
<thead>
<tr>
<th>Place of Using Internet</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Network</td>
<td>243</td>
<td>73.8</td>
</tr>
<tr>
<td>Internet Café</td>
<td>29</td>
<td>8.7</td>
</tr>
<tr>
<td>Public Internet</td>
<td>41</td>
<td>12.3</td>
</tr>
<tr>
<td>Main Campus</td>
<td>93</td>
<td>27.8</td>
</tr>
<tr>
<td>Friend’s/ Relative House</td>
<td>25</td>
<td>7.5</td>
</tr>
<tr>
<td>Any other</td>
<td>19</td>
<td>5.7</td>
</tr>
</tbody>
</table>
The table above describes the place of internet access for AIOU students. This table elaborates that where students of AIOU usually go to use internet. This table very clearly indicates that majority of the students’ access internet at their homes (73.8%). While the second big source of internet access is AIOU’s main campus (27.8%). The least number (5.7%) access internet through other sources.

4.5. PURPOSE OF USING COMPUTER

<table>
<thead>
<tr>
<th>Purpose of Using Computer</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>250</td>
<td>74.9</td>
</tr>
<tr>
<td>Information</td>
<td>211</td>
<td>63.2</td>
</tr>
<tr>
<td>Entertainment</td>
<td>99</td>
<td>29.6</td>
</tr>
<tr>
<td>Any other</td>
<td>19</td>
<td>5.7</td>
</tr>
</tbody>
</table>

When purpose of using computer was analysed it was revealed that majority of the students was using computer for education purposes (74.9%). While for information purposes the usage of computer was (63.2%). There might be some other purposes for using computers which were least in number (5.7%).

4.6. PURPOSE OF USING INTERNET

<table>
<thead>
<tr>
<th>Purpose of Using Internet</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>243</td>
<td>83.5</td>
</tr>
<tr>
<td>Social Media</td>
<td>152</td>
<td>45.5</td>
</tr>
<tr>
<td>Email</td>
<td>150</td>
<td>44.9</td>
</tr>
<tr>
<td>News</td>
<td>105</td>
<td>31.4</td>
</tr>
<tr>
<td>Religion</td>
<td>73</td>
<td>21.9</td>
</tr>
<tr>
<td>Entertainment/Sports/Games</td>
<td>65</td>
<td>19.5</td>
</tr>
<tr>
<td>Other</td>
<td>17</td>
<td>5.1</td>
</tr>
</tbody>
</table>
The table above indicates how respondents are using internet; means to say that it explains the purpose for using internet. It was explored that students were found using internet for various purposes. It was very obvious the purpose with highest percentage (83.5%). The purpose with the second highest percentage is social media (45.5%). The other purpose for which internet was being used was (5.1%). The “other” here means the purpose of using internet which has not been mentioned in the questionnaire and was added by the respondents.

4.7. TASK RELATED TO ICT USAGE OF AIOU WEBSITE

<table>
<thead>
<tr>
<th>Tasks for Using ICT</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Result Checking</td>
<td>235</td>
<td>70.4</td>
</tr>
<tr>
<td>Downloading Assignments</td>
<td>56</td>
<td>16.8</td>
</tr>
<tr>
<td>Downloading Exam. Forms</td>
<td>96</td>
<td>27.8</td>
</tr>
<tr>
<td>Course Registration</td>
<td>38</td>
<td>11.4</td>
</tr>
<tr>
<td>Downloading Course Material</td>
<td>103</td>
<td>29.9</td>
</tr>
<tr>
<td>Reviewing Faculty Information</td>
<td>55</td>
<td>16.5</td>
</tr>
<tr>
<td>Downloading Videos/Audios</td>
<td>32</td>
<td>9.6</td>
</tr>
<tr>
<td>AIOU Live (Radio/ TV)</td>
<td>26</td>
<td>7.8</td>
</tr>
<tr>
<td>Tutors’ Particulars</td>
<td>110</td>
<td>32.3</td>
</tr>
<tr>
<td>Any Other</td>
<td>22</td>
<td>6.6</td>
</tr>
</tbody>
</table>

The above table describes the different tasks for which respondents were using AIOU’s website. In this table various tasks were listed ranging from “Academic Results checking” to knowing about “Tutor’s Particulars”. It was found that most of the students use
AIOU’s website for their Academic Results checking (70.4%). The second purpose for which university’s website was used included knowing about Tutor’s Particulars (32.3 %).

4.8. RELIABILITY TESTS

To test the reliability of questionnaire’s items the test of reliability Cronbach’s alpha was run. Cronbach’s alpha coefficient of reliability usually varies between 0 and 1. But there is no such lower limit to the coefficient. For greater consistency Cronbach’s alpha value should be close to 1. Basic formula for Cronbach’s alpha is \( \alpha = \frac{rk}{1 + (k-1)r} \) where the number of items considered are denoted by \( k \) and represents is the mean of the inter-item correlations. The following rules of thumb were provided by George and Mallery (2003) “\( \alpha > .9 \) – Excellent, \( \alpha > .8 \) – Good, \( \alpha > .7 \) – Acceptable, \( \alpha > .6 \) – Questionable, \( \alpha > .5 \) – Poor, and \( \alpha < .5 \) – Unacceptable” (p. 231).

Table 4.8: Cronbach’s Alpha of Pilot Study

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cronbach’s Alpha</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliance</td>
<td>.766</td>
<td>5</td>
</tr>
<tr>
<td>Helpfulness</td>
<td>.915</td>
<td>15</td>
</tr>
<tr>
<td>Relevance</td>
<td>.894</td>
<td>6</td>
</tr>
<tr>
<td>Limitations</td>
<td>.668</td>
<td>9</td>
</tr>
<tr>
<td>Gratification</td>
<td>.885</td>
<td>7</td>
</tr>
<tr>
<td>Motivation</td>
<td>.831</td>
<td>10</td>
</tr>
<tr>
<td>Interest</td>
<td>.837</td>
<td>4</td>
</tr>
<tr>
<td>Frequency of ICT Usage</td>
<td>.606</td>
<td>4</td>
</tr>
<tr>
<td>Preference for ICT usage</td>
<td>.547</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 4.9: Overall: Reliability Statistics of Pilot Study

<table>
<thead>
<tr>
<th>Cronbach’s Alpha</th>
<th>Number of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.96</td>
<td>61</td>
</tr>
</tbody>
</table>

Above two tables express the reliability test which confirms the reliability of research instrument. From the results of above two tables it can be inferred that values of all constructs fall within the normal range. Overall reliability is 0.96 which is normal range of Cronbach’s
alpha and falls within excellent range “_ > .9.” Hence it is concluded that the questionnaire is reliable.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cronbach’s Alpha</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliance</td>
<td>.696</td>
<td>5</td>
</tr>
<tr>
<td>Helpfulness</td>
<td>.922</td>
<td>14</td>
</tr>
<tr>
<td>Relevance</td>
<td>.845</td>
<td>6</td>
</tr>
<tr>
<td>Limitations</td>
<td>.794</td>
<td>10</td>
</tr>
<tr>
<td>Gratification</td>
<td>.884</td>
<td>7</td>
</tr>
<tr>
<td>Motivation</td>
<td>.831</td>
<td>10</td>
</tr>
<tr>
<td>Interest</td>
<td>.854</td>
<td>4</td>
</tr>
<tr>
<td>Frequency of ICT Usage</td>
<td>.631</td>
<td>4</td>
</tr>
<tr>
<td>Preference for ICT usage</td>
<td>.8</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 4.11: Overall: Reliability Statistics

