BANDURA'S SYMBOLIC LEARNING THROUGH ICT AND ITS IMPACT ON STUDENT LEARNING AT UNIVERSITY LEVEL IN PAKISTAN

Muhammad Mushtaq

72-FSS/PHD/EDU/S-11

Department of Education

Faculty of Social Sciences

INTERNATIONAL ISLAMIC UNIVERSITY,

ISLAMABAD

2015

BANDURA'S SYMBOLIC LEARNING THROUGH ICT AND ITS IMPACT ON STUDENT LEARNING AT UNIVERSITY LEVEL IN PAKISTAN

RESEARCHER:

MUHAMMAD MUSHTAQ
72-FSS/PHD/EDU/S-11

SUPERVISOR:

DR. MUHAMMAD MUNIR KAYANI

CO - SUPERVISOR:
DR. MANZOOR HUSSAIN ARIF
(Lt.Col. Rtd.)

DEPARTMENT OF EDUCATION
FACULTY OF SOCIAL SCIENCES
INTERNATIONAL ISLAMIC UNIVERSITY
ISLAMABAD

2015

BANDURA'S SYMBOLIC LEARNING THROUGH ICT AND ITS IMPACT ON STUDENT LEARNING AT UNIVERSITY LEVEL IN PAKISTAN

Muhammad Mushtaq

72-FSS/PHD/EDU/S-11

Submitted in partial fulfillment of the requirement for the degree of Doctor of Philosophy in Education

Department of Education

Faculty of Social Sciences

INTERNATIONAL ISLAMIC UNIVERSITY,

ISLAMABAD

2015

CERTIFICATE

The thesis entitled **"Bandura's Symbolic Learning Through ICT and its Impact on Student Learning at University Level in Pakistan"** submitted by MUHAMMAD MUSHTAQ (72-FSS/PhD/EDU/S-11) in partial fulfillment of PhD degree in Education, has been completed under our guidance and supervision. We are satisfied with the quality of student's research work and allow him to submit this thesis for further process, as per IIU rules & regulations.

_____

Supervisor: Dr. Muhammad Munir Kayani,

_____

Co-Supervisor: Dr. Manzoor Hussain Arif
(Lt.Col. Rtd.)

APPROVAL SHEET

Thesis titled **"Bandura's Symbolic Learning through ICT and its Impact on Student Learning at University Level in Pakistan**" submitted by Muhammad Mushtaq, Registration No.72-FSS/PhD/EDU/S-11) in partial fulfillment for the requirement of Ph.D. degree in Education with specialization in Curriculum Development and ICT is accepted by the Department of Education, Faculty of Social Sciences, International Islamic University Islamabad for the award of Ph.D. degree in Education.

Viva Voce Committee:

Supervisor: _____

(Dr. Muhammad Munir Kayani)

Co-Supervisor: _____

(Dr. Lt.Col.Rtd Manzoor H. Arif)

Internal Examiner: _____

(Prof. Dr. N.B. Jumani)

External Examiner I: _____

(Prof. Dr. Hamid Khan Niazi)

External Examiner II: _____

(Prof. Dr. Allah Bakhsh Malik)

Dated: 25/11/2015

Chairman _____
Department of Education,
International Islamic University, Islamabad

Dean _____
Faculty of social sciences,
International Islamic University, Islamabad

DEDICATION

This study is dedicated to my parents, brothers, sisters, wife and daughters whose prayers and affections are a source of strength for me at every step of life. Their devoted prayers are the means to my achievements. May Allah keep them safe and sound.

ACKNOWLEDGEMENTS

Allah never spoils any effort and it is obvious that every work is rewarded according to the nature of devotion for it. I offer my most humble and sincere words of thanks to Almighty Allah, the most compassionate and the most merciful whose bounteous blessings enabled me with the potential and ability to make some contribution to the already existing ocean of knowledge in education.

I greatly appreciate and admire Dr. Muhammad Munir Kayani for providing me a talented and sagacious guidance for completion of my thesis. His cooperative behavior, sympathetic attitude and sincere counseling were of great advantage to me. I cannot forget Dr. Manzoor Hussain Arif for his expert opinion, timely guidance and thoughtful advice at all occasions, and extended encouragement to carry on the work. His valuable consultancy will always be remembered.

I am extremely thankful to Dr. N.B Jumani, Dean Faculty of Social Sciences for his valuable and thought provoking ideas who always kept himself busy in imparting knowledge and skills during course work that paved my way for this study. I have a great reverence and respect for Dr. Samina Yasmeen, chairperson, Department of Education, Dr Shamsa, Dr Munazza and Dr Asad Abbas Rizvi for their valuable guidance and encouragement all the time. I express my very special thanks to Dr. Muhammad Azhar, Dr. Sheikh Tariq Mehmood, Dr. Muhammad Zafer Iqbal and Dr. Muhammad Nasir who shared their fund of knowledge with me from time to time.

I also acknowledge the help provided by my friends Sheikh Tariq, Nasir Hussain Bukhari, Abdul Ghaffar Tahir, Muhammad Qasim, Naila, Summera, Aashiq Hussain, Niaz Ahmed, Kamran Ali, Saima Arif for their cordial help in collecting the data I

needed, I am also thankful to my family, my wife Shahnaz and daughters (Anoosha, Manahil, Sameen and Hadia) who never bothered or disturbed me during this study.

Last, but not the least, I appreciate the input of Prof. Muhammad Hashim Abbasi, visiting faculty member of IIUI for editing this report.

(Muhammad Mushtaq)

ABSTRACT

Symbolic learning is a twenty first century idea of Social Learning Theory. It presents how people learn through media, particularly social media. The research study "Bandura's Symbolic learning through Information and Communication Technology (ICT) and its Impact on Students Learning at University Level in Pakistan" is essentially an attempt to explore the contents of two media, that is, internet and mobile phone. The objectives of the study were to enlist the university students' opinions about the learning opportunities through internet and mobile at university level at four Bandura's stages on symbolic learning model, and to obtain university teachers' views about availability of ICT facilities and their perception of media impact on students learning activities. It was a descriptive survey research conducted through two questionnaires, one for university students and second for university teachers. A multistage cluster sampling technique was used to select twelve universities out of twelve general universities having three social sciences departments, nine from Punjab and three from Islamabad Capital Territory. Sixty students were selected as a convenient sample from each university; twenty students and two teachers from each department were drawn from three departments of social sciences. The student sample was 720 (38%) of the population and teachers sample was 72 (25%) of the population. Two questionnaires were used to collect data about opinion of the students and teachers. Chi square and Frequency count were statistical techniques to make analysis of data by using SPSS. The study found out that students, at attention stage, had access to emails, data bases, digital books and search engines but they had no access to messengers, Facebook and Twitter on internet while on mobile phone, they had access to phonebooks, messages, calendar and Multimedia. At

retention stage, the downloaded contents were the study material, songs, videos and job advertisement keeping them on hard drive or Universal Serial Bus (USB) data storage device and use of Microsoft Word and Power Point to write assignments and internet browsers to find problematic questions. The contents on mobile phone they used were talking, sending Short Message Service (SMS), watching movies, video clips and pictures. At reproduction stage, they used group discussion; academic forums, Wikipedia, digital libraries and search engines including free access sites, research journal, songs, digital books, movies, and Holy Quran. The contents on mobile phone were words and phrases, calculator, time watching, listening music, talking, sending text messages, playing video games and waking up alarm. At Motivation stage, the academic performance and internet use, role of social networks, digital libraries, online articles, discussion forums, students' blogs and professional associations mostly improved students' performance, vision, and studies. The motivation for mobile use was to keep in touch with teachers and students and storing study material on mobile phone. The teachers' views on Impact of ICT on student learning were significant as internet; ICT and Mobile Phone had positive effect on student learning. Digital libraries, social networks, professional groups, blogs and associations had significant positive effect on students learning. The digital contents would replace paper contents and students preferred to read online research articles. It is recommended that the students of social science be encouraged to use ICT in class and out of the class, the contents possibly be digitalized, access to all social networks be provided and ICT oriented tasks be provided by teachers to students.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABREVIATIONS USED IN THE STUDY

FJWU	Fatima Jinnah Women University
FUI	Foundation University Islamabad
HEC	Higher Education Commission
HU	Hajvery University
ICT	Information and Communication Technology
IIUI	International Islamic University Islamabad
NUML	National University of Modern Languages
PMASAU	Pir Mehr Ali Shah Agriculture University
PU	Punjab University
UNESCO	United Nation Education, Scientific and Cultural Organization
UGC	University Grants Commission
UOG	University of Gujrat
UW	University of Wah
UCP	University of Central Punjab
UOS	University of Sargodha
UF	University of Faisalabad
SMS	Short Message Service

OECD	Organization for European Countries Development
SOR	stimulus (S) organism (O) and (R) response
IT	Information Technology
NWFP	North West Frontier Province (Khaiber Pukhtoonkhawa)
PC	Personal Computer (Desktop)
OML	Old Millennium Learner
NML	New Millennium learner
WWW	World Wide Web
TV	Television
TCP	Transmission Control Protocol
IP	Internet Protocol
MMS	Multimedia Messaging Service
USA	United State of America
UK	United Kingdom
MS	Microsoft
IOS	Mobile Operating System by Apple
USB	Universal Serial Bus
PIII	Pentium three computer brand (started with Pentium I)

PIV	Pentium four computer brand last of the brand
TBL	Technology based learning
4 RS.	1. Re-use,2. Redistribute,3. Revise and 4. Remix
SCORM	Sharable Content Object Reference Model

CHAPTER 1

INTRODUCTION

Skinner (1984) supported learning as ontogenic rather than phylogenic adaptation, the first relies on individual personal interaction with its environment and the second is a slow process of anatomy of all members of species. It has always been a hot debating topic among educationists and psychologists. They advocated different theories and practiced them but each one of the theories has its own implications and characteristics. Cognitive, behaviorist and humanist theories of learning were very popular but the second half of twentieth century observed a significant change stepped up by electronic media, television, internet and mobile communication. The effects of the media on human learning and social set up were tremendous. It developed cultural identification on one side and multi-cultural, mixed culture and diverse cultural societies on another side. The learning did not remain aloof and isolated but polarized and vulnerable to other societies. Olson (2006) rightly observed that the concept of learning being taught has to be best represented. This resulted in emergence of social learning theory.

Bandura (1977) presented the social learning theory. It focused on propagation of a new set of models; live learning model, instruction learning model and symbolic learning model. Each of the models focuses on certain aspect of learning. Live learning model encompasses real life situation in which the learner is brought into direct contact with live situation to observe and see the things. The instruction learning model emphasizes on instruction set out for learners to perform some acts. The instructions are clear and direct which lead the learner to real life conditions. The symbolic learning model endeavors an assumed and a staged life situation in the

forms of films, dramas and stage shows. It also focuses on interaction of human to different gadgets of technology like television, mobile phones and computer. Prince (2004) argued that students learn effectively when the activities had been developed on the basis of learning outcomes to promote profound action, resulting in knowledge retention, conceptual understanding and engagement of the activities.

Clark (2004) defined learning as students' technique of adopting and using stimuli in context of learning which later on he himself practices and produces. The observational learning considers observation as an important source for learning. The observation can be of two major kinds in this high tech world, direct observation and indirect observation. The first kind requires physical movement and observing things minutely and it is necessary for one to be present at the event while the second kind of observation can further be divided into symbolic and live observation. There are differences based on originality of the things such as the first is manipulated, the other can be captured and presented from one angle while the other angles remain unobserved. The quality and expertise required for preparing a scene or event for digital contents depends on the person and the device used to prepare and capture. Fink (2003) summarized his discussion by maintaining that as there are different needs of community as well as individuals with reference to the public demand of what to learn and how to learn it.

The symbolic learning encompasses different type of learning which starts from primary level in the form identification of alphabet and goes to higher education level which includes statistical formulas, graphical displays, diagramed demonstration, terms and words which gives whole of the functions in all subjects. The symbolic learning cannot be limited to some particular type of learning but it

covers a whole range of subjects and all aspects of modern learning contents. This type of learning got rhythm and speed in the emergence of science and technology, particularly with the advent of information and communication technology. The focus of the study was on the contents of the internet and mobile phone which presents symbolic learning to the university students.

These models were projected and advocated by Bandura (1977) who had foreseen the future of learning in the advent of digital media. It was a time when media was influencing learning in a great quantum. Many aspects of social learning theory were discussed and debated in developed countries but there was a dire need of exploration of the model in situation of developing countries. The application of it deemed necessary not only in the classroom but also out of the classroom when students have chances to interact through digital media at different places and formats.

Haggarbloom and Warnick (2002) survey concluded by ranking Bandura as number fourth most cited psychologist, after B.F. Skinner, Sigmund Freud, and Jean Piaget, considering him as the most frequently quoted living one. The survey further added that he was the most influential personality of all time. The concept of symbolic learning is found in observational learning or model learning. There are different forms and stages of symbolic learning. Three core areas envisaged different aspects of learning.

1.1 Observational Learning

McGill & Beaty (1995) explained observational learning as process that can begin at any age, having no limit to the number of cycles without reflecting on it. The

learning can take place through observation because when the things are observed and seen, they remain in the memory for longer time. The observation can be direct observation, simulated observation and artificial situation observation. All kinds of observation affects one's memory and the learner really grasps the gist of the action and processes. It may be skill oriented as well as knowledge oriented because in both form, a learner constructs his own idea or understanding and later performs or demonstrates the way he/she perceived the things. This type of learning may take place from beginning to adult life. As we see, a child learns by imitating elders at lower level in actions, language and behaviors. When he/she becomes adult, learning continues to form skills of observation as he buys clothes keeping the way his favorite persons wear. He follows the talking, walking and posing of his favorite personality. It means he has not learned them through books but through observation. All three types of observations do affect the learning of the organism.

1.2 Mental States and Learning

Bandura (1977) considered the second important area as mental states. The earlier theories presented that external reinforcement is necessary to motivate one for action but there is intrinsic motivation which plays very important role in learning. External reinforcement sometimes does not work and learner does not get motivation but internal instigation often works effectively and learner gets ready to perform an action. Mental states can be influenced by internal reward like pride, satisfaction and self-accomplishment which are abstract and may not be visible. Social learning theory presents a new formula (S>O>R), the stimulus (S) affects the organism (O) which produces (R) as response which is dependent on stimulus which is dependent on organism.

1.3 Learning and Change in Behavior

Bandura (2006) considered third important point about learning which does not necessarily lead to a change in behavior because it is noticed that a learner knows many things but he acts on a few and leaves many. In our society, people learn many values of faith and they claim to be its follower, they know so many values but this learning does not bring change in their behavior. There may be learning but there may not be a change in visible behavior.

1.4 Distance and Online Learning

Simonson et al (2011) describes distance learning as recently used online learning which has a long history of increased access to education. The history of Open University in UK and Allama Iqbal Open University in Pakistan shows that they are working effectively and making tremendous progress. In distance education, students get course material and assignments via postal services and the assignments are returned, through the same channel. Pappano (2012) stated that the currently used online system in America is called as (MOOCs)–Massive Open Online Courses which has created different challenges for educationists in New York. The purpose of MOOCs was to increase interest and awareness of learners about online learning system. Allan and Seaman (2011) stated the open courses geared up discussion about the opportunities of online education. There is no doubt that open access technologies in the digital age would change higher education view as long as the relevant course contents are developed. Christensen et al. (2006), discussing online learning provision, pointed out disruptive innovation, in new services that take roots in simple applications at the bottom of a market and the eventually displace the established market.

In Pakistani situation, distance education trend is now rising as in the past, there was one Open University (AIOU) but now apart from Virtual University, Sarhad University, International Islamic University and many other universities have taken initiative to launch distance education programs because of the geo-dynamics and urban rural division of the people. It is getting high success so far. ICT is an added flavor for the privileged areas where electricity and internet services are available but our 60% population does not have electricity. The idea of distance education may perhaps never be dominated by online learning.

1.5 ICT in National Education Policy 2009

Pakistan National Education Policy (2009) stated that the importance of ICT is emphasized to meet the challenges, to improve the quality of higher education, to meet international standards and to prepare learners as international competitors. Higher education of a good quality is one of the most important elements for realizing the idea of knowledge oriented economy into reality. It also plays vital role to the attainment of social goals to develop civic responsibility, social cohesion and a tolerant society. Through research, at higher education facilitates reform process, economic growth, social unity and sustainable development.

The Role of Higher Education Commission (HEC) is to provide services as a central unit for all important matters concerning development of policy, mapping out plans, arranging programs, setting standards and providing funds for higher education in order to change teaching learning process as source of development and growth of national economy and social progress. The accreditation and quality assurance for all academic programs is the responsibility of the commission. It has many challenges that include limited access to higher education, inadequate resources and quality in all

respects, lack of research and development capacity and dual college governance system. In spite of these barriers, the commission has a strategic vision which highlights how it can address each problem.

To respond to the challenges of limited access to the disadvantaged groups, two faceted strategy is envisaged, as a first step promoting change in culture by creating higher education as a valuable entity among general public. The second step is dealing with barriers of prohibited expenditure of higher education through open, non-formal and distance education, by incorporating e-learning and mobile learning that become a part of ICT. The optimal use of existing physical infrastructure would be the first requirement of access to higher education. Moreover, it would require the investment of additional resources in different ICT equipment, facilities to set laboratories and provide a space to meet requirement of increased students' enrolment. The information and communication technology (ICT) is essential for improving programs of higher education. With increased allocation of resources, growing demands come for accountability in the transparent use of these resources.

The core responsibility of higher education institutions is to deliver the quality of higher education and research by assisting in policy development and serve as 'think tank' in both public and private sectors. There is no doubt that the institutions of higher education are centers of knowledge where faculty and students both acquire knowledge at one side and apply it on other for understanding and solving national and international problems and issues. To ensure the quality of outcomes of higher education, internal quality assurance process of institutions of higher learning must conform to international standards. Excellence should be recognized and supported.

The employment market of the rapidly changing global economy requires a different courses that should be learnt and updated at regular intervals through lifelong learning .Higher education should work cooperatively with the stake holders to offer such courses. Teaching faculty can rightly be called 'heart and soul' of higher education, their qualification, professional development, ICT skills and motivation are the sources for improvement in the quality of higher education. Faculty training in pedagogical skills, communication skills and information and communication technology (ICT) competencies skills are required to improve and impart teaching efficiently in the context of 'paradigm shift' from teaching to learning, from teacher centered teaching to learner centered teaching.

The policy actions suggested that the enrolment would be increased from currently 4.7% to a lofty goal of 10% up to 2015 and further unrealistic 15% by 2020. To achieve this target, the investment to higher education is suggested to be increased to 20% and budget allocation to be raised to 7% of the GDP. Information and communication technology (ICT) would be effectively used to support high quality teaching not only on campuses but also through distance education. The teachers would be provided technical and scholarly information to facilitate communication between teachers and researchers.

1.6 Symbolic Learning and ICT

This digital media age reflects high social expectations and professional competence, extreme carefulness to integrate ICT in education because it is not just add-on teaching or learning but a medium of literacy and learning beyond traditional reading and writing. This is not an easy task even if the teachers and learners have

skills to do so; therefore it needs to take advantage of action research to find practical implications relevant to social contexts.

The question how symbolic learning is associated with information and communication technology needs to be addressed. In the era of technology where everything depends on technology, learning has also been pillowed by it because the interaction of human beings with it is more frequent and continuous. It is a learning that takes place by observing and experiencing the things particularly in digitalized form. The students of today are exposed to a lot of things; they watch, experience and interact daily so their learning has become broadened. They are joining world communities and cyber space sharing and affecting the world by their actions, ideas and beliefs. They are not restricted to their own class teacher or subject teacher but they are exposed to different contents which they may not have seen or observed. They try to go deep down and find the information through digital media which provides them symbolic learning which have apparently great effects.

The world is growing rapidly into a global village and it has been energized by digital media. The term 'digital media' covers different sources that include internet and mobile phones. The students learn many things from them and cherish ideas and concepts; they are too busy in using these sources. They are helpful in curricular activities but they mostly prevent them from going to extracurricular activities. Sports, games and socialization are interdependent but they are very significant areas of learning which play important role in building development, growth and balanced personality among young learners. In the present world, students are keen to explore and experience different things particularly away from their own culture, tradition and society. The media has helped them to acquire and explain those things which they

may not get adequately answered from their teacher and parents, particularly in a growing society. Many areas would be explored but the focus is on meaning and nature of symbolic learning, impact of television channels, mobile phones and internet.

The section of the society selected for this study is the university students because this is the powerful age period, a prime time and the most vulnerable duration of life. It is time that shapes the destiny of youth and future career and ideas are strongly built up. The need of the time is to explore the serious issues related to their developments, socially, mentally and physically. Another important thing is the purpose they use ICT either for educational purpose or for entertainment, the daily time which they spend on these activities and daily time they spend on other co-curricular activities.

1.7 Technology-Based Learning (TBL)

Technology based learning constitutes learning via electronic technology, including the Internet, intranets, satellite broadcasts, audio and video conferencing, bulletin boards, chat rooms, webcasts, and CD-ROM. TBL also encompasses related terms, such as online learning and web-based learning that only includes learning that occurs via the Internet, and computer based learning that is restricted to learning through the use of computers. E-learning is synonymous with TBL and has largely replaced it in scholarship and industry as the term of choice. TBL holds the promise of substantially transforming the way learning takes place because of its numerous advantages. Among these, TBL fosters greater accessibility to learning by offering anytime and anywhere delivery. It is readily scalable to both large and small groups since it can accommodate larger numbers of learners at little extra cost and smaller

groups of learners that otherwise would not be able to participate in traditional classroom training because of low seat allocation in a program. Further, the content of TBL courses, especially those that are delivered online, can be centrally developed and updated whenever the need arises; therefore, the cost of replacing outdated course materials and retraining of teachers and instructors drops significantly. At the same time, TBL is not without its challenges. Among the most important of these is the "digital divide," caused by low computer literacy rates and lack of access to technology among some learner populations. Additional challenges include "social loafing," characterized by students who work less diligently than they otherwise might, or who become frustrated by course material or technology and thus less engaged, because of the relative absence of instructor learner and learner-learner interaction. Further, some TBL has been characterized by high attrition rates among learners.

Course developers face their own challenges, as they grapple with problems related to technological incompatibility, and they must be certain to make appropriate accommodations to promote access for learners with disabilities. Although these benefits and challenges apply in a general sense, TBL in fact is an umbrella term that encompasses multiple delivery modes and methods, with each having particular strengths, given certain contexts and learning objectives. For example, TBL includes tutorials, web conferences, online forums, simulations, and gaming, among other methods. The learning can be synchronous, when delivery occurs or when instructors and learners meet at a specific time in a physical or virtual classroom, or it can be asynchronous, when the learning does not occur at a pre-specified time and thus can be self-paced.

The current evidence supports that there is not only a digital divide in education but also an issue of access to technology based learning that was identified as right competencies and skills to benefit from computer use and those who had the access but they can utilize it fully because of lack of core competencies. There could be many reasons because competencies had linked with economic, cultural and social capital of the students. The policy measures need to cater for these implications too.

The social and economic development require changing needs; these needs envisage a variety of new skills and competencies that are labeled as 21st century skills. For knowledge and technology based economy, these skills are key enablers for responsible, matured and successful citizenship. The European Parliament (2007) suggested eight core competencies for knowledge society, digital competency was one of them and lifelong learning another.

Council in European Parliament (2007) set 16 sixteen core indicators to monitor progress and performance in education by placing information and communication technology skills as a core indicator that suggested the importance and vital role ICT has to play in upcoming years. Last but not the least, the question remained unanswered as what could be expected from knowledge society, from teaching and learning experience at all levels of education. It did not have concern with type of technology but it had great concern with productivity in education. The educationists would have to find which technology based teaching strategies could improve the learners' performance as compared to the traditional methods, considering other factors that intervene. Researches need to be addressed to find explicit relationship of a triangle of technology, instructional strategy, psychological processes and contextual factors.

Despite that the conventional methods of teaching have been more or less similar around the world, the adaptation of teaching strategies and styles to different social, economical and educational contexts has been always an issue for consideration. Donnelly & O' Rouke (2007), Potter & Johnston (2006) stated that the tremendous growth of technology and computer applications affected almost every aspect of everyday life, worldwide. This is also the case in the field of education; the latter has changed dramatically by endorsing applications that help students improve their written and verbal abilities as well as help them develop new skills that broaden their potentials. The process of learning in a virtual environment has contributed significantly towards a social change in higher education; this is achieved through the provision of new media allowing access to new knowledge, promoting dialogue among teachers and students and also among students themselves.

Livingston & Condie (2006), Love & Fry (2006) concluded that in general, it is not an overstatement to claim that the internet has strongly affected education including the dynamics and speed of learning while electronic learning (e-learning) has also placed new challenges to the design of the relative curricula. The main methods of contemporary teaching include video watching and role playing, while students are encouraged to attend and participate in lectures via interactive whiteboards, too. Cottel & Millis (1993), Bonner (1999) concluded that different functions of the virtual learning environment such as chat rooms and self-assessment encourage essential communication skills and interaction among members of the digital educational environment. Indeed, the application of technology creates a virtual environment that has the potential to motivate students by allowing mutual learning and facilitating cooperation. Traditional teaching methods including case studies, group quizzes, lectures and, more recently collaborative teaching, homework,

use of blackboard and even more recently, computer programs and other techniques like the pause method, allow student participation in lectures while providing them with the opportunity to select their own learning process. Modern teaching methods, on the other hand, including contemporary software programs, distance-learning and hybrid teaching methods aim for the same end. It should be noted however that, students' background knowledge, academic performance and learning abilities need to be taken into consideration for the selection of the most suitable teaching method and combination of teaching applications.

Table 1 Traditional Teaching Strategies versus Modern Teaching Strategies

Traditional Teaching Strategies	Modern Teaching Strategies
• Reading texts and problems • Formulate questions • Attending lectures • Monitor discussions • Writing and replying brief or extensive questions and objective type questions • Solving short or lengthy unstructured problems and cases • Oral presentation of topic and reply to short questions from the audience • Studies	• Video Watching • Attendance and participation in lectures using interactive whiteboards • Accounting applications using simple systems • Role Playing • Simple modelling • Computer assisted teaching • Social networks teaching • Online learning • Digital contents learning

Source: Cottel & Millis, 1993; Bonner, 1999

By implication, teaching curricula and academic goals should be formed according to the needs, demands and ambitions of a given student population and educational context in order to strengthen students' motives and ensure active participation in the learning process.

The lecture method is a relatively poor instructional approach for maintaining student attention. Stuart & Rutherford (1978), Bligh (2000) found in their research that student concentration during lectures begins to decline after 10-15 minutes. Wilson & Korn (2007) have both reviewed this literature and questioned this claim. Their critique, however, does not challenge the consistent findings of recent research demonstrating that when compared to traditional 50-minutes classroom lectures, interactive lectures produce superior educational outcomes. Knight & Wood (2005) in an article titled 'Teaching More by Lecturing Less', reported the results of a study completed in a large, upper-division Biology lecture course. When compared to students' performance, the course was taught using a traditional lecture format, students who were taught with (a) in-class activities in place of some lecture time, (b) collaborative work in student groups, and (c) increased in-class formative assessment and (d) group discussion were observed to make significantly higher learning gains and better conceptual understanding

1.8 Forms of Symbolic Learning

Symbolic learning has different forms and manifestation; the alphabets are the bottom level format of symbolic learning while describing charts, preparing diagrams, setting symbols and showing ideas in short formulas are the advanced level of conceptual learning. It also includes demos, acts, scene and processes in form of digit contents. The propaganda on electronic media envisages different kinds of symbolic learning. It is useful for both the disadvantaged learner as well as the intelligent one.

It has quick and lasting impact on learners as they see action, comprehend it and then follow it

1.9 Linkage in ICT and Symbolic Learning

With advent of 21st century, numerous projects about demand and need of the learners were initiated. One of them was digital generation project endeavored by MacArthur Foundation in United Kingdom. The project was about digital media and learning of the students that includes finding out the pattern of students' engagement, self-directed learning and creativity by using digital media. It drew an attention of the educational administrators to develop among them, an ability to listen and reflect on learners' needs and demands to mold and divert digital media influence toward learning and skills development because digital media had more dynamic role and effective part in lives of the students.

Arnseth et al., (2007) concluded that a vast majority of the youth use social media on daily basis. Their ages range from 16-19 that raises a question of ICT use within the university forming the basis for our understanding of digital media and its role in learning. It is imperative to broaden the scope by including out of university use of it and extensive use of digital media at their residential places. This study focused on finding out the impact of symbolic learning through ICT on learning activities of the students during their master level education in different universities of the province of Punjab and Federal Area.

1.10 Objectives of the Study

Followings were the major objectives of the study:

A) To find out the opinion of university students about;

1. The nature and range of contents of learning they attended on internet and mobile phone.

2. The kind of contents they opted to retain in their mind available on internet and mobile phone.

3. The selection of the contents they exercised and practiced available on internet and mobile phone.

4. The content areas on internet and mobile phone that motivate them to perform the learnt behavior

B) To obtain the views of university teachers to;

5. Indicate the type of media that affected the students' activities on internet and mobile phone

6. Explore the preferred use of social networks by the university students and its impact on student conceptual learning.

1.11 Delimitations of the Study

The study was delimited to four important components, the first one in mobile phone and internet because so many studies had already been conducted with radio and television. The internet and mobile are new media used for learning purposes all over the world including Pakistan. Pakistan is a rapidly growing media market particularly internet and mobile phone

The study was delimited to;

1 Learning through ICT (Mobile Phones and Internet only)

2 The province of Punjab and Federal Capital Territory

3 Students of Bachelor and Master level

4 Teachers from three department of social sciences teaching at this level

1.12 Research Questions

Following were the research questions of the study;

1 What facilities of ICT are available to the students at university, home and hostel?

2 What are the content areas that attract the students' attention the most on internet and mobile phone for conceptual learning?

3 What are the contents of internet and mobile phone that students store in their minds for conceptual learning?

4 What are the contents of internet and mobile phone the students prefer to practice for conceptual learning?

5 How far the contents of internet and mobile phone motivate students to perform the learnt behavior?

6 What general facilities of ICT are available to university teachers?

7 What special facilities are available to university teachers in the university?

8 How far these social networks leave an impact on students learning?

1.13 Statement of the Problem

A complicated learning process could be made easy by using media. The purpose of the study was to identify possibility and prospects of availability, access and usage of internet and mobile phone as a medium to make teaching learning process effective. The four stages of symbolic learning model were scrutinized by the opinion of university students and teachers of social sciences in perspective of Mobile phones and Internet. The effects of these two media on the learning of the students at university level were assessed to determine the future scope and trend by making analysis of the current scenario.

1.14 Significance of the Study

The study is likely to be relevant to different sections of society. The following sections may get more benefits than the others.

Policy Makers and Other Institutions

The findings of the study are likely to be useful for policy makers in education sectors in Pakistan and abroad at all levels if they are interested in using or thinking of using Information and Communication Technology in their educational programs. The institutions in which they are willing to enhance ICT in their teaching learning process would also be able to get advantages from the findings of this study.

The policy makers need to rethink as they suggested in Education Policy (2009) in terms of providing facilities, funds allocation for ICT, the ICT policy for different tiers of education and other associated facilities to be used most effectively in light of the recommendations of the study. The policy makers at national level need to reshape their policy, while policy at provincial level could be framed in light of the

federal government. The university authorities may need to revise the policy adopted earlier for the social sciences students that they do not need to use ICT gadgets and do not require ICT labs. The study recommendations might provide food for thought for all those who suppose or assume it and they should work for improvement of ICT in social sciences disciplines

Future Planners

The future planners can get significant insight into the matter and they may find how to utilize the media for educational purposes and how to prevent the effects that are detrimental for the society, particularly the society where social values, norms and respect for law are dying and the society could find out the way to prevent it. This study results might have some potential to direct ways and means for locating the areas which need to be focused.

Curriculum Developers

The curriculum developers are the rich sources of program changes. They can reconsider how curriculum development can enhance and incorporate the electronic media into digital curriculum for enhancing technology of learning. The curriculum developers take much time in changing and replacing it but if the curriculum is in digital form, they can change it within the stipulated time. The results of this study might be beneficial for them because it is the base from where education plans takes off to meet international standards and requirements.

The study results may also provide awareness of the key areas in curriculum development as if the contents of any subject are developed on the basis of ICT then student will get more familiar with it and they would try to explore further areas

related to their special area of study. The international collaboration and comparison can only be made when the other countries' curriculum, contents, instructional technology and assessments posture and patterns are available to them. There is a dire need to develop a curriculum alignment with ICT as it is a modern gadget. The content selection, books recommendation and articles references are to be made core elements of curriculum development

Educational Administrators

This study results might be equally useful for the educational administrators to implement and regulate the ICT education and its implications. For its effective delivery, they can arrange systems to regulate and organize the things for powerful and productive use of ICT. There is no doubt that all the educational administrators want to bring innovation to promote their institutions but it can only happen if they try to align their infrastructure with modern needs. The study has laid a pattern of the learning environment depending highly on information and communication technology.

University Teachers

The study results could be utilized by the university teachers for incorporating the current electronic media contents and more likely to know how to bring about this change into their daily tasks given to the students. They can gain insight into academic activities to make them modern and futuristic. The study might suggest different techniques for the teachers training to enhance their professional development, the social networks can also help them to find the topics of their interests.

Individuals and Parents

The prime uses of ICT for students is that they can seek potential guidelines and signals for the individuals and parents to become more concerned for the child social and physical development which is being distracted by some of the ICT components.

IT Labs Administrators

The study results might also provide the data about how labs and IT facilities could be enhanced to deliver more effectively and efficiently. The students reservation identified in the study could be valuable for all those who manage and organize computer laboratories for successful and efficient use of the available facilities.

University Management

The study would equally provide feedback for the ICT facilities in the university management in determining the actions and activities to manage the learning opportunities of the students in lab environments. The university management can take benefit of the study results by removing the barriers for the students of social science disciplines particularly in using computer labs and its related infrastructure. They can also provide multimedia and other open sources learning tools to the teachers and students.

1.15 Methodology of the Study

This was a descriptive survey study that aimed at finding out university students' views on availability of ICT, their choices of contents on internet and mobile phone, and university teachers' views about impact of ICT on university students in perspective of symbolic learning model of the Social Learning Theory. A Cross sectional survey was conducted in which the responses of the students and teachers were compared. A set of two questionnaires was used as instruments to collect data. The first questionnaire was developed for students' respondents, and second related to the teachers.

Population of the Study

The target population consisted of all the students and teachers of public and private general universities in the province of Punjab and Islamabad Capital Territory. The total population of students was (1768) and teacher (288).

Sample of the Study

Multi stage cluster sampling technique was used for this study. The first stage sampling was universities selection, second stage was selection of public and private sector universities and third stage the selection of Education, Psychology and one other of the social sciences department. Twelve universities were selected out of general universities in Punjab and Islamabad Capital Territory. Education, Psychology and one another department were selected. Then sixty students and six teachers were selected as a convenient sample from each university; twenty students from each department and two teachers were drawn from three departments of social

sciences. The student sample was 720 (38%) of the population and teachers sample was 72 (25%) of the population.

Research Tools

A set of two questionnaires was used to collect data from the respondents. The validity of the questionnaires was established from conducting pilot testing and by getting experts opinions. The reliability of the questionnaires was checked by dividing student questionnaire into four portions and using Cronbach Alpha to determine reliability. The Alpha is more reliable statistical technique as compared to other available tools used in SPSS. Sijtsma (2009) believed that it is the most widely and frequently used reliability index. Bentler (2009), Kane (2006), and Flora & Curran (2004) supported and considered one of the best techniques to measure internal consistency.

Data Collection

The data were collected in multiple ways, firstly the researcher personally visited some of the universities to distribute the questionnaires and collected them back. Secondly, the researcher sent questionnaires to friends, and acquaintances in other universities to distribute the questionnaire to the respondents in the respective departments of the universities and collected them back. The close ended questionnaire items for the university students and teachers were used. A close ended questionnaire was used to collect data from 72 university teachers teaching at Bachelor and Master Levels. The items inquired about basic facilities of ICT and their perception of ICT impact on the students and how they incorporated ICT in their teaching.

Data Analysis

The quantitative data were analyzed by using SPSS statistical tests such as Chi-square, Crosstabs and Frequency counts. The four stages of symbolic learning model through internet and mobile phone were assessed and analyzed. The responses of the study participants were categorized according to the response options given against the items in order to arrive at the trend about the opinion; Chi square test was used to find differences in opinions. The level of significance was set 0.05, including charts and graphical display of frequencies.

1.16 OPERATIONAL DEFINITIONS OF VARIOUS CONCEPTS USED IN THIS STUDY

1 ICT stands for information and communication technology but in this study it is used for two mode of ICT internet and mobile phone.

2 Symbolic Learning is a learning takes place in result of interaction with people, places and groups through internet and mobile phone.

3 Basic facilities means the facilities of availability of computer, internet connection, access to social networks and mobile phone as gadget

4 Special facilities means the facilities that are provided to university teachers like Moodle, video conferencing, video recorded lectures, interactive boards and motivation to become member of academic and social network

5 TBL has three words as task based learning, team based learning and technology based learning, in the study TBL stands for technology based learning

6 The term home/ hostel was used in questionnaire. Home means the place where students live with their parents and guardians while hostel means if they live in university hostel or privately managed hostel or even rented house.

5 Questionnaire 'A' for students consists of five parts basic facilities, contents at attention stage, retentions stage, reproduction stage and motivation stage

6 Questionnaire 'B' for teachers contains three parts basic facilities, special facilities and a part to find the impact of social media on students

CHAPTER 2

REVIEW OF LITERATURE

In this chapter, the researcher has reviewed two major themes of the topic that cover many aspects of learning in general and symbolic learning or learning by observing, in particular. The first part is about conceptual framework of the study that starts with learning and ends in symbolic learning, the second part is about review of related studies.

2.1 Learning and its Nature

Learning is a most complex concept in education. It has many directions and various aspects because it is mostly the result of some stimuli. Learning is defined by Merriam Webster dictionary as:

1**:** the act or experience of one that learns

2: knowledge or skill acquired by instruction or study

3**:** modification of a behavioral tendency by experience (as exposure to conditioning)

Denial (2011) advocated that learning is a process which evolves in acquiring new or modifying the existing knowledge, skills, behaviors and values. It is based on experience which produces changes in the organism and the changes produced are relatively permanent. The process may involve different steps emphasizing one more than the other but these steps do exist in learning which takes place by following the footprints of the process.

Baars and Gage (2007) commented that learning may occur consciously or without conscious awareness, it is aided by motivation or a result of education or training. It is very clear that learning is not a stoppable thing, none can promote or prevent good learning or bad learning but it can be modified and diverted by education and learning. It continues since beginning till death but the pace of learning may be different at different stages and with different contents.

Atkinson et al. (1993) defines learning as a relatively permanent change in behavior that results from practice. It is a debatable concept because human organism changes from time to time so the permanent change is a controversial idea, the dynamics of the change and the limit of permanency remains abstract and need to be defined what permanent change really means.

Simon (1996) says that the purpose of learning has shifted from being able to recall information to being able, to find and use it. The first he called 'surface' learning and second he called 'deep' learning. Recalling and remembering is a kind of learning for temporary purpose but for the long term, it needs to be used and exercised. Surface learning means learning for temporary time and purpose but deep learning is something that requires learning with enhancement and imbibing the core idea to be performed later.

Glaser (1991) says that learning is a constructive, not receptive, process in which the leaner's understanding comes through experience and interaction with the environment using previous knowledge as foundation to construct new understanding. It is not only something that learner receives but he needs to reproduce it or construct a new behavior by absorbing the present conditions and actions. The outcome may

due to his interaction with others or just as a result of his own experiences of environment.

Kolb (1984) defined that learning cycle begins by interacting with the environment in form of concrete experience by comparing and integrating with existing knowledge which can be called reflective observation. The major and most common learning takes place by observing and particularly observing others while doing things. An intelligent learner usually learns things immediately than a slow learner, thus, social media today with ICT has made learning so rapid and quick that a happening in any corner of the world may be transferred within minutes and seconds to the other. The world has become a global village in true sense.

Zull (2002) while discussing learning and brain functions, declared that knowledge is organized and structured in networks or related concepts that is why new knowledge must connect to, or build upon a framework of existing knowledge. The connection and interconnection of pre and post experiences actually make learning more dependable on new things and newer technologies. Machines are working like mind and they may beat human in games and other functions because they do what man assigns them to do.

Abbott (1994) says that learning is a reflective activity which enables the learners to draw upon previous experience to understand and evaluate the present for shaping new actions for future and formulating new knowledge. It tells us that learning is an active process in which learner release new experiences to existing meaning and may accommodate and assimilate new ideas with reference to present, past and future and develop a link among them

Bruner (1996) advocated that learning can take place by being shown, by being told, by constructing meanings and by joining a knowledge generating community. All these functions are being presented by information and communication technology (ICT), particularly through internet and mobile phones.

There are two basic kinds of learning in strict sense as the result of repeated experiments on animals by different psychologists. They labeled their findings and conclusions as a separate type of learning, cause and effect relationship. These were classical conditioning and operant conditioning. There is no doubt that the learning different aspects of skills, knowledge and values may have some of the relationship with stimuli but not necessarily all learning is the result of stimuli and it is better to discuss them one by one in detail;

2.1.1 Learning as Classical Conditioning

Horowitz (2014) discussing the Russian psychologist, Pavlov discovered this phenomena while doing research on digestion system on dogs by inserting tubes into various organs to measure bodily reaction. He observed that dog began to salivate as soon as the meat was presented to it. Later, it began to salivate as soon as the person enters the room. He concluded that there is association of things with other things as one of them happens, the other will also take place. There is stimuli-response relationship in it. He called it conditioning. It was so interesting for him that he left the study on digestion and took sole interest in learning of things.

2.1.2 Learning as Operant Conditioning

The second type of learning, a step forward to classical conditioning, was operant conditioning. Operant refers to how organism operates on the environment or

how a response is made when interaction takes place. The experiment involved a cat placed in a box only with one way out. A particular lever needs to be pressed to open the door. To get freedom, the cat tried to get out of the box. Accidently it pressed the required lever and got the door opened. Later on, when it was placed, it did the same as it remembered the previous action. As many times, it was placed in the box, it pressed the required lever in lesser time which means that it learned through natural consequences to gain freedom. That is why it can be thought as learning due to the natural consequences of our actions.