Above two tables express the reliability test which confirms the reliability of research instrument for the whole research studies. From the results of above two tables it can be inferred that values of all constructs fall within the normal range. Overall reliability is 0.96 which is normal range of Cronbach’s alpha and falls within excellent range “_ > .9.” Hence it is concluded that the questionnaire is reliable.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Area of Residence</th>
<th>Min</th>
<th>Max</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helpfulness</td>
<td>Rural Areas</td>
<td>1</td>
<td>5</td>
<td>81</td>
<td>3.7496</td>
<td>.74558</td>
<td>.08284</td>
</tr>
<tr>
<td></td>
<td>Urban Areas</td>
<td>1</td>
<td>5</td>
<td>119</td>
<td>3.5030</td>
<td>.74489</td>
<td>.06828</td>
</tr>
<tr>
<td>Reliance</td>
<td>Rural Areas</td>
<td>1</td>
<td>5</td>
<td>99</td>
<td>3.4828</td>
<td>.74888</td>
<td>.07527</td>
</tr>
<tr>
<td></td>
<td>Urban Areas</td>
<td>1</td>
<td>5</td>
<td>118</td>
<td>3.4085</td>
<td>.77763</td>
<td>.07159</td>
</tr>
<tr>
<td>Relevance</td>
<td>Rural Areas</td>
<td>1</td>
<td>5</td>
<td>95</td>
<td>3.4842</td>
<td>.78516</td>
<td>.08056</td>
</tr>
<tr>
<td></td>
<td>Urban Areas</td>
<td>1</td>
<td>5</td>
<td>130</td>
<td>3.5179</td>
<td>.80701</td>
<td>.07078</td>
</tr>
<tr>
<td>Interest</td>
<td>Rural Areas</td>
<td>1</td>
<td>5</td>
<td>101</td>
<td>3.4084</td>
<td>.83496</td>
<td>.08308</td>
</tr>
<tr>
<td></td>
<td>Urban Areas</td>
<td>1</td>
<td>5</td>
<td>129</td>
<td>3.5581</td>
<td>.88692</td>
<td>.07809</td>
</tr>
<tr>
<td>Limitations</td>
<td>Rural Areas</td>
<td>1</td>
<td>5</td>
<td>97</td>
<td>3.3013</td>
<td>.79365</td>
<td>.08058</td>
</tr>
<tr>
<td></td>
<td>Urban Areas</td>
<td>1</td>
<td>5</td>
<td>129</td>
<td>3.3144</td>
<td>.69251</td>
<td>.06097</td>
</tr>
<tr>
<td>Gratification</td>
<td>Rural Areas</td>
<td>1</td>
<td>5</td>
<td>97</td>
<td>3.2548</td>
<td>.90380</td>
<td>.09177</td>
</tr>
<tr>
<td></td>
<td>Urban Areas</td>
<td>1</td>
<td>5</td>
<td>123</td>
<td>3.4367</td>
<td>.77501</td>
<td>.06988</td>
</tr>
</tbody>
</table>
4.9. DESCRIPTIVE STATISTICS

The descriptive statistics of the data collected from the sample of the study is as follows:

Table 4.12 documented above the description of data i.e. average and its deviation from the average. Results of above table showed the descriptive statistics of helpfulness. The maximum value and minimum value of rural respondents’ helpfulness shows the extremities in the responses which were 1 and 5 respectively that showed how diversely the values were spread out. The results showed an average level of (3.76) which was more than the average level (3). Hence, it is concluded that the respondents find ICT helpful in their studies. The value of standard deviation (0.74) showed the deviation of the responses from its mean value.

Whereas the maximum value and minimum value of urban respondents’ helpfulness shows the extremities in the responses which were 1 and 5 respectively that showed how diversely the values were spread out. The results showed an average level of (3.50) which was more than the average level (3). Hence, it is concluded that the respondents find ICT helpful in their studies. The value of standard deviation (0.74) showed the deviation of the responses from its mean value.

The results of the above mentioned table 4.12 show the descriptive statistics of reliance i.e. average and its deviation from average. The maximum and minimum value of rural respondents’ reliance extremities in the responses which were 1 and 5 respectively that showed how values were dispersed out. The results showed an average level of (3.4828)
which was more than the average level of (3). Hence it is concluded that that respondents rely on ICT in their studies. The value of standard deviation (0.74) expressed the deviation of responses from its mean. Whereas the maximum and minimum value of Urban respondents’ reliance shows extremities in the responses which were 1 and 5 respectively showed how diversely they were spread out. The results showed an average value of 3.40 which was more than average level (0.3). Hence it is concluded that urban students rely on ICT in their studies. The value of standard deviation (0.77) showed the deviation of responses from its mean.

The results of the above mentioned table show the descriptive statistics of relevance i.e. average and its deviation from average. The maximum and minimum value of rural respondents’ relevance extremities in the responses which were 1 and 5 respectively that showed how values were dispersed out. The results showed an average level of (3.4842) which was more than the average level of (3). Hence it is concluded that that respondents find ICT relevant in their studies. The value of standard deviation (0.78) expressed the deviation of responses from its mean. Whereas the maximum and minimum value of urban respondents’ relevance shows extremities in the responses which were 1 and 5 respectively showed how diversely they were spread out. The results showed an average value of 3.51 which was more than average level (0.3). Hence it is concluded that urban students find ICT relevant regarding their studies. The value of standard deviation (0.80) showed the deviation of responses from its mean.

The results of the above mentioned table show the descriptive statistics of interest i.e. average and its deviation from average. The maximum and minimum value of rural respondents’ interest extremities in the responses which were 1 and 5 respectively that showed how values were dispersed out. The results showed an average level of (3.40) which was more than the average level of (3). Hence it is concluded that that respondents find ICT
interesting for their studies. The value of standard deviation (0.83) expressed the deviation of responses from its mean. Whereas the maximum and minimum value of urban respondents’ interest shows extremities in the responses which were 1 and 5 respectively showed how diversely they were spread out. The results showed an average value of (3.55) which was more than average level (0.3). Hence it is concluded that urban students find ICT creating interest in their studies. The value of standard deviation (0.88) showed the deviation of responses from its mean.

The results of the above mentioned table show the descriptive statistics of interest i.e. average and its deviation from average. The maximum and minimum value of rural respondents’ gratification extremities in the responses which were 1 and 5 respectively that showed how values were dispersed out. The results showed an average level of (3.25) which was more than the average level of (3). Hence it is concluded that that respondents find ICT gratify their needs for the studies. The value of standard deviation (0.90) expressed the deviation of responses from its mean. Whereas the maximum and minimum value of urban respondents’ gratification shows extremities in the responses which were 1 and 5 respectively showed how diversely they were spread out. The results showed an average value of (3.43) which was more than average level (0.3). Hence it is concluded that urban students find ICT creating interest in their studies. The value of standard deviation (0.77) showed the deviation of responses from its mean.

The results of the above mentioned table show the descriptive statistics of interest i.e. average and its deviation from average. The maximum and minimum value of rural respondents’ motivation extremities in the responses which were 1 and 5 respectively that showed how values were dispersed out. The results showed an average level of (3.39) which was more than average level of (3). Hence it is concluded that that respondents find ICT creating motivation for the studies. The value of standard deviation (0.86) expressed the
deviation of responses from its mean. Whereas the maximum and minimum value of urban respondents’ motivation shows extremities in the responses which were 1 and 5 respectively showed how diversely they were spread out. The results showed an average value of (3.57) which was more than average level (0.3). Hence it is concluded that urban students find ICT as motivation factor in their studies. The value of standard deviation (0.84) showed the deviation of responses from its mean.

The results of the above mentioned table show the descriptive statistics of frequency of Use i.e. average and its deviation from average. The maximum and minimum value of rural respondents’ motivation extremities in the responses which were 1 and 5 respectively that showed how values were dispersed out. The results showed an average level of (3.33) which was more than the average level of (3). Hence it is concluded that that respondents use ICT frequently for the studies. The value of standard deviation (0.73) expressed the deviation of responses from its mean. Whereas the maximum and minimum value of urban respondents’ motivation shows extremities in the responses which were 1 and 5 respectively showed how diversely they were spread out. The results showed an average value of (3.22) which was more than average level (0.3). Hence it is concluded that urban students use ICT frequently in their studies. The value of standard deviation (0.72) showed the deviation of responses from its mean.