Learning is a complex issue so it took interest of many psychologists who developed different learning 'isms'. In the following paragraph, these learning 'isms' are discussed in detail.

2.1.3 Learning in Behaviorism

As it is defined in learning section that learning is the process leading to permanent behavioral change in result of the way we perceive our environment, the way we interpret incoming stimuli. Watson (1878-1958) laid the foundation of behaviorism as he was the first to study how learning affects our behavior. The core idea of behaviorism was that only observable behaviors are to be judged as learning because other complex issues like a person's mood or thoughts are subjective and they cannot be measured. This school of thought assumed the ambition to become an exact science due to emergence of industrialization and electronic devices development. It entered into psychology and then to social sciences, which tries to achieve the goal to predict and control behavior. It left impact on objectives of the education, particularly skills, trainings and crafts. The curriculum was made more scientific and result oriented. Behaviorists considered mind as a black box as

response to a stimuli may be observed and assessed quantitatively, they ignored the thought process that occurred in the mind.

Later on, Skinner (1904-1990) believed that internal states could be influenced and affected by external stimuli and it is difficult to disconnect two types of behaviors. That was the reason he was considered as radical behaviorist. Marryam & Cafferala (1999) said that major focus of behaviorism was on apparent actions, observable activities and measurable skills which were incorporated into curriculum in shape of behavioral objectives and outcomes in skill development, training and computer assisted learning.

Jones and Elcock (2001) described that behaviorism originated as social science because learning is performance based that is displayed in change in behavior in result of the connection between stimuli and response and the goal is to ensure survival of human species in societies and individuals. Behaviorism showed interest in how our behavior resulted from the stimuli in the environment and within ourselves. It exhibits while controlling for as many variables as possible but the result is in learning a great deal about our behaviors, the effects of environment on us and how we learn new behaviors as a result of motivation and this brings change or no change.

2.1.4 Learning in Humanism

Behaviorism believed man as a machine because they believed in stimuli and response theory but they overlooked the core thing that there is process in the mind which interprets, translates and conceives things in different way because every mind

is different from the other. This shortcoming brought another school of thought; the humanism.

Kenick et al (2010) commenting on Maslow's hierarchy of needs and their fulfillment prepared oneself for next stage hierarchy of needs. Human organism needs to have basic needs first and then he moves for the other so there is a relationship between the needs mentioned in the pyramid. For learning, the human being needs to achieve all of them until he reaches self-actualization.

The self is a hallmark of humanistic psychology which emerged as an earlier explained scientific explanation of person which reduced the person to an object for enquiry. Tennant (1997) argued that as compared to behaviorism, humanism reaffirmed the human qualities of the person. It focuses on how individuals acquire emotions, attitudes, values and interpersonal skills. Macloed (2007) explained Roger's concept of self-actualization by saying that the organism have one basic tendency of striving to actualize, maintain and enhance the experiencing organism. He further explained that fully functioning person needs to have the characteristics of openness to experience, existential living, trust, feelings, creativity and fulfilled life. There is a much variety and dynamics of human being that play an important role in learning of individuals.

2.1.5 Learning in Constructivism

Constructivist learning model focuses on the process of making meaning. The interaction with experience and environment in the constructing of knowledge which is a learner centered process. There is a slight controversy on the nature of reality, the role of experience and the process of making meaning is individual or social. It gives

an edge to the social learning theory as meanings are usually made socially, not individually.

2.1.6 Learning in Cognitivism

Cognitive learning developed by Piaget (1973) emphasizing on learning as a sequential activity divided by age groups and stages of infancy, preschool, childhood and adolescence, so learning is associated with intellectual development. Learning takes place by mental process such as recognizing, recalling, analyzing, reflecting, applying, creating, understanding and evaluating. The idea was strengthened by Vygotsky's (1978) zone of proximal development as earlier Bruner's (1966) argued four components; curiosity and uncertainty, structure of knowledge, sequencing and motivation. They believed that learning process is adoption of techniques of organization, procedures, structures that developed synopsis in the brain. The learner needs to develop prior knowledge and integrate it with new knowledge. This theory brought drastic changes in education as teacher centered learning moved to child centered learning and curriculum design became flexible, annual assessment to continuous assessment and emphasis on reproduction to meta-cognition. It also developed concepts like memory, mental imagery, language acquisition, problem solving and decision making. The focus on mind and cognition left other aspects of human learning aside which had taken important place in the advent of information and communication technology. Cognitive learning usually refers to all learning that does not occur through traditional classical or operant conditioning. Usually, what is learned is more complex than a simple response to a stimulus. In cognitive learning, we often learn by observing, by reading, by imitating others, or by reasoning.

2.2 Social Learning Theory

Social learning theory consists of learning through observation around oneself so what one observes around him made his whole world. It depends on family environment, interaction with people, places and things. With emergence of information and communication technology, this type of learning has taken a grand proportion of human personality. Bandura (2011) claimed that cognitive learning evolves so many things considering the modern gadgets. The media, electronic and social networking has doubled the pace of learning among young people. The screen learning has taken central role in the modern world. The following picture tells us how learning is integrated with other people, places and their interaction. The link among authors, teachers, students, parents and the focus on information and communication technology play a pivotal role in learning in present era.

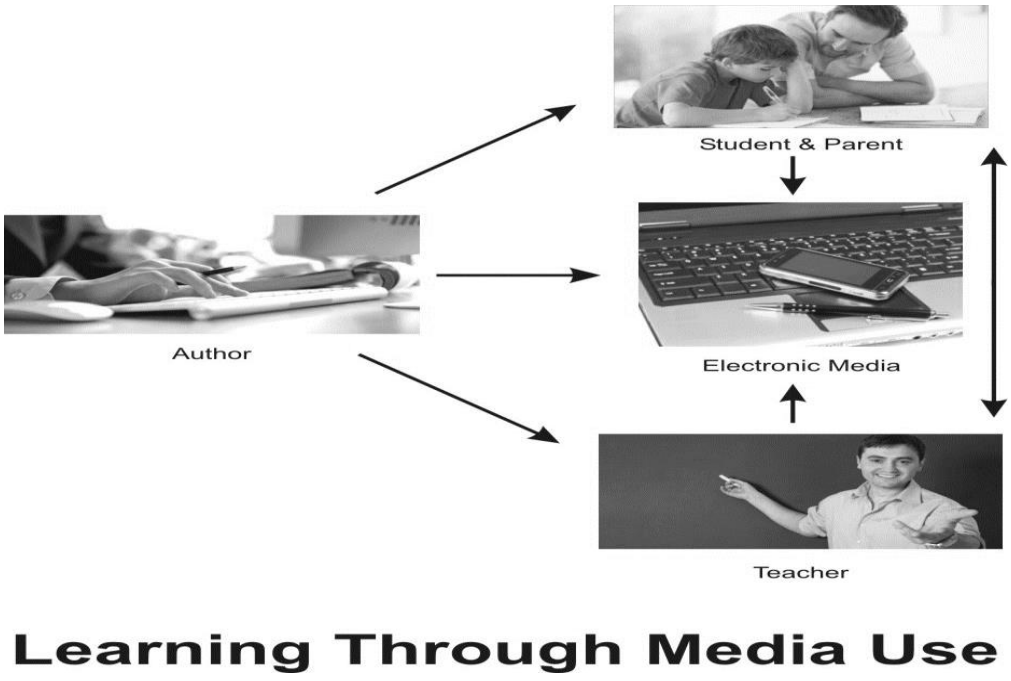

Figure 2.1 Learning through Media Use

Courtesy of CDE - UAF http://distance.uaf.edu/cc/CE603/homework/03/H03.2.html

Marriam and Caffarella (1999) classified social learning theory as an equal importance with other theories like constructivism, humanism, behaviorism and cognitivism but Tennant (1997) commented that a diverse range of theories apart from approaches are covered by social learning theory. Social learning theory encompasses a diverse range of theories and approaches. He added a new term for this theory as 'social environment' perspective. First the person could be observed as one of the passive receptor of behaviors, social roles, other attitudes and general values that are promoted, developed and kept intact by surrounding environment. Stapleton (2002) supported the second type of learning in shape of behavioral objectives which revolves around an active role of a person that stems out from humanism.

Jarvis et al. (2003) confirms that the interaction and mutual influence involves relationship between individuals and society. It is further added in the discussion that learning itself is a social phenomenon because mind and self both are socially constructed so every learning comes through mind to the other parts of body. Individuals possess the capability to regulate and direct oneself in the direction that he wants. The learning is formulated by reciprocal determinism of interdependent individuals and environmental influence. Its impact could be observed in different forms of learning like lifelong learning, informal learning, experiential learning and collaborative learning.

2.2.1 Social Cognitive Learning Theory

The concept of social cognitive learning was presented and advocated by Bandura in the broader context of social learning theory. Bandura (1986) renamed this social learning theory with social cognitive learning theory as a better description of his actual mind. The purpose of this theory was to predict individual and group

behavior and to identify method to modify and change behavior. Social learning theory defines behavior as a triadic, dynamic and reciprocal interaction of individual factors, behaviors and the environment. In this theory, the major focus was placed on human cognitive with their social experiences. Bandura (2009) argued that there are certain factors that affect human mind, particularly in this modern high tech world. These mediums play very significant role in shaping and molding thinking process of the mind. The question related to the process of cognition influences development of behaviors. Jonassen (2006) explained that modelling in cognitive learning occurs when ICT is incorporated and that promotes the idea of modeling or vicarious learning. In social cognitive learning, the new concepts like reciprocal determinism, self-efficacy and temporal variation in time lapse between cause and effect relationship. The mind is an active agent of learning, so many concepts are stored in form of symbols which later on one exercises.

The three factors of person, environment and behavior play a very important and pivotal role in shaping one's behavior which is regulated antecedently through cognitive process, so the behaviors usually form expectation which results in behavioral outcomes. Drior (2011) stated that a cognitive approach to e-learning can also bring about new approaches to learning, and open up new possibilities for improving patient safety and care (such as training for error recovery. A cognitive perspective is critical if we want to live up to the opportunities and challenges that technology offers us in medical training. This behavior is mostly learned vicariously. Jones (2001) argued that the human mind, is of course, an active force which always constructs one's own reality by selecting and encoding information. It obviously performs behavior on foundation of values, human expectations to impose structure

on its own action. It is done by feedback and reciprocity through person's own reality and interaction of the environment and cognitions. Kim, & Reaves (2007) defined as "the learner, tool, and activity form a joint learning system, and the expertise in the world should be reflected not only in the tool but also in the learning activity within which learners make use of the tool." The cognitions change as a function of maturation and experience. It depends on understanding of the process of constructing reality to enable human behavior which could be understandable, predictable and changeable. Social cognitive theory consists of the following constructs. Kim, & Reaves (2007) further argued that "A cognitive activity usually reflects some aspects of all three cognitive distributions: social, symbolic, and physical. For example, brainstorming for ideas as a team exemplifies social distribution of cognition among people. Drawing a diagram on the board to visualize their discussed ideas reflects their dependence upon the symbolic and physical distribution."

Sharpel, Tayler & Vavoula, (2005) emphasized that cognitive learning is associated with technology including 21st century skills apart from cultural context which indicated control, context and communication. They concluded that it describes a cybernetic process of learning through continual exploration of the world and negotiation of meaning, mediated by technology. This can be seen as a challenge to formal schooling, to the autonomy of the classroom and to the curriculum as the means to impart the knowledge and skills needed for adulthood. But it can also be an opportunity to bridge the gulf between formal and experiential learning, opening new possibilities for personal fulfilment and lifelong learning.

2.2.2 Reciprocal Determinism

Bandura (1968) defines behavior as a triangular process of reciprocal interaction of the environment, personal factors and behaviors. It is very difficult to measure the influence of all the factors and the question whether they have equal strength or not remains unanswered. Although it accepts that most of the factors had stronger influence than the other and it is not necessary that all factor affect simultaneously. The interaction of triadic factors differed depending on the individuals, their particular behavior which could be examined in specific situation where it occurs. This model seems complex so far as it does not clarify some of the things which it presented. Bandura (1989) extended an example for the expectations of human being, their beliefs and their self-perceptions of goals and intentions that give format and paths to future behavior which is later carried out and affect one's own thought and emotion.

There are some other biological and personal factors like sex, ethnicity, temperament and genetic predisposition that also influence behavior. Bandura (1989) further explains that personal characteristics are developed by the result of interaction that modified the human expectation, cognitive competencies and beliefs through social influence and physical structures of the environment. These influences could perform as a source of knowledge, human reactions by following it as a model, which attracts them to be persuaded and practiced. He further advocates that humans are inspired and instigated differently from the same social environment interaction even if they had different backgrounds as age, race, sex and physical attractiveness. Finally, in this context, Bandura considered people as both product and producer of their environment. Behaviors are determined by the environment to which they are

normally exposed and that can be modified and diverted. A behavior is an opted experience with the environment through a selective attention. Human preferences and competencies are selected through a vast range of possibilities. These practices determine an environment for further behaviors.

In reciprocal determinism, the people are not free agent of their own free will but they had ability to influence their own destiny. They are not automatically being shaped or being controlled by the environment. These are the inner forces that do it. They can be characterized by five basic capabilities that included symbolizing, self-reflective, vicarious forethought and self-regulatory which develop the cognition process for determining human behavior.

2.2.3 Symbolizing Skills or Capability

Social cognitive theory strongly advocates that external influences usually affect behavior by cognitive process. Bandura (1989) considered that the symbols serve as a mechanism for thoughts, by forming symbols, images, words or mental pictures, a learner had the skills to interpret, create links with his experiences to make symbols, store information and guide human behaviors through observing the model behavior. Generally symbols perpetuates a process that grant permission to mind to solve problems as well as engage itself in foresightful activities. It is usually a foresight which enables to realize results of activities which are normally performed. Bandura (1991) supported that there is a relationship between language acquisition and cognitive development.

2.2.4 Capability of Self Reflection

Reflective capability is a skill which enables human to make analysis of self-experiences, critically evaluate personal thought process to amend or alter

their mind accordingly that generates self-efficacy which determines self-regulation. It is a reflective process of one's own behavior, actions, activities and postures. Self-efficacy is developed in lieu of the obtained goals and objectives in a special area, observation of other success and failures, persuasion of others or own physiological state while performing a behavior. School results, grades and awards are strong sources of self-efficacy.

2.2.5 Vicarious Skills and Capability

Bandura (1991) emphasizes that learning does not depend only upon direct experiences but also observing the environment. Thus, observational learning permits to make ideals to be followed at later stage, the observed action is coded and used as a precedent for future actions. It has taken a vital place because this process makes human to repeat the patterns rapidly. It also avoids time consuming trial and error which can be costly and fatal. It allows exploring situations and activities to achieve new knowledge in less time, resources and mobility. Just like social media and internet both broaden the vision about models and their activities as one interact with them daily, transcending the boundaries of local environment. Vicarious learning is based on four processes which include attention, retention, reproduction and motivation.

The following diagram is a presentation of symbolic learning model and its different stages that are interrelated and connected. It shows that the first stage is attention stage where learner carries out observation and interactions with objects coming into his way. The second stage is retention and reproduction stages which are the same because when a learner retains some action or information which are so many but he can only produce a few of them because he could retain a few in shape of

action or activity. The next stage tells us about motivation that he has intention to perform the same act in future.

Symbolic Learning Model

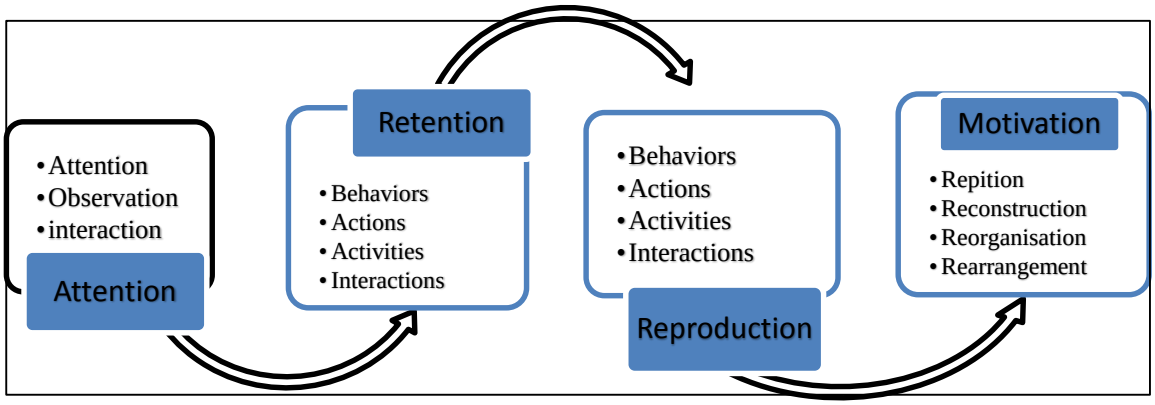

Figure 2.2 Showing Symbolic Learning Model

The above figure shows four indicators of learning in light of symbolic learning model because it says that learning takes place by paying attention or by observing things, then retaining some and rejecting others and later producing the action in similar way. The last stage which keeps this learning experiences live is motivation, so if there is motivation, then this action will be repeated time and again. If there is no motivation, the action may be forgotten and discarded from human behaviors. The details are given below;

- Attention Process

This phase of learning enhances the ability to observe an action and behavior which is available in the environment and it reflects upon the core or particular information that is learnt by every observation. The observer might have some particular abilities which vary from person to person, environment to environment, age to age and personal background to past events. The observed activity itself may get more attention of some and less attention of others. The observer characteristics

and retained observed activity that usually controls and regulate the magnitude of observation which had been exercised. These types of activities mostly influence the amount of attention one gives to it and later on selects it for future course of action. The association between the model and the mind can be short term or long term. In both cases, they remain in his memory.

- Retention process

It is a process in which symbols are formed of the observed behavior that is earlier stored in the memory. After forming and storing these symbols, they need to be changed into suitable forms for modeling to take place. There are two steps in retention process, the first is to store information or observed behavior in memory. It may vary from person to person, depending on the ability of the observer and his/ her sense of observing minute things or just keeping some important ones. The previous knowledge is also critical and the angle from where it is being observed. The second step is converting it into manageable and appropriate forms. This conversion also depends on knowledge and background information of the observer and his environment. This phase needs to be well directed because there are chances to make incorrect conversion.

- Reproduction Process

The reproduction stage is the key stage which determines how the learning has taken place because, at this stage, learner performs the action and behavior which he has modeled and apprehended so far. This practice may be for longer period of time or it can be short. It depends on the feedback which one receives from his peers and colleagues. The question is how to practice on it, when it occurs. There can be a

difference in modeled behavior and pursued action because there is mental activity which requires intelligence and wit to exercise fully and completely.

- Motivation Process

This process takes place when one acts upon the model and sometimes he gets social approval and sometimes he does not get positive feedback. The degree to which an exercised behavior results in social arena would have affected a modeled behavior in future. The expectancies of the action complete motivational process.

2.2.6 Forethought Capability

Most of the human behavior is purposive and regulated by thought. Bandura (1989) claimed that capability of forethought motivates and guide the action anticipatorily. The stimuli leave an impression by the expected action outcome. There is a relationship of contiguity with previous experiences that developed a behavior performance. The expected outcomes are usually more than the actual happenings that do affect the possibility of an action to be performed again. They hint out to one's assessment of expected outcomes. The skills to rearrange a person's behavior support mechanism for foresightful behavior, which is based on expectations and expectancies that is possible because of the capability of symbolizing. The process of forming symbols permits one to represent coming events cognitively during current time.

2.2.7 Capability of Self-Regulation

Bandura (1989) suggested that external influences are mediated by the self-regulatory systems and it provides foundation for purposeful action that is why people have control over actions, motivation, thoughts and feelings. The concept of self-regulation covers a mechanism of internal controlling that regulates the performed behaviors and its results. It also grants permission of systematic alternate of covert

controls for overt control of behavior. He further adds that self-regulation takes place through the activity of environmental sources to influence the actions that formed motivation, moral and social standards. The applications of the motivational standards for guidance of an action are results of a long process of discrepancy production. Usually, people set goals for them and compare them with their personal achievements. In this process, standard could mold and motivate him to work hard for change in behavior.

Motivation can occur internally or externally in form of praise, grades, marks and appreciation to achieve a standard. Self-motivation is led by three factors, anticipated time, feedback and self-efficacy for achievement of the goals. These moral and social standards usually regulate the persons' behavior. The relationship of conduct and thought is facilitated by the practices of moral agents. Self-evaluation is a process of self-approval that mostly internalize moral standards to organize human conduct. In case of a person internalizing an idea that law violation is a bad habit, resultantly he would impose sanctions on himself to keep and follow his conduct according to law which is an internal process. He may compare himself with a developed nation and consider himself as a responsible citizen. This process will regulate his behavior and he will stop violating the law.

Bandura (1991) believes that moral standards emerge from a variety of influences, the first and foremost is by instruction which is the easiest way to develop standards, the second type of standards can be developed through feedback and other's response to an action or behavior particularly by those who matter a lot for one, the third by modeling of moral standards by interacting, discussing, chatting and physically observing others. Fourthly, they can be developed by organizational

systems, encompassing education of religion, media, political and legal organizations. He emphasizes that sensory use of human mostly overwhelms the oral instructions as it is observed in the "bobo doll" experiment. It is not necessary that people follow all types of behavior that they are exposed to but they select some and reject others. The social standards are always relied on the level people value an activity, their perception of individual personal management of behavior. This is the way self-regulations takes place which could internally maintain pro-social behavior.

2.2.8 Digital Media Impact on Cognitive Learning

The digital media impact on cognitive learning varies from one generation to another as Taylor, Sharples et al (2006) classified two types of learners, Old Millennium Learner (OML) and New Millennium Learner (NML). As per their classification, the first is less prone to work with ICT while the second is more comfortable and quick in learning through ICT. They placed following characteristics for both of them. Old Millennium Learners already know the specialties of the instrument they interact. They do not accept changing them. These users believe that using digital gadgets is neither a tension free activity, nor it is time saving but it is also confusing and unpleasant too. That is why they always stick to the old techniques they are using.

New Millennium Learners are able to operate in more abstract space and less rigid. They can easily adapt themselves with new gadgets, prefer to use and experiment with new sets, consider package, price and utility of the mobile phone and they are always ready to change it whenever possible or manageable.

2.2.9 Online Education and Learning Skills

Selwyn (2011) suggested the following online learning skills, the first, is aptitude that includes being comfortable with a self-learning environment, having a good time management skills, being self-disciplined, being self-reliant and self-motivated and having the ability to read and follow written instructions. The second, the learner needs to have computer skills that include the basic computer literacy as locating files on hard drives, flash drive and servers, saving them on particular place in identifying the folders, modify or delete it and upload and download skills. The third, the learner needs to have emails skills as creating email address, open, save, compose, forward and send emails.

Craft (2012) confirmed that the learner must have skills to add name and address book, paste text from word file and send attachment and open it. The fourth, the learner needs to have a browser skills that is going to specific URL webpage, print a page and follow hyperlink text, search topic by using browsers and going back to previous page. The fifth, the learner needs to have word processor skills that include opening a new document or opening an existing document, save a document, cut, copy, paste text, print a document and format text then save it. The sixth, the learner needs to have skills to connect internet, find its speed and join social networks, obtain their membership and develop interaction and communication skills with other members. Geer & Sweeney (2012) supported the same requirements for online education and learning skills for college students.

2.2.10 Twenty First Century Learning Skills

There has been a significant shift over the last century from manufacturing to emphasizing information and knowledge services. Knowledge itself is growing ever more specialized and expanding exponentially. Trilling & Fidel (2009) believed that

information and communication technology is transforming how we learn and the nature of how work is conducted and the meaning of social relationships. Shared decision-making, information sharing, collaboration, innovation, and speed are essential in today's enterprises. No longer can students look forward to middle class success in the conduct of manual labor or use of routine skills – work that can be accomplished by machines or easily out-sourced to less expensive labor markets. Today, much success lies in being able to communicate, share, and use information to solve complex problems, in being able to adapt and innovate in response to new demands and changing circumstances, in being able to command and expand the power of technology to create new knowledge. Hence, new standards for what students should be able to do are replacing the basic skills, competencies and knowledge expectations of the past. To meet this challenge, institutions must be transformed in ways that will enable students to acquire the creative thinking, flexible problem solving, collaboration and innovative skills they will need to be successful in work and life.

Moresch (2010) explained learning skills as 21st century learning, the first is critical thinking and problem solving, the second is creativity and innovation, the third is the collaboration, teamwork, and leadership, the fourth is cross-cultural understanding, the fifth is communications, information, and media literacy, the sixth is computing and ICT literacy and the seventh is career and learning self-reliance. All of these skills can be enhanced through ICT because it has opened up new horizons for human being.

Taylor (2006) sees an opportunity among youth to have skills of adaptation among cognitive functions by interacting with multi-dimensional and more complex

devices as compared to their parents. That is why their learning is more authentic and quick because this whole process is funded by these devices.

Taylor ,Sharples and Vavoula (2005) explaining mobile learning stated that it is imperative to distinguish the basic characteristics of mobile learning and other type of learning process. A vivid distinction is the assumption of learning while at move which is a continuous process. The mobile learner collects and gathers ideas, information from one location and applies or replicates it in another place. Time does not affect them because learning can takes place at any time and any place, he actually revisits knowledge putting different contexts, making generalizations, concluding results and modifying them as per requirement of the situation and making himself as lifelong learner. The theory of mobile learning has to embrace a large amount of learning that happens outside classroom and many other formal learning places because people started to construct their actions as structured one depending on educational activities.

Vavoula (2005) reported that adult learning mostly occurs at home, office or work place as it is 52% of the whole learning. The remaining part happens at outside office, friend's house, leisure place, worshiping and other places. It proved that it is not necessary for mobile learning to move physically but learning can occurs at any place, at any time and at any form. It was suggested that there are chances for development of new technology to be utilized for learning during traveling as human spend most of their time in travelling. Three examples have been included, the first one is about three children with IPod under a table in classroom to have a private learning space, the second one is about an adult who wants to get a print, having all things but does not know, fortunately visited by a friend who settles down things for

him so he learnt it for life time. The third one is a value depending on contemporary accounts of practice for successful learning.

The US National Research Council (1999) conducted research on educational effectiveness across ages and subject area and concluded that effective learning is learner based that enables them to learn from their own experiences so it has to be preferred on other types of learning. The findings directly supported the social constructivist idea that considers learning as not passive but an active process of knowledge building, practice in a community resulting in personal enrichment and development with conceptual change. Finally, the ever presented use of shared technology and mobile phone need to be focused as in UK, 75% population keeps mobile phone.

Crabtree (2003) surveyed university students and found that only 43% students had laptops showing a disparity but after ten years, the ratio must have increased up to now. The students have portable computers, mobile phones, cameras and music players that prove an ownership of one of the technology gadgets. A newer trend had been observed that states are going to prefer mobile phone technology in place of fixed networks particularly in rural areas. That is why there is almost all parts of the world are covered under the umbrella of mobile phone coverage. It has boosted the idea of learning through mobile especially in remote areas.

Leadbetter (2005) concluded that learning is being reorganized and restructured because it has become a personalized, individualized and learner based activity as new technologies had offered students oriented services. Now the learning had not been traditional classroom based activity only but a situated and collaborative learning practice that had enabled people to develop communication links across the world.

Banks (2004) stated that technology embedded devices are major sources of learning as it could be observed in photocopiers and television, both performed human functions themselves as they keep a user manual with them. Their durability is also extended as new software packages help us to last a longer time. People can store, arrange and preserve their valuable documents and they are retrievable when they are needed.

Vavoula (2004) believed that learning is a dynamic activity which could not be separated from daily routine actions. The questions whether we can classify learning and non-learning activities which are a very difficult because all type of activities involve some or the other type of learning as all activities are interwoven. Learning takes place when human wants to satisfy their goals and objective either they are externally set or generated by oneself. The process of generating and regenerating continues as learning broadens by forming new targets, goals and expeditions. The difference between class room learning and mobile learning is that the first is linked with teachers, course contents while mobile learning is associated with many resources like guides, technologies, plants, animals and buildings including teachers and books. Context is like a shell and the corner of the shell is looked by the learner so different learning experiences had different context and they may mean differently. It is the interaction and exploration of the learner which makes it complex, dynamic or simple because environment matters a lot.

Sharples (2007) had reservations that mobile learning forms complementary or conflicting entity with formal education. The classroom learning might be extended to other places like field trips, home visits and interaction with digital technologies. Review of material given by teacher or collection and analysis of information on

mobile phone may disrupt the classroom environment which is carefully managed. The conversation with people outside classroom and sending text messages are some of the barriers for learning through mobile phones during an active class lectures.

Gemmell, Bell, & Lueder (2006) proclaimed that mobile phone learning stipulated many serious issues such as ethics, privacy and ownerships. The mobile phone is a helpful device to organize, allow and reflect upon the recorded pictures, sounds and lectures after the classroom. For lifelong learning and short memory students, it would be a powerful device to keep and check records an additional learning aid. The parents and teachers may also check their activities and it would become an extension of school activity while they are at leisure.

Sharples (2005) explained that tagging devices on mobile phone would affect privacy law but they are more useful for parents and teachers. Considering its benefits, it is not only another type of learning but also another type of complete learning package as before emergence of computer technology, the mass print era emphasized on text books as medium of instruction. Today, it is needed to re-conceptualize the construction of knowledge as processing, modeling and interacting process depending upon conversational context through mobile technology.

2.3 Future Trends in Learning

There are many challenges for the 21st first century but the most important is how learning and socialization process be delivered to masses. The nature, style, method and pattern of learning needs more focus and attention because these are the areas that have to be in right direction. The international communities are taking drastic actions and provide all possible facilities to the poor nations to achieve

millennium goals. Some of the countries have already adopted a range of nontraditional education patterns and encourage those education providers who are ready to accept changes. These changes will remain continuing as the technology has long lasting effects on it. There are two important questions to understand; the first one, is finding out the way students perform learning better and second is identifying the patterns of teaching that leave impact on learning.

The other changes like globalization, modernization, movement of learners, e-learning and mobile learning are newer concept that will change the nature of learning apart from lifelong learning, flexible learning, mass education and apprenticeship. Many researchers have proved that there is a shift in learning from traditional forms of teaching and learning toward physical interaction or more specific self-directed learning, students centered strategy and problem based learning. Technology, particularly internet and mobile, would have a great impact on the process of teaching and learning. Online and distance learning will decrease the value of class room attendance as a formal mode of learning. It may take the shape of a blended learning where all the parts will play their role.

2.3.1 Concept of Blended Learning

Blended learning is a new concept which focuses on learning rather than any of the forms of learning. It includes formal learning, informal learning and social learning. The first one enhances learning as road shows learning: conferences, educational forums, instructor led class room, professional video, virtual world and taxonomy. Informal learning envelops the learning by mentoring, live web casts, recorded webinars, video conferencing, workshops, coaching, websites, case studies

and books while social learning will cover wikis, discussion forums, internal you tube tagging, user generated contents, blogs, folksonomy, social networking, comments and web chats. The dimension of learning will be changed and learning will take place by all of these sources, not depending on either of the sources. The world has become broadened in learning and shrunk distances by communications, the development of one place and area definitely effect the other so is the research of one county can be used by many countries at the same time. The following chart shows a very good picture of the sources of learning in future.

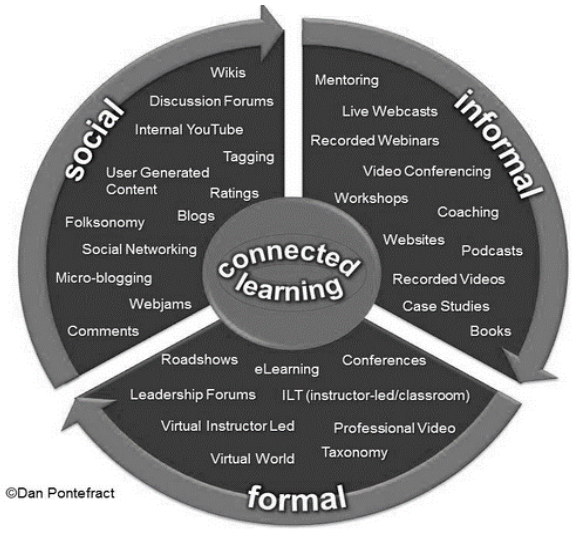

Figure 2.3 Showing Connected/ Blended Learning

2.3.2 Authentic Learning

It is a new modern term used in educational arena. It means a learning of the natural world, its complicated issues and sorting them out. It uses exercises, activities, role playing, case studies and taking part virtually- by means of television, internet and mobile phone. The multidisciplinary learning is not studying one subject only in books or in computers but practical work like managing a city, flying an airplane and

finding solution of the problems. Authentic learning goes beyond contents and grabs the opportunity to take head on the issues, using mind and other body faculties.

This type of learning is used in apprenticeship, but it is difficult to manage students at a working place because of their number and the working environment where space is limited. It needs to be carried out by using careful design of web based learning environments, it is low cast and provides same opportunity to an ordinary student to get access to a world class working environment. A few of the examples can be given of this type of learning as internet depended authorization to wireless data provided opportunity to us to discover horizons left over by the scientists. The same is the case with history students who gathered conclusions themselves about sociology and history of the time. Through internet, the access to rare and expensive devices which is made easy for students to interpret data for themselves and develop new hypotheses. On the other hand, technology has made novices experiential learners able to visualize images, develop abstract models without using physical material and resources.

Access to digital data bases and archives guarantee authentic learning experiences using communication of the web as tool to help students finding each other's help easily. Social networking, blogs, e-portfolios, quizzes and video conferencing can add more value to learning in this environment. Developing software at one side and presenting things in simulations is another type of learning. So authentic learning is learning not necessarily learnt in real life situation but can be learnt and grasped in form of symbolic learning, particularly in engineering, other sciences and generally in humanities.

It seems that in coming years, a brilliant picture of simulation of schools, universities, clinics, workplaces and laboratory would supplement the traditional experience placement which would be only be possible if they could get quick access to family of mentors, to the sources of global network and to one another. The authentic learning is necessary to have high speed internet connectivity, synchronous and asynchronous communication and social networks, intelligent tutoring system and virtual laboratories with feedback mechanisms and mobile devices to feed and quick access of data. There is also need of some experts to provide quick feed back to the learners.

2.4 Theoretical Framework of the Study

The method and pattern to carry out research is mentioned below as there are six columns stating model and its steps then the mediums to carry out and sources for analysis and then findings;

Table 2.1 Theoretical Framework of the Study

Model	Steps	Medium	Contents of	Sources	Results
Symbolic Learning	Attention	**Learning by ICT**	Internet	1 Questionnaire for University students	Findings
	Retentions				Conclusion
	Reproduction		Mobile Phones	2 Questionnaires for Teachers	Recommendations
	Motivation				

The concept starts with symbolic learning which has four stages; attention, retention, reproduction and motivation. These stages were scrutinized by the opinions of university students and teachers, the media was internet and mobile phone and

tools was close ended questionnaires. The collected data led the research to draw findings, conclusion and suggest recommendations.

The below mentioned figure is a true representation of patterns of symbolic learning model as it displays the four stages of learning presented by Bandura. The first one has a broad spectrum and covers a vast area while the second begin to narrow down and third shrink further and fourth, further. It tells that learners have attention to many things but they retain lesser and reproduce, lesser. The last motivation is the smallest as below model shows.

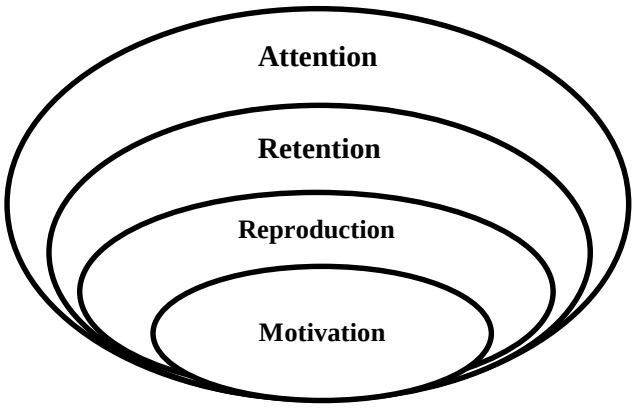

Figure 2.4 Patterns of Learning in Symbolic Learning Model

The above figure shows a true picture of the symbolic learning which evolves four stages, the first stage comprises the observation of the learner what he/she sees around him in physical form or in symbolic form like internet and mobile phone. Under his observation, there are many programs, sites, search engines and social networks; a huge world of digital media is exposed to him. First time, he may open it for no particular purpose but later on he has to make a choice which covers retention stage, the next is reproduction what behavior is being reproduced by him after interaction with these things. The last, but not the least, is the motivation which inspires him to do an action or he designs a motive to perform certain actions.

The concept of symbolic learning is derived from Bandura (1977) social learning theory which states that the observation is the major source of learning when it is made possible by modeling which is called symbolic learning. Social learning theory advocated that symbolic learning could happen in context of symbolic learning model, described earlier as well as below.

2.4.1 Symbolic Learning Model

This model encompasses an idea that modeling takes place through media, including radio, television, internet, movies and literature. It evolves a natural disposition demonstrating in the behavior. Observation stipulates an idea or pattern of behavior performance that later provides clues to an action. Bandura (1977) further elaborated the Modeling Process by saying that it is not necessary that all observed behaviors are learned proficiently. There are many factors related to the model and learner that make learning effective. The important point for symbolic learning model is learner interaction with people, places and things, this interaction is very vast and big but the learner retains some of the things he observed, then whenever a situation arises he performs those retained behaviors, generally he repeats those actions that he likes and he has a motivation to act them. Not a single action is required but different stages are needed to follow in modeling process and they are mentioned below;

- **Attention:**

Merriam-Webster dictionary (2014) defines attention as the act or state of applying the mind to something or a condition of readiness for such attention. It also involves especially a selective narrowing or focusing of consciousness and receptivity. It further elaborated a view to action, as a position assumed by a soldier with heels together, body erect, arms at the side and eyes to the front in arm parade. James (1890) claimed that attention means possessing or taking in custody of mind

with clarity and vividness. It includes quite a lot of concurrently possible objects or trains of feelings. It is an action of extraction from one thing to deal the other effectively. It is observed that in general writing, we make bold or italic words to get learner attention or sometime make graph, chart or table that takes attention of the reader. Attention means to divert concentration to a particular thing to have a better view of it or to understand it completely.

Paying attention is imperative to learn. The action that distract one's attention might cause negative effect on learning, particularly when it is observational. Making the model attractive, interesting and novel would have a positive effect on learning and congregate full attention and dedication of the learner. So the architecture and construction, design and development had to be accurate and correct so that it could be understood by learner effectively and easily.

- **Retention:**

Merriam-Webster defined retention as an act of retaining or the state of being retained. It is an ability to retain things in mind particularly a preservation of the effects of experience and learning that makes recall or recognition possible.

The skills and abilities to retrieve information play a vital role in learning process and practice. Retaining of information could be affected by so many factors. These factors involve mental abilities, collecting events step by step and withholding them bit by bit, maintaining their sequences and remembering all details of the observed behaviors.

- **Reproduction**:

Reproduction is a process to reproduce things, concepts, ideas and thoughts in the same form or other forms. The skill to perform this act is called reproduction. In

symbolic learning, it is used for the students to reproduce and redevelop the knowledge, skill and values which makes one learner better than other.

Finally performing them and carrying out as they were observed in their true perspective are vital parts of observational learning process. Reproduction is the process of filtering out errors by doing it again and again that might lead to improvement of the action and advancement of the skills.

- **Motivation:**

Motivation is a driving force that draws human being toward some action. Just like hunger is a motivation which elicits a desire to eat. The roots of motivation are in physiological, behavioral, cognitive and social areas. It is an urge to minimize physical, mental and emotional pain and maximize well-being of human being. It originates from basic needs like eating, drinking, sleeping and resting. It is an inner move to behave or act in certain manner. These inner conditions like wishes, desires and goals keep one activated to continue struggle in particular direction. The successful learning depends on motivation and skills to imitation of the model. The external stimulus, positive or negative, could boost, heighten and increase motivation. This reinforcement can be internal as well as external and sometime it is exercised without any type of motivation. Competition is also a constructive element of motivation as it is observed in the class in case of early arrival but there are some students who always come on time without any type of motivation.

The following evidences show that there is a mixed responses for and against the media effect but the people against media do not claim that media does not have any effect, they advocated that media has an effect on social life but it has a negative effect on academic life.

Terry, Lewer & Macy (2003) & Leuven et al (2004) advocated that they did not find a relationship between use of ICT and student performance. A consistently negative relationship was observed but they admitted that there is marginally significant relationship in using ICT and student academic performance. Coates et al (2005) differed and pointed out in comparison of online teaching and face to face teaching methods, considering students' individuality and students' choice of bias, the student in online format performed 15% higher than the traditional one. He emphasized that online teaching brings more positive results than traditional methods.

Sharples (2005) stated that there are some of the issues of mobile learning which pertain more generally to informal learning, the distinguishing side of mobile learning is its mobility, arrangement and distributed participants on one side and on other side, their interaction of learning and portable technology. Considering mobile learning as an educational interaction might miss its broader significance.

Vavoula (2004) stated that the learner is a mobile one rather than the technology. As a start, his focus was on particular portable technologies but as a result of successive studies of MOBI Learn project, he concluded that interaction of learning and technology is complicated and wide ranging like personal gadgets to other gadgets where he goes and moves. Learning could not be separated from daily activities, it is interactive and inter woven process that is unstoppable at any stage.

Harrison (2002) defines that the special distinctiveness of the media or medium, the content of media or a medium and a definite factor within firm forms of communication may have diverse impacts but they do affect human mind as stated by Bandura.

Salmon (1984) expressed that all of the concepts and their process, apart from many others, can be considered a causal agent in the studies of media effects. The social scientific philosophy had undergone multiple changes due to it.

Biddle, Fox and Boucher (2000) pointed out that media has deprived the student from extracurricular activities and other socio physical activities. Their claims seem to be true in our situation as the students prefer to stay at home rather than playing in the fields, there may be shortage of play grounds particularly in city areas which is depicted in our performance in sports and games. We are among top ten world populous countries but in sports arena, we remain in the last slot of medals.

Boreham and Reddoch (2001) emphasizes on physical activities as integral part of learning for physical, mental growth and development. Physical activities also avert the daily tension that arises from different sides. If there are more sports activities, less crimes lesser anti-social activities

Arya (2004) stated that the time spent on electronic media is many times more than the time spent on book studies. It is because people like to watch and interact through digitalized sources rather than physical contact. They are more attracted to visual things and they like to share things with the friends whom they know on net and mobile phones.

Vavoula (2005) presented how media can help in mobile learning and its effects on students learning abilities. He advocated that mobile can be used for learning and it will be a very useful and result oriented learning because student of digital age like to learn from digital devices rather than using old traditional methods.

Topper (2002) endorses that web based learning will take place in future so the students will be involved in on net rather than on books. It suggests that there is an urgent need to have digitalized curriculum to cater for future needs of the learner and

to attract their attention. The idea of web based learning is rapidly growing among developed countries and the developing countries need to foresee the future of it clearly if they want to compete and challenge world market and knowledge economies and societies.

Sun and Zhang (2006) proposed moderating factors in using technology in schools and colleges for academic purposes. They emphasis on the ways to incorporate and embed the digital learning through information and communication technology which will be the future of the world and knowledge based societies.

2.5 Review of Related Studies

Sheikh (2007) made analysis of role of television and social change in the country. It identified the nature of television viewership as compared to other medium of mass communication. It finds changes in other social elements as culinary practices, their attires, house construction, architectures, house decoration, music traditions, social customs, and celebration of festivals, education system, clans and family system concluding that change occurs in all sphere of life.

Bickham, et al (2006) explored television viewership, the time they spent on it, television contents and peer integration along with its effect on them. In conclusive remarks, it was stated that more the students watch TV, the less they have time for their friends. Resultantly, they have poor peer relationship and suffered social isolation and anxiety disorders. They are socially bent toward antisocial behavior, agoraphobia, aggression and gang participation.

Shah et al (2005) concluded that media plays significant role in learner life but how can it be averted. He suggested that stopping media is almost impossible. This world is world of screens and computers which has shifted people attention toward

electronics rather than traditional reading and writing. If change is not adopted and modified as per requirement of the time, then ICT would do it itself.

Lippert and Forman (2005) suggested technology model does have a value that could raise serious issues like technology mapping, technology adoptions and their parsimony and generality. Supplementary theories and models are needed to incorporate and inculcate social change by digitalization. Social learning theory anticipated its width and breadth for technology acceptance. Theoretically, it proposed different learning aspects that had potential to enhance digitalized curriculum and learning by using high technology.

Stoel and Lee (2003) advocated the concept presented by social learning theorists earlier and later in self-efficacy theory. There is a confusion conceptually and operationally of the knowledge in its purest form and experience in its practical form with self-efficacy.

Harris et al. (2003) criticized that very little was developed and designed so far to meet and manage internet knowledge as one of the reliable and valid construct. There is need to examine potential effects of internet acceptance. It means that there is need of the time to maintain and develop such type of learning activities that could meet the chances and challenges of the coming years effectively and efficiently. The nations who will do it may surpass the others in world knowledge based economy.

Potosky (2007) confirmed that computer and internet knowledge has directed the way and patterns of life of the learners in day to day life. He did not mention which way and life pattern were directed and how they were directed. It is true in the European context where mobile learning and technology have taken deep roots and

scholars are searching out for the contents of learning which could be delivered to the students through mobiles contents.

Cheung and Huang (2005) stated that the Internet has become one of the major source for integration in school and college education in the world. The teachers and students are encouraged to communicate to interact via internet and mobile phones. The use of hard copy notes might be avoided and material could be uploaded for students. The instructions given on net are easily accessible and manageable because students pass most of their time on net and they have their peers and groups to share their ideas and beliefs. Physical travelling, displacement of oneself, carrying out load of books, boosting traffic problems daily and suffering from daily travel fatigues can be avoided by using ICT mode of learning. They further argued that the future is going to become digital and virtual. Effective use of internet can play a vital role in determining students' academic success in their institutions. The studies show that the learners using internet perform better than those who do not use it which is a clear indication of the importance of internet and mobile phone learning.

Wei and Hindman (2007) said that the civic participation and political awareness make people learn and consult toward media when it takes a shape changing forces. The idea of change got spread and propagated depending on the speed of information and rational analysis of things. The digitalization has clearly demarcated the areas which need changes and certainly these changes are big challenge as well.

Selwyn (2004) explained that a purposeful commitment with the Internet could have developed a unique and tremendous impact on social quality,

communities, individuals, social inclusion and cohesion and the masses empowerment. It would enhance general public and particular students' abilities to meet their demanded role in the society.

Oliver (2007) discussed that the participation in other social activities, other than school are usually neglected because of internet and mobile phones, but the example from studies in America refuted it and they show a positive effect on sports participation. Therefore, the participation in sports and curricular activities are nil because one of the factors is that students keep themselves busy in playing and chatting on net and mobile than going to the playground.

Ma, and Streith (2005) concluded three important perceptions of students and teachers that could affect their learning through ICT. The students and teachers considered usefulness of technology, ease of use of it had positive effect while possible external influence had no direct effect on their intention to use computer technology. The perception of students and teachers needs to be clarified and rectified to use ICT smoothly in the learning process.

Dong (2003) declared in his research findings about faculty, researchers and students use of internet that men use internet more than women. The study discovered that students used e-mail 84.8% browsed WWW 58.2%. The use of ICT was learnt by them through self-instruction 46.1% and by friends or colleagues 35.7%. The statistics show that ICT learning can be self-directed and needs not much of classes and regular programs.

Mamtora (2003) wrote that academic staff of the university used e-mails to communicate and explored WWW to find information and learning material. It was

recommended in the study that a training session had to be conducted about how to use internet effectively. Nasir Uddin (2003) concluded his study revealing that faculty used internet for e-mails as 88.07% while 70.64% used WWW resources. Apart from these the faculty use internet for seeking information about overseas education and learning 74.31%, about publication and research 68.81%, about higher education 53.67%, about conferences information 44.05%, about library resources 29.36% and about job seeking 29.36% which showed that majority of the faculty member were using internet facility for academic purposes. Academic purpose stands out for using this facility for improving teaching learning process among universities in social sciences.

Momani (2003) wrote about his investigation of internet use by the faculty considering satisfaction, nature, extent and purpose. The study revealed internet as an effective tool for exploring information and searching research communities. Although the respondents had certain obstacles like lack of speed, lack of access, lack of time, lack of training and lack of university administration support.

AL Ansari (2006) conducted similar study in Kuwait University where he found the pattern of internet use including purpose, impact, resources and problems faced by them. The respondents were from different schools of the university and structured questionnaire was used as a tool. The findings included that internet used for communication, research, and publication with positive impact but again the respondents complained against slow speed, lack of access from home and lack of time.

2.5.1 Current Scenario of ICT in Pakistan

There is no doubt that Pakistan is facing many challenges. It needs to confront these challenges boldly and sagaciously. It has talented youth among its population. Pakistan is situated in south Asia, one of the big users of internet and mobile phone. The statistics dispaly that Asia uses 44.8% of the total internet use in the world which tells us that how big the scope and market of internet is in Asia.

Pakistan is a developing county, having many internal issues like terrorism, literacy, health, rule of law and unemployment and external pressures by big powers to deliver more. It is one of the least literate country in the Asian region, having literacy ratio of about 50%. The population of the country is very dense that means 6.2% of the world population lives in Pakistan. It is fourth largest contributor to the non-literate population which can be estimated that by the year 2015, the county's non literate population will cross 55 million, even then they are one of the main internet users in the world. In spite of all these factors, the internet and mobile use is rapidly increasing and about more than 50% of the population, including women, have mobile phones. The scope and capacity of using mobile phone as device of learning and literacy can be seen and used for development of mass literacy program and good citizenship.

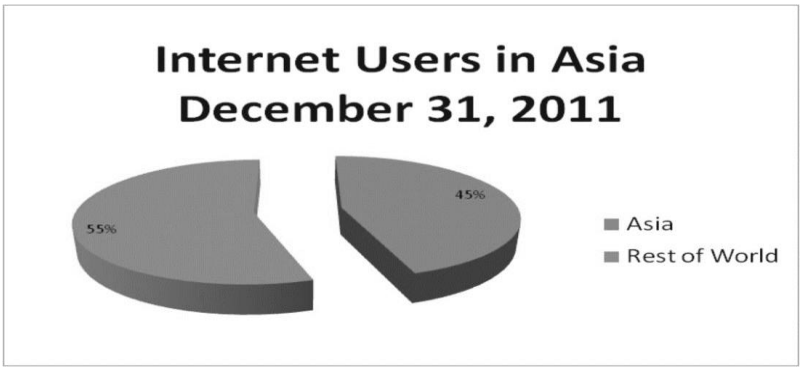

Figure 2.5 Internet User in Asia

In Asian countries Pakistan stands out prominently as it is heading Malaysia and Thailand in internet use, the following tables shows the exact figures.

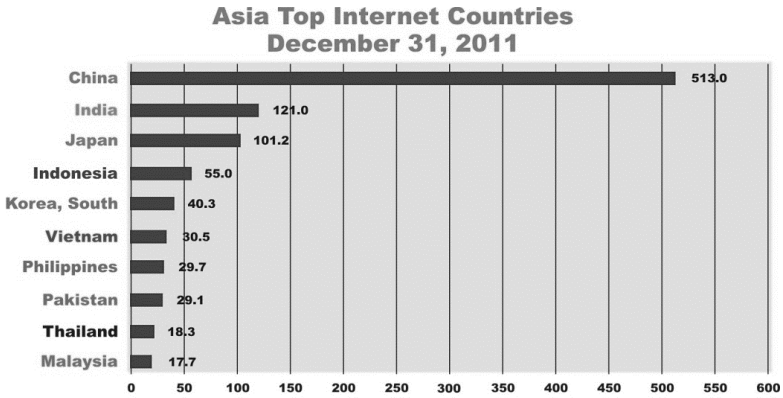

Figure 2.6 Top Asian Internet User countries

The above table No 2.6 shows that Pakistan is among the top ten countries of Asia in using internet. The Asian Tribune reports that with the rapid growth of cell phone use and continuous growing of internet adoption with high speed internet connections in Pakistan. It has raised chances of access and availability to information and communication technologies (ICTs). The broadband internet users had crossed the 1.5 million mark which is a significant growth in telecom industry. Internationally, Pakistan was ranked and rated among top ten countries who registered themselves as high growth rate in broad band internet penetration. A booming telecom sector recorded as 46.2% growth rate of subscribers clinching fourth position in the ranking list, supported by fifty (50) internet service providers and ten (10) broad band companies providing services across the country.

World Bank (2010) reported Pakistan as one of the countries rapidly increasing access for financial services apart from other countries of the world in using smart bank cards and cell phone networks. Cell phone penetration has rapidly increased removing the barriers of gender discrimination, half of the population including males and females, urban and rural areas have an access to cell phone.

Although the ratio among men and women is not equal as more than (86%) of men and (40%) of women possess mobile phone. The ranking shows Baluchistan at the bottom, Sindh at third, KP at second and Punjab with AJK at top.

The contents use of mobile consisted of voice service 78.5%, data service and SMS 40.2% while in urban and rural area the ratio consisted of 45 % and 36.7%. The SMS is most frequently used by men less frequent by women.

The present study took out its footings from the benchmarks of digital learning set out by OECD (2009) in three orders bench marks, firstly, access to ICT, secondly, to what ways and what extent ICT is used for teaching learning and thirdly, the impact of ICT on teaching and learning process.

Kozma (2008) has identified important reasons for investing in ICT for education. He supported that growth in economy occurs only if human capital is developed and increased that resulted in increase in productivity of workforce. Secondly, it is imperative to enhance and promote social development through shared knowledge, fostered cultural creativity, increased democratic participation, improved access to state services and enhanced social cohesion. Thirdly, he pointed advancement in educational reforms particularly in curriculum revision, changes in pedagogy and assessment. Fourthly, he emphasized on teaching learning management, its accountability by computer based testing and evaluation. He further elaborates that infrastructures, teachers training, technical assistance, curricula and digital contents development should be strengthened to meet the challenges of this century.

2.5.2 Open Education Resources (OER)

Atkins et.al.(2007) stated “Educators worldwide are developing a vast pool of educational resources on the Internet that is open and free for all to use. These

educators are creating a world where each and every person on earth can access and contribute to the sum of all human knowledge. They are also planting the seeds of a new pedagogy where educators and learners create, shape and evolve knowledge together, deepening their skills and understanding as they go."

UNESCO (2002) defined OER as "technology enabled, open provision of educational resources for consultation, use and adaptation by a community of users for non-commercial purpose". William & Flora (2010) supported OER for equalizing access to knowledge for teachers and students around the globe. They believed that all learning resources which stay in public domain or released under an intellectual property license to use it free, need to be available for all particularly the developing countries. OER includes full courses, course materials, modules, textbooks, streaming video, tests and software that support access to knowledge and expertise of the local and international level.

Downes (2011b) defined OER as the materials used to support education that may be freely accessed, reused, modified and shared by anyone. Rossini (2011) defined OER as a community for teaching, learning and research material in any format that stays in public domain or releases under an open license for free use and reuse purposes by others. The contents that are digitally published in an article form, research papers, blog discussion or reflection of thoughts need to be made available for all those who want to access it and use it. Wiley (2010) defined OER in very candid, clear way by focusing on three elements of it, the first one is the concept of free which is a necessary feature but it may remain as a window shopping, the second is the four RS. which are re-use, redistribute, revise and remix, thirdly, non-interfering technology and media choices and the teachers and students must have effective control of it.

OER projects are launched by different universities in the world. Wiley & Gurrell (2009) stated that millions of learners got benefit from OER materials apart from institutions, distance education providers. They have significant rewards in shape of reputation, students' enrolment, developing innovative ways, increasing learner enrolment and preparing distance learning materials. Boss, Brown & Bull (2011) commenting on different challenges like free information and education, using and reusing it, licensing, intellectual propriety, copyright, development policy, sustainability and quality, stated that OER movement is growing and gaining significant importance in all type of education, particularly higher education among developing nations, but there are limited number of OER initiatives in Australia as compared to other developed countries.

Bates (2011), with some other, criticised open education resources by labelling it as 'elitist' that indicates a cultural imperialism but it is not specific because most material is not out of this label. It is also said that the contents are not free, someone pay for it. This charge is somewhat right but the end line user does not pay so he used it free. The term contents was required more concentration as without question the learner may not learn so it is imperative for learners to develop contents questions. The study has only focused on the social networks, browsers and other material available online with free of cost. Students do not need to pay any money for them. As for as data basis and digital libraries are concerned, Higher Education Commission has made arrangement for the universities and their students can access them free of cost as well.

2.5.3 ICT Concepts Investigation

In the beginning, when radio was introduced, educationists believed that it would be a great help for teachers and learner but soon television replaced it and they

started admiring television to be a major source in future teaching learning, then computer emerged which changed the total dynamics of education, along with internet and mobile phone. The last two mediums are used widely and growing very fast as medium of education and learning the world over.

Pakistan is a developing country, the basic facilities of internet and mobile phone are rapidly growing as earlier mentioned. The first point to explore consists of access of internet and mobile phone, how many university students have access at university and at home or hostel, the next phase was to analyze the usage of internet and mobile phone, the third phase was effect of internet and mobile phone. Internet and mobile phone have the potential to improve and increase the students and teachers interaction. This fast interaction will surely remove the unnecessary delays and procrastination of the teaching learning process. The effective use of ICT will shred the burden of papers and other hard copies on both students and teachers.

2.5.4 Internet

It is a global system of interconnected computer networks which use standard protocols TCP/IP to connect billion of devices the world over. It consists of millions of academic, business, government and private networks locally and globally by linking a broad array of electronic, wireless and optical networking gadgets to carry out information resources, application, World Wide Web, infrastructure, file sharing and telephonic contacts.

2.5.5 Mobile Phone

Mobile phones are usually called as cellular phone, hand phone or cell phone used to call and receive communication, send text messages, MMS and emails. It has

a short range wireless communication like infrared and Bluetooth. Mobiles are used for multi purposes like taking pictures, recording video, playing games planning ahead, calendar, watch and photography. Apart from this, mobile phone can be used to communicate with teachers, students, class fellows and other people who are experts in their area of subject.

2.5.6 Digital Library

Digital library means collection of text, visual material, and audio material in micro form with facilities of organizing, arranging, storing and retrieving the files and folders kept in digital format. It is just like general library that has a collection of books and journals. It has the same characteristics including copying and pasting or transferring from one place to other within a short span of time. The contents of books, journals, archives and images can be accessed locally as well as globally, easily and rapidly. The digital libraries provide easy and round the clock access, retrieval and storage copy and pasting, low space and preservation services. Digital libraries in many respects serve as centers of interdisciplinary hubs shared by learners from all types of disciplines. They also provide diverse information resources available beyond physical space shared by different groups of learner. Digital resources and libraries bring together the people from formal, informal and professional learning missions while common technologies like printing, photography and computing do exist across all settings.

2.5.7 Video Conference

It is a kind of technology that allows people from two or more locations to interact via two way video and audio transmission, simultaneously. Usually lectures

of great philosophers, professors and scientists are usually shown by the university but it lacks proper use, particularly in social sciences. Video phone calls are designed for individual purposes rather than groups. Satellite Transmission are used in USA to disseminate video learning material and video conferencing. In 1989, educational channels were created to exchange learning material internationally. Japanese universities use it for teacher education and they provide a permanent link to local schools to observe teaching learning in more developed areas. Video conferencing is mostly used in business meetings, educational training, health officials and other representatives. So, it can be said that video conferencing covered telemedicine, telemarketing, telecommunication, education, surveillance and security in the world. There is no doubt that it has more advantages than disadvantages such as removing geographical disparity, helping to create global classroom, promoting collaborative learning, convenience in using it and getting very useful in remote areas.

2.5.8 Multimedia

Multimedia is a media which uses different contents forms. It includes combination of text, audio and still images, animation, video and other interactive contents. These things can be recorded, played, accessed by computerized and electronic devices. The mid 1980's was start of media as user interface was introduced by different software companies. Microsoft led the rest in it that presented a complete package for MS-Word, MS- Excel, MS-Power Point and MS- Access. The gadgets like CD ROM and DVD and USB made it convenient to user for shifting from one place to other. It has decreased the use of white boards and make easy for teachers to disseminate knowledge to learners, although substandard material is being

used by teachers by just downloading from internet and showing to students on multimedia slides.

2.5.9 Types of Computers

In the beginning the computers were very heavy and awkward but with passage of time, the computer producing industry started developing desktop computer and then laptops which made it easy to use. The range of computer type starts mainframe computers, midrange computers, microcomputers and super computers. There is a difference in all of them on the basis of their performance, speed and other functions. The old computer may not run new programs so the computer type will determine the learner ability to use it for educational purposes. The dual core and I core 1-7 are major modern computers

2.5.10 Internet Speed

Internet is connection that develops links among different people and it bridges the communication among different parties. In developed countries, they use high speed internet facility but developing countries are striving hard to acquire the fast technology as Pakistan has recently issued the licenses of 3G and 4G to mobile companies. This connection varies from 256 kb to 2 GB or more. The internet speed also determined how the learner is experiencing the connection problems.

2.5.11 Search Engines

Search engine, as its name indicates, is the sources that provide a transport to different websites. If you want to find any site, you have to use a search engine like Google Chrome or any other to explore it. In Pakistan, people use the Google

Chrome, Internet Explorer, Mozilla, and Alta Vista as some of the major search engines.

2.5.12 Social Networks on Internet

A social network is a platform for social interaction among people who intend to share their interests, activities and information about themselves and about others. The service provider actually collects information of the people who are its members. This service consists of representation of users, their social links and different variety of services. It is a web based service that allows individuals to create a public profile, list of users to share connections and view their information. These networks have basically initiated programs on internet by emails or instant messaging and later on grow faster and incorporate new features as mobile connectivity, photo and videos and sharing and blogging. Initially, they were individual based communication but, later on, they grew into community based online services. The members can share ideas, pictures, activities, events, interests and aspiration with the people in their network. Marche (2012) argued that social media gives us a platform where we can control how we want our social life. This control is what makes the users addictive. Turkle (2011) stated that the feeling of safety, the new generation feels when they are connected to their social network, is an aspect of addiction to social media. Rosen (2012) argues that social media offers an easy and fast way to obtain positive feedback from peers. Rosen claims that people need to opt the particular form of media that meet their personal needs and gives internal satisfaction.

The major types in social networking are those that contain categories like places, institutions, interests and like that are usually added in the networks. Face book, Google + You Tube , LinkedIn, Tumblr and Twitter are widely used in Pakistan

while some other like Instagram Pinterest, Badoo, Bebo, Hi5, Orkut, Myspace are used in America and other countries. The experts believe that the largest social networks users are in Asian-pacific regions.

2.5.13 Messengers

Messenger is basically a term used to send messages. This term began to use in social media when different software were developed for communication. It is a set of communication technologies which involve oral and written communication between two or more than two people through internet and mobile phones. There is a difference between instant messages and emails on technical ground but both can play role of messenger. Instant messenger can be connected by webcams to see each other or it can directly talk to other person by using microphone, headphones and loud speakers. It also provides facilities like transfer of files and pictures. Mobile instant messaging allows quick messaging services through portable devices, ranging from standard mobile phone to smart phones.

2.5.14 Facebook

Face book is perhaps most popular social networks in Pakistan. It was founded in 2004 for Hawardian students but it spread very fast and now its users are in billions. Anyone above 13 years of age can become its member the world over. After registration, one can create personal profile, adding other users as friends, family, classmates or coworkers, he can post messages, pictures, status and updates. The timeline created has made it easy to save the most favorite contents in it, using half a petabyte of data daily which has raised serious issues in privacy policies. Thuseethan, & Kuhanesan (2014) stated that Facebook is an addiction for all, mostly for the

university students. Nowadays, Facebook is ruining the future and academic carrier of university students Afzal (2012) claimed that Pakistani students waste their time on Facebook activities, preferring Facebook activities on their assignments and test preparation so they get low grades in studies. Some students believe that using Facebook will not affect their studies and they came to know about the reality when they get their results.

Junco (2012) examined the relationship among many measures of frequency of Facebook use with time spent preparing for class and overall GPAs. Hierarchical linear regression analysis showed that time spent on Facebook was strongly and significantly negatively correlated with overall GPA.

2.5.15 Twitter

Twitter is another social network or micro blog that provide users to send and read a short 140 character text message which is called tweet. Only registered users can post tweets but registered and unregistered both can read text messages. It was created in 2006 and gained worldwide popularity in short span of time. Now it has 500 million registered users who posted 340 million tweets per day. It is among the top ten most visited web sites of the world. It is a short crisp message floated for concerned people to read and react for the person who wants it to be public and show his feelings, emotions and reactions.

2.5.16 E-mails

Email means electronic mail sent in form of digital contents and through valid email of the receivers that can be one or hundreds. Email servers accept, forward, deliver and store messages. There is no need for receiver to be online at the time when email is sent. Initially, it was used as electronic mail for electronic documents transmission like fax document. Email has three important components, the message

envelop, the message header and message body, the first contain controlled information as originators mail and recipient mail address, the second contains head or subject along with date and time that is automatically generated while writing a mail. The third keeps body of the message which can be text, image and other type of contents, files can be attached if desired so.

2.4.17 Data Bases

Data bases are actually the data banks from where the user can collect information. Data is sequenced form of symbols that can be interpreted and transmitted. In qualitative and quantitative variables, set of items in rows and columns can be presented inform of graphs, tables and charts. There are different type of data bases according to various heads like animation, back end, bibliographic, current data, surveys data and information system data. It is stored for local and national purposes, for research and development and for records. There are different type of data with multiple intentions and multi dynamic orientation for states, organizations and departments for future use.

2.5.18 Wikipedia

Wikipedia is multi lingual, free access encyclopedia used the world over by students and scientists. It has published thirty million articles in two hundred eighty seven languages. The New York Times, (2014) rated Wikipedia as fifth among all websites globally. It started in 2001 but got attention in 2006 by print media and since then it has grown as a major free internet sources all over the world. The open sources Wikipedia got severe criticism because of its quality of writing and the accuracy of information but a continuous process of articles reviewing system embedded in it has made it one of the reliable sources in digital market. Now, the wiki has established an

APA referencing style by placing date and month in the publication year which has made it a referenceable mode of literature.

2.6 Mobile Operating Systems

Operating system means the particular set of programming that runs a mobile phone as per developer aspirations. It is not a new concept because it is based on computer operating system that runs computer like windows. The technology grows large and the gadgets grow small, same is the case with mobile phones. There are different systems in the market that are in use of customer. They include the following;

2.6.1 Symbian by Nokia

This is an operating system by Nokia. It started with simple phone that only used limited functions but, later on, Nokia has improved it and now they have introduced smart phone that used Symbian operating system, particularly in Asha series.

2.6.2 Android by Google

Android is an open source operating system developed by Google, keeps a large amount of software like Play Store, Google Search, Google Play Service, Music. Its introduction in 2009, made a blast in mobile history and many devices were developed to use this operating system

2.6.3 IOS by Apple

The most authentic mobile software developer ‘Apple’ has introduced this software which is a closed source. The second generation system is used by IPhone, iPod, touch, pad including apple TV. The system is developed by Apple and devices

are manufactured by Foxconn. This system is not very much liked by the majority because of its restricted functions.

2.6.4 Bada by Samsung

Bada is an operating system developed by Samsung with collaboration of Korean partners and it ranges from mid end to high end Smartphone. Samsung has considered to release source code number to foster the device but later on they decided in 2013 to stop it under the brand of Samsung but continued it under the banner of Tizen.

2.6.5 Mobile Contents

Although the different mobiles have different pattern of contents but, more or less, all of them have the similar characteristics and functions. The contents contain contacts, messages, phone book, games, media player, gallery, calendar, watch and other utilities like videos, songs, dictionary, encyclopedia, planner and many other small application which make them a useful device in the present age.

2.6.6 Moodle

Ajadi, Salawu & Adeoye (2008) defined Moodle which later on was confirmed by Suleiman (2011) as Moodle stands for (Modular Object Oriented Digital Learning Environment) remained an open source course management system that may be labelled as learning management system or virtual learning environment. It has become very popular among educators around the world as a tool for creating online dynamic web sites for their students. Many institutions use it as their platform to conduct fully online courses, while some use it simply to augment face-to-face courses. Holbl and Welzer (2010) concluded in their study that Moodle is a very useful and good platform for E-learning as students' survey confirmed it. Young

(2005) stated that Moodle allows educators to control and manage all features of course content and delivery, using one integrated system.

Moodle project was focused on the best tools to promote, manage and present the learning material. It can be an activity module like forums, data basis and wikis for development of collaborative learning environment around their subject matter. Other teachers use it to deliver content to students like SCORM (Sharable Content Object Reference Model) to assess learning. It is a student centred course management system to develop quality online courses. Moodle 2.0 had many features that enable learners' versatile interactivity to import and export contents.

Knight & Bush (2009) stated that its evaluation techniques and delivery system has improved a lot since its inception. Its key features are making popular worldwide because it is an open source software that caters the needs and requirement of the learners. Elias (2010) suggested some other features like its interface link for learner about current week, discussion post and logoff place apart from offering text-only, mobile and offline options because the current interface is effective only when the students have fast internet connection. He further suggested that there is an immediate need to incorporate multimedia, assistive technologies with rapid change in technology, there is a fear of deprivation for poor countries because the learning involves network technologies for creating, fostering, delivering and facilitating teaching and learning at any time and any place. The following are some of the sub heads for internet learning concepts developed by Apple.

a. I-life

The media is a rich and ideal source for teachers to remain in touch with students. Considering its value Apple's award winning software I-life is enriched with

all the tools to develop and design research projects, documentaries, photos, foreign language podcasts and science projects. It is equipped with tools for composing, organising and sharing photos. 'Apple' produced I-DVD that allows user to produce DVDs. Teachers across the globe are using i-life to enliven lessons, meet standards, and prepare students with 21st-century skills.

b. Garage Band

GarageBand is a whole music creation studio right inside your Mac-with a complete sound library that includes software instruments, pre-sets for guitar and voice, and virtual session drummers. An intuitive interface makes it easy to learn, play, record, create, and share your hits worldwide. It's never been easier to make music like a pro. This is another tool for learning music and creating podcasts. The user can share transfer and upload his creation.

c. I-web

It is a supporting tools to develop and design websites. I-web was actually a part of I-life which enable users design and develop blogs, websites with no coding and apple designed themes. It had many pages templates with coordinated fonts and colours which can be customised by users as replacing place holder text dropping and dragging photos and movies.

d. I-movie

I-movie is a very useful tool for sharing the knowledge and expressing themselves in digital movies. The students can develop and design quality video for abstract concepts, documentaries on different social issues including their personal practices to present and show to their peers and teachers. They can develop promising projects by incorporating digital video, photos, music and their own voice narration. It

is useful for making rich presentation, video reports, class projects, digital storytelling and book trailers.

2.7 Summary of Literature Review

The review of literature reveals enough evidences that social learning theory can offer an alternate learning paradigm, particularly when associated with information and communication technology. The world has become a global village and not a single nation can keep themselves away from international developments. The millennium development goals and Pakistan vision, 2025 represents the will and want of the state to eradicate illiteracy and ignorance. The statistics show that Pakistan is a country where growth rate of mobile and internet users are increasing day by day. International business is getting attraction as recently it is observed in bidding of 3G and 4G licenses. Social networks are commonly used by even common people so it is high time to think and think fast to develop digitalized contents and curriculum for development of mass education program at one side and provide facilities of ICT at university level at other side.

The contents selected for this survey research were supported by different studies across the world. The three layers have been identified at first, availability of ICT facilities, at second, the four learning symbolic learning stages for the students on internet and mobile and at third, the future scope and importance of ICT among universities students. The questionnaires were developed keeping in view all the concerns and complications. The limitation of ICT use in Pakistani culture and restriction posed by different sections of the society has been considered with full weight.

Symbolic learning is a twenty first century idea of Social Learning Theory. It presents how people learn through media, particularly social media. This idea was a new step to explore a newer horizon of teaching learning process because this world of high technology has grasped the students in its shackle as they remain busy all the time with media, first television, then internet and third mobile phone. This research study "Bandura's Symbolic learning through ICT and its Impact on Students Learning at University Level in Pakistan" is actually an attempt to explore the contents of two media that is internet and mobile phone.

The questionnaire items at attention stage contained emails, data basis, digital books and search engines including access to messengers, face book and twitter on internet. The contents on mobile phone were phone book, messages, calendar and Multimedia.

At retention stage, the questionnaire items had the download contents, study material, songs, videos and job advertisement and the source to keep them on hard drive or USB drives. MS Word and Power Point and internet browsers and their uses were also mentioned. The contents on mobile phone are talking, sending SMS, watching movies, video clips and pictures. The contents like dictionary, encyclopedia, games and picture are major contents on mobile phone.

At reproduction stage, the questionnaire items have group discussion, academic forums, Wikipedia, digital libraries and search engines including free access sites, research journal, songs, digital books, movies, research articles and Holy Quran. The contents on mobile phone are words and phrases, calculator, time watching, listening music, talking, sending text messages, playing video games and waking up alarm.

The contents at Motivation stage are the academic performance, internet use, role of social networks, digital libraries, online articles, discussion forums, students' blogs and professional associations. The motivation for mobile use is to keep in touch with teachers and students and to keep study material on mobile phone.

For the Impact of ICT on student learning, the questionnaire included the contents like ICT and Mobile Phone Digital libraries, social networks, professional groups, blogs and associations their effect on student learning.

The evidences from literature review propelled the researcher to develop the research tool including all the areas that have been covered in above mentioned pages. The learning contents for symbolic learning stages and the impact of information and communication technology on students learning were major areas taken out from the review while access and availability of information technology which is a very critical issue in developing countries like Pakistan. This part of the study provided fruitful thoughts and direction to be highlighted in the study.

Online learning remained an open source for the learner as well as teachers to have interaction with one another. Online tools depend highly on the communication sources that include internet speed and digital contents density. If the link continued to be low due to internet connection or some other reasons the learner and teacher cannot communicate timely and quickly. The virtual sources has to be very authentic and need to be multiple bases so that there is no congestion in communication.

The literature review plays two important factors and roles in the study, one is to provide basis and evidences from the past about the development of the proposition, and second is to develop the instrument of the study to measure responses. The first part of the study provides information about learning, its forms and implication and modern technology role in carrying out teaching learning process.

How and what different scholars, authors, theorists and teachers consider teaching and learning and the ways to make this process more effective. The second part is related to development of research tools. It provides information about development of tools. The social networks, open education resources particularly involving internet and mobile phone were included and synthesised. The issues and challenges related to OER were also critically analysed.

This study was planned and conducted because of the following reasons; the first one is, the increased use of internet and mobile phone among youth of Pakistan as statistics shown, the second is, a few researches were conducted on impact of ICT but no research on impact of internet and mobile phone among social sciences students, the third is, it is assumed that the students of social sciences are not efficient in using technology imbibed gadgets, the fourth is, the facilities provided to social sciences departments do not meet the requirement so it was imperative to assess and analyse the current scenario of ICT uses among social science students and faculty.

There is a clear change in landscape of Pakistani education system as it is observed in the data provided for internet and mobile usage. There is a dire need to provide basic facilities in the universities with fast internet speed which could speed up the pace of incorporating and enhancing of ICT in all areas of teaching and learning at university level.

CHAPTER 3

RESEARCH METHODOLOGY

This was a descriptive survey study that aimed at finding out university students' views on availability of ICT, their choices of contents on internet and mobile phone, and university teachers' views about impact of ICT on university students in perspective of symbolic learning model of the Social Learning Theory. A Cross sectional survey was conducted in which the responses of the students and teachers were compared. A set of two questionnaires was used as instruments to collect data. The first questionnaire was developed for students' respondents, and second related to the reflections of the teachers.

3.1 Method and Procedures

The data were collected and presented in tabular form. The Chi square test and Frequency count formed the statistical techniques used for data analysis and interpretation. The statistical techniques were as per requirement of data analysis.

The questionnaire for student respondents contained (110) items, (33) items were for attention stage, (28) were for retention stage, (23) items were for reproduction stage and (20) for motivation stage. The contents included personal computers, laptop, mobile, internet connection choice of search engines, type of study material, storage place, social networks and preferred choice of them. The second questionnaire was designed for university teachers. It contained (32) items based on three parts. The first part asked about availability of ICT for teachers in the university and second part contained questions about facilities of internet and computer at university and third part keeps items on the impact of information and communication

technology on students learning. It is teachers' perception of ICT and how they used it in the classrooms including the type of assignments they designed.

The questions were added to determine the symbolic learning and its link with information and communication technology. The items in questionnaire included the student's membership in social networks, using mobile for different purposes and sitting on net for various activities. It was assumed that a few students used internet on mobile but a majority of them did not use it for the purpose because they did not have smart phones. The close ended questionnaire for students had one hundred and ten (110) multiple choice items. The questionnaire for teachers contained (32) close ended items which determined the ICT general facilities, ICT special facilities for teachers and the impact of ICT on students learning at university level.

3.2 Population of the Study

The population was consisted of three clusters, the first cluster was universities, the second cluster was public and private universities having social sciences departments and the third cluster was three department of the social sciences i.e. education department, psychology department and third was economics/ any other so the population consisted of all the students and teachers of these clusters in the province of Punjab and Islamabad Capital Territory. The students 'population was (1768) and teachers population was (288) of social sciences from the twelve selected universities were the accessible population of the study as the study was delimited to social sciences students and teachers teaching at this level. The student and teacher respondents included both male and female.

3.3 Sample of the Study

Multi stage cluster sampling technique was used for this study. The first stage sampling was selection of the twelve universities. The second stage was to select public and private sector universities so eight public and four private universities were chosen on the basis of the departments under Social Sciences umbrella. The third stage was to select the departments out of social sciences so the Education, Psychology and one of other department were selected. The department varies as most of the universities did not have similar structure. The following further breakdown of the sample was as below.

At fourth stage, a convenient sampling technique was used to select student and teacher respondents of the respective departments, twenty (20) respondents from each of the department and sixty (60) from each of the universities were selected. The total sample of the students was (720) and the teachers respondents were (72). There were three reasons to include teachers in the research study. The first one is to find out the impact of internet and mobile phone on students learning because the teachers are better judge to find impact on students' academic learning and growth. The second is to find out the facilities provided to teachers by the university because the teachers can incorporate internet and mobile phone in teaching learning process. The third reason is to validate the students' response about their use of internet and mobile phone for learning purposes. The researcher himself visited most of the universities to distribute questionnaires and collect them while personal links were also used to distribute and collect the questionnaires. The questionnaires were distributed and collected after they were filled in. A few students and colleagues helped the researcher in collection of data.

There is no doubt that social sciences in discipline ladder are at the bottom level because of its productivity, Although psychology and economics stands very prominent but education again stands at lower level in terms of quality and quantity. The sample selected was adequate as it is observed by Yount (2006) who provided the 'thumb rule' on the sample size and as earlier Gay (1987) recommend and Curry (1984) supported the same. This is given in the following table but it was added that larger sample would be better and the best is to leave it to the researcher.

Table 3.1 Yount (2006) Stated Size of Population and Sampling Percentage

Size of Population	Sampling percent
0-100	100%
101-1000	10%
1001-5000	5%
5001-10000	3%
10000 +	1%

As above table shows, the percentage of respondents for a research study, the researcher followed this table and increased the sample size as it was suggested that bigger sample will be an advantage. The population varies in different universities so the researcher selected equal number of respondents from each of the university. Although the percentage varies from university to university. The reported population by the university administration also varies so a mean score is calculated to identify the population size of the study to select the sample out of it. The students and teachers sample was selected conveniently. The statistics of the following table justified the population and sample selection.

Table 3.2 Sample Universities Selection

Region	General Category of Universities	Universities having Social Sciences Departments	Sample Selected
Punjab	13	09	09(100%)
Federal	06	03	03(100 %)
Total	19	12	12(100 %)

Table 3.3 Sampling Frame Students Respondents

Region	**Univ.**	**Departments of Social Sciences/others**	**Estimated Number of students' Population**	**Total**
Punjab	09	60x9= 540	1293	240
Federal Capital Area	03	60x3 = 180	475	180
Total	12	720	1768	720=38%

Table 3.4 Population and Sample of Teachers

Title	**Selection Criteria**		**Population**	**Sample**
Teachers	2 from each of the departments	6x 12	288	72 =25 %

Table 3.4 describes that 38% of the population was selected which was reasonable enough to represent the population while in table 3.5 the sample is 25% that is quite representative for generalization of the study results. The student respondents were 720= 38 % and the teachers respondents were 72= 25 % that would really help in result generalization.

3.4 Research Tools

A set of two questionnaires was used to collect data from the respondents. Validity of the questionnaires was established from conducting pilot testing and by getting experts opinions.

The questionnaire were sent abroad for validation and renowned professors- Prof. Dr Wang Xioyang (Director Institute of Education, Tsinghua University, Beijing, China) and Prof. Dr Debora Yeoba (Institute of Social Sciences, Staffordshire University, Stoke- on Trent United Kingdom) helped the researcher in arranging some of the items and adding a few more. The questionnaire for students consisted of two portions and each portion had four stages as advocated by symbolic learning theory. The first part was about internet, its availability and access to contents for students at university and at home. It is the attention phase which reports whether students had paid attention to it or not. The second portion of the first part was about retention of the contents available to students at internet. It was very difficult to enlist all the contents available at internet but a few of them which were considered mostly visited by students, by previous researches. Questionnaire for male and female student respondents is placed at Appendix A. The items in the questionnaire are divided in four parts to find the symbolic learning stages, the first parts determines the attentions, second part retention, third part motivation and fourth part reproduction. All these parts are analyzed separately.

Questionnaire for university teachers is placed at Appendix B. The second questionnaire was for the teachers which determined the impact of ICT on learning of the students at university level. It has three parts, the first describes demographics of ICT use by the teachers, second part tells how teacher perceive ICT role in social sciences and third part found the future of digitalized curriculum.

3.4 Validity of the Instruments

The questionnaire for students had 110 items and that for teachers 32 items. Initially students' questionnaire had 80 items, and teacher questionnaire had 25 items,

but on the feedback of experts, 30 more items for students' questionnaire and 7 more items for teachers' questionnaire were added. The questionnaires were pilot tested and sent abroad to two experts, apart from 7 local professors who all validated them.

3.5 Reliability of the Instrument

The Alpha is more reliable statistical technique as compared to other available tools used in SPSS. Sijtsma (2009) believed that it is the most widely and frequently used reliability index. Bentler (2009), Kane (2006), and Flora & Curran (2004) supported and considered one of the best techniques to measure internal consistency. The Cronbach Alpha was used for finding out reliability of the questionnaires. The questionnaire for students was divided into four portions for attention stage, items were 33 and alpha was (.662), for retention stage, the items were 28 and alpha was (.642), for reproduction stage, items were 23 and alpha was (.672) and for motivation stage, items were 26 and alpha was (.756). The questionnaire items were analyzed separately as in the blow tables. The overall Alpha reliability of the students questionnaire was .749. The statistical calculation of Cronbach Alpha at different portion of the questionnaire is presented in table 3.5.

Table 3.5 Reliability of the Questionnaire

Cronbach's Alpha	**N of Items**
.749	110

Attention stage, Reliability Statistics	
Cronbach's Alpha	N of Items
.662	33

Retention stage Reliability Statistics	
Cronbach's Alpha	N of Items
.642	28

Reproduction stage Reliability Statistics	
Cronbach's Alpha	N of Items
.672	23
Motivation stage Reliability Statistics	
Cronbach's Alpha	N of Items
.756	26

Questionnaire for Teacher Respondents

Thirty two items were given in the questionnaire for teachers to find availability of ICT facilities and its impact of the information and communication technology on students at university level.

Table 3.6 Reliability of Questionnaire B for Teachers

Case Processing Summary			
		N	%
Cases	Valid	72	100.0
	Excluded[a]	0	.0
	Total	72	100.0

Reliability Statistics	
Cronbach's Alpha	N of Items
.701	32

Table 3.6 established reliability of the instrument for teacher respondents. The items were 32 and Cronbach's Alpha was .701 that shows higher level of reliability.

3.6 Data Collection

The data were collected through the selected respondents of fourth stage cluster sampling who were derived from first, second and third stage clusters. The students respondents were from master and bachelor level while two faculty respondents teaching at this level in the respective departments. The two questionnaires were used as tools to collect data from teachers and students. The data collection tools were distributed and collected by multiple ways; firstly the researcher personally visited some of the universities to distribute the questionnaires and collected them back. Secondly, the researcher sent questionnaires to friends, acquaintance in other universities to distribute the questionnaire to the respondents in the respective departments of the universities and collected them back. The close ended questionnaire items for the university students and teachers were used. A close ended questionnaire was used to collect data from 72 university teachers teaching at Bachelor and Master Level. The items inquired about basic facilities of ICT and their perception of ICT use by the students and how they incorporated ICT in their teaching.