The results of the above mentioned table show the descriptive statistics of preference i.e. average and its deviation from average. The maximum and minimum value of rural respondents’ preference extremities in the responses which were 1 and 5 respectively that showed how values were dispersed out. The results showed an average level of (3.65) which was more than the average level of (3). Hence it is concluded that that respondents prefer ICT usage for the studies. The value of standard deviation (0.90) expressed the deviation of responses from its mean. Whereas the maximum and minimum value of urban respondents’
motivation shows extremities in the responses which were 1 and 5 respectively showed how
diversely they were spread out. The results showed an average value of (3.64) which was
more than average level (0.3). Hence it is concluded that urban students prefer ICT usage for
their studies. The value of standard deviation (0.89) showed the deviation of responses from
its mean.

4.10. SKEWNESS AND KURTOSIS

To test the assumption of normal distribution, researcher run Skewness and Kurtosis
to check the normality of responses obtained for each variable. As a basic need in most of the
statistical analyses, it is vital to check the location and variability (skewness and kurtosis) of a
data set. Skewness measures the symmetry or lack of symmetry present in the data set. In a
normal distribution data set should look symmetric i.e. bell shaped data set which is same to
the left and right sides from its centre. Whereas Kurtosis measures the flatness or peakness of
data set. It is shown by heavy-tailed or light-tailed data set. A flat or low tailed kurtosis data
set shows minimum outliers and normal distribution of data set. The histogram is an effective
graphical technique for showing both the skewness and kurtosis of data set. The values for
asymmetry and kurtosis between -2 and +2 are considered acceptable in order to prove
normal univariate distribution (George & Mallery, 2010).

The following table provides the detailed descriptive values of normality of responses:

<table>
<thead>
<tr>
<th>Model</th>
<th>Helpfulness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skewness</td>
<td>-1.043</td>
</tr>
<tr>
<td>Std. Error of Skewness</td>
<td>.170</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.705</td>
</tr>
<tr>
<td>Std. Error of Kurtosis</td>
<td>.338</td>
</tr>
</tbody>
</table>

The value of skewness for helpfulness is -1.043 which shows that the data is within
normal range of -2 and +2 (George & Mallery, 2010). Furthermore, the value of Standard
Error of Skewness is 0.170 which also lies in the acceptable range of a normal distribution.
Hence, the data set is from a normal distribution which is further confirmed by the value of Kurtosis which is 1.705 and the value of Standard Error of Kurtosis which is 0.338. A graphical representation of my normal distribution is shown as under with the help of Histogram along with the normal curve:

![Histogram with normal curve](image)

### Table 4.14: Normality of Responses for Reliance

<table>
<thead>
<tr>
<th>Model</th>
<th>Reliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skewness</td>
<td>-.320</td>
</tr>
<tr>
<td>Std. Error of Skewness</td>
<td>.163</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.323</td>
</tr>
<tr>
<td>Std. Error of Kurtosis</td>
<td>.325</td>
</tr>
</tbody>
</table>

The value of skewness for reliance is -.320 which shows that the data is within normal range of -2 and +2 (George & Mallery, 2010). Furthermore, the value of Standard Error of Skewness is .163 which also lies in the acceptable range of a normal distribution. Hence, the
data set is from a normal distribution which is further confirmed by the value of Kurtosis which is \(-.323\) and the value of Standard Error of Kurtosis which is 0.325. A graphical representation of my normal distribution is shown as under with the help of Histogram along with the normal curve:

![Histogram with normal curve](image)

### Table 4.15: Normality of Responses for Relevance

<table>
<thead>
<tr>
<th>Model</th>
<th>Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skewness</td>
<td>-.724</td>
</tr>
<tr>
<td>Std. Error of Skewness</td>
<td>.160</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>.743</td>
</tr>
<tr>
<td>Std. Error of Kurtosis</td>
<td>.320</td>
</tr>
</tbody>
</table>
The value of skewness for relevance is -.724 which shows that the data is within normal range of -2 and +2 (George & Mallery, 2010). Furthermore, the value of Standard Error of Skewness is .160 which also lies in the acceptable range of a normal distribution. Hence, the data set is from a normal distribution which is further confirmed by the value of Kurtosis which is 0.743 and the value of Standard Error of Kurtosis which is 0.320. A graphical representation of my normal distribution is shown as under with the help of Histogram along with the normal curve:
<table>
<thead>
<tr>
<th>Model</th>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skewness</td>
<td>-.259</td>
</tr>
<tr>
<td>Std. Error of Skewness</td>
<td>.159</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-.384</td>
</tr>
<tr>
<td>Std. Error of Kurtosis</td>
<td>.316</td>
</tr>
</tbody>
</table>

The value of skewness for interest is -.259 which shows that the data is within normal range of -2 and +2 (George & Mallery, 2010). Furthermore, the value of Standard Error of Skewness is 0.159 which also lies in the acceptable range of a normal distribution. Hence, the data set is from a normal distribution which is further confirmed by the value of Kurtosis which is -.384 and the value of Standard Error of Kurtosis which is 0.316. A graphical representation of my normal distribution is shown as under with the help of Histogram along with the normal curve:
The value of skewness for Limitations is -0.873 which shows that the data is within normal range of -2 and +2 (George & Mallery, 2010). Furthermore, the value of Standard Error of Skewness is 0.160 which also lies in the acceptable range of a normal distribution. Hence, the data set is from a normal distribution which is further confirmed by the value of Kurtosis which is 0.968 and the value of Standard Error of Kurtosis which is 0.319. A graphical representation of my normal distribution is shown as under with the help of Histogram along with the normal curve:

<table>
<thead>
<tr>
<th>Model</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skewness</td>
<td>-0.873</td>
</tr>
<tr>
<td>Std. Error of Skewness</td>
<td>0.160</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>0.968</td>
</tr>
<tr>
<td>Std. Error of Kurtosis</td>
<td>0.319</td>
</tr>
</tbody>
</table>
Table 4.18: Normality of Responses with Gratification

<table>
<thead>
<tr>
<th>Model</th>
<th>Gratification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skewness</td>
<td>-.964</td>
</tr>
<tr>
<td>Std. Error of Skewness</td>
<td>.163</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.107</td>
</tr>
<tr>
<td>Std. Error of Kurtosis</td>
<td>.325</td>
</tr>
</tbody>
</table>

The value of skewness for Gratification is -.964 which shows that the data is within normal range of -2 and +2 (George & Mallery, 2010). Furthermore, the value of Standard Error of Skewness is 1.107 which also lies in the acceptable range of a normal distribution. Hence, the data set is from a normal distribution which is further confirmed by the value of Kurtosis which is 0.325 and the value of Standard Error of Kurtosis which is 0.319. A graphical representation of my normal distribution is shown as under with the help of Histogram along with the normal curve:

![Histogram with normal curve](image.png)
Table 4.19: Normality of Responses with Motivation:

<table>
<thead>
<tr>
<th>Model</th>
<th>Motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skewness</td>
<td>-0.948</td>
</tr>
<tr>
<td>Std. Error of Skewness</td>
<td>0.166</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>0.826</td>
</tr>
<tr>
<td>Std. Error of Kurtosis</td>
<td>0.330</td>
</tr>
</tbody>
</table>

The value of skewness for Motivation is -0.948 which shows that the data is within normal range of -2 and +2 (George & Mallery, 2010). Furthermore, the value of Standard Error of Skewness is 0.166 which also lies in the acceptable range of a normal distribution. Hence, the data set is from a normal distribution which is further confirmed by the value of Kurtosis which is 0.826 and the value of Standard Error of Kurtosis which is 0.330. A graphical representation of my normal distribution is shown as under with the help of Histogram along with the normal curve:

![Histogram of Motivation](image.png)

Table 4.20: Normality of Responses with Frequency of ICT Usage
The value of skewness for Frequency of use is -.153 which shows that the data is within normal range of -2 and +2 (George & Mallery, 2010). Furthermore, the value of Standard Error of Skewness is 0.159 which also lies in the acceptable range of a normal distribution. Hence, the data set is from a normal distribution which is further confirmed by the value of Kurtosis which is 0.067 and the value of Standard Error of Kurtosis which is 0.318. A graphical representation of my normal distribution is shown as under with the help of Histogram along with the normal curve:
Table 4.21: Normality of Responses with the Frequency of Use

<table>
<thead>
<tr>
<th>Model</th>
<th>Preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skewness</td>
<td>-0.557</td>
</tr>
<tr>
<td>Std. Error of Skewness</td>
<td>0.160</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>-0.049</td>
</tr>
<tr>
<td>Std. Error of Kurtosis</td>
<td>0.320</td>
</tr>
</tbody>
</table>

The value of skewness for Frequency of use is -0.557 which shows that the data is within normal range of -2 and +2 (George & Mallery, 2010). Furthermore, the value of Standard Error of Skewness is 0.160 which also lies in the acceptable range of a normal distribution. Hence, the data set is from a normal distribution which is further confirmed by the value of Kurtosis which is -0.049 and the value of Standard Error of Kurtosis which is 0.320. A graphical representation of my normal distribution is shown as under with the help of Histogram along with the normal curve:
After checking the normality of the data set, the researcher can run Independent Sample T-Test to verify or reject the hypotheses made in this study. Independent Sample T-Test evaluates the difference between the means of two independent groups i.e. students with rural residence and students with urban residence. The following assumptions were fulfilled before conducting the test:

i. Assumption of independence. The data are independent of each other. It assumes that no score of a participant is systematically related to that of others. (students with rural residence and students with urban residence are totally independent)
ii. Assumption of normality. Dependent variable is normally distributed within each of the two groups. (normality test results are provided in earlier analysis)

iii. Assumption of homogeneity of variance. The variances of dependent variable are equal within each of the two groups.

First two assumptions of Independent sample t-test are met earlier. So, the researcher runs Levene’s test to check the third assumption of Independent sample t-test.

**4.12.1. LEVENE'S TEST FOR EQUALITY OF VARIANCES TO TEST HYPOTHESES**

The researchers run Levene's test for Equality of Variances on the groups of data to validate the ANOVA's assumption of homogeneity of variances which states that the groups can have different means but their variance should be same. The following table provides the statistics about homogeneity of variances:

<table>
<thead>
<tr>
<th>Table 4.22: Homogeneity of variance about Helpfulness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levene's Test for Equality of Variances</td>
</tr>
<tr>
<td>F</td>
</tr>
<tr>
<td>-----</td>
</tr>
<tr>
<td>Helpfulness assumed</td>
</tr>
<tr>
<td>Helpfulness not assumed</td>
</tr>
</tbody>
</table>

The results shown in Levene’s Test reveal that the variances in two groups (rural areas and urban areas) were the same. Sig. Value (P value) of Levene test of homogeneity of variance for helpfulness is 0.432 which is not significant. Hence the researcher accepts the assumption that the variances of two groups are equal. So the above results fulfill the condition of equality of variance as a condition for t-test.
4.12.2. Independent Sample T-Test

4.23: Independent Sample T-test for Helpfulness

<table>
<thead>
<tr>
<th>Area of Residence</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Areas</td>
<td>3.7496</td>
<td>.74558</td>
<td>.08284</td>
</tr>
<tr>
<td>Urban Areas</td>
<td>3.5030</td>
<td>.74489</td>
<td>.06828</td>
</tr>
</tbody>
</table>

The table above shows the descriptive statistics of Independent Sample T-Test of two groups i.e. student from rural areas and students from urban areas. The mean of these two groups are not significantly different. Helpfulness is almost equal for the students of rural areas and urban areas. Furthermore, standard deviation of the groups is almost same. Same is the case is with standard error of mean where there are no statistically significant difference for the groups. Hence, the researcher has rejected H1 made during the study.

H1: Students of urban areas find ICT more helpful in their studies than the students of rural areas. Not Supported

4.12.3. Levene's Test for Equality of Variances:

The researchers run Levene's test for Equality of Variances on the groups of data to validate the ANOVA's assumption of homogeneity of variances which states that the groups can have different means but their variance should be same. The following table provides the statistics about homogeneity of variances:
The results shown in Levene’s Test reveal that the variances in two groups (rural areas and urban areas) were the same. Sig. Value (P value) of Levene test of homogeneity of variance for reliance is 0.899 which is not significant. Hence the researcher accepts the assumption that the variances of two groups are equal. So the above results fulfil the condition of equality of variance as a condition for t-test.

4.12.4. Independent Sample T-Test

The table above shows the descriptive statistics of Independent Sample T-Test of two groups i.e. student from rural areas and students from urban areas. The mean of these two groups are different. Reliance on ICT is slightly different for the students of rural areas and urban areas. Furthermore; standard deviations of the groups are also different. Same is the case is
with standard error of mean where there is slight difference for the groups. Hence, the researcher has accepted H2 made during the study.

**H2:** Urban students have greater reliance on ICT than rural students. **Not Supported**

### 4.12.5. Levene's Test for Equality of Variances:

<table>
<thead>
<tr>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F</strong></td>
<td><strong>Sig.</strong></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>1.050</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>- .315</td>
</tr>
</tbody>
</table>

The results shown in Levene’s Test reveal that the variances in two groups (rural areas and urban areas) were the same. Sig. Value (P value) of Levene test of homogeneity of variance for relevance is 0.307 which is not significant. Hence the researcher accepts the assumption that the variances of two groups are equal. So the above results fulfil the condition of equality of variance as a condition for t-test.

### 4.12.6. Independent Sample T-Test

<table>
<thead>
<tr>
<th>Area of Residence</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relevance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural Areas</td>
<td>3.4842</td>
<td>.78516</td>
<td>.08056</td>
</tr>
<tr>
<td>Urban Areas</td>
<td>3.5179</td>
<td>.80701</td>
<td>.07078</td>
</tr>
</tbody>
</table>

The table above shows the descriptive statistics of Independent Sample T-Test of two groups i.e. student from rural areas and students from urban areas. The mean of these two groups are
different. Relevance of ICT is slightly different for the students of rural areas and urban areas. Furthermore, standard deviations of the groups are also different. Same is the case with standard error of mean where there is slight difference for the groups. Hence, the researcher has accepted H3 made during the study.

**H3:** Urban students find ICT more relevant for their studies as compared with the rural students. **Supported**

### 4.12.7. Levene's Test for Equality of Variances:

<table>
<thead>
<tr>
<th></th>
<th>Levene's Test for Equality of Variance for Interest</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Levene's Test for Equality of Variance</td>
<td>Mean Difference</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>Interest</td>
<td>Equal variances assumed</td>
<td>.627</td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
<td>-1.313</td>
</tr>
</tbody>
</table>

The results shown in Levene’s Test reveal that the variances in two groups (rural areas and urban areas) were the same. Sig. Value (P value) of Levene test of homogeneity of variance for interest is 0.427 which is not significant. Hence the researcher accepts the assumption that the variances of two groups are equal. So the above results fulfil the condition of equality of variance as a condition for t-test.

### 4.12.8. Independent Sample T-Test

<table>
<thead>
<tr>
<th>Area of Residence</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest</td>
<td>Rural Areas</td>
<td>3.4084</td>
<td>.83496</td>
</tr>
<tr>
<td></td>
<td>Urban Areas</td>
<td>3.5581</td>
<td>.88692</td>
</tr>
</tbody>
</table>
The table above shows the descriptive statistics of Independent Sample T-Test of two groups i.e. student from rural areas and students from urban areas. The mean of these two groups are different. Interest in ICT is slightly different for the students of rural areas and urban areas. Furthermore, standard deviations of the groups are also different. Same is the case with standard error of mean where there is slight difference for the groups. Hence, the researcher has accepted H4 made during the study.