3.7 Data Analysis

The quantitative data were analyzed by using statistical tests. The effects of internet on four stages of symbolic learning and the effects of mobile phone on these stages content wise were described. The responses of the study participants were categorized according to the response options given against the items. In order to arrive at the trend in their opinion, chi square test was used. The level of significance was set at 0.05 level.

For Qualitative analysis, the opinion of students, teachers as obtained through the questionnaires were compared to arrive at the conclusions regarding the impact of ICT on students learning. First of all an overall view of the students respondents in questionnaire was presented university and department wise to have a clear picture of the data. Secondly, the internet use by students were analyzed at four stages, thirdly the mobile use was also analyzed at four stages, and fourthly the relationship of internet use and academic performance and mobile and academic performance was equally analyzed and lastly the teacher questionnaire (B) was analyzed as availability of ICT in the university teachers, the special facility provided to them by the university and the impact of ICT on students at university level.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

This chapter deals with analysis of data which are tabulated and interpreted below:

Table 4.1 Summary of University Department Wise Respondents

UNIVERSITIES	DEPARTMENT			Total
	Education	Psychology	Other	
IIUI	20	20	20	60
NUML	23	17	19	59
FUI	18	22	21	61
PMASAU	22	19	20	61
P.U	20	20	20	60
UOG	20	21	18	59
FJWU	20	20	21	61
U.W	20	20	19	59
UCP	20	20	20	60
H.U	20	20	20	60
UOS	21	18	21	60
U.F	20	20	20	60
Total	**244**	**237**	**239**	**720**

Table 4.1 presents a panoramic picture of the respondents of different universities, department wise. A sample of twenty (20) students was collected from each of department and sixty (60) students from a university. The total numbers of respondents from each of the department of education were 244, psychology 237 and

239 from one of the other departments. On the whole, 720 respondents were drawn from 12 universities.

Table 4.1.1 Summary of the Data Analysis of all Questions

Questionnaire	Questions No	Statistical Analysis	Display
A	1(1-3), 3,4,5,6(1-7),9,10,11,13,14, 15 (1-6),17,18,21,22,23,24	Frequency Count Percentage	Tables Graphs
B	1(1-3),2,3,4,5,6,7,8,9(1-14)	Frequency Count Percentage	Tables Graphs
A	16(1-6),19(1-6),20(1-),25(1-5), 26(1-5) 27 (1-15), 28(1-8),29(1-8)	Chi Square	Tables
B	10(1-8)	Chi Square	Tables

The above table no 4.1.1 describes a summary of the statistics used for data analysis in this chapter. The first column represents questionnaires which were two as indicated A and B, the second column shows questions number and their parts, the third column shows the statistical tool (SPSS 20) used for data analysis and the fourth column shows the display of the results.

4.1 Analysis of Basic Facilities

In this part, the data were collected in view of finding of the availability of ICT resources on campuses of the universities and off campuses. The major focus was identification of basic infrastructure about ICT facilities. The data were presented in form of tables and graphs.

Table 4.2 PC's Available at University Campus

PIII	PIV	Dual Core	I core 1or More	Not Available	Total
46	463	158	25	28	720
(6.4%)	(64.3%)	(21.9%)	(3.5%)	(3.9%)	100%

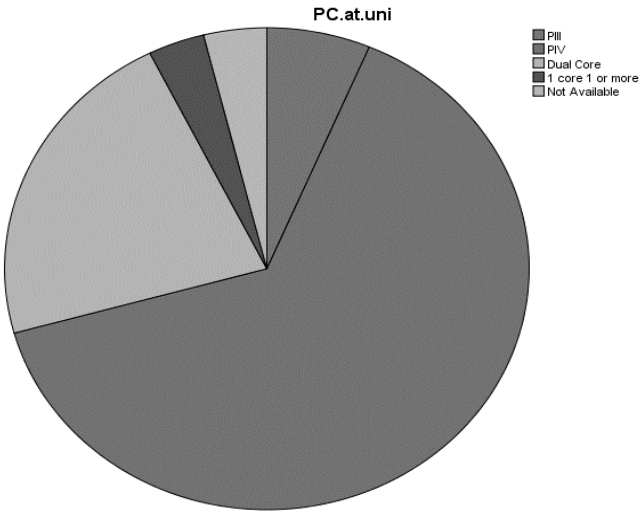

Figure 4.1 The personal computer available in the university campus

Table 4.2 and figure 4.1 of pie chart show a large majority of respondents (64.3%) reporting that they had PIV available at the university while a reasonable number of respondent (21.9%) marked that they had dual core in campus whereas 6.4 % respondents marked that they had PIII and 3.9 % claimed that there was no computer available for them in the university. The results are not unexpected as it was assumed that universities do not spend money on facilities for social sciences.

Table 4.3 PC Available at Hostel or Home

PIII	PIV	Dual Core	I core 1or More	Not Available	Total
23	421	196	26	54	720
(3.2%)	58.5%)	(27.2%)	(3.6%)	(7.5%)	(100%)

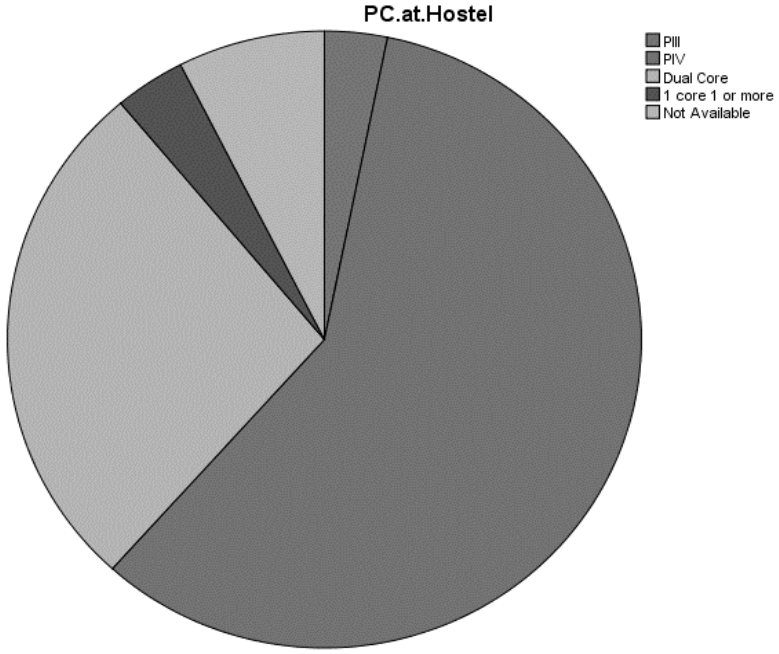

Figure 4.2 Showing PC at Hostel/Home

The table no 4.3 figure 4.2 showed the type of computers available in home or hostels. 58.5 % students had PIV at hostel or home while 27.2 % students had dual core, 7.5% had I core 1 or more while 3.2 % had PIII, whereas 7.5 % students possessed no computers at home or hostel. These results are somewhat unexpected because it is usually assumed that the students have the computer facilities at home or at hostels, they have the same type of computer as they had in universities.

Table 4.4 Students Having Type of Laptops

PIII	PIV		Dual Core	I core 1or More	Not Available	Total
22	124	389	70	110	720	
(3.1%)	(17.2%)	(54.0%)	(10.4%)	(15.3%)	(100%)	

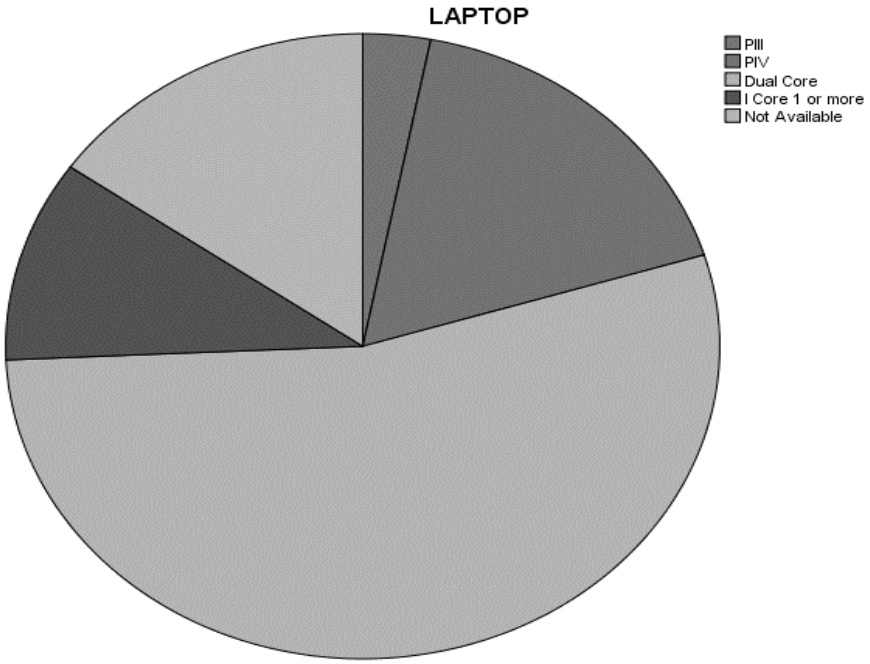

Figure 4.3

Showing Laptops Available to the Students

The statistics of above table 4.4 figure 4.3 show that 54.0% respondents have dual core laptops, 17.2 % had PIV laptops. A small number of respondents had I core 1 or more laptops. 15.3% respondents did not have laptops with them. Even though the federal and provincial governments had distributed many laptops but perhaps they had gone to only pure sciences subject students or high achievers. The social sciences are again ignored or placed at bottom level.

Table 4.5 Status of Computer Labs in the University

Well Equipped	Not Equipped	Badly Managed	Not Available	Total
45	441	1972	62	720
(6.3%)	(61.3%)	(23.9%)	(8.6%)	(100%)

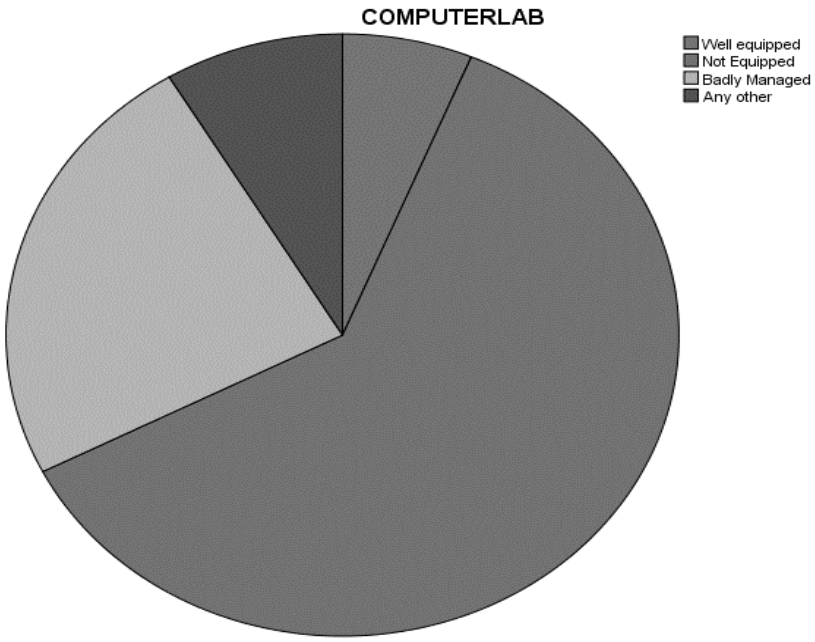

Figure 4.4 Figure showing computer lab hours

Table 4.5and figure 4.4 show the status of computer labs. 61.3% students claimed that the university lab was not adequately equipped and 23.9 % believed that it was badly managed. The statistics show that the universities pay inadequate attention to the labs for social sciences students. A small percentage of 6.3% said that their labs were well equipped while 8.6% marked that they had no labs facility at university. This is a very significant result for university authorities that their computer labs are not adequately equipped or well managed. This is important for policy makers and university administration to look over the matter.

Table 4.6 Availability of Net Connection at University

Below 512	512	1Mb	2Mb or More	Any other	Total
94	78	164	295	89	720
(13.1%)	(10.8%)	(22.8%)	(41.0%)	(12.4%)	100%)

Table 4.6 indicates the availability of internet connection at university. 40.0% students claimed that they had 2Mb speed connection at university while 22.8% students said they had 1Mb connection speed at university campus. Other 13.1% students said they had below 512 Kb connections at university while 10.8% said they had 512 Kb net speed at university. Another 12.4% students said they had some other speed at the university campus. This is very concerning results as internationally the universities used high speed internet connection while here it is still in MBs not GBs so authorities need to address it.

Table 4.7 Availability of Internet Connection at Home

Below 512	512	1Mb	2Mb or More	Any other	Total
22	113	245	269	71	720
(3.1%)	(15.7%)	(34.0%)	(37.4%)	(9.9%)	100%)

Table 4.7 shows the availability of internet connection to students at home or hostel. 37.4 % students had access to 2 Mb speed connection at home, 34.0% students had 1 Mb net connection speed at home where as 15.7% had 512 Kb and 3.1% had below 512 Kb net connection speed at home. Another 9.9 % had any other speed connections. This is a result seems contradictory to PTCL claim, the large internet provider company, that they offer students package with university collaboration but

they offer only 1MB speed net similar packages of high speed can be offered and they will be useful for students.

Table 4.8 Availability of Lab for Students Use in University

8-2 pm	9-4 pm	9-5 pm	9-10 Pm	Any other	Total
137 (19.0%)	195 (27.1%)	231 (32.1%)	45 (6.3%)	112 (15.6%)	720 (100%)

Table 4.8 shows the results of labs availability to students in the university. 32.1 % students believed that labs was opened from 9-5 p.m. while 27.1 % students considered that it was opened from 9-4 p.m., other 19.0% students believed it was opened from 8-2 p.m. while 6.3% believed there labs in the university remained opened from 9 am to 10 pm. It was found that the computer labs timings were short which need to be extended to 9-10 p.m. slot for students and teachers convenience. A policy frame is needed for that purpose by either university or by the higher education commission.

4.2 Stage 1: Attention toward Internet Contents

The contents at this stage are presented in frequencies form showing the percentage of each variable. There are ten tables which show that the type of content on internet and mobile phone students attended at this level. This stage presents information about all the available resources of ICT to students at university, home or hostel.

Table 4.9 Duration of Computer Use by the Respondents

Before 2000	2004	2008	After 2012	Any other	Total
65	169	292	157	37	720
(9.0%)	(23.5%)	(40.6%)	(21.8%)	(5.1%)	(100%)

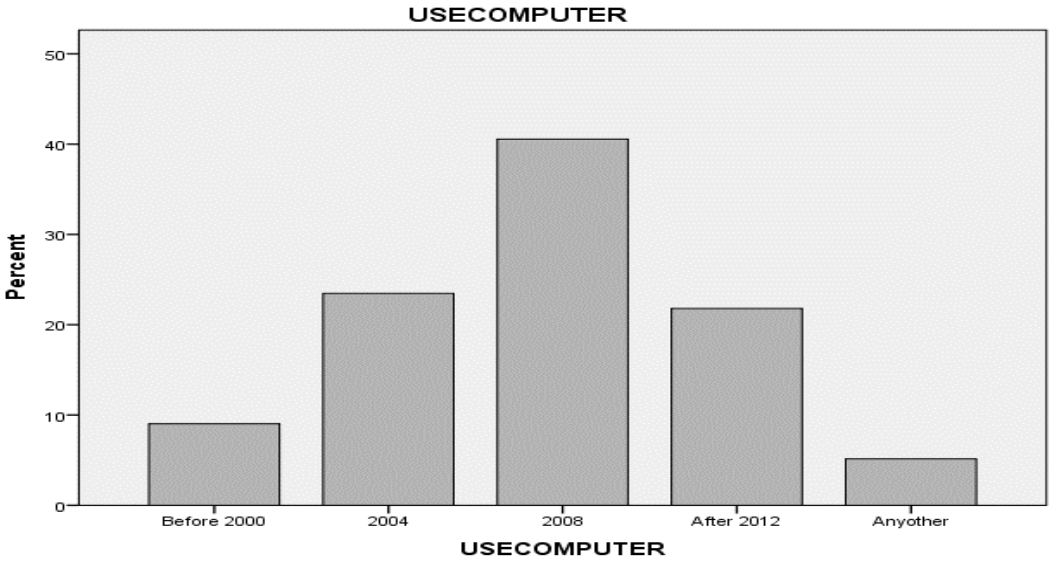

Figure 4.5 Graph Showing the Year Computer Use Started

The table 4.9 and graph 4.5 show that 40.6% respondents used computer since 2008 and 23.5 % used it since 2004, 21.8% started using it after 2012 while 9.0 % started using it since 2000. The computers were largely under use of students since year 2004. It is understandable that computer was introduced very late in Pakistan so majority 40.6% of the students started using it very late. Now the situation has become better and more students have access to computer and tabs.

Table 4.10 Sources of Learning Computer by the Respondents

Internet	Formal course	Colleagues help	Trail and Error	Any other	Total
209	163	152	146	50	720
(29.0%)	(22.6%)	(21.3%)	(20.3%)	(6.9%)	(100%)

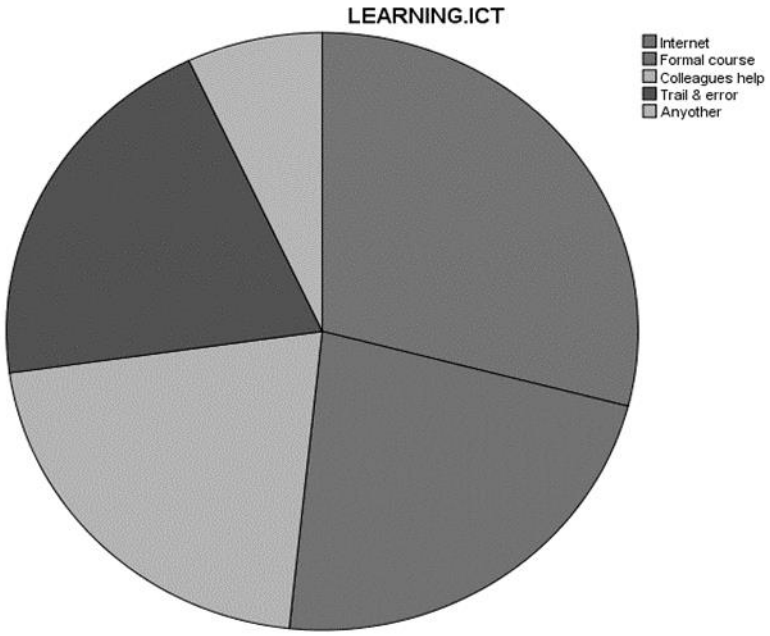

Figure 4.6 Showing about How they Learn ICT

Table 4.10 and figure 4.6 of pie chart show that how the students learnt computer. 29% students learnt computer through internet while 22.6 % students learnt it by a formal course, 21.1% learnt it from a colleagues help while 20.3 % learnt it by trial and error. It indicates that the students learnt computer through internet, colleagues help and trial and error method. A formal course is needed which can improve ICT skills of the students.

Table 4.11 Hourly Daily Use of Computers by the Respondents

Less than 1 hours	1-2 hours	2-4 hours	4-6 hours	More than 6hours	Total
139	210	258	48	65	720
(19.3%)	(29.2%)	(35.8%)	(6.7%)	(9.0%)	(100%)

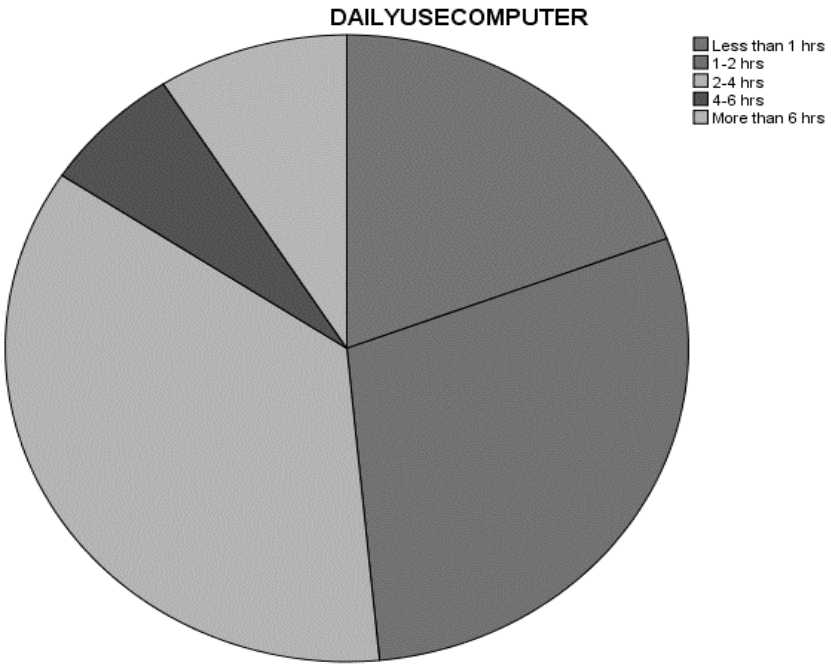

Figure 4.7 Showing Daily Use of Computer

Table 4.11 and pie chart 4.7 describe about the daily time spent on computer use. 35.8 % students used computer for 2-4 hours while 29.2 % students used it for 1-2 hours daily while 19.3 % students used it less than 1 hour but 9.0 % students used for more than 6 hours and 6.7 % use 4-6 hours daily. This statistics show that they spent quite a lot of time in using computer, ranging from an hour to more than 6 hours a day. The question what they do on computer needs to be explored separately.

Table 4.12 Respondents Access to Search Engines at the University

Yes	No	Do not Know	Total
612 (85.0%)	95 (13.2%)	13 (1.8%)	720 (100%)

Table 4.12 shows the responses of students about availability of search engines in the university. 85.0% students believed they had permission to use any of the search engine, 13.2 % students said they were not allowed to use it while 1.8% did not know about it. It indicates that the majority of the universities had allowed students to use their any of the search engines. The question is that which search engine supported contents for learning are available in Pakistan.

Table 4.13 Respondents Access to Emails at the University Campus

Yes	No	Do not Know	Total
653 (90.7%)	62(8.6%)	5 (0.7%)	720 (100%)

Table 4.13 tells us about the access to emails in the university campuses. So 90.7% students confirmed that they had access to email accounts, while 8.6 % students said they had no access to email at university and 0.7% did not know about it. The data indicated that the students had access to emails in the university. It is the basic use of internet so the university needs to provide email addresses to the students so that the necessary information could be communicated effectively and efficiently.

Table 4.14 Respondents Access to Digital Books at the University

Yes	No	Do not Know		Total
565 (78.5%)	147 (20.4%)	8	(1.1%)	720 (100%)

Table 4.14 displays the results of the students' access to digital books at university. 78.5 % students confirmed that they had access to digital books while 20.4 % students admitted that they had no access to digital books. The percentage shows that majority of students had access to digital books at university campus.

Table 4.15 Respondents Access to Data Bases at the University

Yes	No	Do not Know		Total
601 (83.5%)	117 (16.3%)	2	(0.3%)	720 (100%)

Table 4.15 shows that students access to data bases in the university. 83.5 % students claimed that they had access to data basis while 16.3 % students believed that they did not have access to data bases. It shows that universities provide the facility of national and international data bases and students were allowed to access these data bases in the university. It is needed to see the types of data bases how many students conduct research based on these data bases.

Table 4.16 Access to Messengers at the University

Yes	No	Do not Know	Total
116 (16.1%)	603 (83.8%)	1 (0.1%)	720 (100%)

Table 4.16 displays the results of the students' access to Messengers at the university. 83.8 % students claimed that they did not have access to any of the messengers at campus while 16.1 % students claimed that they had access to messengers. The table indicated that the social networks like messengers were not allowed in universities that could help students in learning as well as sharing their own experiences with other. They may not be able to interact with teachers as well.

Table 4.17 Access to Facebook at the University

Yes	No	Do not Know	Total
184 (25.5%)	529 (73.5%)	7 (1.0%)	720 (100%)

Table 4.17 indicated the results of the respondent's access to Facebook at the university. 73.5% students said that they did not have access to Facebook, while 25.5 % students believed that they had access to Facebook at the university. It seemed that universities did not allow students to use Facebook for one or the other reasons, although this social network is mostly used by Pakistani people.

Table 4.18 Access to Twitter at the University

Yes	No	Do not Know	Total
77 (10.7%)	636 (88.3%)	7 (1.0%)	720 (100%)

Table 4.18 displayed the results of the students' access to Twitter at the university. 88.3% students did not have access to Twitter while 10.7% students claimed that they had access to Twitter at the university. The results of the table show that the students were not allowed to use another social network at university campuses which could be helpful for students learning.

Table 4.19 Respondents as Member of Academic Networks

Yes	No	Do not Know	Total
429 (59.6%)	194 (26.9%)	97 (13.5%)	720 (100%)

Table 4.19 shows the results of students as members of academic networks. 59.6% students were members of academic network while 26.9% students were not members and 13.5 % students were unaware of it. The majority of the students formed membership of an academic networks. If they were allowed to use it their academic performance could increase as other studies shown.

4.3 Stage 2 Retention of Internet Contents

At this stage the learner may not retain all the available facilities, they keep some and leave others. The following tables and figures show about their retention of internet contents out of the all available contents.

Table 4.20 Major Downloads from Internet at the University

Songs& Videos	Study Material	Job adds	All of them	None of them	Total
108	296	17	195	104	720
(15.0%)	(41.1%)	(2.4%)	(27.1%)	(14.4%)	(100%)

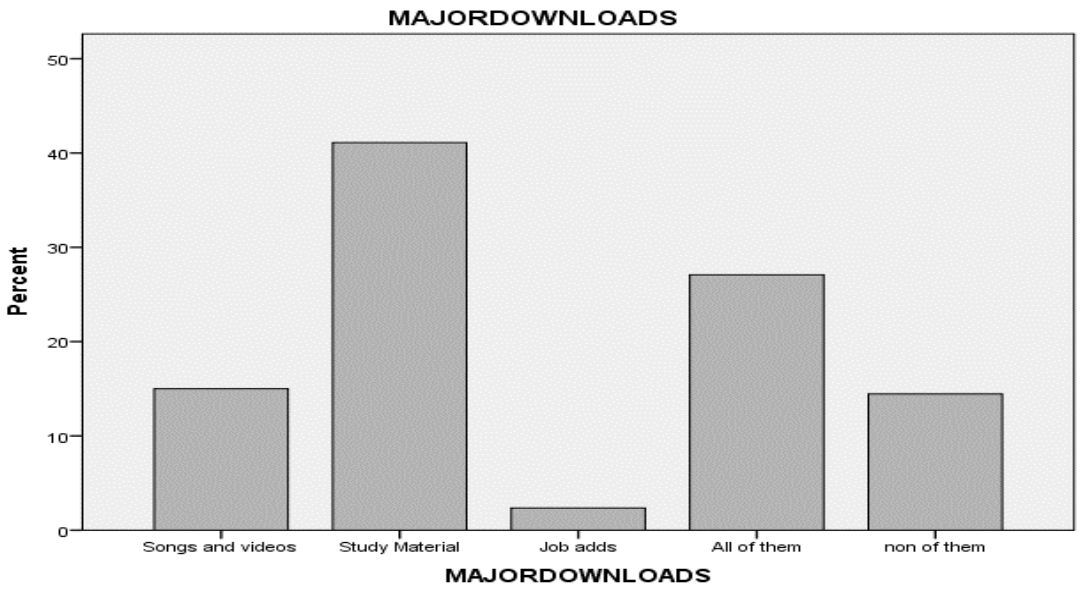

Figure 4.8 Showing the Major Downloads

Table 4.20 and figure 4.8 show the results about downloaded material from internet. 41.1% students downloaded study material, 27.3 % students downloaded songs and video, study material an job adds. The first column shows that they downloaded songs which were 15.0% while other 14.4% said they download none of them. Thus the students mostly downloaded study material along with songs and videos.

Table 4.21 Respondents Store Digital Study Materials

Hard Drive	CD/DVD	USB Drive	Any other	Total
149	26	495	50	720
(20.7%)	(3.6%)	(68.8%)	(6.9%)	(100%)

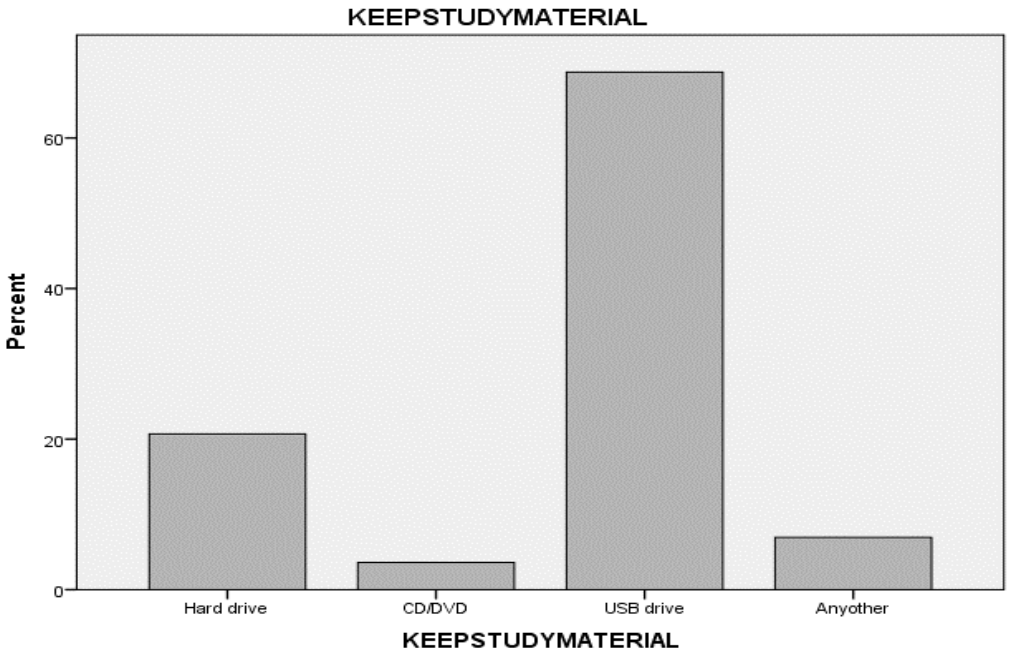

Figure 4.9 Showing the Drive to Keep Study Material

Table 4.21 describes the digital contents storage place where students keep their digital study material. 68.3% students kept it in USB drive, 20.7% students kept it in hard drive of the computer,3.6% kept on CD/DVD, while 6.9% kept it at some other places. The bar at number 3 of the chart shows that the highest number of students kept digital material on USB drive. The second highest bar is one which tells that they kept their study material on hard drive of the computers.

Table 4.22 Respondents Preference for Writing Assignments

MS Word	Power Point	Both	Coral Draw	Any other	Total
230	64	402	13	11	720
(31.9%)	(8.9%)	(55.8%)	(1.8%)	(1.5%)	(100%)

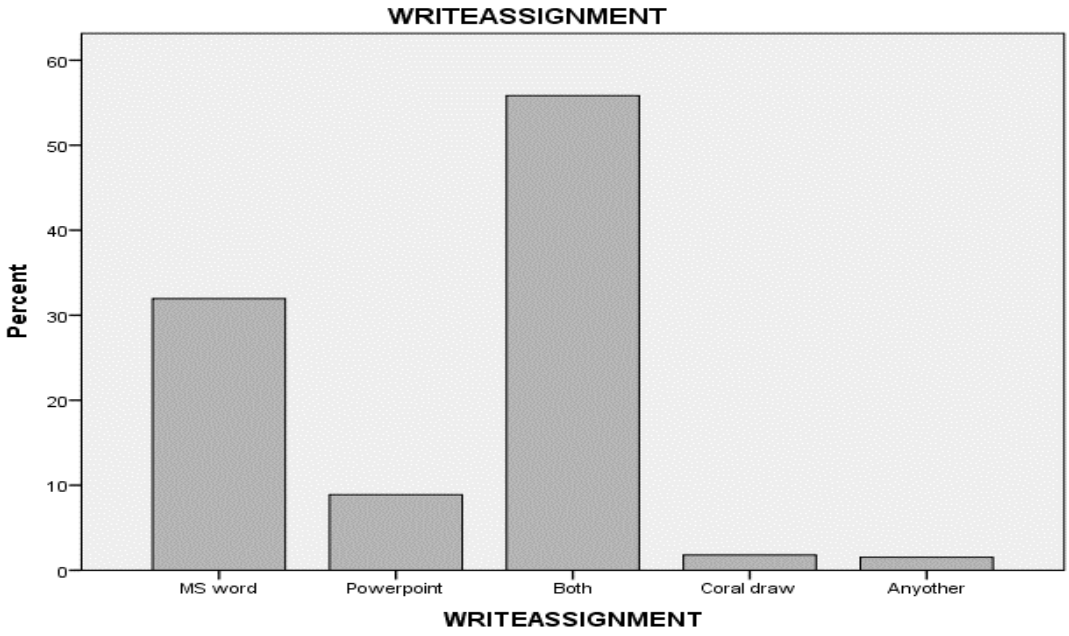

Figure 4.10 Options for Writing Assignments

Table 4.22 and figure 4.10 show result about the student preferred writing assignment. 55.8% students used both MS Word and Power Point, while 30.9% students used just MS Word for writing assignments. Other 8.9 % students used PowerPoint and 1.8% students used CorelDraw and 1.5% used some other. Thus, there seemed a trend of using MS Word and PowerPoint for writing assignments and developing power point presentation to present in the class.

Table 4.23 Respondents Favorite Reading Material Format

Digital form	Book form	Picture form	Any other	Total
374 (51.9%)	197 (27.4%)	122 (16.9%)	27 (3.8%)	720(100%)

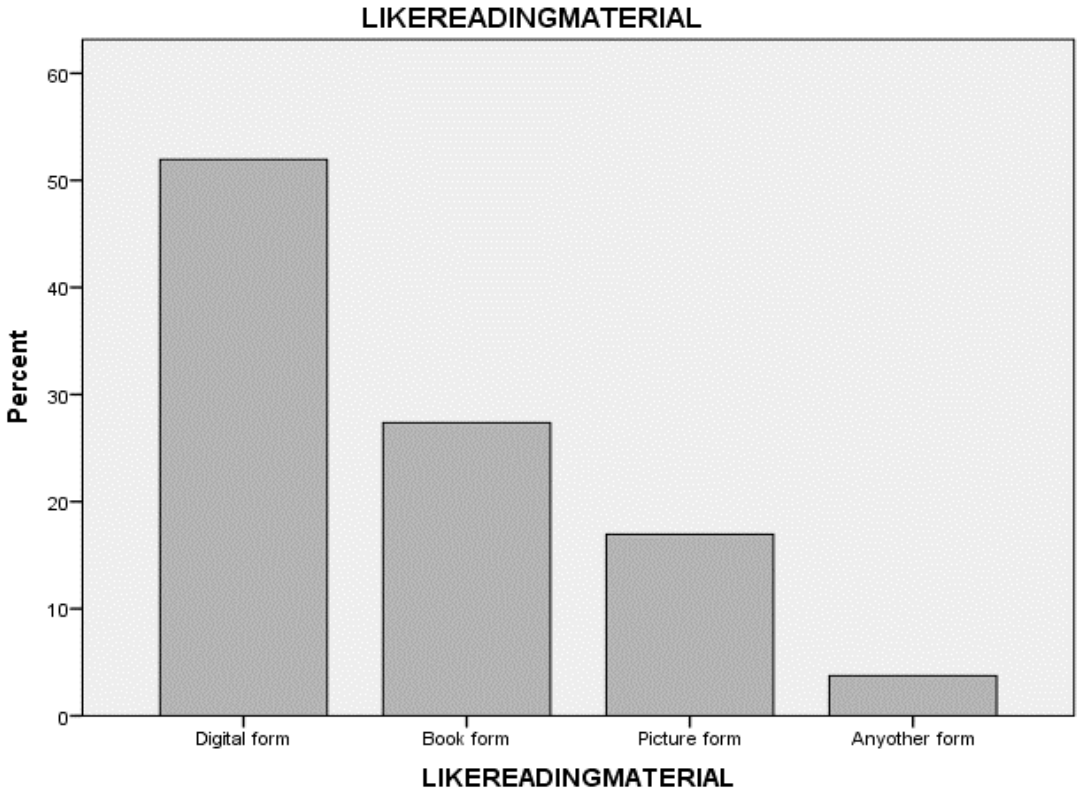

Figure 4.11 Showing the Students Choice of Reading Material

Table 4.23 figure 4.11 describe about the results of students choice of reading material as majority of students (51.9%) liked material in digital form while 27.4% students liked in book form and 16.9% students liked reading in picture form, 3.8% students liked in any other form. Thus the data shows that majority of the students liked reading material in digital form.

Table 4.24 Preferable and Understandable form of Presentations

Multi media	Oral lectures	Use of Board	Any other	Total
365	209	126	20	720
(50.7%)	(29.0%)	(17.5%)	(2.8%)	(100%)

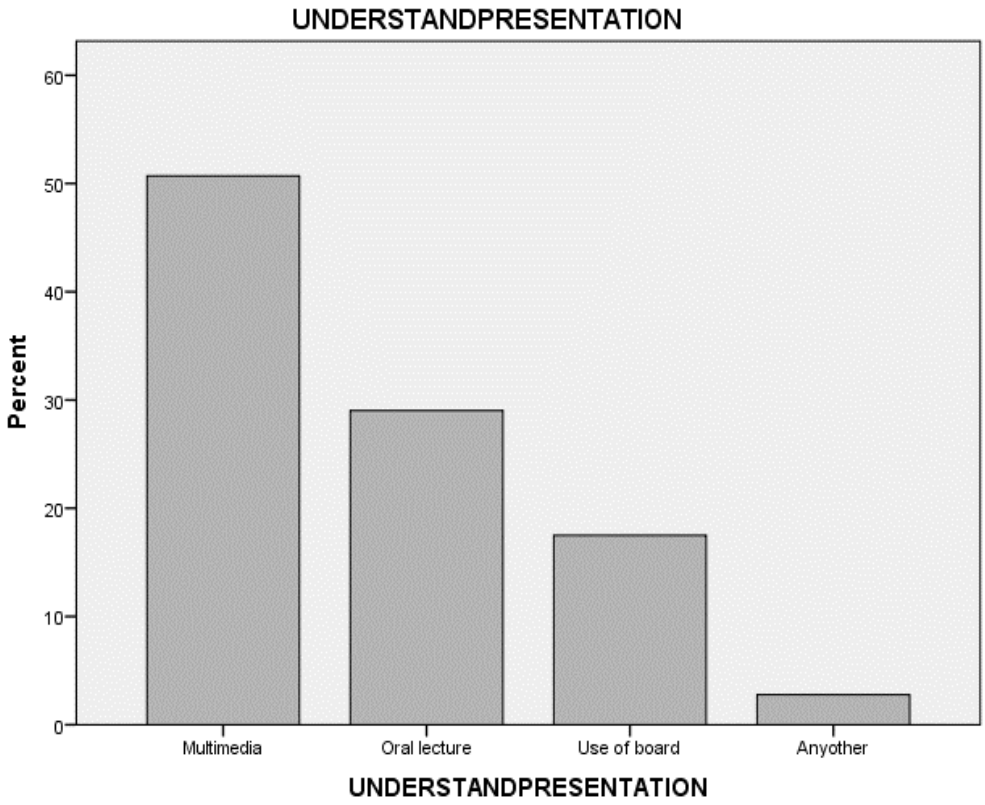

Figure 4.12 Displaying the medium through that students understand better

Table 4.24 and figure 4.12 display results about the medium students understand better. 50.7% students understood better if they are taught by multimedia, while 29.0% students understood better if they are taught by lecture. The data confirmed that use of multimedia could improve retention of the students if teachers used it adequately.

Table 4.25 Prefer Use of Chrome as a Search Engine

Never	Seldom	Frequently	Always	Total	df	X^2	Asymp. Sig.
65 (9.0%)	69 (9.6%)	197 (27.4%)	389 (54.0%)	720 00%	3	385.20	.000

Table 4.25 describes the results of preferred use of a search engine. A majority of students (54.0%) always used Google Chrome as their web browser and another 27.4 % students used it frequently while 9.6% students used it seldom and 9.0% never used it. The high X^2 value was 385.20 at significance level 0.05. It shows that majority the students used Google chrome. The data shows that in Pakistan a large majority used Google Chrome when they search any type of material on internet.

Table 4.26 Prefer Use of MSN as a Search Engine

Never	Seldom	Frequently	Always	Total	df	X^2	Asymp. Sig.
334 (46.4%)	236 (32.8%)	127 (17.6%)	23 (3.2%)	720 100%	3	301.722	.000

Table 4.26 shows the results of use of MSN as a search engine. 46.4% students never used it other 32.8% students seldom used it. The high X^2 value was 301.722 at significance level of 0.05 indicated that students never used it which means a significant number of respondents either never or seldom used this search engine.

Table 4.27 Prefer Use of Yahoo as Search Engine

Never	Seldom	Frequently	Always	Total	df	X^2	Asymp. Sig.
166 (23.1%)	261 (36.3%)	249 (34.6%)	44 (6.1%)	720 100%)	3	166.744	.000

Table no 4.27 shows the results about the use of Yahoo as search engine. As 36.3 % students seldom used Yahoo browser and 34.6% students frequently used it and, 23 .1% students never used it while 6.1% always used it. The Chi square value was 166.744 at significance level 0.05. It shows that some of the students used Yahoo as a browser but they are not in majority.

Table 4.28 Prefer Use of Internet Explorer as a Search Engine

Never	Seldom	Frequently	Always	Total	df	X^2	Asymp. Sig.
142 (19.7%)	224 (31.1%)	278 (38.6%)	76 (10.6%)	720 100%)	3	132.222	.000

Table no 4.28 displays the results of the use of Internet Explorer as search engine by the students, 38.6% students frequently used it and 10.6 % students always used while 31.1% seldom used it and 19.7% never used it. Chi square value was 132.222 at significance level 0.05 that indicates majority of them used internet explorer as a search engine. It is second highest used search engines in Pakistan among university students.

Table 4.29 Prefer Use of Mozilla as a Search Engine

Never	Seldom	Frequently	Always	Total	df	X^2	Asymp. Sig.
80 (11.1%)	155 (21.5%)	263 (36.5%)	222 (30.8%)	720 100%	3	107.100	.000

Table no 4.29 displays the results of using Mozilla as a search engine. 36.5 % students used it frequently while 30.8% students always used it while 21.5% students seldom used it and 11.1% never used Mozilla as a search engine. Chi square value was 107.100 at significance level 0.05 that indicated majority of the students used Mozilla browser as their search engine.

Table 4.30 Prefer Use of Alta Vista as a Search Engine

Never	Seldom	Frequently	Always	Total	df	X^2	Asymp. Sig.
472 (65.6%)	166 (23.1%)	74 (10.2%)	8 (1.1%)	720 (100%)	3	701.556	.000

Table 4.30 displays the results of the students' opinion about the use of Alta Vista as a search engine. A large majority of the students did not use Alta Vista as 65.6% students never used it and 23.1% students seldom used it only 10.3% students frequently use it and 1.1% always used it. Chi square value was 701.556 at significance level 0.05. Thus, the majority of the students did not use it as web browser. It indicates that most of the university students used Chrome, Internet Explorer and Mozilla as search engines and the contents supported can be displayed and shown.

4.4 Stage 3 Reproductions of Internet Contents

At this stage of symbolic learning the students are able to get benefit of learning out of the retained contents of internet. The following tables and figures describe students' responses about their reproduction stage of the contents.

Table 4.31 Major Sources for Students to Obtain Guidance

Social Networks	Group Discussion	All of them	None	Total	df	X^2	Asymp. Sig.
216	176	246	82	720	3	332.767	.000
(30%)	(24.45 %)	(34.2%)	(11.4%)	(100%)			

Table 4.31 shows the results about the major source for students' guidance. These included all social networks, group discussion and all of them. 34.2% of the students used these all while 30.0 % students used social networks and 24.45% students used group discussion, 11.4% used none of them to get guidance about studies. X^2 value was 332.767 at significance level 0.05. The trend is that majority of the students used social networks for guidance.

Table 4.32 Use of Wikipedia to Solve Academic Problems

Never	Seldom	Frequently	Always	Total	df	X^2	Asymp. Sig.
82	126	302	210	720	3	157.244	.000
11.38%	17.5 %	41.9 %	29.16%	100			

Table 4.32 displays the results of the source students used for the solution of their academic problems. The majority of the students (41.9%) frequently used Wikipedia for solving their problems and 29.16% students always used it. While 17.5 % students seldom used it and 11.38% never used it. The Chi-Square value was

157.244 at significance level 0.05 indicated that majority of the students used Wikipedia for solution of their academic problems.

Table 4.33 Digital Library in Academic Problems

Never	Seldom	Frequently	Always	Total	Df	x^2	Asymp. Sig.
71	146	359	142	720	3	259.170	.000
9.8 %	20.27%	49.86%	20.27 %	100%			

Table 4.33 shows the results about their use of digital library to find solution of their academic problems. 49.86% student frequently used digital library and 20.27% students always used it whenever they had a problem. 20.27 % students seldom used it and 9.8% never used it. Chi square value was 259.170 at significance level 0.05. The need and importance of digital library was shown above.

Table 4.34 Use of Search Engine for Academic Problems

Never	Seldom	Frequently	Always	Total	df	X^2	Asymp. Sig.
65	102	237	315	720	3	226.886	.000
9%	14%	33%	43%	100%			

Table 4.34 shows the results of the survey about use of search engine for finding out solution of their academic problems. 43% student always used it when they have an academic problem, 33% students frequently used it. Chi square value was 226.886 at Sig. level 0.05.This indicates more liking of search engines to get solution of any academic problem.

Table 4.35 List Prepared by Students of Internet Contents

Free Access sites	Research Journal	Digital Books	Songs & Movies	All of them	Total
336	171	23	138	52	720
(46.7%)	(23.8%)	(3.2%)	(19.2%)	(7.2%)	(100%)

Table 4.35 displays the results in form of frequencies about the they prepared for different contents of internet that students used and stored in their computers, 46.7% students kept free access site list while 23.8% students kept a list of research journals, other 19.2 % students kept songs and movies while 7.2% kept a list of all these contents and 3.2% kept digital books. This indicated that majority of the respondents had free access sites. This means they wanted to use ICT material.

Table 4.36 Preferred Use of Libraries and Search Engines

Digital Library	General Library	Online Library	Search Engines	Any other	Total
218	256	78	141	27	720
(30.3%)	(35.6%)	(10.8%)	(19.6%)	(3.8%)	(100%)

Table 4.36 describes the results of the survey about their prefer use of the library. 35.6% students preferred to use general library and 30.3% students preferred to use digital library, 19.6% students preferred to use search engines while 10.8% preferred to use online library. A small number of respondents (3.8%) use any other resource. This indicated that majority of the students (49.9%) used digital library as their first choice which shows motivation for digital library in the university.

Table 4.37 Digital Contents Stored in the Computer

YES	NO	Total	df	X^2	Asymp. Sig.
498	221	719	1	106.716	.000
69.16%	30.69%	100%			

Table 4.37 displays the results of the students responses about contents stored in the computer. 69.16 % respondents stored digital contents in their computers while 30.69% do not store them in computers. It indicates that majority of them stored digital form of material in their computers. Chi square was 106.716 at Significance level 0.05. This showed students that most of the students stored study material in their computers hard drive.

Table 4.38 Movies Stored in the Computer

YES	NO	Total	df	X^2	Asymp. Sig.
427	293	720	1	24.939	.000
59.30%	40.69%	100%			

Table 4.38 displays the results of the survey about movie stored in their computers. 59.30% students stored movies in the computers while 40.69% students did not store movies in their computers. Chi square value was 24.939 at Sig. 0.05 which shows significant difference in two types of frequencies as majority of them stored movies in their computer also.

Table 4.39 Songs Stored in the Computer

Yes	No	Total	X^2	df	Asymp Sig.
549	171	720	198.450	1	.000
76.20%	23.75%	100%			

Table 4.39 describes results of the survey about songs stored in their computers. 76.20 % students stored songs in their computers while 23.75% students did not store songs in their computers. Chi-square was 198.450 at Sig. level 0.05. This is an indication of the students' responses of the contents in their computers.

Table 4.40 Research Articles Stored in Computer

Yes	No	Total	df	X^2	Asymp. Sig.
469	250	720	1	66.705	.000
65.13%	34.72%	100%			

Table 4.40 describes the results of the survey about research articles stored in their computers. 65.13 % students stored research articles in their computers while 34.75% did not store research articles in their computers. Chi square value was 66.705 at Sig. level 0.05. It also proved that the majority of them kept research articles in their computers.

Table 4.41 Video Games Stored in Computer

Yes	No	Total	df	X^2	Asymp. Sig.
330	390	720	1	5.00	.025.
45.83%	54.16%	100%			

Table 4.41 displays the results of the survey about video game stored in computers. 54.16 % students did not store movies in their computer while 45.83% students stored movies in their computers. It shows that they did not have a store of video games in their computer but a very reasonable number of students had video games in their computers. Chi square was 5.00 at Sig level. 0.05. Although, mild high but still it indicated they did not store video games in computers.

Table 4.42 Holy Quran Stored in Computer

Yes	No	Total	df	X^2	Asymp. Sig.
600	119	719	1	321.782	.000
83.44%	16.55%	100%			

Table 4.42 describes the results of the survey about storing Holy Quran in computers. A large majority of the students (83.44%) stored Holy Quran in their computers while 16.55% students did not store Holy Quran in their computers. Chi square was 321.782 at Sig level 0.05 that was significant enough to show the contents in their computers.

4.5 Motivation Stage to Use Internet Contents

At this stage the learner motivation for different contents on internet is determined which really changes their learning to performance. The following tables

and figures display the results of their motivation to perform the learnt skills of internet and mobile phone.

Table 4.43 Internet Use Improve Students' Performance

Very low	Low	High	Very high	Total	df	X^2	Asymp. Sig.
33	89	452	146	720	3	585.500	.000
4.58%	12.36%	62.77%	20.27%	100%			

Table No 4.43 describes the results of the student ranking of the statement internet improves their academic performance. It is found that 62.77% students ranked high and 20.27% students ranked very high that internet use increased their academic performance. A small minority of the respondents (12.36%) and (4.58%) ranked low and very low that internet did not increase students' performance. Chi square was 583.500 at Sig level 0.05 that also was significant which indicates that internet use actually increased students' performance.

Table 4.44 Effects of Social Networks on Students Learning

Very low	Low	High	Very high	Total	df	Chi-Square	Asymp. Sig.
61	123	403	133	720	3	385.267	.000
8.47%	17.08%	55.97%	18.47%	100%			

Table 4.44 displays the results of the students ranking of the effect of social network on students learning. As 55.97% students ranked high and 18.47% ranked very high that social networks effect their learning that indicates social networks had positive effects on students learning. The Chi square was 385.267 at Sig level 0.05 and it was significant to indicate that social networks improve students' learning.

Table 4.45 Usefulness of Digital Libraries

Very low	Low	High	Very high	Total	df	Chi-Square	Asymp. Sig.
14	74	418	214	720	3	536.622	.000
1.94%	10.27%	58.05%	29.72%	100%			

Table 4.45 indicates the results of usefulness of libraries by ranking them. 58.05 % students ranked high of the usefulness of digital libraries and 29.72% ranked very high that digital libraries were useful for them while 10.27% students ranked very low and 1.94% ranked low. The majority of the students believed that digital libraries are useful for students. Chi square was 536.622 at Sig. level 0.05 that was significant at this level. Although students did not use digital library in previous responses but they had a strong desire to use it.

Table 4.46 Online Articles are Helpful for Learner

Very low	Low	High	Very high	Total	df	Chi-square	Asymp. Sig.
39	103	374	203	719	3	355.910	.000
5.42%	14.32%	52.01%	28.23%	100%			

Table 4.46 describes the results about online articles are helpful for students. The respondents 51.01% ranked high and 28.23% respondents ranked very high which indicates that online articles are helpful for students learning. Chi square was 355.910 at Sig level 0.05 that indicated a significant relationship.

Table 4.47 Discussion Forums Create New Learning Dimension

Very low	Low	High	Very high	Total	df	Chi-Square	Asymp. Sig.
23	83	422	192	720	3	515.367	.000
3.19%	11.52%	58.61%	26.66%	100%			

Table 4.47 shows the results of the importance of discussion forum that created new learning dimension of the students. 58.61% students ranked high and 26.66% students ranked very high for the importance of discussion forums that created new dimensions of learning. On the other hand, 11.52% students ranked low and 3.19% ranked very low. Chi square was 515.367 at Sig level 0.05 that was significant at this level.

Table 4.48 Students Blogs Improved Professional Attitude

Very low	Low	High	Very high	Total	df	Chi-Square	Asymp. Sig.
34	115	357	214	720	3	322.367	.000
4.72%	15.97%	49.58%	29.72%	100%			

Table 4.48 tells about the results of the survey that students' blogs improve professional attitudes. 49.58% students ranked high and 29.72% students ranked very high of the statement that the students blogs improved professional attitudes of the students. Chi square was 322.367 at Sig level 0.05 that was significant and indicated that the blogs developed new dimension for students learning.

Table 4.49 Professional Associations Enhance New Skills

Very low	Low	High	Very high	Total	Df	Chi-Square	Asymp. Sig.
34	115	357	214	720	3	322.367	.000
4.72%	15.97%	49.58%	29.72%	100%			

Table 4.49 describes the results of the students opinion about professional associations enhance new skills as 49.58% students ranked high and 29.72% students ranked very high while 15.97% students ranked low and 4.72% ranked very low. The table indicates that professional associations enhanced new skills. Chi square was 322.367 at Sig level 0.05 that was significant once again.

4.6 Contents of Mobile Phone at Attention Stage

As earlier the contents on internet were analyzed, in this section the use of mobile and its contents has been analyzed. They are also placed as symbolic learning model. The tables and figures are showing the four stages of the model. At this stage students tells us about the facilities of mobile available to them including the type of mobile phone, its usage and its contents.

Table 4.50 Starting Year of Mobile Use

Before 2003	2006	2009	After 2012	Any other	Total
85	140	323	122	50	720
11.8%	19.4%	44.9%	16.9%	6.9%	100.0

Frequency Table 4.50 shows the results of the year students started using mobile phone. 44.9% students started using mobile phone in 2009, 19.4% students started using since 2006, 16.9% students started mobile use after 2012, 11.8 % students started using it before 2003, 6.9% mentioned some other year. A large majority of the students started using mobile phone in 2009.

Table 4.51 Students Using Mobile Internet Package

Daily	Weekend	Weekly	Monthly	Any other	Total
79	110	204	164	163	720
11.0%	15.3%	28.3%	22.8%	22.6%	100.0%

Table 4.51 describes that 28.3% students used weekly package while 22.8% used monthly package, 22.6% used any other type of package, 15.3% used weekend package and 11.0 % used daily package. The data was scattered but in percentage it could be concluded that weekly package was mostly used.

Table 4.52 Type of Mobile Used by Students

Smart phone	I phone	Android	Any other	Total
238	155	173	154	720
33.1%	21.5%	24.0%	21.4%	100.0%

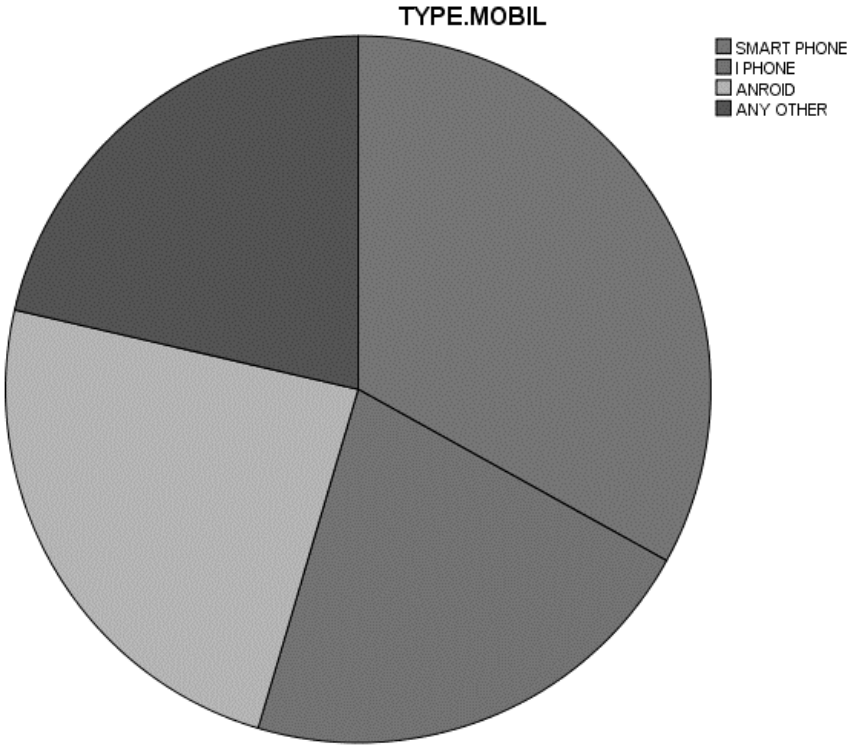

Figure 4.14 Showing Type of Mobile Used by Respondents

Table 4.52 and figure 4.14 of pie chart shows results about the type of mobile phone student used. As 33.1% students used smart phone having all features, 24.0 % students used android phone, 21.5% students used IPhone and 21.4% used some other phones. It tells the diversity of mobile usage in Pakistan and the scope for using mobile phone as a learning device.

Table 4.53 Daily Mobile Use by the Students

Less than 10 minutes	10-25 min.	30-40 min	More than 40 min	Any other	Total
44	302	7	147	220	720
6.1%	41.9%	1.0%	20.4%	30.6%	100.0%

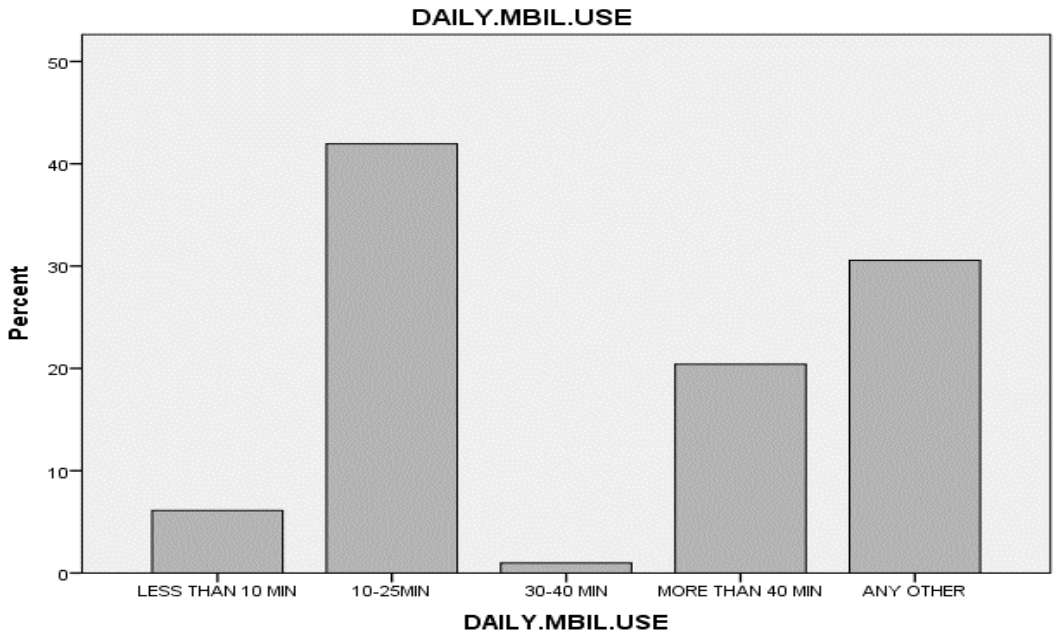

Figure 4.15 Showing Daily Time of Mobile Use

Table 4.53 and figure 4.15 of bar chart displayed the results of the survey about the time students used mobile phones. As 40.9% students used mobile phone for 10-25 minutes daily, 30.6% students used some other slot while 20.4% students used mobile for more than 40 minutes, 6.1% used for less than 10 minutes daily. The timing of using mobile indicated the potential for using it as a learning device.

Table 4.54 Using the Symbian Operating System on Mobile Phone

Never	Seldom	Frequently	Always	Total	df	X^2	Asymp. Sig.
332	166	155	67	720	3	203.856	.000
46.11%	23.05%	21.52%	9.30%	100%			

Table 4.54 describes the statistics about type of mobile operating systems the students used. 46.11% students never used Symbian operating systems and 23.05% seldom used Symbian operating system mobile phone while 21.52% and 9.30% students frequently and always used this mobile operating system. Chi square was 203.856 at Sig level 0.05 and it shows significant difference.

Table 4.55 Use of Google Android Mobile Phone

Never	Seldom	Frequently	Always	Total	df	X^2	Asymp. Sig.
147	171	309	93	720	3	141.000	.000
20.41%	23.75%	42.91%	12.91%	100%			

Table 4.55 tells the statistics about students' use of Google Android mobile phone. It was frequently used as (42.75%) respondents frequently used it and 12.91% respondents always used it which indicates that majority of the respondents used google android phone. Chi square was 141.00 at Sig level 0.05, as it was significant enough to show the result that students used Android by Google.

Table 4.56 Use of IOS Apple Mobile Phone

Never	Seldom	Frequently	Always	Total	df	X^2	Asymp. Sig.
294	219	159	48	720	3	179.900	.000
40.83%	30.41%	22.08%	6.66%	100%			

Table 4.56 describes about Apple IOS mobile phone operating system used in the market, It is not commonly used by students as (40.83%) never used it 30.41% students seldom used it while 22.08% students frequently used it and 6.66% students always used it. It is a major application used in west and America but students did not use it in Pakistan. Chi square was 179.900 at Sig. level 0.05 and it was significant at this level.

Table 4.57 Use of Samsung Bada Operating System

Never	Seldom	Frequently	Always	Total	df	X^2	Asymp. Sig.
186	148	220	166	720	3	15.867	.001
25.83%	20.55%	30.55%	23.05%	100%			

Table 4.57 shows a split responses about the use of Samsung mobile operating system. 30.55% students frequently used, 23.05% students always used but 25.83% students never used it and 20.55% seldom used it. Chi square was 15.867 at Sig level 0.05 that was significant to show the results of the responses.

Table 4.58 Use of Microsoft Operating System

Never	Seldom	Frequently	Always	Total	df	X^2	Asymp. Sig.
172	210	229	109	720	3	46.700	.000
23.88%	29.16%	31.80%	15.13%	100%			

Table 4.58 shows the results about the use of Microsoft operating system on mobile phone, 31.16% students frequently used it and 15.13% students always used it while 29.16% students seldom used it and 23.88% students never used it. The table describes that a reasonable number of students either frequently used it or always used it. Chi square was 46.700 at Sig level 0.05 and it was significant too.

Table 4.59 Use of Phone Book as Content of Mobile Phone

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
26	122	380	192	720	373.467	3	.000
3.61%	16.94%	52.77%	26.66%	100%			

Table 4.59 indicates the responses of the students about using mobile phone contents. The first content was the Phone book. 52.77% students frequently used and 26.66% students always used item on mobile phone. The other 16.94% students seldom used and 3.61% students never used it. Chi square was 373.467 at Sig level 0.05 and it was significant at this level.

Table 4.60 Use of Messages as Content of Mobile Phone

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
11	54	204	450	719	655.982	3	.000
1.52%	7.50%	28.33%	62.50%	100%			

Table no 4.60 describes the status of the message as a content on mobile phone. Majority of the students (62.50%) always used and 28.33% students frequently used messages as the content of mobile while 7.50% students seldom used and 1.52% students never used it. Chi square was 655.982 at Sig level 0.05 which was highly significant.

Table 4.61 Use of Calendar as Content of Mobile Phone

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
48	314	290	68	720	333.467	3	.000
6.66%	43.61%	40.27%	9.44%	100%			

Table 4.61 shows statistics about calendar as a mobile phone content. 43.61% students seldom used calendar as content of mobile phone and 6.66% students never used it while 40.27% students frequently used and 9.44% students always used it as a content. Chi square was 333.467 at Sig. level 0.05 and it was clearly significant at this level.

Table 4.62 Using Multimedia as Content of Mobile Phone

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
72	301	254	93	720	218.611	3	.000
10.00%	41.80%	35.27%	12.91%	100%			

Table 4.62 describes the frequencies of the student responses about the use of multimedia as content of mobile phone. 41.80% students seldom used and 10.00% students never used it while 35.27% students frequently used and 12.91% students always used it. It indicates that although majority of the students did not use it but a reasonable number of students used it. Chi square was 218.611 at Sig level 0.05 that was significant at this level.

4.7 Contents of Mobile Phone at Retention Stage

At this stage, retention of the contents of mobile are analyzed. The students' opinion as per their responses are presented and analyzed by using chi square in SPSS software to find the results.

Table 4.63 Use Mobile Phone for Talking Purpose

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
24	100	352	244	720	357.867	3	.000
3.33%	13.88%	48.88%	33.88%	100%			

Table 4.63 shows the responses of the students about using mobile phone for talking purpose. 48.88% students frequently and 33.88% students always used Mobile Phone for talking as indicated in the table, while 13.88% students seldom and 3.33%

student never used it for the purpose. Chi square was 357.867 at Sig. level 0.05 and it was significant.

Table 4.64 Use Mobile Phone for Sending SMS

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
25	46	308	341	720	468.256	3	.000
3.47%	6.38%	42.77%	47.36%	100%			

Table 4.64 shows the results of mobile phone use for text messages, 47.36% students always used it and 42.77% students frequently used for the purpose while 6.38% students seldom and 3.47% never used it for sending SMS. Chi square was 468.256 at Sig. level 0.05 as it was significant.

Table 4.65 Use of Mobile Phone for Watching Date and Time

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
25	190	380	125	720	373.056	3	.000
3.47%	26.38%	52.77%	17.36%	100%			

Table 4.65 shows the results of mobile phone use for watching date and time so the table statistics show as 52.77% students frequently used and 17.36% students always used for the purpose while 26.38% students seldom used and 3.47% never used it. Chi square was 373.056 at Sig. level 0.05 and it was significant at this level.

Table 4.66 Use of Mobile for Listening Songs

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
66	162	344	148	720	229.111	3	.000
9.16%	22.50%	47.77%	20.55%	100%			

Table 4.66 shows the results of the responses about mobile phone use for listening songs. 47.77% students frequently and 20.55% students always used mobile phone for listening songs while 22.50% students seldom and 9.16% never used mobile phone for this purpose. Chi square was 229.111 at Sig. level 0.05 and it was significant.

Table 4.67 Use of Mobile for Watching Movies

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
352	182	186	0	720	78.433	3	.000
48.88%	25.27%	25.83%	00%	100%			

Table 4.67 shows the result of survey of using mobile for watching movies and its results indicate 48.88% students never used it and 25.27% students seldom used it while 25.83% students frequently used it for the purpose. Chi square was 78.433 at Sig. level 0.05 and it was significant.

Table 4.68 Using Mobile for Video Clips and Pictures

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
84	298	228	110	720	168.578	3	.000
11.66%	41.38%	31.66%	15.27%	100%			

Table 4.68 shows the results of the survey about using mobile for video clips and picture the responses are scattered as 41.38% students seldom used it and 11.66% students never used it for the purpose but a reasonable number of 31.66% students frequently and 15.27% students always used it for purpose. Chi square was 168.578 at Sig. level 0.05 and it was significant.

Table 4.69 Using Mobile for Class Schedules and Tasks

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
131	271	143	175	720	67.089	3	.000
18.19%	37.63%	19.86%	24.30%	100%			

Table 4.69 shows the responses of the question about using mobile phone for class timings, schedule and tasks assigned by teachers. Table indicates that majority of (37.63%) students seldom used it and 18.19% students never used it while a reasonable number of students (24.30%) always and (19.86%) frequently used it. Chi square was 67.089 at. Sig. level 0.05 showing it was significant.

Table 4.70 Using Mobile for Finding Words and Phrases

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
127	232	286	75	720	154.300	3	.000
17.63%	32.22%	39.72%	10.41%	100%			

Table 4.70 indicated the results of the question of using mobile phone for searching /finding words and phrases. 39.72% students frequently and 10.41% students always used it for the purpose while a reasonable number of students (32.22%) seldom and (17.63%) never used it for the purpose. Chi square was 154.300 at Sig. level 0.05, showing it as significant.

Table 4.71 Using Mobile Phone as Dictionary

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
88	198	265	169	720	89.633	3	.000
12.22%	27.50%	36.80%	23.47%	100%			

Table 4.71 shows the results of survey question of using mobile phone as a dictionary. 36.80% students frequently and 23.47% students always used mobile phone as a dictionary while 27.50% students seldom and 12.22% never used it for this purpose. Chi square was 89.633 at Sig. level 0.05 that was significant.

Table 4.72 Using Mobile Phone for Playing Games

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
81	148	311	180	720	155.478	3	.000
11.25%	20.55%	43.19%	25.00%	100%			

Table 4.72 presents the results of survey question about using mobile phone for playing games. 43.19% students frequently and 25.00% students always used it for playing games while 20.55% students seldom and 11.25% never used it for this purpose. Chi square was 155.478 at Sig. level 0.05 and it presents significant results.

Table 4.73 Using Encyclopedia on Mobile Phone

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
157	239	225	99	720	69.978	3	.000
21.80%	33.19%	31.25%	13.75%	100%			

Table 4.73 represents the results of survey question of using encyclopedia in mobile phone, the responses are splinted. 33.19% students seldom and 21.80% students never used it while 31.25% students frequently and 13.75% always used it for this purpose. Chi square was 69.978 at Sig. level 0.05 that was significant.

Table 4.74 Using Mobile Phone for Taking/ Storing Photos

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
55	60	205	400	720	439.167	3	.000
7.63%	8.33%	28.47%	55.55%	100%			

Table no 4.74 presents the results of a question about using mobile phone for taking and storing photos, the results show that 55.55% students always and 28.47% students frequently used it while 8.33% students seldom and 7.63% never used it for this purpose. Chi square was 439.168 at Sig. level 0.05 that was significant.

4.8 Contents of Mobile Phone at the Reproductions Stage

At this stage, the contents on mobile that were used by students frequently are mentioned and analyzed by using Chi square in SPSS. The results are in frequencies also to show the number of frequencies.

Table 4.75 Use Mobile for Meanings of Words and Phrases

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
100	145	352	123	720	224.767	3	.000
13.88%	20.13%	48.88%	17.08%	100%			

Table 4.75 presents responses of the survey question of using mobile phone for finding meanings of words and phrases. The data shows that 48.88% students frequently and 17.08% students always used it for the purpose while 20.13% students seldom and 13.88% never used it for this purpose. Chi square was 224.767 at Sig. level 0.05.

Table 4.76 Using Mobile as Calculator

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
34	156	306	224	720	220.578	3	.000
4.71%	21.66%	42.50%	31.11%	100%			

Table no 4.76 presents the responses of the survey question of using mobile phone for calculations, the results were 42.50% students frequently and 31.11% students always used it for this purpose while 21.66% students seldom and 4.71% never used it for this purpose. Chi square was 220.578 at Sig. level 0.05 and there was significant difference.

Table 4.77 Using Mobile Phone for Watching Time

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
20	127	377	196	720	374.85	3	.000
2.77%	17.63%	52.63%	27.22%	100%			

Table 4.77 presents the responses of the question about using mobile for watching time, the results show as 52.63% students frequently and 27.22% students always used for the purpose while 17.63% students seldom and 2.77% never used it for this purpose. Chi square was 374.856 at Sig. level 0.05 and it showed significant difference.

Table 4.78 Use of Mobile for Listening Music

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
51	163	248	258	720	153.544	3	.000
7.08%	22.63%	34.44%	35.83%	100%			

Table 4.78 represents the responses of survey question about listening music on mobile phone, it indicates that 35.83% students always and 34.44% students frequently used it for this purpose while 22.63% students seldom and 7,08% never used it for this purpose. Chi square was 153.544 at Sig. level 0.05 and it was significant difference.

Table 4.79 Use of Mobile for Watching Movies

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
212	177	195	136	720	17.744	3	.000
29.44%	24.58%	27.08%	18.88%	100%			

Table 4.79 presents statistics of survey question for using mobile phone to watch movies, 29.44% students never and 24.58% students seldom used it for this purpose while 27.08% students frequently and 18.88% students always used it for this purpose. Chi square was 17.744 at Sig. level 0.05 and that was significant.

Table 4.80 Use of Mobile Phone for Sending SMS

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
18	135	329	238	720	299.078	3	.000
2.50%	18.75%	45.69%	33.05%	100%			

Table 4.80 presents the results about the responses of mobile use for sending SMS. 45.69% students frequently and 33.05% students always used mobile for sending text messages while 18.75% students seldom and 2.50% never used it for sending text messages. Chi square was 299.078 at Sig. level 0.05 that was significant too.

Table 4.81 Using Mobile Phone for Playing Games

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
66	199	269	186	720	118.411	3	.000
8.61%	27.63%	37.36%	25.83%	100%			

Table 4.81 presents statistics about the respondents' use of mobile phone for playing games. 37.36% students frequently and 25.83% students always used it for the purpose while 27.63% students seldom and 8.61% never used mobile phone for playing games. Chi square was 118.411 at Sig. level 0.05.

Table 4.82 Use Mobile for Waking Alarm

Never	Seldom	Frequently	Always	Total	X^2	df	Asymp. Sig.
51	199	243	227	720	128.778	3	.000
7.08%	27.63%	33.75%	31.52%	100%			

Table 4.82 presents the statistics of using mobile phone for waking up alarm. Majority of the students (33.75%) frequently and (31.52%) always used it for waking up alarms while 27.63% students seldom and 7.08% never used mobile phone for waking up alarms. Chi square was 128.778 at Sig. level 0.05 and it showed significant difference.

4.9 Contents of Mobile Phone at Motivations Stage

At this stage the students motivation for use of mobile phone is analyzed and presented in form of table using Chi square test with frequencies table. The tables show the statistics.

Table 4.83 Keeping in Touch with Class Tasks

SD	D	SA	A	Total	X^2	df	Asymp. Sig.
51	83	455	131	720	578.200	3	.000
7.08%	11.52%	63.19%	18.19%	100%			

Table 4.83 presents the statistics about students' motivation for using mobile phone to keep in touch with class tasks and activities. 63.11% students strongly agreed and 18.19% agreed that mobile phone kept students in touch with class tasks and activities while 11.52% disagreed and 7.08 % strongly disagreed that mobile

phone kept students in touch with class tasks and activities. Chi square was 578.200 at Sig. level 0.05 which meant significant difference.

Table 4.84 Store Study Material on Mobile Phone

SD	D	SA	A	Total	X^2	df	Asymp. Sig.
34	107	453	126	720	578.278	3	.000
4.72%	14.84%	62.91%	17.50%	100%			

Table 4.84 shows the opinion of the students about storing study material in mobile phone. The statistics presents that 62.91% students strongly agreed and 17.50% agreed that they kept study material in their mobile phone while 14.84% students disagreed and 4.72% strongly disagreed that they did not keep their study material in their mobile phone. Chi square was 578.278 at Sig. level 0.05.

Table 4.85 High Tech Mobile Phone Improves Academic Performance

SD	D	SA	A	Total	X^2	df	Asymp. Sig.
85	212	319	104	720	195.256	3	.000
11.80%	29.44%	44.30%	14.44%	100%			

Table 4.85 displays the results of the opinion of the students about high tech mobile phone improved academic performance of the students as 44.30 % students strongly agreed and 14.44% agreed that mobile phone improved their academic performance while 29.44% students disagreed and 11.80% strongly disagreed that high tech mobile phone improve their academic performance. Chi square was 195.256 at Sig. level 0.05 and it shows significant difference.

Table 4.86 Mobile Phone Keeps in Contact with Teachers

SD	D	SA	A	Total	X^2	df	Asymp. Sig.
8	85	503	124	720	811.522	3	.000
1.11%	11.80%	69.86%	17.22%	100%			

Table 4.86 describes that students believed mobile phone keeps in contact with teachers as indicated in the above table. 69.86% students strongly agreed and 17.22% agreed that mobile phone kept in contact with teachers while 11.80% students disagreed and 1.11% strongly disagreed that mobile phone keeps in contact with teachers. Chi square was 811.522 at Sig. level 0.05 which indicates significant results.

Table 4.87 Mobile Phone with Multimedia is Helpful

SD	D	SA	A	Total	X^2	df	Asymp. Sig.
23	78	390	229	720	453.078	3	.000
3.19%	10.83%	54.16%	31.80%	100%			

Table 4.87 describes that students had positive opinion about mobile phone with multimedia was helpful as 54.16% students strongly agreed and 31.80% agreed with the statement while 10.83% students disagreed and 3.19% strongly disagreed that mobile with multimedia is helpful for them. Chi square was 453.078 at Sig. level 0.05 and it was significant difference.

Table 4.88 Learning by Mobile will Replace Traditional Learning

SD	D	SA	A	Total	X^2	df	Asymp. Sig.
35	112	478	95	720	675.989	3	.000
4.86%	15.55%	66.38%	13.19%	100%			

Table 4.88 displays the results of the responses about learning through mobile would replace the traditional learning as 66.38% students strongly agreed and 13.19% were agreed with the statement while 15.55% students disagreed and 4.86% strongly disagreed with the statement. Chi square was 675.989 at Sig. level 0.05.

Table 4.89 I Pad would Replace Note Taking Registers

SD	D	SA	A	Total	X^2	df	Asymp. Sig.
121	169	321	109	720	158.467	3	.000
16.80%	23.47%	44.58%	15.13%	100%			

Table 4.89 describes students' opinion about IPad would replace writing registers as 44.47% students strongly agreed and 15.13% agreed that IPad would replace the note taking registers while 23.47% students disagreed and 16.80% strongly disagreed with the statement. Chi square was 158.467 at Sig. level 0.05. It indicated high relationship.

Table 4.90 Multimedia Phone will Become Need of the Students

SD	D	SA	A	Total	X^2	df	Asymp. Sig.
39	99	438	143	720	525.033	3	.000
5.41%	13.75%	60.83%	19.86%	100%			

Table no 4.90 presents the opinions of the students about need of multimedia phone. A majority of the students responded (60.83%) strongly agreed and (19.86%) agreed that multimedia phone would become need of the students in future while 13.75% students disagreed and 5.41% strongly disagreed with this statement. Chi square was 525.033 at Sig. 0.05 and that was significant at this level

Table 4.91 Academic Network Membership Status

Yes	No	Do not know	Total
429	194	97	720
59.6%	26.9%	13.5%	100%

Table 4.91 shows that majority of the respondents were member of social networks. 59.6% responded as 'yes' when they asked question about it while 26.9% responded as 'no', they were not member of a social network. 13.5% did not know about it. Their membership shows that they had membership of these social networks and these networks supported them in their daily communication with friends and colleagues. They also take help from these networks for their educational problems and issues and they work as councilor for them.

Table 4.92 Priority of Social Networks by Students

Skype	Facebook	Msn/windows	Twitter	Any other	Total
150	456	38	28	48	720
20.8%	63.3%	5.3%	3.9%	6.7%	100%

In table 4.92, the frequencies show that Facebook was used by most of the students as 63.3% used Facebook as a social network. The Skype was also used as 20.8% respondents used it while 5.3% used MSN and 3.9% Twitter. It is clear that most of the students used Facebook which is restricted by most of the universities. The other social networks were also prohibited particularly in computer laboratory of the universities so it can enhance students learning if allowed in computer labs.

4.10 ICT Facilities for University Teachers

The questionnaire 'B' was distributed to the available two faculty members from each of the department teaching at master and bachelor level. The internal construction of the questionnaire was divided in two portions; the first one was about availability of information and communication technology and the second was about impact of ICT on students learning. The first part has further two type of data the first one was presented in form of bar charts while second was presented in form of frequency tables. The data on the impact of ICT on students learning was analyzed by using Chi square. The first part tells us about availability of ICT facilities for university teachers.

Table 4.93 Personal Computer Available for Teachers at University

PIII	PIV	Dual Core	1 core 1 or more	Total
6	12	40	14	72
8.3%	16.7%	55.6%	19.4%	100.0

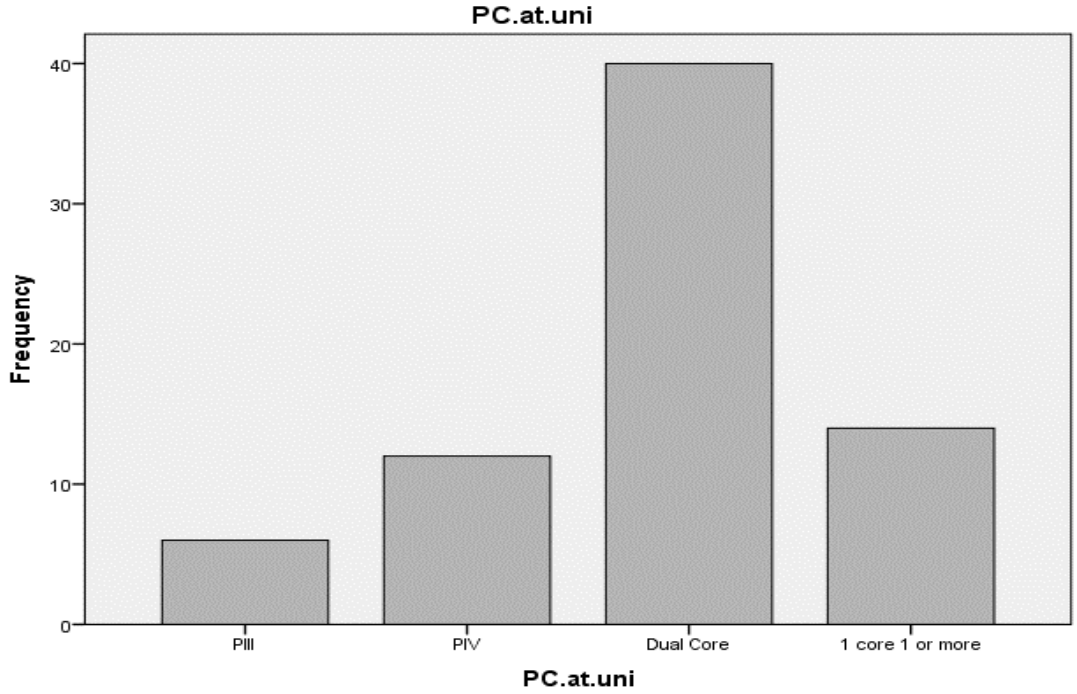

Figure 4.16 Type of Computers Available for Teachers in the University

Table 4.93 and figure 4.16 show that results of type of computer available to university teachers. A majority of teachers (55.6%) had dual core computers, 19.4% teachers had I core 1 or more so over all it was better picture which displays that majority of the universities provided up dated computers to their teachers. Although 16.7 % of them got P-IV and 8% got PIII but they were quite low in number.