**H4:** Students with urban background take greater interest in ICT usage than rural students.

**Supported**

4.12.9. **Levene's Test for Equality of Variances:**

<table>
<thead>
<tr>
<th>Equal variances assumed</th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>3.308</td>
<td>.070</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-.130</td>
<td>190.547</td>
</tr>
</tbody>
</table>

The results shown in Levene’s Test reveal that the variances in two groups (rural areas and urban areas) were the same. Sig. Value (P value) of Levene test of homogeneity of variance for limitations is 0.070 which is not significant. Hence the researcher accepts the assumption that the variances of two groups are equal. So the above results fulfil the condition of equality of variance as a condition for t-test.
4.12.10. Independent Sample T-Test

Table 4.31: Independent Sample T-Test for Limitations

<table>
<thead>
<tr>
<th>Area of Residence</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limitations</td>
<td>Rural Areas</td>
<td>3.3013</td>
<td>.79365</td>
</tr>
<tr>
<td></td>
<td>Urban Areas</td>
<td>3.3144</td>
<td>.69251</td>
</tr>
</tbody>
</table>

The table above shows the descriptive statistics of Independent Sample T-Test of two groups i.e. student from rural areas and students from urban areas. The mean of these two groups are different. Limitations of using ICT are slightly different for the students of rural areas and urban areas. Furthermore; standard deviations of the groups are also different. Same is the case is with standard error of mean where there is slight difference for the groups. Hence, the researcher has accepted H5 made during the study.

**H5:** Student with urban background experience greater limitations of ICT usage than rural students. **Supported**

4.12.11. Levene's Test for Equality of Variances:

Table 4.32: Levene's Test for Equality of Variances for Gratification

<table>
<thead>
<tr>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>1.873</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-1.577</td>
</tr>
</tbody>
</table>

The results shown in Levene’s Test reveal that the variances in two groups (rural areas and urban areas) were the same. Sig. Value (P value) of Levene test of homogeneity of variance
for gratification is 0.173 which is not significant. Hence the researcher accepts the assumption that the variances of two groups are equal. So the above results fulfil the condition of equality of variance as a condition for t-test.

### 4.12.12. Independent Sample T-Test

<table>
<thead>
<tr>
<th>Area of Residence</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Areas</td>
<td>3.2548</td>
<td>.90380</td>
<td>.09177</td>
</tr>
<tr>
<td>Urban Areas</td>
<td>3.4367</td>
<td>.77501</td>
<td>.06988</td>
</tr>
</tbody>
</table>

The table above shows the descriptive statistics of Independent Sample T-Test of two groups i.e. student from rural areas and students from urban areas. The mean of these two groups are different. Gratification with ICT usage in studies is slightly different for the students of rural areas and urban areas. Furthermore, standard deviations of the groups are also different. Same is the case is with standard error of mean where there is slight difference for the groups. Hence, the researcher has accepted H6 made during the study.

**H6:** The students of urban areas are more gratified with ICT usage than the rural students.

**Supported**

### 4.12.13. Levene's Test for Equality of Variances:

<table>
<thead>
<tr>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>.146</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-.1536</td>
</tr>
</tbody>
</table>

133
The results shown in Levene’s Test reveal that the variances in two groups (rural areas and urban areas) were the same. Sig. Value (P value) of Levene test of homogeneity of variance for motivation is 0.703 which is not significant. Hence the researcher accepts the assumption that the variances of two groups are equal. So the above results fulfil the condition of equality of variance as a condition for t-test.


<table>
<thead>
<tr>
<th>Area of Residence</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>Rural Areas</td>
<td>3.3969</td>
<td>.86077</td>
</tr>
<tr>
<td>Urban Areas</td>
<td>3.5763</td>
<td>.84152</td>
<td>.07747</td>
</tr>
</tbody>
</table>

The table above shows the descriptive statistics of Independent Sample T-Test of two groups i.e. student from rural areas and students from urban areas. The mean of these two groups are different. Motivation of using ICT is slightly different for the students of rural areas and urban areas. Furthermore; standard deviations of the groups are also different. Same is the case is with standard error of mean where there is slight difference for the groups. Hence, the researcher has accepted H7 made during the study.

H7: Students having urban background are more motivated in ICT usage than rural ones.

Supported
4.12.15. Levene’s Test for Equality of Variances (Variance differs):
Table 4.36: Levene’s Test for Equality of Variances for Frequency of ICT usage

<table>
<thead>
<tr>
<th>Frequency of ICT usage</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig.</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>.003</td>
<td>.960</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>1.126</td>
<td>214.345</td>
</tr>
</tbody>
</table>

The results shown in Levene’s Test reveal that the variances in two groups (rural areas and urban areas) were the same. Sig. Value (P value) of Levene test of homogeneity of variance for frequency of ICT usage is 0.960 which is not significant. Hence the researcher accepts the assumption that the variances of two groups are equal. So the above results fulfil the condition of equality of variance as a condition for t-test.

4.12.16. Independent Sample T-Test

Table 4.37: Independent Sample T-Test for Frequency of ICT Usage

<table>
<thead>
<tr>
<th>Area of Residence</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural Areas</td>
<td>3.3342</td>
<td>.73167</td>
<td>.07280</td>
</tr>
<tr>
<td>Urban Areas</td>
<td>3.2244</td>
<td>.72978</td>
<td>.06476</td>
</tr>
</tbody>
</table>

The table above shows the descriptive statistics of Independent Sample T-Test of two groups i.e. student from rural areas and students from urban areas. The mean of these two groups are different. Frequency of ICT usage is slightly different for the students of rural areas and urban areas. Furthermore; standard deviations of the groups are also different. Same
is the case is with standard error of mean where there is slight difference for the groups. Hence, the researcher has accepted H8 made during the study.

**H8:** Students having urban background use ICT more than rural ones. **Not Supported**

### 4.12.17. Levene's Test for Equality of Variances:

#### Table 4.38: Levene’s Test for Equality of Variances for Preference of ICT Usage

<table>
<thead>
<tr>
<th></th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Sig.</td>
<td>T</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>.187 .666</td>
<td>.138</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>.138 218.815</td>
<td>.890</td>
</tr>
</tbody>
</table>

The results shown in Levene’s Test reveal that the variances in two groups (rural areas and urban areas) were the same. Sig. Value (P value) of Levene test of homogeneity of variance for preference is 0.666 which is not significant. Hence the researcher accepts the assumption that the variances of two groups are equal. So the above results fulfil the condition of equality of variance as a condition for t-test.

### 4.12.18. Independent Sample T-Test

#### Table 4.39: Independent Sample T-Test for Preference of ICT Usage

<table>
<thead>
<tr>
<th>Area of Residence</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preference</td>
<td>Rural Areas</td>
<td>3.6571</td>
<td>.90754</td>
</tr>
<tr>
<td></td>
<td>Urban Areas</td>
<td>3.6405</td>
<td>.89727</td>
</tr>
</tbody>
</table>

The table above shows the descriptive statistics of Independent Sample T-Test of two groups i.e. student from rural areas and students from urban areas. The mean of these two groups are different. Preference of ICT usage in studies is slightly different for the students of rural areas.
and urban areas. Furthermore, standard deviations of the groups are also different. Same is the case is with standard error of mean where there is slight difference for the groups. Hence, the researcher has accepted H8 made during the study.