Table 4.94 Personal Computer Available for Teachers at Hostel/ Home

Piii	Piv	Dual core	I core 1 or more	Any other	Total
4	7	53	6	2	72
5.6%	9.7%	73.6%	8.3%	2.8%	100.0%

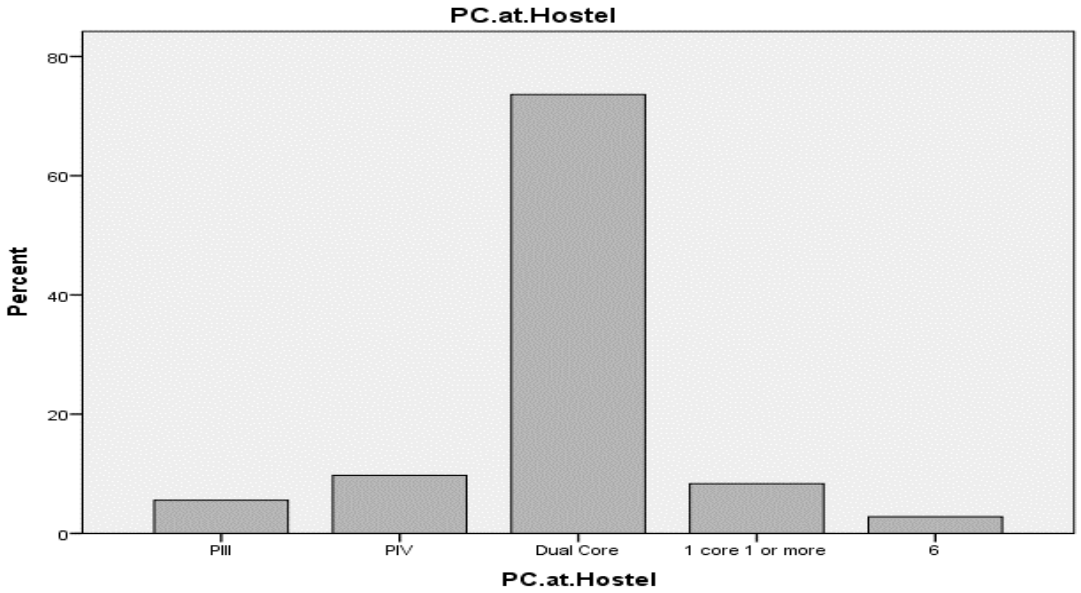

Figure 4.17 Graph Showing the Type of Computers Available at Hostels/home

Table 4.94 and figure 4.17 display the results of the question type of computer available at home or hostel. 73.6% respondents had dual core computer at hostel or at home. 9.7% teachers had PIV and 7.3% teachers had I Core 1 or more. It is true that they had quite reasonable facility of upgraded computers at home.

Table 4.95 Types of Laptops Available to University Teachers

PIV	Dual Core	1 Core 1 or more	Do not have	Total
4	27	28	13	72
5.6%	37.5%	38.88%	18.05%	100%

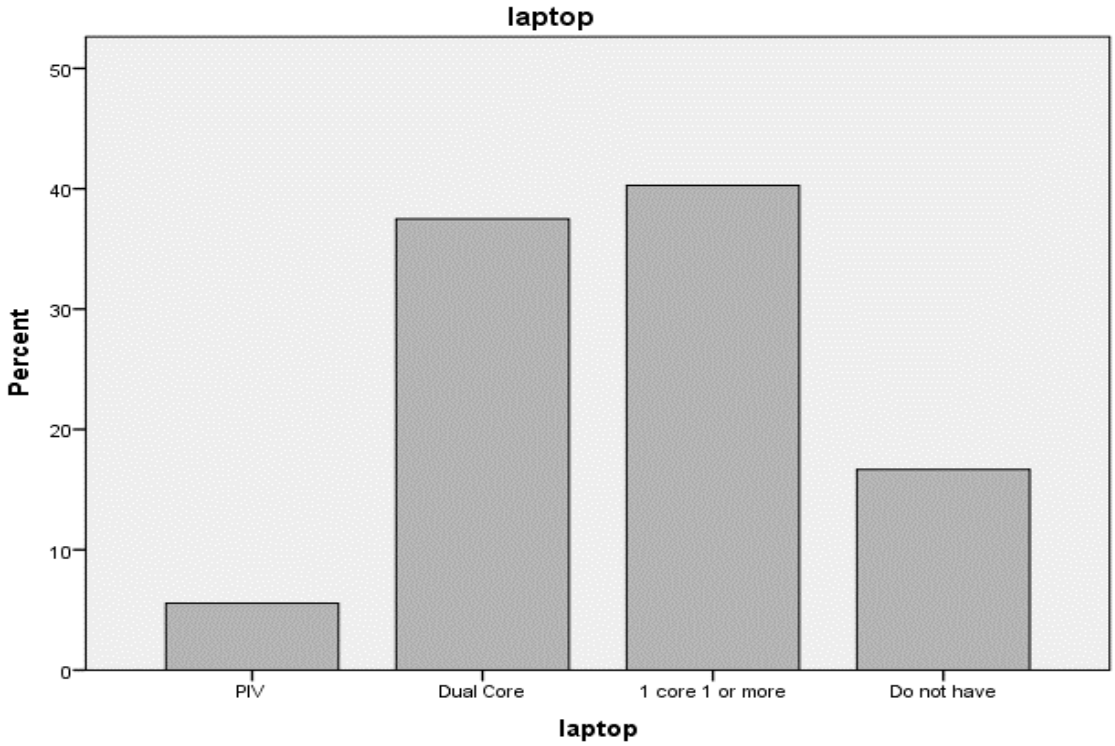

Figure 4.18 Figure Showing the Type of Laptop the Teachers Possess

Table 4.95 and figure 29 show the type of laptop teachers possess. 38.88 % of the teachers had I core 1 or more while 37.5 % teachers had dual core laptop computers. The results were encouraging as majority of the teachers keep laptops but 18.05 % teachers did not have laptops but still they had desktop computers computers at home or hostel.

Table 4.96 Net Connection Available to Teachers at University

Below 512	1 Mb	2MB or more	Any other	Total
6	25	30	11	72
8.3%	34.7%	41.7%	15.3%	100%

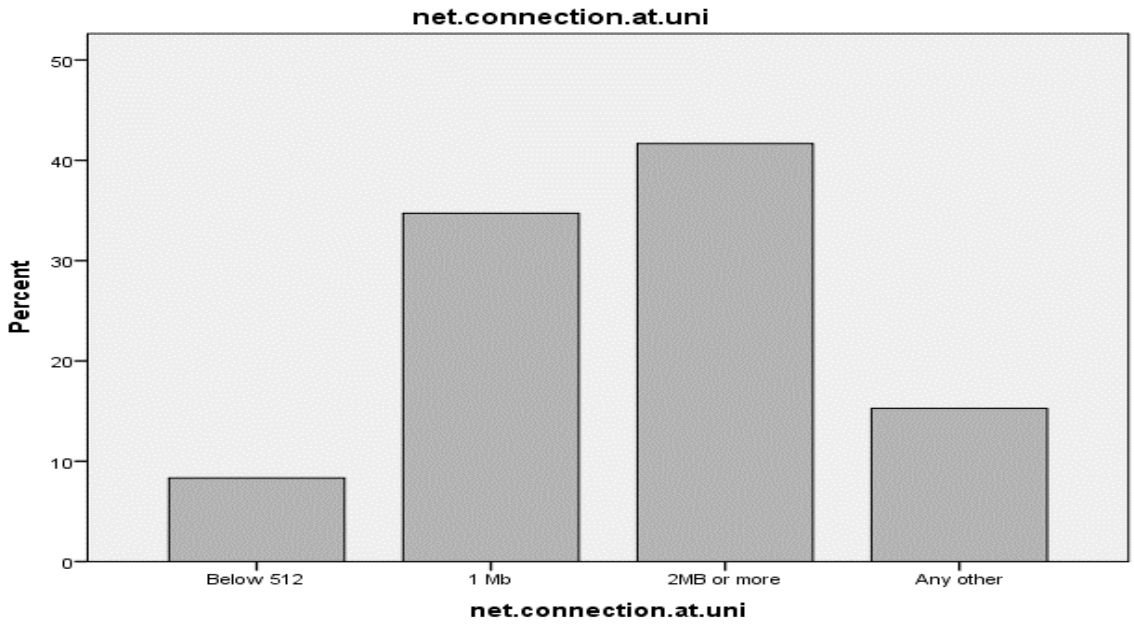

Figure 4.19 Net connection speed at Universities

Table 4.96 and figure 4.19 show the status of internet connection at the university. 41.7 % of respondents had 2 MB net connection speed at university 37.4 % respondents had 1 MB speed which means a high speed internet connection is available to the teachers of the universities. If this speed is compared with international internet connection speed it is far lower than they had because they provided speed in GBs which is very fast now as the government has issued licenses for 3 G and 4 G internet connection speed that will improve the situation in the country and resultantly the universities will incorporate it.

Table 4.97 Net Connection Speed at Home/Hostel

Below 512	512	1 Mb	2MB or more	Any other	Total
4	4	24	37	3	72
5.6%	5.6%	33.3%	51.4%	4.2%	100%

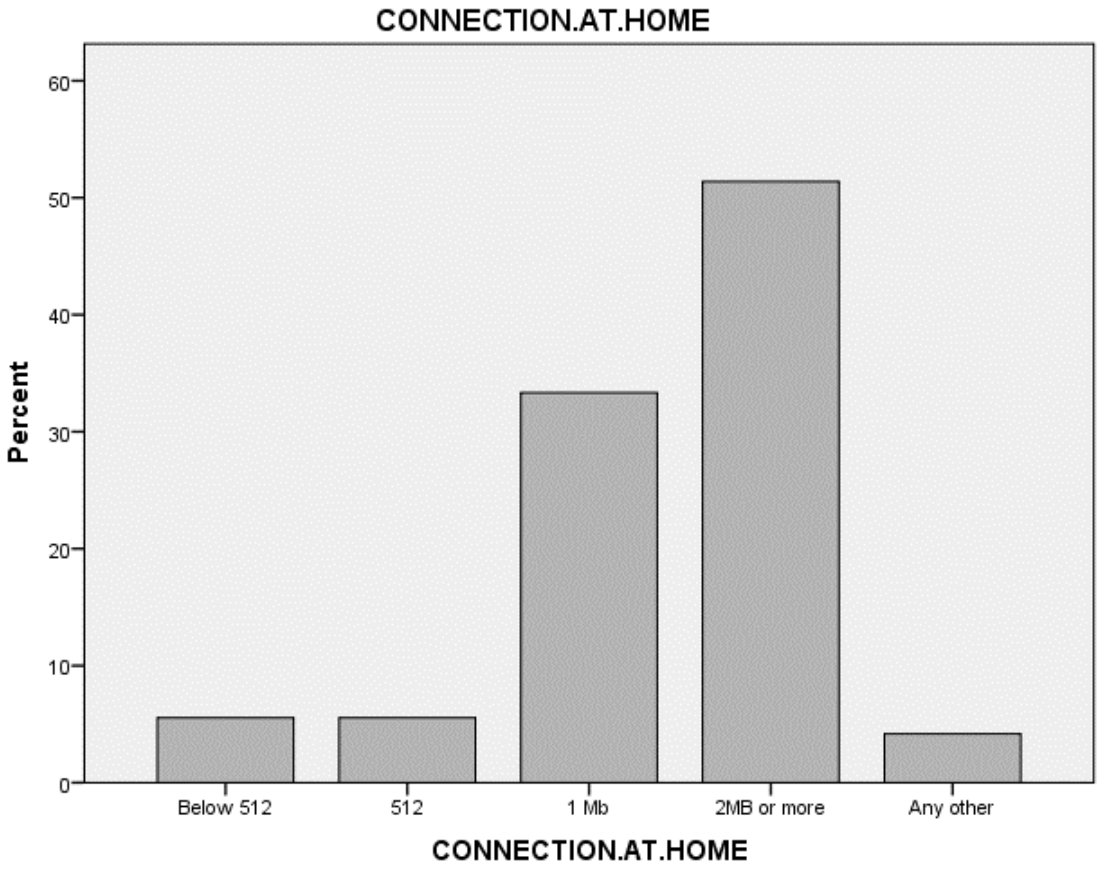

Figure 4.20 Net Connection Speed Available at Home

Table 4.97 and figure 4.20 represent internet connection speed at home or hostel. 51.4% teachers had 2Mb or more speed at home or hostel and 33.3% teachers had 1Mb speed at home or hostel. That was also an indication of the internet speed available to the teachers. It seems that they are having higher speed at home or hostel.

Table 4.98 Use of Mobile Phone by Teachers

Before 2003	2006	2009	After 2012	Total
11	40	5	16	72
15.3%	55.6%	6.9%	22.2%	100%

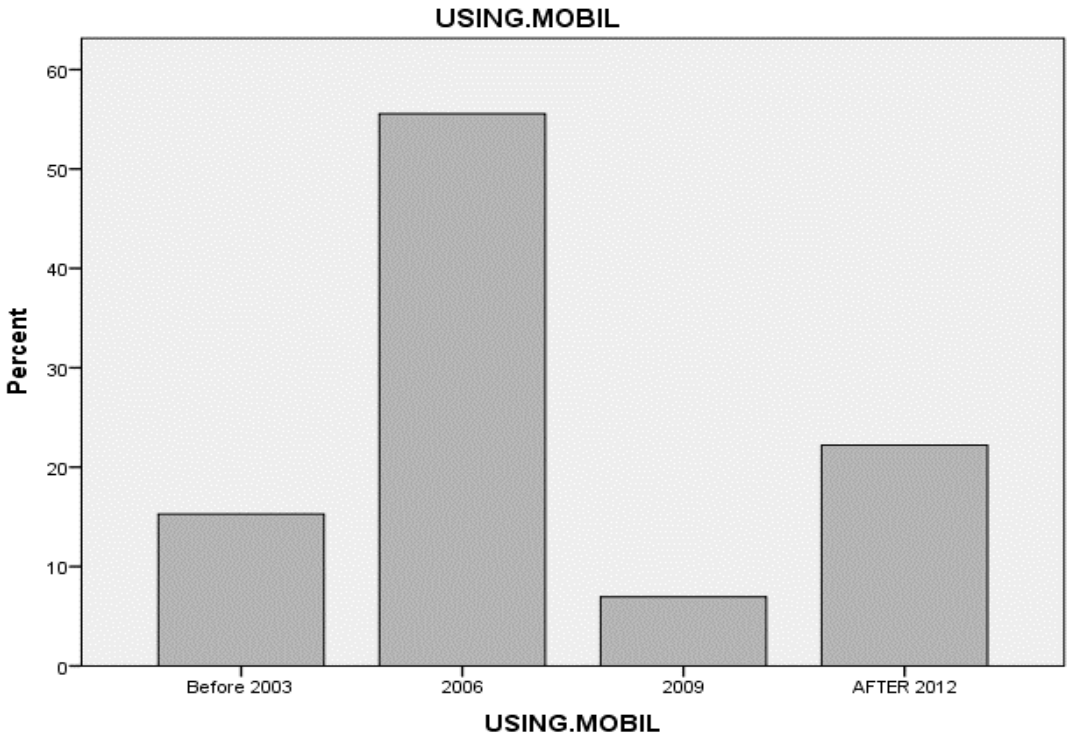

Figure 4.21 Started Year of Using Mobile Phone

Table 4.98 and figure 4.21 show of the teachers started using mobile phone. 55.6 % of the respondents started using mobile phone in 2006 while 22.2% started using mobile phone after 2012, 15.3 % started using it before 2003 so an aggregate can be calculated as majority started using it since 2006.

Table 4.99 Daily Mobile Phone Use by Teachers

Less than 10 min	10-25 min	30-40 min	More than 40 min	Any other	Total
11	26	12	19	4	72
15.3%	36.1%	16.7%	26.4%	5.6%	100%

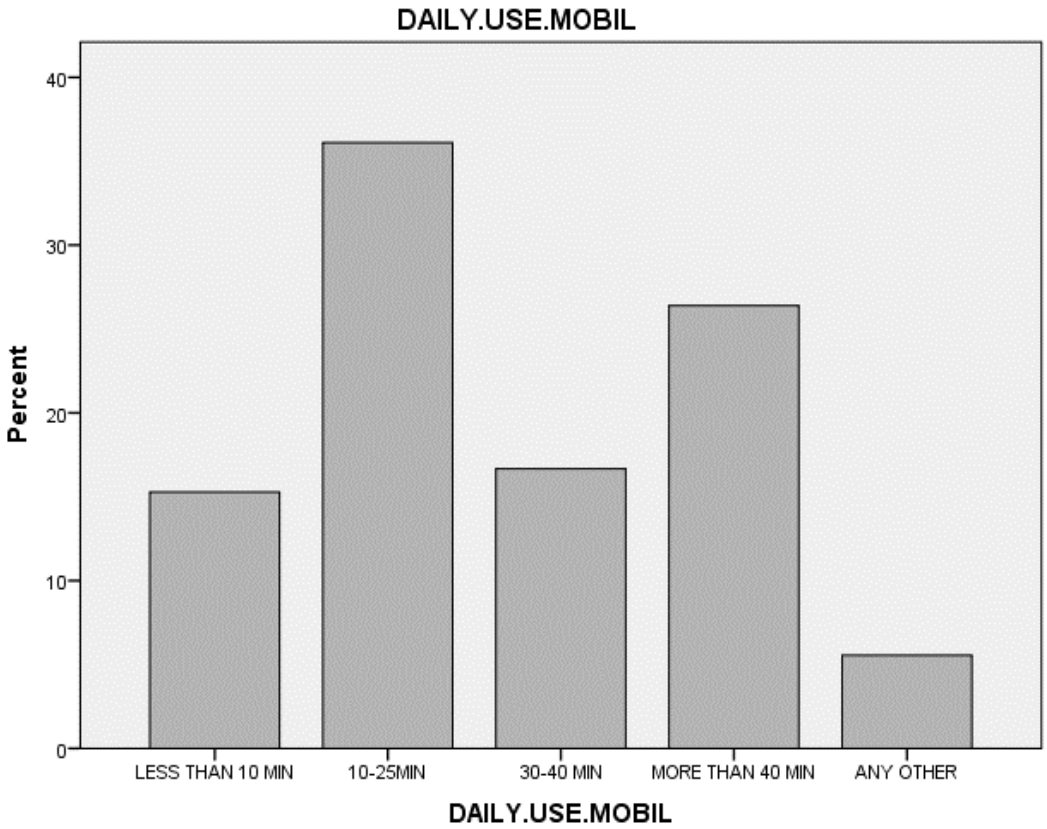

Figure 4.22 Daily mobile use by the teachers

Table 4.99 and figure 4.22 represent the results of the question about teachers' daily use of mobile phone. 36.1 % of the teachers used mobile for 10 to 25 minutes daily while 26.4 % teachers used mobile more than forty minutes in a day. 16.7% used it for 30-40 minutes daily. The results are scattered majority of the respondents used mobile phone daily.

4.11 Facilities Provided to University Teachers

In this section the responses of university teachers are analyzed. These teachers belong to social sciences departments and their opinions were taken about the ICT facilities provided to them in the university.

Table 4.100 Facility of Video Conferencing

None existent	Inadequate	Satisfactory	Good	Total
27	3	30	12	72
37.5%	4.2%	41.7%	16.7%	100%

Table 4.100 indicates the results of the facility of video conferencing at the university. 41.7 % respondents were satisfied and 16.7% considered it as good of the facility of video conferencing at the university. 37.5% teachers claimed that there was no video conferencing facility in the university. 4.2% marked the facility as inadequate in the university.

Table 4.101 Availability of Video Recorded Lectures at University

Non existent	Inadequate	Satisfactory	Good	Total
18	28	18	8	72
25.0%	38.9%	25.0%	11.1%	100%

Table 4.101 describes the status of video recorded lecture at the university. 38.9% teachers considered video recorded lecture were inadequate and 25.0% teachers considered nonexistent in the university while 25% teachers claimed

satisfactory and 11.1% teachers considered as good of the facility of video recorded lectures in the university.

Table 4.102 Availability of Teachers' Blog at University

None existent	Inadequate	Satisfactory	Good	Total
18	24	18	12	72
25%	33.3%	25.0%	16.7%	100%

Table 4.102 displays the results of the question about teachers' blog in the university as 33.3% teachers marked as inadequate and 25% teachers marked as non-existents but 25 % teachers marked as satisfactory teachers' blog in the university about the existence of university blogs. 16.7% teachers claimed good about blogs working.

Table 4.103 Availability of Academic Networks in University

None existent	Inadequate	Satisfactory	Good	Total
18	18	23	13	72
25.0%	25.0%	31.9%	18.1%	100%

Table 4.103 shows the availability of academic networks in the university. The table tells that 31.9 % respondents were satisfied for availability of academic networks in the university and 18 % teachers believed them as good. While 25 % teachers believed that there was no such facility, other 25 % teachers considered that there was inadequate facility of academic networks.

Table 4.104 Availability of Interactive Boards in University

None existent	Inadequate	Satisfactory	Good	Total
2	6	26	38	72
2.8%	8.3%	36.1%	52.8%	100%

Table 4.104 displays the results of the question related to the availability of interactive boards in the university. 52.8 % of the respondents believed that their university had good interactive boards' facility, another 36.1 % teachers responded that the facility was satisfactory but 8.3% teachers considered it inadequate and 2.8% considered there was no such facility in the university.

Table 4.105 Availability of Multimedia at University

None existent	Inadequate	Satisfactory	Good	Total
4	24	22	22	72
5.6%	33.3%	30.6%	30.6%	100%

Table 4.105 displays the results of availability of multimedia at the university. The results are very different as 33.3% teachers believed that there was inadequate facility of multimedia and 5.6 % teachers considered there was no such facility in the university while 30.6 % teachers considered good and 30.6 % teachers considered satisfactory status of availability of multimedia in the classrooms. Over all 61.2% teachers believed that this facility was available in the university.

Table 4.106 Availability of Technology Enhanced Curriculum

None existent	Inadequate	Satisfactory	Good	Total
8	38	13	13	72
11.1%	52.8%	18.1%	18.1%	100%

Table 4.106 shows the facility of technology enhanced curriculum in the university. A majority 52.8 % teachers considered inadequate and 11.1% teaches believed that there is no such facility of technology enhanced curriculum in the university while 18.1 % teachers were satisfied and 18.1 % teachers stated good that the university had technology enhanced curriculum for the use of teachers. Over all 63.9% teachers believed that there was no technology enhanced curriculum available in the university.

Table 4.107 Availability of Moodle at University

None existent	Inadequate	Satisfactory	Good	Total
27	23	20	2	72
37.5%	31.9%	27.8%	2.8%	100%

Table 4.107 displayed the results of the question about Moodle availability in the university. 37.5 % teachers believed that there was no Moodle in the university. Another 31.9 % teachers believed inadequate facility of Moodle in the university while 27.8 % teachers marked satisfactory and 2.8 % teachers considered good for the availability of Moodle in the university.

4.12 Impact of Internet and Mobile Phone on Students' Learning

In this section the impact of ICT on students as observed by teachers of the university is presented by using frequency table and Chi square.

Table 4.108 ICT Improves Students Interest of Studies

Low	High	Very high	Total	Chi Square	df	Asymp.Sig
8	43	21	72	26.083	2	.000
11.11%	59.72%	29.16%	100%			

Table 4.108 describes that the use of ICT improved students' interest as respondents 59.72% teachers marked high and 29.16 % teachers marked very high which indicated that there is a positive impact of internet and mobile on students' learning. Over all 88.88% teachers believed that ICT use improved students' interest for learning. Chi- square value was 26.083 at Sig. level 0.05. It was significant that ICT increased students' interest to education and learning so if ICT is incorporated then they would be able to learn more.

Table 4.109 ICT Helps Students to Improve their Academic Learning

Low	High	Very high	Total	Chi Square	df	Asymp.Sig
2	46	24	72	40.333	2	.000
2.77%	63.88%	33.33%	100%			

Table 4.109 shows the results of statement ICT helps students to improve their academic learning. As 63.88% teachers considered high about the statement that ICT improve students' learning and 33.33% teachers considered it very high that

information and communication technology improve their academic learning. Overall 97.21% teachers believed that ICT improves students' academic performance. Chi-Square was 40.333 at Sig. level 0.05 which indicated that there was an impact of ICT on students' performance. The teachers are better judge to find students' performance so they believed that it helps them too.

Table 4.110 ICT Makes Students Learn Better

Low	High	Very high	Total	Chi Square	df	Asymp.Sig
4	51	17	72	49.083	2	.000
5.55%	70.83%	23.61%	100%			

Table 4.110 shows the results about ICT makes students better learner as table statistics confirmed that 70.83% teachers marked it high and 23.61% teachers marked very high which means that ICT use can make students learn better. Chi square was 49.083 at Sig. level 0.05. This table also confirmed that ICT enhanced material and strategies would be more useful for learner as compare to traditional learning strategies.

Table 4.111 Students Interest in Digital Library

Very low	Low	High	Very high	Total	Chi Square	df	Asym. Sign
1	9	42	20	72	52.778	3	.000
1.38%	12.50%	58.33%	27.77%	100%			

Table 4.111 shows the interest of students in digital library. Teacher respondent believed that students took more interest in digital libraries as 58.33% teaches marked high and 27.77 teachers marked very high. It shows that they

considered student took more interest in digital libraries. Chi- Square value was 52.778 at Sig. level 0.05 which was at the significant level. The question about digital library tells that most of the students like to use digital library rather than general library.

Table 4.112 Replacement of Books by Mobile Phone

Very low	Low	High	Very high	Total	Chi Square	df	Asym. Sign
1	10	44	17	72	57.222	3	.000
1.38%	13.88%	61.11%	23.11%	100%			

Table 4.112 confirms another statement that mobile can replace books as 61.11% teachers marked high and 23.11% teachers marked very high which indicates that majority of the respondents (84.22%) considered that mobile contents might replace the books for the students. Chi Square was 57.222 at Sig. level 0.05. It is high time to prepare digital mobile supported contents to meet the future challenges and requirement.

Table 4.113 Social Net Works are helpful for Students

Very Low	Low	High	Very high	Total	Chi Square	df	Asym. Sign
4	9	37	22	72	36.333	3	.000
5.55%	12.50%	51.38%	30.55%	100%			

Table 4.113 shows the results about social networks are helpful for students. The majority of the teachers believed social networks are helpful for students as 51.38% teachers marked high and 30.55% teachers marked very high. It indicates that teachers believed that social networks were helpful for students in studies. Chi square

was 36.333 at Sig. level 0.05. So it is without doubt that purposeful interaction and communication always increased knowledge and understanding of the learner.

Table 4.114 Professional Groups Share Knowledge and Skills

Very low	Low	High	Very high	Total	Chi Square	df	Asymp. Sig
2	2	52	16	72	92.889	3	.000
2.77%	2.77%	72.22%	22.22%	100%			

Table 4.114 shows that professional groups share knowledge and skills as 72.77% teachers marked high and 22.22% teachers marked very high of the statement that professional groups shared knowledge and skills. Chi square value was 92.889 at Sig. level 0.05. The results of the table show that professional groups share knowledge and skills.

Table 4.115 Mobile and Internet Prevents Students Social Activities

Very low	Low	High	Very high	Total	Chi Square	df	Asym. Sig
2	7	45	18	72	61.444	3	.000
2.77%	9.72%	62.50%	25.00%	100%			

Table 4.115 shows that the mobile and internet prevented students from social activities and they remained busy on net or mobile phone as indicated 62.50% teachers considered high and 25% teachers considered very high. Overall 87.50% teachers considered that mobile and internet prevented social activities of the students. Chi Square value was 61.444 at Sig. level 0.05. These results had serious implication because the social activities will die if students continued using internet and mobile

phones. It is depicted in data that they prefer to use them rather than going to a physical gathering as observed by the teachers.

Table 4.116 Need of Digital Contents for Students

Very low	Low	High	Very high	Total	Chi Square	df	Asym. Sig
2	3	40	27	72	58.111	3	.000
2.77%	4.16%	55.55%	37.50%	100%			

Table 4. 116 indicates that there is a need for digital contents as 55.55% teachers marked high and 37.50% teachers marked very high of the statement. It indicates that teachers believed and realized the need of digital courses. Chi Square value was 58.111 at Sig. level 0.05. The need and importance of digital contents is very much clear as in the above table because the teacher perception of the future is true so efforts are needed to make for developing and designing digital contents.

Table 4.117 Students Prefer Digital Books

Low	High	Very high	Total	Chi Square	df	Asymp. Sig
6	44	22	72	30.333	2	.000
8.33%	61.11%	30.55%	100%			

Table 4.117 tells that majority of the teachers believed that students prefer digital books. 61.11% teachers considered high and 30.55% teaches considered very high that the students prefer digital book and study material while only 8.33% teachers marked it low. Chi Square value was 30.333 at Sig. level 0.05 which showed significant results. The results of the table conform previous table because the

students like and prefer to use digital contents so the importance of digital contents gets very high.

Table 4.118 Blogs Broaden Students Vision

Low	High	Very high	Total	Chi Square	df	Asymp. Sig
12	42	18	72	21.000	2	.000
16.66%	58.33%	25.00%	100%			

Table 4.118 shows that blogs broaden students' vision. 58.33% teachers marked it high and 25% teaches marked very high which indicates that majority of the teachers (73.33%) believed the blogs strengthen students learning and understanding. Chi square was 21.000 at Sig. level 0.05. The opinion of the teacher respondents suggested to use blogs for education purposes because they broaden the students' vision and understanding of the concepts.

Table 4.119 Educational Forums Promote Education

Low	High	Very high	Total	Chi Square	df	Asymp. Sig
7	25	40	72	22.750	2	.000
9.72%	34.72%	55.55%	100%			

Table 4.119 describes that in teachers' opinion educational discussion forums promote education. 55.55% teachers marked very high and 34.72% teacher marked high which indicates that the educational forums promote education among students. Chi Square value is 22.750 at Sig. level 0.05. This opinion also suggested that the promotion of educational forums among universities can enhance students and teachers learning.

Table 4.120 Online Articles Easy to Read

Very low	Low	High	Very high	Total	Chi Square	df	Asym. Sig
1	8	34	29	72	42.556	3	.000
1.38%	11,11%	47.22%	40.27%	100%			

Table 4.120 describes that online articles are easy to read. 47.22% teachers marked high and 40.27% teachers marked very high which confirms statement that online articles were easy to read and quote. Chi Square value was 42.556 at Sig. level 0.05 that was a significant results, so students need to be provided digital contents rather than hard copies of the study material.

Table 4.121 Teachers Professional Association Share Knowledge

Very low	Low	High	Very high	Total	Chi Square	df	Asym. Sig
6	7	29	30	72	29.444	3	.000
8.33%	7.92%	40.27%	41.66%	100%			

Table 4.121 again shows that the teacher professional association share knowledge. 41.66% teachers marked very high and 40.27% teachers marked high that confirms the statement teachers' professional association shared knowledge skills and experiences. Chi Square value was 29.444 at Sig. 0.05. It tells that professional association are needful as they can contribute to the knowledge and expertise of its members.

4.13 Discussion

This study explored a new area of research as the idea of symbolic learning has not been investigated through the use internet and mobile phone. It was a novel idea to bring social learning in context of these two tools of ICT. Earlier, media in the form of radio and TV has been used as instruments for learning.

Plomp, Pelgrum& Law (2007) claimed that the current information society had decreased the shelf life of knowledge and information because lifelong learning through ICT is emerging and spreading fast in the world. It clearly indicates that dynamics of teaching learning are rapidly changing although it is not as fast as it has taken over other areas of human life. This study testifies that, information and communication technology could be used for educational and learning purposes particularly by using internet and mobile phone, on campus as well as off campus. The students interaction with ICT either on campus or off campus; where they go, live and pass holidays and can utilize their full time for learning and interacting with people of the world through social networks and media without having shackles of formal education. This interaction creates an opportunity for the learners and teachers to remain in contact with one another by asking questions, finding solutions and inquiring about new dimensions of their study.

Kozma (2005) emphasized on education as an earning power of individual for economic growth and development which can result in productive skills, further adding that ICT provides several more intangible benefits apart from improved health, home comfort and worldwide social interaction. The study finds that most of the students downloaded job advertisement apart from their course contents which helped

them to get suitable job opportunities at their favorite place. Therefore, ICT performs two way purposes one is to get information, news and current affairs, the other is to find out employment opportunities all over the world. The same type of focus was observed in this study as students use ICT for solving their learning difficulties and problems even though they did not have enough resources and access to international ICT contents. Because their internet speed was low, the computers they used are normally outdated and the facilities provided to them are inadequate.

Cross and Adam (2007) believed in getting maximum benefits from information and communication technology by supporting coherent strategies and action plans for integrating ICT in education, successful implementation requires national vision and local support from authorities to accept change and promote it. This study also supported this idea of maximum benefit as this country is lagging behind in many areas including ICT. Digitalizing curriculum and contents development for internet and mobile phones in view of the students' learning requirement will definitely remove barriers confronting the nation among comity of world. In spite of treading the old paths again and again, the universities will have to take initiative for improvement of ICT facilities for teachers and students if they want to become the global partners in human development and economic progress by meeting the international standards and benchmarks.

Lai &Pratt (2004) focused that infrastructure formed the first requirement and training the second, mechanism was the third so a complete adoption of ICT based teaching learning process seems future of the education. Infrastructure means the availability of high technology gadgets like computers and mobile phones, high speed internet connection and electricity while training means to create awareness among

the educational administrators, teachers and learners about the use of these gadgets and along with their complications. The study has found some of the similar type of concepts as infrastructures and availability of ICT in universities as mandatory. The mismanagement of computer labs was an example of it. The low branded computers like PIV were mostly found in computer labs which did not support the modern gadget and software. The universities needed to have vision in light of the vision by the Government of Pakistan (Vision 2025) that hopefully would focus on ICT use in education. These three directional steps need to be taken to remove the gaps between developed and developing nations.

Casal (2007) believed that investment in production of ICT could be more effective tool for advancement and progress of the society. His findings indicate that technology could support curricular, pedagogical and assessment reforms to create knowledge through social networks, professional association and open forums where learner can share ideas, thoughts, behaviors and knowledge. Contents production would be futile if it is not relevant to students' needs, appropriate and matching to what they already knew and used. This research has explored different contents on internet and mobile that students mostly used in Pakistan so the contents had to be aligned with already existing software, search engines and others.

Young (2002) emphasized that the flexibility of online learning has heightened the availability of in time learning provided to the learners who were constrained by other commitments. These technologies have made learning an activity which was not programmed according to schedules and confined in time but free to participate in learning when time permitted that increased number of students and teachers. Another advantage of learning through internet and mobile phone was the flexibility for the

students and teachers as both could have access to each other either on social networks or through mobile SMS. This study explored that students mostly used social networks to interact with their friends, colleagues and teachers, apart from mobile phone or text messages. The concept of learning through mobile phone and distance education can be promoted through this media. Moore & Kearsley (1996) also supported this concept through distance education that is based upon a vast amount of research and development associated for establishing effective practices and procedures both on and off campus teaching and learning were published and practiced. Use of technology has extended the scope of this activity by making more choices through technology facilitated learning settings.

Littlejohn et al (2002) pointed out that technology facilitated learning created new opportunities for teachers and learners, workplace trainers, mentors, specialists and general students for its affordability and flexibility. This trend seems to continue and grow with new ICT developments and applications. The role of teachers and students demands that they have high skills of using technology to avail the most diverse benefits of ICT in educational settings. This research found the labs in universities, particularly of social sciences were not well equipped and badly managed. This is the matter of concern for the university management.

The results of the study are not completely unexpected but there are a few unexpected findings. For Instance, the opinion of the respondents which indicated a new dimension. Because the teachers' knowledge and use of Moodle was not adequate and frequent. Resultantly, the students who were unaware of this learning tool and its uses were not able to respond correctly. The internet connection speed and computer models that available for social science were also unexpected. The time

available for students and the number of student depending on labs was not rational because many student did not have space and seats to use computers when they were free. The researcher can't conceal its implications for either policy makers or university administration. Only good management, a small portion of training and increased motivation for teachers and students can reduce these implications. There is need to have a will and desire to launch a successful ICT based education program.

Finally, it could be said that the future of any nation depends on the sources they allocate and then use them properly. If our students want to compete with the world market, they have to find ways and techniques to make themselves ICT friendly. New steps and measures has to be taken by the Government and higher education commission to grab the chance of controlling and creating the world labor market and high tech resources generation, along with involving teaching learning process into information and communication technology.

CHAPTER 5

SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

In this chapter, the summary of the study, the findings of the study, the conclusions and the recommendations of the study are dealt with:

5.1 Summary

Symbolic learning is a 21st century idea of social learning theory. It presents how people learn through media, particularly social media. Social Learning Theory which initially believed to be language learning theory was not only a language learning theory because 'bobo doll' experiment was on behavior modification rather than language learning skills. This idea was a new step to explore a newer horizon of teaching learning process because this world of high technology has grasped the students in its shackle as they remained busy all the time with media, first television, then internet and then mobile phone and sometime with all of them at the same time. This study focused on Bandura's Symbolic learning through ICT, and its impact on students learning at University Level in Pakistan. It was an attempt to explore the contents of two media that is, internet and mobile phone. The students' learning is identified by finding out the contents particularly digital contents of internet and mobile phone used by them The objectives of the study were to enlist the learning through internet and mobile at university level at the attention stage of symbolic learning process, to identify the areas students opted to have access on internet and mobile phone at the retention stage of symbolic learning, to compare the pattern of learning at the reproduction stage, to find out the preferred contents on these two

media at the motivation stage, to demarcate type of general and specific facilities available to the university teachers and the media effect on students activities and, finally, to explore the preferred social network use.

As a descriptive study it was conducted through two questionnaires, one for university students and second for university teachers. Twelve universities were selected through multistage cluster sampling technique, eight public and four private universities. Sixty students of master and bachelors level were selected by using convenient sampling from each of the university, 20 students from each of the departments of social sciences i.e Education, Psychology and Economics/ others. The total student respondents were thus 720. Teacher sample was selected by choosing two available teachers from each of the three departments. The teacher respondents were thus 72. The sample, in all, consisted of 792 individuals. Both the questionnaires were distributed by visiting the respective universities and collected back shortly. The collected data was analyzed by using Cross tabs, frequency count and Chi square through SPSS.

Analysis of data yielded that at attention stage, although students did not have enough facilities at university campus to access full internet contents yet they had access to the contents like emails, data basis, digital books and search engines but they did not have adequate access to Messengers, Facebook and Twitter on internet while on mobile phone they had contents like Phonebook, Messages, Calendar and Multimedia. At retention stage, the contents they downloaded included study material, songs, videos and job advertisement storing them on hard or USB drives and use MS Word and Power Point for writing assignments and internet browsers to find difficult problems. The contents on mobile phone they used were talking, sending SMS, watching movies, video clips and pictures and time and date. The contents like

dictionary, encyclopedia, games and picture formed major contents on mobile phone. At reproduction stage, they used group discussion, academic forums, Wikipedia, digital libraries and search engines including free access sites, research journal, songs, digital books, movies, research articles and the Holy Quran were their favorite contents. The contents on mobile phone were words and phrases, calculator, time watching, listening music, talking, sending text messages, playing video games and waking up alarm. At Motivation stage, the academic performance and internet use, role of social networks, digital libraries, online articles, discussion forums, students' blogs and professional associations mostly improved students' performance, vision, and studies and enhanced their learning skills. The motivation for mobile use was to keep in touch with teachers and students and to keep study material on mobile phone. High technology mobile phone, multimedia would replace traditional teaching learning pattern while IPad would replace note taking registers in near future. The Impact of ICT on student learning was significant as internet; ICT and Mobile Phone had positive effect on student learning. Digital libraries, social networks, professional groups, blogs and associations had significant positive effect on students learning. The digital contents would replace paper contents and students preferred to read online article rather than hard copy journals. Another impact of ICT on students was that it prevented them from joining physical games and sports and other social activities.

It was noted that the students of social sciences needed encouragement to use ICT in class and out of the class, contents possibly be digitalized, access to all social networks be provided and ICT oriented task be assigned by teachers to their students.

5.2 Findings of the Research Study

Analyzing of the data revealed the following findings of the study at four stages of symbolic learning namely, attention, retention, reproduction and motivation.

5.2.1 Availability of Personal Computers at University

The facilities of PCs and Laptops with internet were generally available at universities campus, home and hostel with speed of 1Mb and 2Mb. The type of PC's available at university were not modern and they were outdated like PIII and PIV. The majority of students (40.6%) started using computer since 2008 and 2004, the span of computer usage is not very long. The students learnt computer by help of internet, by help of attending formal courses and with help of their friends and colleagues. Most of the students (65%) used computer 1-4 hours daily. Computer lab at universities was less equipped as 61.3% and 23.9% considered that they are badly managed. The timing that lab is available for students use (59.2%) is 9-5 pm which is mostly the classes time. Table Nos 10,12,13,14,15,16,25 and 26 while figures No 8-14 displays the results.