H9: Students having urban background have more preference of ICT than rural ones. Not Supported
CHAPTER 5: FINDINGS, RESULTS, DISCUSSION AND CONCLUSIONS

This research was primarily aimed at knowing the Role of ICT in Distance Education emphasizing AIOU as a case study so all the objectives were related to ICT and Distance Education. It particularly focused on ICT usage in Distance Education, benefits of ICT usage, needs and importance of ICT in DE with particular focus on AIOU. The research was theoretically based on two important theories namely Knowledge Gap Hypothesis and Uses and Gratification theory of Mass Communication. As knowledge Gap Theory deals with the digital divide so the researcher also tried to know the differences in ICT usage between rural and urban students so the rural and urban background of respondents was important variable in the research. The other important variables that were analyzed included: Frequency of ICT usage, Helpfulness of ICT, reliance on ICT, Interest in ICT, gratification with ICT usage, motivation for ICT usage, preference of ICT usage and limitations of ICT Usage. All these variables were analyzed by knowing the difference between rural and urban students. It is of vital importance to report all findings, discussion, conclusions and recommendations in all academic research. The chapter five deals with all above discussed factors.

This research dealt with the Role of ICT in Distance Education (A Case study of Allama Iqbal Open University). Major focus of this research was Allama Iqbal Open University as a case study. Due to constraints of time and sources it was not possible to analyze the whole population of the university. Resultantly, this research was limited to only MPhil and PhD students of the university. As already deliberated that this research study is based on AIOU so the population of this research is students enrolled in MPhil and PhD programs of AIOU in autumn 2014, spring 2015, autumn 2015 and spring 2016 semester. As the population of the whole sample is known so probability sampling technique was used. Sample from population was selected by applying Krejcie and Morgan (1970) formula for sample selection. Respondents were selected from all four faculties namely: Faculty of Social
Sciences and Humanities, faculty of Science, faculty of education and faculty of Arabic and Islamic Studies. Sampling frame consisted of 6845 members and sample which was selected comprised of 364 respondents.

To study the Role of ICT in DE (A Case study of AIOU) the researcher studied extensively and thoroughly different researches related to ICT usage in DE. After complete analysis of previous research studies the researcher developed a questionnaire which was the primary tool of this research. After developing questionnaire a pilot study was conducted to test its reliability and validity. The Cronbach’s Alpha test was run to test the reliability of questionnaire items. The overall reliability of item having Cronbach’s value of was 0.960. This value indicates that there is greater consistency in items.

After conducting pilot study the questionnaire was modified and repetitions were deleted and some necessary questionnaire items were added. After performing pilot testing 364 questionnaires were distributed among respondents and 334 were returned with the response rate of 91%. For analyzing the collected data SPSS (Statistical Package for Social Sciences) was used. Again Cronbach’s Alpha test was used to test the reliability of questionnaire’s items. Cronbach’s Alpha of each variable (items) was checked individually and the results were found according to the normal range which above 0.6 to 1.0. All values fall within the normal range. Similarly overall reliability was also checked in which Cronbach’s Alpha value was 0.961.

5.1 FINDINGS AND DISCUSSION

After analysis, the following major findings of the study are to be discussed as under:

i. While studying the demographics of respondents it was revealed that male respondents were 64.7 percent female respondents were 33.4 percent. Ages of respondents from below 25 years to above 40 years. Majority of the respondents were
found falling in the age between 25 years to 30 years (30.1%). Our respondents were classified into the rural and urban. Rural respondents comprised (46.5%) of the population and urban consisted (53.5%) of the whole population.

ii. When information about various faculties of AIOU was investigated it was found that majority of the respondents belonged to the faculty of Social Sciences and Humanities (36.8%). The university has also other three faculties which are faculty of Science, faculty of education and faculty of Arabic and Islamic Studies. The second highest respondents belonged to the faculty of Science (33.8%).

iii. One of the questionnaire items included information about different kinds of ICT devices that were owned by the respondents. When asked it was revealed that there were 213 laptops (63.8%) followed by smartphones 155 (46.4 %).

iv. The questionnaire also included information about the types of internet connections being used by the students. When asked it was revealed that some of the students were using more than one internet connections also but overall the internet connection which was being used by most of the respondents was mobile internet (52.1%) followed by wireless devices (37.1%).

v. Important information that was acquired from respondents was about the place of internet access that consisted of the place where the respondents approach internet. Majority of the respondents were found using internet at home network (73.8%). One of the probable reason for using home network is that the respondents belong to DE system so they perform most of their academic tasks staying at home. Hence, they prefer to use home network which is instantly available to them. Respondents also used internet at main campus as well when they come to attend workshops or come to seek guidance from their respective supervisors. It was found that (27.8%) were using internet at main campus.
vi. It is evident from different researches related to use of ICT in DE that computer is one of the important sources of acquiring and storing information. This research studies also included information asking respondents about the purpose of using computer. It was revealed that a great majority of AIOU students were using computer for the purpose of education (74.9%). Although responses also included other options like information, entertainment and any other.

vii. In the current modern era of information and communication internet is considered as one of the most important source of information, education and entertainment. This research also included information about the purpose of internet usage among AIOU students. The respondents were asked about the different purposes of internet usage which included education, social media, email, news, religion, entertainment/sports/games and some other purposes. It was found that a wide majority of respondents (83.55%) was using internet for education purposes which shows that most of the university students were interested education related internet usage. The second highest use of internet was for the purpose of using social media (45.5%).

viii. AIOU is a pioneer university in DE and it has enrolment of almost 1.3 million students across the globe. The University is making best use of all available ICT devices. University’s website is one of the important source of information and education for the respondents. The respondents were asked about the tasks related to ICT usage of AIOU’s website. These tasks varied from academic results checking to knowing about the tutors’ particulars. It was found that majority of the students were using AIOU’s website for the purpose of academic results checking (70.4%). The second frequent use of AIOU’s website was the downloading course material (29.9%).
To test the normality of variables the researcher also ran normality tests of Skewness and Kurtosis. Results of Skewness and Kurtosis of all the variables indicated that they are falling under normal range. These tests were prediction of that the whole data was normally distributed and hence relevant tests for checking the hypotheses could be applied.

As already mentioned that this research sought its base line from Knowledge Gap Hypothesis so the hypotheses were also developed under the umbrella of this theory. For running T-test there were few assumptions that were necessary to be fulfilled. These assumptions include independence, normality and homogeneity of variance.

5.2 CONCLUSIONS

The first hypothesis was related to the helpfulness of ICT between rural and urban students. The assumption of hypothesis was that

\[ H1: \text{Students of urban areas find ICT more helpful in their studies than the students of rural areas.} \]

When independent sample T-test and Levine’s tests were run it was found that hypothesis was not supported due to the following reasons:

i. From the results of Levine’s test it was concluded that the variances of students with rural and urban background for helpfulness were same so condition for Levine test was fulfilled.

ii. Mean value of Helpfulness of ICT for urban background students was 3.5030 and mean value for rural background students was 3.7496. From mean value of the students it was inferred that hypothesis couldn’t be supported as the mean value of rural background students was lesser than urban students.

The second hypothesis of this research was
**H2:** *Urban students have greater reliance on ICT than rural students.*

When independent sample T-test and Levine’s tests were run it was found that hypothesis was not supported due to the following reasons:

i. From the results of Levine’s test it was concluded that the variances of students with rural and urban back ground for reliance were same so condition for Levine test was fulfilled.

ii. Mean value of Reliance on ICT for urban back ground students was 3.4828 and mean value for rural back ground students’ was 3.4085. From mean value of the students it was inferred that hypothesis couldn’t be supported as the mean value of rural back ground students was lesser than urban students.

In the light of above two statements it was concluded that **H2: Urban students have greater reliance on ICT than rural students** was not supported because it doesn’t fulfil all assumptions.

Third hypothesis was related to the relevance of ICT between rural and urban students. This hypothesis stated that

**H3:** *Urban students find ICT more relevant for their studies as compared with the rural students.*

When independent sample T-test and Levine’s tests were run it was found that hypothesis was supported due to the following reasons:

i. From the results of Levine’s test it was concluded that the variances of students with rural and urban back ground for relevance were same so condition for Levine test was fulfilled.
ii. Mean value of Relevance of ICT for urban back ground students was 3.5179 and mean value for rural back ground students’ was 3.4842. From mean value of the students it was inferred that hypothesis was supported as the mean value of urban back ground students was higher than the students with rural background.

Fourth hypothesis was related to taking of interest in ICT between rural and urban students. This hypothesis stated that

**H4:** *Students with urban background take greater interest in ICT usage than rural students.* When independent sample T-test and Levine’s tests were run it was found that hypothesis was supported due to the following reasons:

i. From the results of Levine’s test it was concluded that the variances of students with rural and urban background for interest were same so condition for Levine test was fulfilled.

ii. Mean value of interest in ICT for urban back ground students was 3.5581 and mean value for rural back ground students’ was 3.4084. From mean value of the students it was inferred that hypothesis was supported as the mean value of urban back ground students was higher than the students with rural background.

Fifth hypothesis was about the Limitations of ICT usage between the students with rural and urban background. This hypothesis stated that

**H5:** *Student with urban background experience more limitations in ICT usage than rural students.*

When independent sample T-test and Levine’s tests were run it was found that hypothesis was supported due to the following reasons

The hypothesis was tested with below two assumptions
i. From the results of Levine’s test it was concluded that the variances of students with rural and urban background for limitations were same so condition for Levine test was fulfilled.

ii. Mean value of limitations in ICT for urban background students was 3.3144 and mean value for rural background students’ was 3.3013. From mean value of the students it was inferred that hypothesis was supported as the mean value of urban background students was higher than the students with rural background.

Sixth hypothesis was like that

\[ H_6: \text{The students of urban areas are more gratified with ICT usage than the rural students.} \]

In order to test the hypothesis following two assumptions were checked

i. From the results of Levine’s test it was concluded that the variances of students with rural and urban background for gratification were same so condition for Levine test was fulfilled.

ii. Mean value of limitations in ICT for urban background students was 3.4367 and mean value for rural background students’ was 3.2548. From mean value of the students it was inferred that the mean value of urban background students was higher than the students with rural background.

It can be observed from above two statements that the mean value of gratification with ICT for the students of urban background is higher than the students with rural background. Results of Levine’s test and mean value supported the hypothesis. So, the hypothesis stating

\[ H_6: \text{The students of urban areas are more gratified with ICT usage than the rural students was supported.} \]

Seventh hypothesis stated that
**H7:** *Students having urban background are more motivated in ICT usage than rural ones.*

In order to test the hypothesis following two assumptions were checked

i. From the results of Levine’s test it was concluded that the variances of students with rural and urban background for motivation were same so condition for Levine test was fulfilled.

ii. Mean value of motivation in ICT usage for urban background students was 3.5763 and mean value for rural background students’ was 3.3969. From mean value of the students it was inferred that the mean value of urban background students was higher than the students with rural background.

It can be observed from above two statements that the mean value of motivation with ICT for the students of urban background is higher than the students with rural background. So, the hypothesis stating **H7:** *Students having urban background are more motivated in ICT usage than rural one* was supported.

Eight hypothesis was worded like that

**H8:** *Students having urban background use ICT more frequently than rural ones.*

In order to test the hypothesis following two assumptions were checked

i. From the results of Levine’s test it was concluded that the variances of students with rural and urban background for frequency of ICT use were same so condition for Levine test was fulfilled.

ii. Mean value of ICT usage for urban background students was 3.2244 and mean value for rural background students’ was 3.3342. From mean value of the students it was inferred that the mean value of urban background students was lesser than the students with rural background.
As the results show that mean value of urban background students is lesser than the students with rural background so the hypothesis \( H8: \text{Students having urban background use ICT more frequently than rural ones} \) was not supported.

Final hypothesis was related to preference of ICT usage in studies. This hypothesis stated

\[ H9: \text{Students with urban background prefer more usage of ICT than rural ones.} \]

In order to support or refute the hypothesis the following steps were taken.

i. From the results of Levine's test it was concluded that the variances of students with rural and urban background for limitations were same so condition for Levine test was fulfilled.

ii. Mean value of ICT usage for urban background students was 3.6405 and mean value for rural background students' was 3.6571. From mean value of the students it was inferred that the mean value of preference of ICT urban background students was lesser than the students with rural background.

As above two assumptions were not fulfilled so the hypothesis \( H9 \) was not supported.

5.3 IMPLICATIONS OF THE STUDY

The findings of this study are helpful to students, teachers, policy makers and educational institutions. Results show that ICT will be helpful for them and will motivate them for the effective usage and application of ICT in their respective fields. Overall results of the study reveal that the rural-urban gap is also one of the probable reasons for difference in ICT usage among urban and rural students. Keeping these results in mind government and policy makers can make policies and take practical steps for the promotion of ICT across the whole country crossing the barriers of rural-urban divide and rather they can make effective use of ICT to bridge the information gap between rural and urban students. Results of the
study indicates that there are certain limits or constraints related to the ICT usage for academic purposes with the mean value of 3.30 for rural students and mean value of 3.31 for urban students. In order to overcome these limitations it is important that government should introduced ICT policy of its own. The overall results of this study conclude there exists a difference in ICT usage between the students of rural and urban background. Serious efforts can help to minimize the gap or difference yet to some extent it will prevail because of the rural urban divide.

5.4 RECOMMENDATIONS FOR FUTURE RESEARCH

This research was confined to only M. Phil and Ph. D students of the AIOU due to certain constraints of time and expenses as well. There is a greater room for future research in the field of ICT and Distance Education. Future researcher may explore the following areas.

i. In future research researcher may conduct research on comparative studies of Distance Education universities Pakistan to know about the difference of ICT usage in the comparative universities.

ii. Research can be performed to investigate the role of ICT among Matric, Inter, and BA level students of AIOU by keeping socio-economic status of the respondents as important variable.

iii. There is also a greater scope for studying the role of ICT at school level.

iv. Apart from role of ICT there is space to conduct research related to the impact of ICT on students’ academic performance.

v. No doubt teachers/educators at all level of education are of prime importance as they impart knowledge to the students. So, keeping the role of teacher there is a suggestion to conduct research about ICT Usage of teachers for teaching purposes.
vi. To analyse the role of ICT researchers are advised to work on comparative studies of Distance based and regular universities regarding the role of ICT. This research may consist of Teachers’ ICT Usage comparisons between two universities; and Students’ ICT usage comparison between two universities.

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APPENDIX A

QUESTIONNAIRE
ROLE OF ICT IN DISTANCE EDUCATION IN PAKISTAN: A CASE STUDY OF ALLAMA IQBAL OPEN UNIVERSITY

It is stated that the researcher is a doctoral student currently enrolled in Department of Media Studies, The Islamia University of Bahawalpur. He is conducting a study to analyze the role of information and communication technologies (ICT) in distance education in Pakistan. By specifically selecting the case of Allama Iqbal Open University (AIOU), registered students of AIOU enrolled in MPhil and PhD. Programs will be engaged in the study. In order to complete this study, your active participation and valuable time is required.

It is undertaken that your personal information will neither be gathered nor be disclosed in the study. Secondly, you will be at minimal risk with no physical harm while participating in this survey. I shall be thankful to you for your time and concentration.