5.2.2 Availability of Computers at home

Majority of the students (58.5%) had PIV at home while quite reasonable number of respondents (27.2 %) had dual core computers at home or at hostel. This type of computer tells the proficiency capability of the computers to carry out variety of works and run latest software on it but many modern software could not be run at it because of its low volume of RAM and processors. These type of computers had been obsolete in the western market because they do not support the modern gadgets and software. (Table 11 and figure 9)

5.2.3 Availability of Internet Connection at University

The internet connection speed at university was 41.0 % students claimed 2 Megabyte or more and 22.8% claimed as 1 Mega bite, other 23.9% believed they had a 512 Mb or below it. There was no unanimity among universities in using internet speed at campus. The overall internet speed is very low as compared to that available speed for the private users. The broad band facility was not available at any university. **(**Table 14)

5.2.4 Status of Computer Labs

The status of computer for social sciences in the universities was not encouraging as 61.3% students believed that computer lab was not well equipped, other 23.9% students considered it as badly managed so it showed the lab for social science was usually ignored and it was not adequately managed. The students of social sciences were not able to use computer lab in their full capacity.(Table 13 and figure 11)

5.2.5 Daily Computer Use

Daily computer use varies as 35.8% respondents used computer daily for two to four hours, other 29.2% used computers daily for one to two hours. If we put them together then 65.0% of the respondents used computer for up to four hours that seemed a lot of time. If this time is used for learning and reading that consisted a very handsome time of learning. (Table No 19)

5.2.6 Availability of Mobile Phones to Students

The mobile phones were available to majority of the students and they 33.1% students had smart phones. A quite reasonable number of students 21.4% used other mobile phone than smart phones. The students used weekly, monthly and weekend packages of the mobile phone. It indicated that majority of the students had

mobile phone so learning through mobile phone is very much possible if this device is used for learning purposes. (Tables No 57,58,59,60 and figure No 25,26)

5.2.7 Contents of Internet at Attention Stage of Symbolic Learning

85.0% students had access to search Engines, 90.7% had access to Emails, 78.5% had access to Digital Books and 83.5% had access to Data Basis but as far as the social networks are concerned, 83.8% students did not have access to Messengers, 73.5% did not have access to Facebooks and 88.3% did not have access to Twitter. The digital contents were available to them and they could download them save them but live chat and messaging was not available to them so they could not share talk and send message through university computers. 59.6% students were members of social networks. 59.2% students believed that computer lab was generally available for students' use from 9-5 from morning to evening. This time is very short due to their classes so they were unable to visit lab frequently. (Tables Nos. 17, 18, 19, 20, 21, 22, 23, 24, 27)

5.2.8 Mobile Phone Contents at Attention Stage of Symbolic Learning

Duration of daily Mobile phone usage was as 48.0% students used mobile phone up to 25 minutes daily which indicated enough time spared for mobile phone. The operating system they used were 55.83% students used Android by Google, 53.61% Bada by Samsung and 46.94% Windows by Microsoft, 30.83% Symbian by Nokia. 79.44 % students used phonebook, 90.83% messages, 35.83% calendar and Multimedia. These contents were used by the student most of the time. The time spared for mobile phone use was quite enough, the type of operating system is mostly supported by digital contents there were limited contents on their phone because no education related software was available to them for this purpose. (Table Nos. 61, 62, 63, 64, 65, 67, 68, 69)

5.2.9 Internet Contents at Retention Stage of Symbolic Learning

At retention stage, 41.1% students downloaded study material with 15% songs and videos from internet. It shows no educational material was downloaded as digital books and articles. 68.8% students kept digital material in USB and 20.7% on hard drive of the computer which shows they did not use other storage place available for any internet users. In writing assignments, 55.8% students used MS Word and Power Point. The students liked digital contents as 51.9% liked it while 27.4% liked paper contents in reading. In search Engines choice, the majority students used Google Chrome as indicated Chi Square value is 385.20 that shows very high number of students used this search engine, X^2 132.222 value for the use of Internet Explorer indicated high number of students used this search engine and X^2 107.00 indicated that Mozilla is also used by many respondents but they did not like to use MSN as X^2 301.722 never used this search engine, the responses about prefer use of Yahoo browser was analyzed as X^2 value 166.744 indicated they seldom used it while X^2 701.556 value tell us about Alta Vista use so very high numbers of respondents never used this search engine. There is an indication of the students' trend to use digital contents and the items their favorite internet browser supported.(Table.Nos.28,29 ,30,31,32,33,34, 35, 36,37 and figures Nos 15, 16, 17, 18, 19, 20, 21, 22, 23)

5.2.10 Mobile phone Contents at Retention Stage of Symbolic Learning

Use of mobile for talking had to be the primary objective but it was observed that students frequently used as X^2 value 357.867 indicated it for the purpose of talking but they always used as indicated X^2 value 468.256 which shows that they used it for sending SMS or text messages. It was also used for watching time and dates as X^2 value 373.056 indicated it, the students use it for listening songs as X^2 value is 229.111. The students never used it for watching movies as X^2 78.433, while

for video clips and pictures they used it most of the time as X^2 168.578 value shows it. The use of mobile for keeping in touch with class schedule and tasks was minimum as they seldom used it as depicted in X^2 67.089 for the purpose, but the mobile was used for finding words and phrases as indicated X^2 154.300, locating dictionary words X^2 89.633 and playing games X^2 155.478. A quite reasonable number of students X^2 69.978 used encyclopedia on mobile phone but highest level of respondents used mobile phone for taking photos and clips and watching them as indicated in this value X^2 439.167. (Table Nos 70,71,72,73,74,75,76,78,79,80,81)

5.2.11 Internet Contents at Reproduction Stage of Symbolic Learning

Students sought guidance from all type of social networks as indicated X^2 332.767. In response to academic problems, a large majority of them, as indicated X^2 157.244 used Wikipedia source, X^2 259.170 value indicated they used digital libraries and X^2 226.886 value showed that they used search engines for the above mentioned purpose. The students 46.7% had prepared a list of free access sites, 23.8% research journals and 19.2% songs and movies in the computer. At the question of preference use of libraries, 35.6% students liked to use general library, 30.3% students preferred to use digital library and 19.6% students preferred to use search engines, not the libraries. The contents saved in computer were digital books as X^2 106.716 shows that they stored it, X^2 24.939 value showed that they stored movies, X^2 198.450 value showed they had songs in their computers, about the research articles the value of X^2 66.705 indicated they stored the contents in their computers and the large majority of the respondents stored Holy Quran as indicated in X^2 321.782 that constituted some of the items stored in their computers while the least number of students kept video games on their computers X^2 5.00 value showed it. (Table Nos. 38,39,40,41,42,43,44, 45,46,47,48,49 and figure No 24)

5.2.12 Mobile Contents at Reproduction Stage of Symbolic Learning

Mobile Phone was used for finding out words and phrases as indicated X^2 224.767 value while the respondents used it as a calculator X^2 220.578 that a reasonable number of respondents used it for the purpose. The responses of the mobile phone used for time watching device as indicated X^2 374.85 and listening music as indicated X^2 153.544. The majority of the respondents used mobile phone for sending text messages as indicated X^2 299.078. Majority of students 74.15% never used it for watching movies but they used it for sending text messages and playing video games. Mobile was also used for waking up alarm. Mobile phone was used for different purposes including learning but it could be used more for academic purposes if the contents are designed and developed for them by the university teachers (Table Nos 82, 83, 84, 85, 86, 87, 88, and 89)

5.2.13 Internet Contents at Motivation Stage of Symbolic Learning

The students were asked about internet and their performance so a large majority of them claimed that internet improved their academic performance as indicated in X^2 585.500 value. The respondents also believed the social networks were usually helpful and improved their learning as indicated in X^2 385.267 value. They believed that digital libraries were most useful for them as indicated in X^2 536.622 value. These contents and students responses are indicated in Chi Square values. Online articles are helpful for students as indicated X^2 355.910, discussion forums created new learning dimension as indicated X^2 515.367, students blogs improved professional attitude as indicated X^2 322.367, professional associations mostly improved their vision and enhanced their learning skills as indicated in X^2 322.367. If the teachers provide guidance and path for their respective subjects, the students could learn more (Table Nos 50, 51, 52,53,54,55 and 56)

5.2.14 Mobile Contents at Motivation Stage of Symbolic Learning

The students agreed that mobile phones was used to keep students up to date with class room activities as indicated in X^2 578.200 value. It also motivated students to use it for the purpose. They also stored study material on mobile phone to use it when necessary as indicated in X^2 578.278. The students believed that high technology mobile phone improved their academic performance as indicated X^2 195.256 while it was a source of close contact with teachers as indicated in the value X^2 811.522. Mobile Phone with multimedia was also helpful in presentations during the class and out of the class as indicated in X^2 453.078 value. The respondents believed that mobile phone would replace traditional teaching learning pattern as indicated in X^2 675.989 while IPad would replace note taking registers in near future as indicated in X^2 158.467. Multimedia phone would become need of the students in the upcoming years was responded positive as indicated X^2 525.033. (Table Nos 92,93,94,95,96,97,98 and 99)

5.2.15 Membership of Social Networks

Finally, a large majority of the students 59.6% were member of the academic networks which meant they had joined one of the available academic networks. Although there were no such networks available in universities but a large number of the students joined open source social networks as Facebook, Skype and Twitter respectively. The Facebook remained at the top as 63.3% used it while 20.8% students used Skye. (Table no 90, and 91)

5.2.16 Basic Facilities of ICT to Teachers

The facilities available to university teachers included 55.6% had dual core computers as desktop and 19.4% had I core 1 or more which was a quite good computer. They had same type of computers at hostel or home. The majority of the teachers 76.38%

had laptops but 16.7% did not have laptops. The internet speed was 41.7% had 2 Mb and 34.7% had 1 Mb at university and similar type of speed they had at home. Among teachers, majority of them started using mobile since 2008. They 51.4% frequently used mobile phone for up to 25 minutes.(Table Nos100,101,102,104,105,106 and figure Nos 27,28,29,30,31,32 and 33)

5.2.17 Special Facilities of ICT for Teachers provided by Universities

The facility of video conferencing was available according to 41.7% of the teachers but 37.5% teachers reported that they did not have this facility at the university. The facility of video recorded lecture was inefficient at university as 63.9% teachers regarded inadequate or nonexistent while 25% regarded it satisfactory. Teachers' blog were available as 41.7% teachers considered as satisfactory or good while 33.3% teachers considered it inadequate at university. As for the availability of academic networks 49.0% teachers were satisfied with this facility while 25.0% teachers considered it as inadequate. A large majority 88.9% teachers believed that the facility of Interactive board was available in the university while only 11.1% believed that their universities did not have such facility. The question about availability of technology enhanced curriculum was responded by 63.9% teachers considered inadequate whereas 36.2% teachers considered adequate facility in the university. The availability of Moodle in the university was inadequate as 69.4% teachers believed it and 30.6% teachers believed the universities had this facility at their campuses. (Tables' Nos. 107,108, 109,110,111,112,113 and 114)

5.2.18 Impact of ICT on Students Learning

The impact of ICT on students learning was found significant as the first question of ICT improved students' interest was responded in positive as indicated X^2 26.083 at df 2 and Sig .000. The second question was that ICT helped students

improve their learning also got the positive response as indicated in X^2 40.333 at df 2 and Sig .000 level. In other words a large majority of them 63.88% teachers considered it high and 33.33% very high. In response to the question that ICT makes students better learner was responded significantly positive as indicated in X^2 49.083 at df 2 and Sig .000. Responding to the question about taking more interest to digital libraries the responses of the teachers were positive and significant as indicated X^2 52.778 at df 3 and Sig .000. In other words 87.77% teachers were in favor that students took more interest in digital libraries. The interesting question whether mobile phone would replace books was responded positive and significant as indicated in X^2 57.222 at df 3 and Sig .000. In other words 61.11% teachers marked high and 23.61% very high, that indicates they believed mobile phone would replace the paper books in future. (Table Nos 115, 116, 117, 118, 119, 120, 121, 122, 123,124,125,126,127 and 128)

5.2.19 Impact of Social Networks on Students Learning

The role of social networks for students had also been supported by the teachers as indicated in Chi Square value X^2 36.333 at df 3 and Sig .000. In other words 74.44% teachers favored it and believed that these networks were helpful for the learner and which improved their studies. Professional groups sharing of knowledge and skills also got a significant positive effect on students learning as indicated X^2 92.889 at df 3 and Sig .000. In other words 72.22% teachers considered high and 22.22% very high. Another finding of the study was the negative impact of mobile and internet on social activities as indicated in X^2 61.444 at df 3 and Sig .000. It showed that students kept themselves busy in mobile and internet while they avoided social gatherings and sports which was a negative effect of ICT on students learning. The research showed that in future, digitalized courses would be needed to

get students interest as indicated in X^2 58.111 at df 3 and Sig .000 that clearly indicated they would need digital contents in future because students preferred to read digital contents and online articles most of the time so digital books would be the need of the time.

5.2.20 Impact of Blogs on Students Learning

The next finding of the study was that blogs broaden students' vision and scope which was indicated X^2 21.000 at df 2 and Sig .000 as positive and significant because these blogs' member belonged to different culture classes and countries so sharing experiences would definitely help them. The same was the case with educational forums that promote education as indicated in X^2 22.750 at df 2 and Sig .000. These educational forums spread education across nations and countries. The teachers professional association also helped them share knowledge, skills and values as indicated in X^2 29.444 df 3 and Sig .000, having different backgrounds, experiences sharing would explore new dimensions as well. Online articles were responded significant and positive as indicated in X^2 42.556 df 3 and Sig .000. All these evidences proved that there is a positive impact of ICT on students learning as responded by teachers who are better judge to suggest impact of ICT on learning of the students.

Keeping in view of the findings of this study regarding the impact of symbolic learning through ICT, the institutions of higher learning may provide opportunities for the students that facilitate them to go through all the four stages of symbolic learning model as presented by Bandura and explored in this study.

5.3 Conclusions

The following conclusions are drawn from the above findings of the study: The study explored the four stages of Bandura's Symbolic Learning Model with reference to use of internet and mobile phone.

1. In order to give attention to what they learn, the students had access to the contents like emails, data basis, digital books and search engines but they did not have access to messengers, face book and twitter on internet while on mobile phone, they had contents like phone book, messages, calendar and Multimedia. The students could not use Facebook and other social networks in the university because most of the universities blocked and restricted access to these social media at the university computer labs.

2. In order to retain what students attended, the contents they downloaded were study material, songs, videos and job advertisement keeping them on hard drive or USB drives and used MS Word and Power Point to write assignments and internet browsers to find problematic questions. The contents on mobile phone they used were talking, sending SMS, watching movies, video clips and pictures. They liked dictionary, encyclopedia, games and picture.

3. In order to practice what they attended and retained for reproducing the favorite contents, they used group discussion, academic forums, Wikipedia, digital libraries and search engines including free access sites, research journal, songs, digital books, movies, research articles and Holy Quran. The contents on mobile phone were words and phrases, calculator, time watching, listening music, talking, sending text messages, playing video games and waking up alarm.

4. In order to perform what students attended, retained and reproduced they made use of internet, social networks, digital libraries, online articles, discussion forums,

students' blogs and professional associations which mostly depicted students' overt performance, vision, and studies and enhanced their learning skills. The students' motivation to perform was indicated through mobile use in order to keep in touch with teachers and students and to keep study material on mobile phone.

5. The university teachers reported that they were provided basic facilities of internet and computer but they did not have special facilities as interactive boards, recorded lectures and multimedia facility in the classrooms.

6. The most of the universities blocked the contents on Facebook, twitter and Skype at the universities premises so the students studying in those universities were unable to use the social networks to share their ideas and knowledge with other.

7. The university teachers felt that the impact of ICT on student learning was significant as internet; ICT and Mobile Phone positively influence student learning. Digital libraries, social networks, professional groups, blogs and associations had significant positive effect on students learning. In their opinion, the digital contents would replace paper contents and students would prefer to read online articles rather than hard copy journal's articles. The response of the answer to questions about social networks that prevents social gathering was detrimental as viewed by teachers that it prevented them from joining games and sports and other social gatherings. Thus, sociability, tolerance and sharing are the missing elements of socialization.

5.4 Recommendations of the Study

Following analysis of data, findings generated and conclusions drawn, the following set of recommendations were formulated.

1. The teachers and universities administration collectively need to develop variety of contents for internet and mobile phone for students to get their attention

apart from the available contents, the contents based on this study findings may be retained and reproduced by the students and teachers.

2. Universities labs need to be upgraded in terms of PC brands and the software installed on it and its management also needs to be improved by increasing timings, allocated for the students of each department.

3. A formal ICT training based course for the university students and teachers, particularly for social sciences, may be initiated and repeated from time to time to increase the computer skills.

4. The university students are supposed to be aware of the new computer technology so that they could use upgraded computers and its relevant applications.

5. Motivation is needed to use computers for more time to find digital learning materials both for teachers as well as for students.

6. Universities are required to provide access to different types of social networks at campus particularly, professional networks. Department wise webpages and chat rooms may be developed by the faculty and students.

7. Access to data basis of national and international level may be made available to students and teachers, particularly in relevant subjects and disciplines of social sciences.

8. Students liked digital contents so digital content might be developed. The contents can be downloaded through internet and both teachers and students may consult the same material for discussion and teaching purposes in class.

9. Students need to be provided training to use scheduled tasks, calendar use and alarm for timely completing the different works by help of mobile phone.

10. The contents like digital dictionary and digital contents need to be made available for students not through open sources but through institutions so that the authentic and reliable learning material could be retrieved.

11. Academic forums need be developed among and between different universities for students and teachers to share their experiences, problems, difficulties and other study related issues including the study material.

12. Access to paid sites of learning material and learning technology may be hired and managed by the universities themselves or Higher Education Commission.

13. Time table alert and class timing may be initiated, applied and followed which could help students and teachers in time saving and develop a time conscious mind for both learners and teachers.

14. Access to digital libraries be made available to the students and teachers, particularly the use of library through internet, search books, refining searches and making requests to their university librarians for some special books.

15. Students blogs and discussion forums may be developed within university campuses. It means that a university student need to have options to use local, national and international blogs and forums. The students may be provided guidance and links for these types of blogs and forums.

16. Learning through media, particularly mobile phone and internet, needs be incorporated and made available to students at university level by university administration and teachers.

17. The full utilization of information and communication technology in teaching learning process needs to be made available for collaboration with national teaching learning circles as well as with international organizations.

18. The contents of internet and mobile phone that were explored as per Bandura symbolic learning four stages attention, retention, reproduction and motivation may be strengthened and easy access of students to these contents be made available

19. The computers for teachers at university level should be the upgraded models. The current status of the computers for the teachers was not found up to the mark because majority of the universities provided dual core computer to teachers but there I core 5 and above brands are available. The teachers may be provided upgraded computers.

20. Internet speed needs be increased at university campuses because time plays important role when the students want to download some contents, this takes a lot of time so they leave its downloading. The improvement in internet speed can make this activity easier and quicker.

21. Video conferencing facility may be developed at departmental level or faculty level and there needs to be time schedule for using it because some of universities have video conferencing room but it is rarely used.

22. Video recorded lectures be arranged at university and they can be kept in university library for students' access. If there is a variety of these lectures, it can be helpful for students as well teachers.

23. Technology enhanced curriculum needs to be incorporated in curriculum development that may be made mandatory for all students and faculty for using them so that they learn ICT use. Digitalization of curriculum needs to be gradually promoted and developed. This means that the assignments, projects and papers of the students may be kept in record for future use and maximum contents be provided in digital forms that are easily accessible for students.

24. The study results indicate that mobile phone may replace books, so the contents for mobile application be developed and the contents format be compact and less dense so that they could be easily downloaded on mobile phones.

25. Diversified national and international social networks need to be created and promoted at university campuses to develop mutual and diversified educational culture for research and development. Designing and implementing a social network is necessary to support learning communities of universities. These social networks allow greater interaction and collaboration among all members, and provide an opportunity for more personalized attention to all the problems that may arise in supervising.

26 Creating a training and advice virtualized environment for teachers is imperative for training networks and processes of teaching and learning based on ICT.

5.5 Recommendations for future Researchers

Following are a few recommendations for future researchers to consider while planning and conducting research.

1. Analysis of prospects of using Symbolic learning at elementary and secondary school level in urban areas be explored because in rural areas, no electricity and no trained teachers may not be feasible for researchers to conduct their research.

2 Analysis of practical implications of educational software developed by different countries and possibility and prospect of their use in Pakistan may be explored. The researchers may select different type of ICT based learning tools and incorporate them in their local setting in order to assess their effectiveness.

3 Use of Mobile Phone for literacy improvement in remote areas be investigated as Mobilink initiated a project in some districts of KP. A competition could be

generated among mobile providers for increasing literacy rate in Pakistan. Key features of this program may be analyzed.

4 The relationship between use of Internet and mobile phone and students' academic performance be examined. Although it is difficult to bifurcate them but a comparison can be made by using academic results of the students and the purpose to use of internet and mobile daily. The benefits of their accessibility and training that is self-paced and matched to the learners' needs, full scalability, and timely dissemination of up-to-date information so that effective learning delivery can be achieved easily.

5 Comparative studies of learning through mobile phone and Internet at different levels may be studied. The studies can be initiated within disciplines and inter tiers and the gadgets they learn through it. The comparison through mobile phone versus computer could also be quite interesting for study.

6 Impact of technology on students' socialization status. Normally the students of social sciences are shy and they hesitate to interact with others because the more one is socialized, the more he learns. A deep probe of socialization process including social values, violation of the norms and breaching the rule of law is desired. The students of social sciences and the organizations working for social betterment can undertake studies on the impact of technology on students' social skills so as to find the flaws and shortcomings.

7 Analysis of the relationship of use of Internet and Mobile phones with students' participation in sports and games in Pakistan be carried out to discover the causes and remedies.

8. The future researchers could possibly analyse and explore the currently available open access educational tools at the international level in different countries

like USA, UK and Australia and find prospects and possibilities for incorporating and enhancing those tools and sources for improving current teaching and learning process by the teachers and students. The list of social networks and learning sites is attached as Annexure D.

9. This study explored the basic necessities that required for implantation of ICT through mobile and internet based symbolic learning particularly in social sciences. The researchers may explore the current available at Open Education Resources (OER) and which of them could possibly be suitable for Pakistani situation, keeping in view the current scenario of slow internet speed, high mobile use and low density educational material.

10. The government of Pakistan has already taken initial steps by providing laptops and internet connections to students but they need to take more steps like providing laptops and high speed internet connection to university faculty at a subsidised cost. To study the effects of Prime Minister Laptop scheme on students' academic performance and social activities like sports and games could be a good useful direction for future studies.

BIBLIOGRAPHY

Abbott J. (1994). Learning makes sense: re-creating education for a changing future, Letch worth: Education 2000

Afzal, T. (2012), Impact of Facebook on students, retrieved from http://www.ilmkidunya.com/articles/impact-of-facebook-on-students-1078.aspx on 22nd Oct, 2014.

Ajadi, T. O. Salawu I. O. &Adeoye F. A. (2008). E-learning and Distance Education in Nigeria. The Turkish Online Journal of Educational Technology – TOJET October 2008 ISSN: 1303-6521 Vol 7. (4)

Al-Ansari, (2006). Internet Use by the Faculty members of Kuwait University, The Electronic Library, Vol.24 (6) 791-803.

Allen, I. & Seaman, J. (2011). "Going the Distance: Online Education in the USA." Babson Survey Research Group: Wellesley, MA.

Arya K. (2004). Time Spent on Television Viewing and its Effect on Changing Values of school Going Children. Anthropologist 2004; 6: 269-271.

Arnseth, H. C., Hatlevik, K., Kløvstad, V., Kristiansen, T., Ottestad, G. (2007). ITU Monitor 2007. Skolens digitale tilstand. Oslo: Forsknings- og kompetansenettverk for IT i utdanning, ITU.

Atkinson, R.L., Atkinson, R.C., Smith, E.E., and Bem, D. J.(1993). Introduction to Psychology. Harcourt Brace Jovanovich, Fort Worth, TX, 11th edition.

Attention. (n.d.). Retrieved July 15, 2014, from http://www.merriam-webster.com/dictionary/attention

Attention. (2014, July 13). In *Wikipedia, The Free Encyclopedia*. Retrieved 05:16, July 15, 2014, from http://en.wikipedia.org/w/index.php?title=Attention&oldid=616818593

Ayers, E. (2002). Putting content first: The Valley of the Shadow project and institutional change. Presented at the 2002 ECAR Symposium, Coronado, CA.

Baars, B. J., & Gage, N. M. (2007). Cognition, Brain, and Consciousness: Introduction to cognitive neuroscience. London: Elsevier Ltd.

Bandura, A. (1968). Modeling approaches to the modification of phobic disorders. In R. Porter (Ed.), *The role of learning in psychotherapy: Ciba Foundation Symposium*. London: Churchill.

Bandura, A. (1969). *Principles of behavior modification*. New York: Holt, Rinehart & Winston.

Bandura, A. (1977). *Social Learning Theory.* Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A.(1989). Regulation of cognitive processes through perceived self-efficacy. *Developmental Psychology, 25*, 729-735.

Bandura, A. (1991). Social cognitive theory of moral thought and action. In W. M. Kurtines & J. L. Gewirtz (Eds.), Handbook of moral behavior and development (Vol. 1, pp. 45-103). Hillsdale, NJ: Lawrence

Bandura, A. (2002). Growing primacy of human agency in adaptation and change in the electronic era.*European Psychologist, 7*, 2-16.

Bandura, A. (2006). "Toward a Psychology of Human Agency" Perspectives on Psychological Science, Volume 1 Issue 2.Bandura, A., & National Inst of Mental Health. (1986). Prentice-Hall series in social learning theory. Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall

Bandura, A. (2009). Social cognitive theory of mass communication. In J. Bryant & M. B. Oliver (Eds.), *Media effects: Advances in theory and research* (2nd ed., pp. 94-124). Mahwah, NJ: Lawrence Erlbaum.

Bandura, A. (2011). A social cognitive perspective on positive psychology. *Revista de Psicologia Social*, *26*, 7-20.

Bertoline, G. R., & Dorjgotov E. (2007). The impact of computer-simulated hepatic force feedback on learning. Presented at ELI Spring Focus Session: Immersive Learning Environments: New Paths to Interaction and Engagement. Retrieved April 24, 2007, from ttp://www.educause.edu/ir/library/pdf/ELI07217.pdf

Bickham, D. S., Wright, J. C., & Huston, A. C. (2001). Attention, Comprehension, And The Educational Influences Of Television. In D. G. Singer & J. L. Singer (Eds.), Handbook of children and the media (pp. 101–119). Thousand Oaks, CA: Sage.

Biddle, S. J. H., Fox, K. R. & Boutcher, S. H. (2000). (eds) Physical Activity and Psychological Well- Being. London: Routledge.

Bahr, N., & Rohner, C. (2004). The judicious utilization of new technologies through authentic learning in higher education: A case study. *Annual Conference Proceedings of Higher Education Research and Development Society of Australasia.* Miki, Sarawak (Malaysia). http://www.herdsa.org.au/conference2004/Contributions/RPapers/P033-jt.pdf(Retrieved April 24, 2007)

Bligh, D. A. (2000). What's the use of lectures? San Francisco: Jossey-Bass.

Bonner, S. (1999). Choosing Teaching Methods Based on Learning Objectives: An Integrative Framework. Issues in Accounting Education, 14(1), 11-39.

Boreham, C. & Riddoch. C. (2001). The Physical Activity, Fitness and Health of Children. *Journal of Sports Sciences,*Vol. 19(9), 915-929.

Bossu, C., Brown, M., & Bull, D. (2011). Playing catch-up: Investigating public and institutional policies for OER practices in Australia. The Journal of Open, Flexible and Distance Learning, Vol.15 (2), 41 - 54.

Bruner J.S. (1996). "Folk pedagogy" in his The Culture of Education, Cambridge MA, Harvard University Press.

Bruner, J. S. (1966). *Toward a Theory of Instruction.* Cambridge MA: Harvard University Press. pp. 49–53.

Bentler, P. (2009). Alpha, dimension-free, and model-based internal consistency reliability. Psychometrika, 74, 137-143. doi: 10.1007/s11336-008-9100-1

Casal, C. R.(2007).'ICT for education and development', *info ISSN:1463-6697* Vol. 9(4) 3 - 9.

Cheung, W. & Huang, W. (2005). Proposing a Framework to Assess Internet Usage in University Education: An Empirical Investigation from a Student's Perspective. British Journal of Educational Technology, Vol. 36(2), 237-253.

Chau, P.Y.K. & Hu, P.J.H. (2002). Examining a Model of Information Technology Acceptance by Individual Professionals: An Exploratory Study. Journal of Management Information System, Vol. 18(4), 191-229.

Christensen, C.M., Baumann, H., Ruggles, R. and Sadtler, T.M. (2006). "Disruptive Innovation for Social Change." Harvard Business Review December: 94–101.

Clark, D. (2004). Learning Styles: Or, how we go from the unknown to the known. Available at: http://www.nwlink.com/~donclark/hrd/learning/styles.html.

Coates, D., & Humphreys, B. R. (2004). 'No Significant Distance' Between Face-To-Face and Online Instruction: Evidence from principles of economics. *Economics of Education Review*, Vol. *23*(6), 533-546.

Crabtree, J., Nathan, M. and Roberts, S. (2003). *MobileUK: Mobile phones and everyday life*. London: The Work Foundation.

Craft, A., (2012). "Childhood in a Digital Age: Creative Challenges for Educational Futures". *London Review of Education.* Vol. 10 (2):173–190. doi:10.1080/14748460.2012.691282

Cross, M. & Adam, F. (2007), 'ICT Policies and Strategies in Higher Education in South Africa: National and Institutional Pathways', *Higher Education Policy Vol.* 20(1), 73-95.

Daniel L. et al (2011). *Psychology, 2nd edition*. Worth Publishers. USA

Digital library. (2014, June 29). In *Wikipedia, The Free Encyclopedia*. Retrieved 06:52,July4,2014,from http://en.wikipedia.org/w/index.php?title=Digital_library &oldid=614926057

Dong, X. (2003), "Searching Information and Evaluation of Internet: a Chinese academic user survey", International Information & Library Review, Vol. 35 (2-4), pp.163-87.

Donnelly, R., & O'Rouke, K. (2007). What now? Evaluating e-learning CPD practice in Irish third-level education. Journal of Further and Higher Education, Vol.31 (1), 31−40.

Downes, S. (2007). *Emerging Technologies for Learning*. Coventry, U.K.: Becta. http://partners.becta.org.uk/page_documents/research/emerging_technologies07 _chapter2.pdf (April 24, 2007)

Dror I.E. (2011c). Brain friendly technology: what is it? And why do we need it? In: Dror I.E, editor. Technology enhanced learning and cognition. Amsterdam: John Benjamins

Elias T. (2010). Universal Instructional Design Principles for Moodle. International Review of Research in Open and Distance Learning Vol. 11(2), May – 2010. ISSN: 1492-3831

Email.(2014,June 22).In *Wikipedia,The Free Encyclopedia*.Retrieved 09:20, July 6,2014,from http://en.wikipedia.org/w/index.php?title=Email&oldid=61398582

European School net (EUN) (2006). The ICT Impact Report: a Review of Studies of ICT Impact on Schools in Europe. Brussels: Europe

Ferry, B., Kervin, L., Cambourne B., Turbill, J., Puglisi S., Jonassen, D., & Hedberg, J. (2004). Online classroom simulation: The next wave for pre-service teacher education? *Australasian Society for Computers in Learning in Tertiary Education* (ASCILITE). http://www.ascilite.org.au/conferences/perth04/procs/ferry.html(April 24, 2007)

Fink, L.D., (2003).Creating Significant learning Experiences: An Integrated Approach to Designing College Courses. Jossey-Bass Publishers, San Francisco,CA,295.

Flora, D. B., & Curran, P. J. (2004). An empirical evaluation of alternative methods of estimation for confirmatory factor analysis with ordinal data. Psychological Methods, 9, 466-491. doi: 10.1037/1082-989X.9.4.466

Gay,L., R. (1987). 3rd ed. Educational Research: Competencies for Analysis and Application, (Columbus, Ohio: Merrill Publishing Company, 1987), 101.

Geer, R. & Sweeney, T. (2012). "Students' voices about learning with technology". *Journal of social sciences* Vol. 8 (2): 294–303.

Gemmell, J.,Bell G.,& Lueder,R. (2006). MyLifeBits: a personal database for everything, Communications of the ACM, Vol. 49(1).

Glaser, R. (1991). The maturing of the relationship between the science of learning and cognition and educational practice, learning and Instruction 1 (129)

Haggbloom, S. J., Warnick, R., *et al*. (2002). The 100 most eminent psychologists of the 20th century. *Review of general psychology*, Vol. 6 (2), 139–152.

Herrington, J., Oliver R., & Reeves, T. C. (2003). Patterns of engagement in authentic online learning environments. *Australian Journal of Educational Technology*, *19*(1), 59–71. http://www.ascilite.org.au/ajet/ajet19/herrington.html (April 24, 2007),

Herrington, J., Reeves, T., Oliver R., & Woo, Y. (2002). Designing authentic activities for Web-based courses. In G. Richards (Ed.), *Proceedings of World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education 2001*, (pp.18–27). Chesapeake, VA: AACE.

Herrington, J., & Oliver, R. (2000). An instructional design framework for authentic learning environments. *Educational Technology Research and Development*, *48*(3), 23–48. Retrieved April 24, 2007, from http://edserver2.uow.edu.au/~janh/Elearn/Site/Authentic design_files/ETR&D.pdf

Harrison, C. et al. (2002). ImpaCT2: The Impact of Information and Communication Technologies on Pupil Learning and Attainment. Coventry: Becta.

Hölbl M, Welzer T.(2010).Students' Feedback and Communication Habits using Moodle. Electronics & Electrical Engineering [serial online]. July 2010; (102) :6366. Available from: Computers & Applied Sciences Complete, Ipswich, MA (2010). Accessed December 20, 2011

Horowitz, A. (2014). *Domestic Dog Cognition and Behavior*. Springer.

Internet. (2014, July 4). In *Wikipedia,The Free Encyclopedia*.wikiRetrieved 06:23, July,4,2014,from http://en.wikipedia.org/w/index.php?title=Internet&oldid=615520054

Internet in Pakistan. (2014, July 9). In *Wikipedia, The Free Encyclopedia*.http://en.wikipedia.org/w/index.php?title=Internet_in_Pakistan&oldid=616289159 (July 12, 2014)

Internet world statistics (2012). Usage and population statistics, internet coaching library

Instant messaging. (2014, June 18). In *Wikipedia, The Free Encyclopedia*.Retrieved 09:12,July6,2014,from http://en.wikipedia.org/w/index.php?title=Instant_messaging& oldid=613459660

James, W. (1890). The Principles of Psychology (1st Ed.) New York: Holt

Jonassen, D.H. (2006). Modeling with technology: Mind tools for conceptual change. Columbus, OH: Merill/Prentice Hall.

Jarvis, P. Holford, J. & Grifin, C., (2003). The theory and practice of learning.2nd edition. London: Kogan-Page

Jhone, D. & Kathrine,T. (2009). The MacArthur Foundation, *Digital Media and Learning*. Chicago, Illinois, USA Retrived from http://www.mac found.org/dml/

Jones, D. & Elcock, J. (2001). History and Theories of Psychology. A Critical Perspective. London: Arnold Kenrick, D. T., Griskevicius, V., Neuberg, S. L., & Schaller, M. (2010). Renovating the pyramid of needs: Contemporary extensions built upon ancient foundations. *Perspectives on Psychological Science, 5*, 292. doi: 10.1177/1745691610369469

Kane, M. (2006). Validation. In R. Brennan (Ed.), Educational measurement (4th ed., pp. 17-64). Washington, DC: American Council on Education and National Council on Measurement in Education.

Kim, B. and Thomas C. R. (2007), Reframing research on learning with technology: in search of the meaning of cognitive tools, *Instructional Science*, Vol. 35(3) 207-256. DOI 10.1007/s11251-006-9005-2

Knight,J.K. & Wood, W.,B. (2005). Teaching more by lecturing less. Cell biology Education, 4, 298-310

Knight A. & Bush F. (2009).The development of an integrated learning environment. Proceedings ascilite Auckland 2009: Concise paper: Retrieved from http://www.ascilite.org.au/conferences/auckland09/procs/knight.pdf

Kolb, D.A., (1984). Experiential learning: Experience as the source of learning and development. Prentice Hall, Upper Saddle River, NJ.

Kozma, R. (2005). 'National Policies That Connect ICT-Based Education Reform To Economic And Social Development', *Human Technology* Vol. 1 (2), October 2005, 117-156.

Kozma R. B. (2008). 'Comparative Analysis of Policies for ICT in Education', in: J. Voogt and G. Knezek (eds), *International handbook on information technology in primary and secondary education*. New York

Kirkup, G., & Kirkwood, A. (2005). Information and Communications Technologies (ICT) in Higher Education Teaching-a Tale of Gradualism rather than Revolution. *Learning Media and Technology,* Vol.30 (2), 185-199.

Lai, K. W. & Pratt, K. (2004). 'Information and communication technology (ICT) in secondary schools: The role of the computer coordinator', *British Journal of Educational Technology* Vol.35,461–475.

Leuven, E., Lindahl, M., Oosterbeek, H., & Webbink, D. (2004). The Effect of Extra Funding for Disadvantaged Pupils on Achievement. *IZA Discussion Paper*. No. 1122. Bonn, Germany: Institute for the Study of Labor.

Lipscomb, S. (2006).Secondary School Extracurricular Involvement and Academic Achievement: A fixed Effects Approach. Economics of Education Review, Vol. 26(4), 463-472

Lippert, S.K. & Forman, H. (2005). Utilization of Information Technology: Examining Cognitive and Experiential Factors of Post-Adoption Behavior. IEEE Transactions of Engineering Management, Vol. 52(3), 363-381.

Littlejohn, A., Suckling, C., Campbell, L. & McNicol, D. (2002). The amazingly patient tutor: students' interactions with an online carbohydrate chemistry course. *British Journal of Educational Technology,* Vol. 33(3), 313-321.

Livingston, K., & Condie, R. (2006). The impact of on-line learning on teaching and learning strategies. Theory into Practice,Vol. 45(2), 10−158.

Love, N., & Fry, N. (2006). Accounting students' perceptions of a virtual learning environment: Springboard or safety net? Accounting Education: An International Journal, Vol.15, 151−166.

Ma, W. W., Andersson, R., & Streith, K. O. (2005). Examining User Acceptance Of Computer Technology: An empirical study of student teachers. *Journal of Computer Assisted Learning*, Vol. 21, 387–395.

Mamtora, J. (2003). "The Efficacy of Academic Use of The Internet at USP", *COMLA Bulletin*, Vol. 1 pp.34-9.

Marche, S. (2012). Is Facebook Making us Lonely? The Atlantic, *NA*, NA

Merriam, S. B. & Caffarella, R. S. (1999). Learning in Adulthood: A Comprehensive Guide. (2nd Edition). San Francisco: Jossey-Bass.

McGill, I. & Beaty, L. (1995). Action Learning, (2nd Ed) a guide for professional, management and educational development London: Kogan Page.

McLeod,S.A.(2007). *CarlRogers.* Retrieved from http://www.simplypsychology.org/carl-rogers.html

Mobile Operating Systems. (2014, June 29). In *Wikipedia, The Free Encyclopedia*. Retrieved 09:42, July 6, 2014, from http://en.wikipedia.org/w/index.php?title= Mobile_operating_system&oldid=614913999

Mobile Phone. (2014, June 28). In *Wikipedia, The Free Encyclopedia*. Retrieved 06:41,July4,2014,from http://en.wikipedia.org/w/index.php?title=Mobile_phone &oldid=614701998

Mobile Social Network. (2014, March 17). In *Wikipedia, The Free Encyclopedia*. Retrieved 09:25, July 6, 2014, From http://en.wikipedia.org/w/index.php?title=Mobile_social_network&oldid= 599992130

Momani, H.A. (2003). "Evaluation of the Nature, Extent, and Satisfaction With the Use of the Internet by Applied Science And Technology Faculty Members in Jordan", PhD dissertation, University of Pittsburgh, Pittsburgh, PA.

Momani A. M. (2010). Comparison between two Learning Management Systems: Moodle and Blackboard. Retrieved from ERIC database UUM.http://www.eric.ed.gov.eserv.uum.edu.my/PDFS/ED509728.pdf

Moore, M. & Kearsley, G. (1996). *Distance Education: A Systems View*. Belmont, CA: Wadsworth.

Moresch, C. (2010). Learning & Leading with Technology. Learning & Leading with Technology, Vol. 37(5), 20-23.

Motivation. (2014, July 13). In *Wikipedia, The Free Encyclopedia*. Retrieved 05:31, July 15, 2014, from http://en.wikipedia.org/w/index.php?title=Motivation&oldid=616775768

Mushayikwa, A. (2006). Investigating the Impact of Information and Communication Technology on Self Directed Professional Development of Teachers, PhD thesis in University of York, Zimbawe

Nasir Uddin, M. (2003). "Internet Use by University Academics: a Bipartite Study of Information and Communication Needs", Online Information Review, Vol. 27(4), 225-237.

OECD (2004). Are Students Ready For a Technology Rich World? What PISA studies tell us. Paris: OECD.

Oliver, B. & Goerke, V. (2007). Australian Undergraduates' Use and Ownership of Emerging Technologies: Implications and Opportunities for Creating Engaging Learning Experiences for the Net Generation. *Australasian Journal of Educational Technology*, Vol. 23(2), 171-186. http://www.ascilite.org.au/ajet/ajet23/oliver.html

Olson, J.K., (2006). The Myth of Catering to Learning Style Science and Children Vol. 44(2) 56-57

Pappano, L. (2012). "The Year of the MOOC." Retrieved from: www.nytimes. com/2012/11/04/education/edlife/massive-open-online-courses-aremultiplying-at-a-rapid-pace.html

Piaget, J., & Inhelder, B. (1973). *Memory and intelligence*. London: Routledge and Kegan Paul.

Plomp, T.; Pelgrum, W. J. & Law, N. (2007). 'SITES2006—International comparative survey of pedagogical practices and ICT in education', *Education and Information Technologies* Vol.12(2), 83- 92.

Potosky, D. (2007). The Internet Knowledge (iKnow) Measure. Computers in Human Behavior, Vol.23(6), 2760-2777.

Potter, B.N., & Johnston, C.G. (2006). The effect of interactive on-line learning systems on student learning outcomes in accounting. Journal of Accounting Education, Vol. 24, 16−34.

Prince, M. (2004). Does Active Learning Work? A Review of the Research. Journal of Engineering Education, Vol. 93, p. 223-231.

Retention. (n.d.). Retrieved July 15, 2014, from http://www.merriam-webster.com/dictionary/retention

Rosen, L. D. (2012). I Disorder: understanding our obsession with technology and overcoming its hold on us. New York: Palgrave Macmillan.

Salomon, G. (1984). Television is "Easy" and Print is "Tough": The Differential Investment of Mental Effort as a Function of Perceptions and Attributions. Journal of Educational Psychology, Vol. 76, 647–658.

Suleiman A. A. (2011b). YouTube usage and behavior change among Nigerian university students.Journal of education and sociology, ISSN: 2078-032x, Vol. 4 (2) 2011. 32-42.

Selwyn, N. (2004). Reconsidering Political and Popular Understandings of the Digital Divide. New Media & Society,Vol. 6(3), 341-362.

Selwyn, N. (2011) Education and Technology: Key Issues and Debates. London: Continuum International Publishing Group

Shah. D.V., Cho, J., Eveland, W.P.Jr. & Kwak, N. (2005). Information and Expression in a Digital Age: Modeing Internet Effects on Civic Participation. Communication Research, Vol. 32(5), 531-565.

Sharples, M. (2005). Learning as Conversation: Transforming Education in the Mobile Age. In *Proceedings of Conference on Seeing, Understanding, Learning in the Mobile Age* (pp. 147-152). Budapest, Hungary.

Sharples, M., Taylor,J., Vavoula, G. (2005).Toward a Theory of Mobile Learning,,MLEARN Project UK

Sharples, M., Taylor,J., Vavoula, G.N. (2007). A Theory of Learning for the Mobile Age. In Andrews, R., & Haythornthwaite, C. (Eds.) The SAGE Handbook of E-learning Research. London: Sage

Sheikh, M. A. (2007). Satellite Television and Social Change in Pakistan: A case study of rural Sindh. Karachi: Orient Books Publishing House.

Simon, A.H. (1996). The Sciences of the Artificial, Massachusetts Institute of Technology USA

Simonson, M., Smaldino, S.E., Albright, M. and Zvacek, S. (2011).Teaching and Learning at a Distance: Foundations of Distance Education. Allyn & Bacon: Boston.

Sijtsma, K. (2009). On the use, the misuse, and the very limited usefulness of Cronbach's alpha. Psychometrika, Vol.74, 107- 120.doi:10.1007/s11336-008-9101-0

Skinner, B. F., (1984). The phylogeny and ontogeny of behavior. Behavioral and Brain Sciences, Vol. 7,669-677. doi:10.1017/S0140525X00027990.