Please tick in this box to indicate my informed consent to participate in this study

<table>
<thead>
<tr>
<th>1. Please state your gender</th>
<th>□ Male □ Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Please state your age (years)</td>
<td>□ Below 25 □ 25-30 □ 31-35 □ 36-40 □ Above 40</td>
</tr>
<tr>
<td>3. Please state your faculty</td>
<td>□ Faculty of Sciences □ Faculty of Education</td>
</tr>
<tr>
<td></td>
<td>□ Faculty of Social Sciences □ Faculty of Arabic and Islamic Studies</td>
</tr>
<tr>
<td>4. Please state your Class, Department.</td>
<td></td>
</tr>
<tr>
<td>Class: _______________________________</td>
<td></td>
</tr>
<tr>
<td>Department: __________________________</td>
<td></td>
</tr>
<tr>
<td>5. Please select your area of residence</td>
<td>□ Rural Areas □ Urban Areas</td>
</tr>
<tr>
<td>Note: You may tick multiple options from statement 6 to 11.</td>
<td></td>
</tr>
<tr>
<td>6. What kind of ICT devices do you have for your studies?</td>
<td></td>
</tr>
<tr>
<td>□ Desktop Computer □ Laptop □ Smartphone/Tablet</td>
<td></td>
</tr>
<tr>
<td>□ Printer □ Scanner □ Any other (Please specify) __________</td>
<td></td>
</tr>
<tr>
<td>7. What kind of internet connection do you have for your studies?</td>
<td></td>
</tr>
<tr>
<td>□ Wired Broadband (PTCL/Wateen etc.) □ Wireless Devices (EVO etc.)</td>
<td></td>
</tr>
<tr>
<td>□ Mobile Internet □ Any other (Please specify) - __________</td>
<td></td>
</tr>
<tr>
<td>8. Where do you access internet for distance education?</td>
<td></td>
</tr>
<tr>
<td>□ Home Network □ Internet Cafe □ Public Internet</td>
<td></td>
</tr>
<tr>
<td>□ Main Campus □ Friend’s or relative’s house □ Any other (Please specify)</td>
<td></td>
</tr>
<tr>
<td>9. Please state the purpose of using computer</td>
<td></td>
</tr>
<tr>
<td>□ Education □ Information</td>
<td></td>
</tr>
<tr>
<td>□ Entertainment □ Any other (Please specify) __________</td>
<td></td>
</tr>
<tr>
<td>10. Please state the purpose of using internet</td>
<td></td>
</tr>
<tr>
<td>□ Education □ Social Media □ Email □ News</td>
<td></td>
</tr>
<tr>
<td>□ Religion □ Entertainment / Sports / Games □ Any other (Please specify) __________</td>
<td></td>
</tr>
<tr>
<td>11. What is the purpose of using AIOU website?</td>
<td></td>
</tr>
<tr>
<td>□ Academic Results checking □ Downloading Assessments</td>
<td></td>
</tr>
<tr>
<td>□ Downloading Examination Forms □ Course Registration</td>
<td></td>
</tr>
<tr>
<td>□ Downloading Course Materials □ Reviewing Faculty Information</td>
<td></td>
</tr>
<tr>
<td>□ Downloading Course Materials □ AIOU Live (Radio / Television)</td>
<td></td>
</tr>
<tr>
<td>□ Tutor’s Particulars □ Any other (Please specify)</td>
<td></td>
</tr>
<tr>
<td>----------------------------------</td>
<td></td>
</tr>
<tr>
<td>Reliance on ICT</td>
<td></td>
</tr>
<tr>
<td>12. I rely more on ICT in knowing about my date sheet.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>13. I rely more on ICT in knowing about results of my exams.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>14. It is difficult to study in the absence of different tools of ICT.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>15. I rely more on ICT to connect with my supervisors/teachers/tutors.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>16. I have greater reliance on ICT in attempting course assignments.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Helpfulness of ICT</td>
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</tr>
<tr>
<td>17. ICT helps me to improve my quality of work by providing practical examples through diagrams/visuals.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>18. ICT helps me in improving my language skills.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>19. ICT helps me by providing peer reviews.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>20. ICT helps me in improving my communication skills.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>21. ICT helps to improve independent learning skills of students.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>22. ICT helps me in improving my confidence to interact with others.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>23. ICT helps me to improve motivation to engage in academic social networks.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>24. ICT helps me to seek online academic resources.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>25. ICT helps me in improving my grades.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>26. ICT helps to enhance my academic performance.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>27. ICT helps to enhance my pace of learning.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>28. ICT helps to enhance confidence to perform learning tasks.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>29. ICT is overall helpful in providing study material for my studies.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>30. Frequently Asked Questions (FAQs) are helpful in my studies.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Relevance of ICT</td>
<td></td>
</tr>
<tr>
<td>31. ICT is specifically relevant for getting information about my admission.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>32. ICT is specifically relevant for getting information about my examination.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>33. ICT is specifically relevant for getting information about my results.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>34. ICT is specifically relevant for writing my assignments.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>35. ICT has relevant features which assist me in making presentations.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>36. ICT has relevant features which assist me in searching desired study material.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Interest in ICT</td>
<td></td>
</tr>
<tr>
<td>37. Attractive interface of ICT stimulates my interest in studies.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>38. Help wizard in ICT makes studies interesting for me.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>39. Multiple tools of ICT like computer and internet create more interest in studies.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>40. Using ICT in presentations makes their contents interesting and appealing.</td>
<td>1 2 3 4 5</td>
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</table>
## Limitations of Using ICT

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<tbody>
<tr>
<td>41</td>
<td>Over-reliance on ICT limits my critical thinking and analytical skills.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>42</td>
<td>Excessive use of internet might have bad effects on my mental health.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>43</td>
<td>Excessive use of internet might have bad effects on my physical health.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>44</td>
<td>ICT distracts me from learning by visiting unwanted sites.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>45</td>
<td>I may be induced towards copy paste forgetting the essence of learning and research.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>46</td>
<td>By using computer and internet I have less opportunities of using my own creative writing skills.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>47</td>
<td>ICT may involve high cost of technology and its maintenance.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>48</td>
<td>Searching contents through internet by using ICT makes me limited in getting whole features of the concept.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>49</td>
<td>ICT does not provide information that satisfies my need of information.</td>
<td>1</td>
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**Hint:**

## Gratification With ICT

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<tbody>
<tr>
<td>50</td>
<td>Information acquired through ICT satisfies my need of developing good understanding about my subject.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>51</td>
<td>ICT gratifies my need of interacting with my class fellows.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>52</td>
<td>ICT gratifies my need of interacting with my teachers.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>53</td>
<td>Information obtained through ICT makes me relaxed about my studies.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>54</td>
<td>Information acquired through ICT enhances my credibility about the subject among my fellows.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>55</td>
<td>Usage of ICT makes me more prominent among my peers.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>56</td>
<td>Obtaining related information through ICT makes me feel accomplished in preparing assignments, presentations and exams.</td>
<td>1</td>
<td>2</td>
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## Motivation of Using ICT

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<tbody>
<tr>
<td>57</td>
<td>Information acquired through ICT motivates me for further studies.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>58</td>
<td>Information obtained through ICT motivates me to discuss learning material with others.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>59</td>
<td>ICT motivates me to interact with others using ICT tools like email/Skype etc.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>60</td>
<td>Information acquired through ICT motivates me to record relevant information of my studies.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>61</td>
<td>ICT motivates me to access study material anywhere.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>62</td>
<td>ICT motivates me to read online books pertaining to my studies.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>63</td>
<td>Attractive interface of websites enhances the level of motivation in my studies.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>64</td>
<td>Allied material available on ICT motivates me to increase my skill in conducting research.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>65</td>
<td>ICT motivates me in acquiring more information as compared to traditional modes of education.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>66</td>
<td>ICT motivates me to acquire knowledge by connecting with the scholars of my subject.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

**Hint:** 1. Never, 2. Very rarely, 3. Occasionally, 4. Frequently, 5. Very Frequently

67. How frequently do you use internet? | 1 | 2 | 3 | 4 | 5 |
| 68. | How frequently do you visit AIOU website? | 1 | 2 | 3 | 4 | 5 |
| 69. | How frequently do you receive SMS from the university? | 1 | 2 | 3 | 4 | 5 |
| 70. | How frequently do you receive email from the university? | 1 | 2 | 3 | 4 | 5 |


| 71. | To what extent do you prefer using computer and internet for your studies over traditional methods of studying? | 1 | 2 | 3 | 4 | 5 |
| 72. | To what extent do you prefer to use ICT for conducting research? | 1 | 2 | 3 | 4 | 5 |