Social Networking Service. (2014). In *Wikipedia, The Free Encyclopedia*. Retrieved 10:18, July 6, 2014, from http://en.wikipedia.org/w/index.php?title=Social_networking_service&oldid=615554125

Stapleton, P. (2002). Critical thinking in Japanese L2 writing: rethinking tired constructs. ELT Journal, Vol. 56(3), 250–257.

Stoel, L. & Lee, K.H. (2003). Modeling the Effect of Experience on Student Acceptance of Web-Based Courseware. Internet Research: Electronic Networking Applications and Policy, Vol. 13(5), 364-374.

Stuart, J. & Rutherford, R. J. (1978). Medical student concentration during lectures. The Lancet, 514516.

Sun, H. & Zhang, P. (2006). The Role of Moderating Factors in User Technology Acceptance. International Journal of Human-Computer Studies, 64(2), 53-78.

Taylor, J., Sharples, M., O'Malley, C., Vavoula, G., & Waycott, J. (2006). Towards a Task Model for Mobile Learning: a Dialectical Approach. *Accepted for publication in International Journal of Learning Technology*.

Tennant, M. (1997). *Psychology and Adult Learning*, London: Routledge.

Terry, N., Lewer, J., & Macy, A. (2003). The Efficacy of Alternative Instruction Modes in Economics. *Economic Research Network Educator.* Retrieved from http://ssrn.com/abstract=392561

Taylor, J., Sharples, M., O'Malley, C., Vavoula, G., Waycott, J. (2005). Towards a Task Model for Mobile Learning: a Dialectical Approach. *International Journal of Learning Technology*, Vol. 2(2/3)

Thomas, C. R. (1998). Impact of Media and Techonolgoy in Schools, A Research Report Prepared for Bertlesmann Foundation, The University Of Georgia

Topper, A. (2002). Web-based Learning and Teaching Technologies: Opportunities and Challenges. Teachers College Record, Vol. 104(1), 151-154.

Trilling & Fadel (2009). 21st Century Learning Skills. San Francisco, CA: John Wiley & Sons.

Turkle, S. (2011). Alone together: why we expect more from technology and less from each other. New York: Basic Books.

Thuseethan, S. & Kuhanesan, S. (2014). Influence of Facebook in Academic Performance of Sri Lankan University Students, Global Journal of Computer Science and Technology: E Network, Web & Security Volume 14 (4) 2014 Global Journals Inc. (USA) Online ISSN: 0975-4172 & Print ISSN: 0975-4350.

Vavoula, G. (2004). KLeOS: A Knowledge and Learning Organisation System in Support of Lifelong Learning. Unpublished PhD Thesis, University of Birmingham, UK.

Vavoula, G. N. (2005). A Study of Mobile Learning Practices: Internal report of MOBI learn project.

Venkatesh, V., Morris, M.G., Davis, G.B. & Davis, F.D. (2003). User Acceptance of Information Technology: Toward A Unified View.MIS Quarterly, Vol. 27(3),425-78.

Vian, B. (2010). Media and Scientific Risk: Moving Towards New Research Agendas through Fuller Definitions URL http://hdl.handle.net/10138/15296

Vygotsky, L.S. (1978) Mind in Society: The development of higher psychological processes. Cambridge, MA: Harvard University Press.

Watson, J. B. (1930). *Behaviorism*, revised edition. Chicago: University of Chicago Press.

Wei, L. & Hindman, D.B. (2007). The Digital Divide and the Knowledge Gap. Paper presented at the annual convention of Association for Education in Journalism and Mass Communication, Washington, D.C.

Wikipedia, (2014). In *Wikipedia, The Free Encyclopedia*. Retrieved 09:39, July 6, 2014,
from http://en.wikipedia.org/w/index.php?title=Wikipedia&oldid=615741390

Wiley, D., & Gurrell, S. (2009). A Decade of Development. Open Learning: The Journal of Open, Distance and e-Learning, Vol. 24(1), 11-21.

Willingham, D.T. (2005).Do visual auditory and kinesthetic learners need visual, auditory and kinesthetic Instructions, Vol.29 (2) 21-35,44.

Wilson, K., & Korn, J.H. (2007). Attention during lectures: Beyond ten minutes. Teaching of Psychology, Vol.34, 85-89.

World Bank, (2010). In its annual booklet, Bringing Finance to Pakistan, Paris

Yasir, M.(2011).A research report' Is Pakistan a Pronistan' http://tribune.com.pk/story/283253/internet-users-in-pakistan-cross-20-million-mark/

Young, J. (2002). The 24-hour professor. *The Chronicle of Higher Education,Vol. 48*(38), 31-33.

Young, B. S. Got moodle? T.H.E.Journal, 35(4), 2828,30, (2008). Retrieved on March 10, 2012 from http://search.proquest.com/docview/214821409?accountid =27575

Yount, R. (2006). Research Design and Statistical Analysis for Christian Ministry, Research Fundamentals. 4th Edition 2006 USA.

Zull, J. E. (2002). The Art of Changing the Brain: Enriching Teaching by Exploring the Biology of Learning, Stylus Publishing, LLC

Appendix A

Questionnaire for University Students (Internet & Mobile Contents)

University …… Department …… Semester…….. Gender ……..

Class (Degree Program) ……..…….. City……...…….. Grade/CGPA is last Exam …….

1- Type of desktop computer you use (please tick in the relevant option)

	a- PC at University		**b- PC at Home/Hostel**		**c- Lap Top**	
	Y	**N**	**Y**	**N**	**Y**	**N**
PIII	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
PIV	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Dual Core	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
I Core 1 or more	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
Not Available	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

2- You have been using computer since (Mark only one option)

a- Before 2000 [ ] b- 2004 [ ] c- 2008 [ ]

d- After 2012 [ ]

3- You learn ICT use by:

a- Internet [ ] b- Formal Course [ ]

c- Colleagues help [ ] d- Trail and error [ ]

4- You use computer daily for:

a- Less than 1 hour [ ] b- 1-2 hrs [ ]

c- 2-4 hrs [ ] d- More than 4 hrs [ ]

5- Your department in the university has a computer lab.(Mark only relevant)

a- Well Equipped [ ] b- Not Equipped [ ]

c- Badly Managed [ ] d- Any other [ ]

6- You can access the following at university. (Mark only relevant, Y/N)

a- Search engines [ ] b- Mails [ ]

c- Digital library [ ] d- Messengers [ ]

e- Face book [ ] f- Twitter [ ]

g- Data bases [ ]

7- Your are member of social networks Y- [ ] N- [ ] Do not Know [ ]

8- You prefer using (Mark only Relevant)

a- Skype [ ] b- Face Book [ ]

c- MSN [ ] d- Twitter [ ] e- Any other [ ]

9- Internet connection speed at the university

a- Below 512 Kb [ ] b- 512 Kb [ ] c- 1MB [ ]

d- 2MB [ ] e- Any other [ ]

10- Internet connection speed at home is

a- Below 512Kb [ ] b- 512 Kb [ ] c- 1MB [ ]

d- 2MB or More [ ] e- Any other [ ]

11- The computer lab is available up to

a- 8am -2pm [ ] b- 9am-4pm [ ] c- 9am-5 pm [ ]

d- 9am-10pm [ ] e- Any other [ ]

12- Your major downloads are

a- Songs and videos [ ] b- Study Material [ ]

c- Software [ ] d- Job adds [ ]

e- All of them [ ] f- None of them [ ]

13- You keep digital study materials in

a- Hard drive [ ] b- CD/DVD [ ]

c- USB drive [ ] d- Any other [ ]

14- You write assignments by using

a- MS Word [ ] b- Power Point [ ]

c- Both [ ] d- Corel Draw [ ] e- Any other [ ]

15- You understand presentation better

a- By Multimedia [ ] b- By oral lecture [ ]

c- By use of board [ ] d- Any other

16- You like reading material in

a- Digital form [ ] b- Book from [ ]

c- Picture form [ ] d- Any other [ ]

17- You get guidance for learning from

a- Social Networks [ ] b- Group discussion [ ]

c- Academic forum [ ] d- Online chat [ ]

e- None of them [ ] f- All of them [ ]

18- You frequently use the search engines. (Mark as you use it)

Search Engine:	**Never**	**Seldom**	**Frequently**	**Always**
a- Google Crome	[ ]	[ ]	[ ]	[ ]
b- MSN Bingo	[ ]	[ ]	[ ]	[ ]
c- Yahoo	[ ]	[ ]	[ ]	[ ]
d- Internet Explorer	[ ]	[ ]	[ ]	[ ]
e- Mozilla	[ ]	[ ]	[ ]	[ ]
f- Alta Vista	[ ]	[ ]	[ ]	[ ]
g- Any other	[ ]	[ ]	[ ]	[ ]

19- You consult for academic problems. (Marks the relevant)

Sources:	**Never**	**Seldom**	**Frequently**	**Always**
a- Wikipedia	[ ]	[ ]	[ ]	[ ]
b- Digital Dictionary	[ ]	[ ]	[ ]	[ ]
c- Teachers	[ ]	[ ]	[ ]	[ ]
d- Class fellows	[ ]	[ ]	[ ]	[ ]
e- Hard copy notes	[ ]	[ ]	[ ]	[ ]
f- Search engines	[ ]	[ ]	[ ]	[ ]
g- Any other	[ ]	[ ]	[ ]	[ ]

20- You prepared a list of

a- Free access sites [ ] b- Research journal [ ]

c- Digital books [ ] d- Songs and movies [ ]

e- All of them [ ] f- None of them [ ]

21- You prefer the use of

a- Digital library [ ] b- General library [ ]

c- Online library [ ] d- Search engine [ ]

e- Any other [ ]

22- You have large store of the following contents in your computer. (Mark the relevant)

Large Store of :	**Y / N**			**Y / N**	
a- Digital Books	[ ]	[ ]	b- Movies/Films	[ ]	[ ]
c- Songs	[ ]	[ ]	d- Research Articles	[ ]	[ ]
e- Video Games	[ ]	[ ]	f- Holy Qurat	[ ]	[ ]
g- Any other	[ ]	[ ]			

23- You consider learning through Internet beneficial. (Mark the options as you consider it)

Contents Areas	**Very Low**	**Low**	**High**	**Very High**
a- Internet increase students performance	[ ]	[ ]	[ ]	[ ]
b- Social networks boost learning of the students	[ ]	[ ]	[ ]	[ ]
c- Digital libraries are most useful for learner	[ ]	[ ]	[ ]	[ ]
d- Online articles are very helpful for learner	[ ]	[ ]	[ ]	[ ]
e- Discussion forums create new dimensions	[ ]	[ ]	[ ]	[ ]
g- Students Blogs improve professionalism	[ ]	[ ]	[ ]	[ ]
h- Teacher professional association enhance new skills	[ ]	[ ]	[ ]	[ ]
i- Any other	[ ]	[ ]	[ ]	[ ]

24- You have been using Mobile phone since (Mobile phone contents)

a- Before 2000 [ ] b- 2004 [ ]

c- 2008 [ ] d- 2012 [ ] e- Any other [ ]

25- You have mobile Internet package

a- Daily [ ] b- Weekend [ ]

c- Weekly [ ] d- Monthly [ ] e- Any other [ ]

26- You use this type of mobile

a- Smart Phone [ ] b- I Phone [ ]

c- Anroid [ ] d- Any other [ ]

27- You use mobile phones daily for

a- less than 10min [ ] b- 10-25min [ ]

c- 30-40min [ ] d- More than 40min [ ] e- Any other [ ]

28- You use the following operating system/software on your mobile phone (Mark the relevant)

Operating System	Never	Seldom	Frequently	Always
a- Symbian by Nokia	[ ]	[ ]	[ ]	[ ]
b- Android by Google	[ ]	[ ]	[ ]	[ ]
c- IOS by Apple	[ ]	[ ]	[ ]	[ ]
d- Bada by Samsung	[ ]	[ ]	[ ]	[ ]
e- Windows by Microsoft	[ ]	[ ]	[ ]	[ ]
f- Any other	[ ]	[ ]	[ ]	[ ]

29- You often click on these contents of your mobile phone. (Tick the most relevant)

Contents	Never	Seldom	Frequently	Always
a- Phone book	[ ]	[ ]	[ ]	[ ]
b- Massages	[ ]	[ ]	[ ]	[ ]
c- Calendar	[ ]	[ ]	[ ]	[ ]
d- Multimedia	[ ]	[ ]	[ ]	[ ]
e- Setting	[ ]	[ ]	[ ]	[ ]
f- Any other	[ ]	[ ]	[ ]	[ ]

30- You perform the following tasks on your mobile phone. (Tick the relevant box)

Tasks	Never	Seldom	Frequently	Always
a- Meanings of words and phrases	[ ]	[ ]	[ ]	[ ]
b- Calculations	[ ]	[ ]	[ ]	[ ]
c- Watching time	[ ]	[ ]	[ ]	[ ]
d- Listening music	[ ]	[ ]	[ ]	[ ]
e- Watching movies	[ ]	[ ]	[ ]	[ ]
f- Sending SMS	[ ]	[ ]	[ ]	[ ]
g- Playing games	[ ]	[ ]	[ ]	[ ]
h- Waking alarm	[ ]	[ ]	[ ]	[ ]
i- Any other	[ ]	[ ]	[ ]	[ ]

31- You often use mobile phone for. (Mark the most appropriate)

Purposes	Never	Seldom	Frequently	Always
a- Talking	[ ]	[ ]	[ ]	[ ]
b- Sending Massages	[ ]	[ ]	[ ]	[ ]
c- Calendar and watch	[ ]	[ ]	[ ]	[ ]
d- Listening songs	[ ]	[ ]	[ ]	[ ]
e- Watching movies	[ ]	[ ]	[ ]	[ ]
f- Video or pictures	[ ]	[ ]	[ ]	[ ]
g- Schedules or tasks	[ ]	[ ]	[ ]	[ ]
h- Words and phrases	[ ]	[ ]	[ ]	[ ]
i- Class Schedule and tasks	[ ]	[ ]	[ ]	[ ]

j-	Dictionary	[ ]	[ ]	[ ]	[ ]
k-	Games	[ ]	[ ]	[ ]	[ ]
l-	Various type of music	[ ]	[ ]	[ ]	[ ]
m-	Various type of movies	[ ]	[ ]	[ ]	[ ]
n-	Encyclopedias	[ ]	[ ]	[ ]	[ ]
o-	MS Words/Power Point	[ ]	[ ]	[ ]	[ ]
p-	Photos	[ ]	[ ]	[ ]	[ ]
q-	Any other	[ ]	[ ]	[ ]	[ ]

30- You consider Mobile phone benefits. (Mark the options as you consider it)

		Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**
a-	You remain up to date of the classroom tasks	[ ]	[ ]	[ ]	[ ]
b-	You store study material in mobile phone	[ ]	[ ]	[ ]	[ ]
c-	High tech mobile improves academic performance	[ ]	[ ]	[ ]	[ ]
d-	Mobile phone keeps me in touch with teachers	[ ]	[ ]	[ ]	[ ]
e-	Mobile phone with multimedia is helpful in learning	[ ]	[ ]	[ ]	[ ]
f-	Learning by mobile may replace traditional learning	[ ]	[ ]	[ ]	[ ]
g-	I Pad will replace note taking Registers	[ ]	[ ]	[ ]	[ ]
h-	Multimedia phone will become need of the students	[ ]	[ ]	[ ]	[ ]
i-	Any other	[ ]	[ ]	[ ]	[ ]

Appendix B

Questionnaire for University Teachers

University …… Department …… Title …….. Gender ……..

City……...…….. Qualification ……..…….. Experience …….

1- Type of desktop computer you use (please tick in the relevant option)

	a- PC at University	**b- PC at Home/Hostel**	**c- Lap Top Y / N**
		Y / N	**Y / N**
PIII	[ ] [ ]	[ ] [ ]	[ ] [ ]
PIV	[ ] [ ]	[ ] [ ]	[ ] [ ]
Dual Core	[ ] [ ]	[ ] [ ]	[ ] [ ]
I Core 1 or more	[ ] [ ]	[ ] [ ]	[ ] [ ]
Not Available	[ ] [ ]	[ ] [ ]	[ ] [ ]

2- You have been using computer since (Mark only one option)

a- Before 2000 [ ] b- 2004 [ ] c- 2008 [ ]

d- After 2012 [ ] e- Indicate if any other [ ]

3- You learn ICT use by:

a- Internet [ ] b- Formal Course [ ]

c- Colleagues help [ ] d- Trial and error [ ] e- Indicate if any other [ ]

4- You use computer daily for:

a- Less than 1 hour [ ] b- 1-2 hrs [ ]

c- 2-4 hrs [ ] d- More than 6 hrs [ ]

5- Internet connection speed at the university

a- Below 512Kb [ ] b- 512 Kb [ ] c- 1MB [ ]

d- 2MB or more [ ] e- Indicate if any other [ ]

6- Internet connection speed at home is

a- Below 512 Kb [ ] b- 512 Kb [ ] c- 1MB [ ]

d- 2MB or More [ ] e- Indicate if any other [ ]

7- You have been using Mobile phone since (Mobile phone contents)

a- Before 2000 [ ] b- 2004 [ ]

c- 2008 [ ] d- After 2012 [ ]e- Indicate if any other [ ]

8- You use mobile phones daily for

a- less than 10min [ ] b- 10-25min [ ] c- 30-40min [ ]

d- More than 40min [ ] e- Indicate if any other [ ]

9- Impact of ICT on Students learning. (Mark the most relevant)

Impact of ICT	**Very Low**	**Low**	**High**	**Very High**
a- Students interest in study improved	[ ]	[ ]	[ ]	[ ]
b- Students academic performance improved	[ ]	[ ]	[ ]	[ ]
c- Students access to ICT makes them better learner	[ ]	[ ]	[ ]	[ ]
d- Students take more interest in digital libraries	[ ]	[ ]	[ ]	[ ]
e- Mobile Phone contents may replace books	[ ]	[ ]	[ ]	[ ]
g- Social networks are helpful in learning	[ ]	[ ]	[ ]	[ ]
h- Professional groups share knowledge and skills	[ ]	[ ]	[ ]	[ ]
i- Mobile and Internet prevent students from sports & games	[ ]	[ ]	[ ]	[ ]
j- Digital course contents are needed in future	[ ]	[ ]	[ ]	[ ]
k- Students prefer using digital contents	[ ]	[ ]	[ ]	[ ]
l- Educational blogs broaden students vision	[ ]	[ ]	[ ]	[ ]
m- Educational discussion forums promote education	[ ]	[ ]	[ ]	[ ]
n- Online articles are easy to read and qoute	[ ]	[ ]	[ ]	[ ]
o- Teacher professional association share knowledge & skills	[ ]	[ ]	[ ]	[ ]
p- Any other				

10- Facilities provided by the University

Facilities	None Existent	Inadequate	Satisfactory	Good
a- Video conferencing	[ ]	[ ]	[ ]	[ ]
b- Video recorded lectures	[ ]	[ ]	[ ]	[ ]
c- Course Teachers Blogs	[ ]	[ ]	[ ]	[ ]
d- Academic learning net works	[ ]	[ ]	[ ]	[ ]
e- Interactive white boards	[ ]	[ ]	[ ]	[ ]
f- Multimedia in classrooms	[ ]	[ ]	[ ]	[ ]
g- Technology enhanced curriculum	[ ]	[ ]	[ ]	[ ]
h- Moodle	[ ]	[ ]	[ ]	[ ]
i- Any other	[ ]	[ ]	[ ]	[ ]

Appendix C

A LIST OF THE UNIVERSITIES

1 Fatima Jinnah Women University

2 Foundation University Islamabad

3 Hajvery University

4 International Islamic University Islamabad

5 National University of Modern Languages

6 Pir Mehr Ali Shah Agriculture University

7 Punjab University

8 University of Gujrat

9 University of Wah

10 University of Central Punjab

11 University of Sargodha

12 University of Fa isalabad

Annexure D

Tools and services for distance learning solutions, top resources

1 **Adobe Connect** - Much like teachers and students need to know their way around the company's ubiquitous PDF files, it also pays to be familiar Adobe's collaboration and learning solutions. The educational version of the company's online meeting software allows for teachers to easily tweak presentations, provide real-time quizzes and facilitate interaction, breakout sessions and more. There are also a number of tracking mechanisms to allow for real-time feedback on course content and setup, as well as monitoring of students' progress.

2 **Blackboard** - Blackboard is a platform for education that functions much like the blackboard in traditional classrooms. It provides a number of different ways for teachers and students to collaborate and connect, all in one easy-to-use place. Instead of piecing together various tools for communicating and participating in lessons, Blackboard makes them all available in one place. The company also specializes in other areas of distance learning and education as well, making it a promising one-stop solution for administrators.

3 **Canvas** - Canvas is an "open source" solution to online collaboration that's designed to be as simple as possible to users. Unlike some of its competitors, it's free, and seeks to integrate tools and program that people already know how to use, such as Google Docs or YouTube, rather than creating their own versions.

4 **Coursera** - Coursera is an online portal that hosts courses from universities around the country and the world, essentially providing a way for students anywhere to "audit" classes they would otherwise not have access to. It provides a readymade way to learn online and see the benefits of distance learning first hand.

5 **edX**- edX is one of the leading sites for accessing MOOCs, or massive open online courses. The venture was founded by Harvard and MIT, and offers classes from those prestigious institutions, as well as material from an expanding list of partners.

6 **ePals** - Collaboration site ePals offers a way for groups of students around the world to be matched up and paired with other classrooms, and allows teachers to create their own projects or join another class' existing ones.

7 **FaceTime** - Just as millions of everyday users have come to embrace Apple's popular videoconferencing tool, so too should teachers and educators give it a look -- it's among the simplest and most widely-available ways to connect via voice and video with others online. Both users will require an Apple device to participate in discussion and learning, however.

8 **Google Plus Hangouts** - Google's social network shines for its own online video chat solution as well, which lets teachers, students and third-party experts easily videoconference in groups -- we've even seen it used to broadcast presenters live to packed auditoriums.

9 **iTunes U**- Apple's in-house solution for online and connected learning, iTunes U provides thousands of audio and video courses on-demand. Using it, you can access learning and presentations from many top K-12 schools and universities worldwide -- and learn more about the world without setting foot in a formal classroom.

10 **Schoology** - As a distance learning tool, Schoology differentiates itself by placing an emphasis on the monitoring and education of students, promising teachers a way to help analyze and better educate kids based on usage and activity.

11 **Skype** - Skype ranks among today's most widely-utilized ways to make voice or video calls online, providing for communication across PCs, smartphones, tablets and mobile devices, making it a useful tool in educators' arsenal. Thousands of teachers and kids can use it to connect with experts, or fellow pupils and educators, for real-time chats -- and for free.

12 **Udacity** - Another major player in the MOOC scene, Udacity sees its role as "democratizing education," as it brings online lessons and classes to more than 160,000 students in nearly 200 different countries.

13 **YouTube** - With so many educational videos and classes available online, YouTube provides a surprisingly robust information resource, and source of insight into topics ranging from science to mathematics, history and geography. While quality, substance and efficacy of educational content widely varies (hint: take everything with a grain of salt), many leading schools and lectures post material online, with myriad snippets from instructional videos, documentaries and TV programs also frequently available.

Annexure E

List of Social Networks and other Sources

1 - Twitter

2 - Google Docs/Drive

3 - YouTube

4 - PowerPoint

5 - Google Search

6 - WordPress

7 - Dropbox

8 - Evernote

9 - Facebook

10 - LinkedIn

11 - Google+ & Hangouts

12 - Moodle

13 - Slide share

14 - Blogger

15 - Wikipedia

16 - Skype

17 - Google Chrome

18 - Google Scholar

19 - Gmail

20 - Adobe Connect

21 - Outlook

22 - Coursera

23 - Khan Academy

24- Adobe Photoshop

25 - OneNote

26 - Google Apps

27 - Tumblr

28 - Firefox

Annexure E

Specialised Sources for teachers

TOOLS FOR K-5 TEACHERS

Young learners benefit most from collaborative games and fun, animated educational tools.

1. WhyVille: WhyVille is a free, online community where every kid is a valued citizen. Your students can play geography, science and art games with each other, or with other kids from around the world. They can even earn money ("clams") and start their own businesses!

2. Animoto: This incredible tool allows you to create short video clips and vibrant slideshows that will wow your students. Add music, text and other extras for full-featured presentations. The Animoto Lite version is completely free, and teachers can apply for a free Animoto Plus account.

3. AudioBoo: A free account lets you make recordings up to 3 minutes each, which you can then share on your class's wiki, blog or other media – or even as a simple link. Just imagine all the fun applications: scavenger hunts, guess-the-sound games, classroom songs and so much more!

4. Storybird: Billed as a new literacy tool for the new generation, this collaborative storytelling site is definitely something your students will love. Work together to create artful stories to share, print and read. Your students can even play their stories like games, or send their works of art to friends and family, as books or greeting cards.

5. SecretBuilders: SecretBuilders is an imaginative world of kid-friendly, online multiplayer gaming. Games are educational and interactive, not to mention age-appropriate. The best part: the site goes far beyond the usual word searches and jigsaw puzzles to teach students about

history, literary figures, historical people, and the world around them. You can even enroll your entire class through the Teacher's Console.

6. Arcademics: What do you get when you mix awesome arcade games with academics? Arcademics, an online gaming site where students can collaborate on multiplayer games to test their math, language, social studies and other skills.

7. Free Rice: If you're in the market for educational gaming with a conscience, look no further than Free Rice. Challenge your students to collaborate on answering questions about geography, humanities, vocabulary, grammar, math, foreign language, literature and other subjects. Every correct answer earns 10 grains of rice dedicated to starving families in developing nations, including Bangladesh, Cambodia, Bhutan, Uganda, and Nepal.

8. Mind42: Kids are never too young for mind maps, at least when mind maps can include photos and other images! Mind42 is a great, web-based mind-mapping tool that gets even the K-5 set engaged in idea creation. Best of all, you can open up your maps to group editing and even share your maps with parents, tutors and other classes.

9. Wizehive: This comprehensive application has a lot of functionality: build forms, manage tasks, update your activity feed and create workflow sheets. Wizehive is a great pick for sharing upcoming projects, classroom modules, events and other class activities with parents.

10. Skype in the Classroom: This tool is great for any age group, but we particularly love Skype's application for very young learners. With Skype in the Classroom, you can take virtual field trips to anywhere in the world, and connect with sister classrooms across oceans and continents. It's like a 21st century version of class penpals.

11. Wikispaces Classroom: Young children have brilliant minds, and what better way to light the creative spark than to get your class involved in social storytelling? Wikispaces helps you create an online home for your class's writings, to share with parents and other students.

12. Twiddla: Take your dry erase board online with Twiddla, a virtual whiteboard app. Billed as a meeting playground with a trial sandbox, this tool seems built for the littlest learning set. And it is: draw, write, and do everything you'd do on a real whiteboard, but online, where you can also add media resources, like audio and video.

13. Padlet: Whether your class is building a poster board dedicated to ancient Egypt or outlining the scientific method, Padlet takes you from blank wall to beautiful display. K-5 students will love that they worked together to create the masterpiece, especially if their homework involves collecting more goodies for their virtual display wall.

14. FunBrain: Circling back to educational games, FunBrain serves up a smorgasbord of classroom-friendly games for the K-8 crowd. Challenge your students to the Reading Arcade, play board games where math is the solution, and more.

15. Raz-Kids: This award-winning website lets elementary learners read anytime, anywhere – and allows teachers to monitor students' progress, so you can keep class discussions relevant and timely.

16. SpellingCity: Build vocabulary, play games, and take fun language arts quizzes at SpellingCity. You can log on as a group, or let students play individually or in teams.

17. Starfall: For classrooms that practice phonics-based learning, Starfall has a suite or games, plays, magic tricks and more. Starfall aligns with Common Core Standards.

18. Wowzers: This cloud-based online math tool makes fun out of arithmetic, multiplication and division. You can personalize learning plans, challenge your students based on their abilities, run necessary assessments, and involve your class in individual and group games.

TOOLS FOR MIDDLE SCHOOL TEACHERS

Middle school-aged kids need collaborative learning tools that are streamlined and easy to use, with a little bit of cutting-edge thrown in for good measure.

19. Fakebook: Middle-schoolers may not be old enough to use the real thing (Facebook), but that makes Fakebook even cooler. Charge your students with creating Fakebook profiles for historical figures, authors, and other persons of note.

20. Flickr: Sixth through eighth-graders will love using your Flickr class account to share photos of classroom events, projects and other notables. The possibilities don't end there: you can create sets (albums) for how-to guides, cull Creative Commons images to illustrate current places of study, and spark creative thinking by telling stories through imagery.

21. FlickrPoet: Speaking of stories and imagery, FlickrPoet is a great tool to show your students that poetry is more than words on a page. Prose and verse take flight with FlickrPoet, which puts images to your students' poems. Have kids work together to create several photo versions – each reload pulls new images – and discuss which best brings their words to life.

22. Folding Story: For language arts and culture classes, nothing beats group storytelling. This innovative, free site lets your students collaborate on stories you assign, or even jump on board those that are currently "folding" (being told). Be sure to filter for age-appropriate content.

23. Storify: If you class vibes on storytelling, take stories real and global. Storify culls media from around the web to tell full-featured reports of current events and news. Helpful security settings ensure you pull only age-appropriate content for your class.

24. PBworks: Formerly PBwiki, this online collaborative tool opens up a world of group projects. Build websites together; give your students access to online materials, book lists, and

resource links; and share information between students and teachers. The basic edition is free for classroom use.

25. Creaza: Classroom assignments have never been so fun as they are with Creaza. Your students can collaborate to create multimedia presentations that incorporate audio, video and even original cartoons! Creaza can also be leveraged for mind mapping, slideshows, and other educational uses.

26. Popplet: Done well, mind mapping is an incredible tool that turns ideas into tangible, visual plans of action. Popplet, which is available via the web and as an iPad app, helps your students think creatively and learn visually, creating mind maps they can access anytime, anywhere.

27. Google Earth: If you're teaching geography or earth science or geological processes or social studies or world cultures or, well, almost anything, Google Earth can make your lessons more interactive, more real and very 3-D. Think of it as an insta-passport to anywhere in the world.

28. WordPress.com: A class blog has huge potential: you can collaborate on storytelling, teach your kids about the implications of social media & online information, or simply chronicle classroom projects and activities. WordPress allows each student to write as an individual contributor, so the possibilities are endless.

29. Search Team: When students are just learning how to conduct web research, collaborating with friends and peer groups can be a great help. Search Team does that, allowing small teams to collaborate to find the best, most applicable search results to any question you pose.

30. Bounce: Here's another tool for young web researchers. Bounce lets students share their thoughts on any webpage, and then "bounce" that back and forth with other students, group members, and teachers.

31. Dweeber: The name may be a little, well, dweeby, but Dweeber is a great place for middle school kids to meet for online study sessions. A free account lets students connect with friends from school, so they can collaborate on group projects and homework. Sketching, note sharing and other features make this tool versatile.

32. Wridea: Brainstorming is an important part of the creative process. Wridea allows students to collaborate to organize and streamline their ideas, in order to create better, more cohesive group projects.

33. ScribLink: More than just a scribble pad, ScribLink is an online whiteboard that you can share in real-time. Now, students can access the day's notes from anywhere, anytime: while you're teaching, when they're reviewing their homework, and even when they're studying for an upcoming test.

34. Sync.in: When your students are working on collaborative documents, Sync.in lets them edit, type and revise in real-time. They call it document conferencing.

35. Lino: Go old school with new school technologies: Lino lets your students create sticky notes, pin photos, and share ideas and discussions on a virtual canvas that requires nothing more than an Internet connection and web browser.

36. Marqueed: Learning can be as simple as a better discussion. Marqueed lets you do just that, about images. Simply upload a photo or graphic – say, a National Geographic shot or new infographic – and let your class annotate and discuss everything from the lighting to the facts they ferret out.

37. Podcast Garden: Podcasting can be an incredible tool for teaching your students about the power of the Internet. Even better, they'll become experts on whatever topic you choose, like *Everything You Need to Know You Learned in 7th Grade* or *The English Grammar You Forgot*.

38. HeyMath!: For every kid who has ever struggled with math, HeyMath! offers an easy, totally fun answer. And the collaborative part? Students can ask friends and teachers for help on any question – or offer their help to solve others' problems.

39. Collaborize Classroom: This collaborative platform complements your in-class lessons with assignments, activities and online discussions that encourage 100% participation.

40. Cool Math: Cool Math is more than just math: it's science, reading and geography, too! All games are designed for classroom use, and include fun activities like collaborative algebra and adventurous WebQuests.

TOOLS FOR HIGH SCHOOL TEACHERS

High school students are tech-savvy, mobile consumers – and often, just a tad know-it-all-can't-impress-me. These collaborative tools will grab their attention and get them learning and working together online, with nary an eyeroll in sight.

41. Canva: Canva provides teachers and students with an excellent and free way to create beautiful slides, flyers, posters, infographics, and photo collages. Begin by selecting a template and then drag and drop designs, clip art, photos, and text boxes to create your graphic. Once complete, you can download your images as PNG or PDF files.

42. VoiceThread: This collaborative tool allows students and teachers to create multimedia slideshows complete with video, images, documents and voiceovers. When working in a group, each contributor can leave comments via text, voice, audio file or video. Your students can share files amongst each other or send them to you; they can even export to mp3 or video, to embed on your class wiki or other site. VoiceThread offers a free upgrade to their K-12 educators account for, well, K-12 educators.

43. WeVideo: If the 21st century classroom needs an online, collaborative video-creation tool, WeVideo fits the bill. Get your students involved in active learning and get their creative juices flowing with group filmmaking and video storytelling.

44. Scrible: Some collaborative tools are flashy and complex; others are simple. Scrible definitely sits on the simple side of the scale, but that doesn't make it any less ingenious: this straightforward tool (in beta at the time of publish) lets your students collaboratively share resources, take notes, and markup the web for their next research project.

45. A.nnotate: Here's another collaborative annotation tool, this one with a little extra oomph: in addition to enabling your student groups to collaboratively take notes on web pages and online images, A.nnotate also lets them annotate any PDF or Microsoft Word document they use in their research.

46. Crocodoc: If you'd prefer an annotation tool that's just a wee bit flashy, Crocodoc is a great choice. (High schoolers will be hard-pressed not to like Crocodoc's new "box view.") Students can collaborate to annotate – comment, underline, highlight or strikeout text – PDFs and Word Documents, and you can easily comment on final papers and projects, no red pen required.

47. Evernote: It's likely that many of your students already use Evernote; it's one of the most popular, cross-platform tools available for mobile and desktop devices. (It syncs information across all platforms.) Collaboration through Evernote means saving important webpages, working on group notes and docs, and collecting research in one place.

48. Sketch: If you've ever wished you could *really* markup an outline, paper, or project, Sketch is what you're looking for. Available from the makers of Evernote, this cool tool lets you digitally draw arrows, checkmarks, question marks and other annotations (including text notes) onto shared docs.

49. Prezi: Gone are the days when PowerPoint was your only choice for presentations. If you want to wow – and truly engage – your students, Prezi helps you create dynamic, beautifully designed presentations that integrate images, words, graphs and more. You can collaborate with other teachers to create presentations, and your students (groups up to 10) can use Prezi as a shared whiteboard.

50. WordPress.org: WordPress.com's big brother, WordPress.org is an incredibly versatile tool for collaborative blogging and website-building. Creating a class blog, sharing group storytelling, and other projects have endless possibilities with the vast array of free WordPress themes (templates) and plugins available.

51. Google Drive: Once known as Google Docs, Google Drive offers a comprehensive suite of collaborative, online tools: word documents, spreadsheets, presentations, forms or drawing files.

52. Dropbox: Dropbox is an awesome resource for sharing files with your students. Sign up for a free account and get 2+ GB of space to share documents, PDFs, videos, and images with students' own Dropbox accounts.

53. Scoot & Doodle: Innovative and well designed, this online tool can be your go-to for collaborative projects. Not only can you work with your students – and your students with other students – on projects, but you can even get remote experts, tutors, parents, other teachers and peers involved in the process. Even better, Scoot & Doodle integrates with Google Hangouts to let up to 10 team members work simultaneously.

54. Blackboard Collaborate: You've likely heard of Blackboard, but if not, this online tool allows for collaborative lesson planning and creates a virtual classroom where your students will flourish. Blackboard Collaborate makes it easy to create web conferences, conduct real-time classes, add voice authoring to your lessons, and instant message with your students.

55. Simple Surface: Whiteboards are a great tool for sharing ideas, outlining projects and more. Simple Surface allows students to share thoughts, plan and organize their ideas, and publish to Pinterest, Facebook or PDF. They can even take their plans public.

56. Wunderlist: This mobile and web-based to-do list is great for on-the-go students. It allows for personal to-dos and is also collaborative, letting students share to-do lists and edit (add/check off) items on shared lists, all in the name of productivity.

57. ThinkBinder: This online meeting hub is designed to create a web-based, group study group. There's also whiteboard capabilities, where students can sketch and share thoughts, thus making group study sessions easier and more productive.

58. Scribblar: If you need to connect with students remotely, Scribblar offers an easy solution. This online whiteboard tool allows for information sharing, and adds real-time audio, file upload for documents, text chat and other features.

59. Google Hangouts: Google Hangouts are an easy way to get students to collaborate out of the classroom. You can share photos and files, and even video chat, if necessary. All for free, with your Google account.

60. ThinkFree: Cloud office tools are nothing new, but ThinkFree's comprehensive productivity suite is simple, useful and great for collaborative projects. The web interface is helpful, but your students will also love the mobile support, which means they can view and edit docs on their desktops, laptops, tablets and smartphones.

61. 99 Chats: If you need to connect with an entire classroom (or four), you can create a chat room for up to 99 participants, completely free and online. Discuss a project, maintain contact with a sister school, take international penpals to the next level – the possibilities are many.

62. CiteULike: When it comes to serious research papers, CiteULike lets students discover scholarly articles, share them with their peers, and receive automated recommendations for new, reliable sources.

63. Edmodo: Edmodo is a blend of social networking site and classroom collaborative tool. Add calendars, make assignments, receive assignments, and communicate with your class online, in real time – and in a social setting your students already know and love.

64. BigMarker: Sometimes all your students need is a change of pace. Enter BigMarker, an online conference tool and webinar platform. You can host your own webinar, or sign your class up for some outside tutelage, on topics like economic justice, parlaying failure into success, and statistical analysis with Excel.

65. Speek: Sometimes student groups just need to have a real conversation, not a group email or text chat. Conference calls are the solution, and Speek is a free, web-based platform to quickly and simply organize a group call.

66. Co-Op: For long-term projects or group research papers, students need a central place to meet, converse and plan. Co-Op does the trick, making it easy to track conversations, review the daily or weekly agenda, and keep the group on-target to meet goals.

67. PodBean: Podcasting – audio blogging, in a sense – is a great way to turn learners into educators. Help your class launch its own podcast on whatever topic they desire, and watch their creativity and quest for knowledge take flight. There are myriad ideas for educational podcasting, like *Weird but True History* or *Yes, You Will Use Calculus in Real Life!*

68. DoSomething.org: Teach your students about social conscience with DoSomething.org, where every week begins with a new challenge to save the planet, feed the poor, or stop bullying. Join more than 2.5 million teens around the world, in changing the world together.

69. iCivics: For U.S. students, iCivics delves into the details of American democracy and encourages your class to get hands-on. Argue real cases before the Supreme Court, have a student run for president, and participate in other activities of true patriotism.

70. My BackPack™: Communicate directly with parents and students through My BackPack™. Give parents real-time updates – and hold your students accountable – with daily or weekly details on attendance, schedules, homework completion, and grades.

71. Poll Everywhere: Where does testing meet texting? At Poll Everywhere, where you can engage your class anywhere, anytime. Send trivia questions during field trips, challenge your students on possible test questions, or simply seek their opinions, all via text message, on upcoming projects and activities.

72. Dipity: History and social studies has never looked so pretty as with Dipity, an online timeline tool. Students can create interactive timelines to trace persons of interest, political and civil movements, and other themes throughout history, adding photos, video and text as they go.

TOOLS FOR TUTORS

In today's world, tutors need an entire toolbox of teaching methods: ways to teach their tutees not only textbook facts, but how to use new technologies, create A-worthy projects, and dominate the 21st century classroom.

73. Quizlet: Quizlet's study sets work like flashcards, helping students memorize or reinforce information on any subject under the sun (and beyond, for the astronomers out there). Quizlet lets you create your own, customized study sets for free; you can also use the more than 20 million sets already on the site.

74. Wordle: If you're tutoring students in language arts, English, poetry or a foreign language, Wordle makes vocab fun. Create visually appealing word clouds in an array of designs and colors, for printing, memory recognition and other uses. (In fact, here's a great post on 125 ways to use Wordle in the classroom.)

75. Planboard: Here's a tool you can use with other teachers and other tutors. Planboard allows you to collaborate on lesson planning, or simply access a teacher's lesson plan to view current study subjects and what to focus on with your students.

76. Jing: Jing is an awesome, online tool for taking screenshots and recording screencasts (videos of your computer screen). Add images, voiceovers and other multimedia support to take tutees on a step-by-step tutorial of how to do anything, from complicated math problems to using a new computer program.

77. ChannelME: Though targeted to customer service reps, ChannelME is a great tool for tutors, too. Now you can browse the web with your students, in real time, from a remote destination. So if they need a bit of homework help, or just don't understand something online, you can hop on your computer and tutor them in the moment, right when they need you.

78. Hackpad: This simple tool is a great way to collaborate with tutees on various documents and projects. Bonus: it's billed as hyper collaborative, because you can share any of your "pads" (documents) with anything from one other user, like your tutee, to an entire educational team, including teachers and parents.

79. Titan Pad: If Hackpad doesn't suit your needs, try Titan Pad. This handy, online app lets you work on a document at the same time as your students. You can even get parents and teachers in on the act. Text is color-coded to the user, so you'll never wonder who typed what.

80. Chatzy: If you need instant messaging capabilities but don't want to add students to your personal messenger account, Chatzy is a good solution. This web-based tool lets you chat with

anyone, anytime, no signup or software involved. You just need your name and your student's email, and you're ready to chat.

81. Vyew: Hop onto Vyew for real-time, online collaboration through video chat, document sharing, and annotation. You can upload many file types to share images, docs and other resources with your tutees.

82. Stinto: If you're tutoring several students from the same school, group chats can come in handy. Stinto lets you create free, online group chats where you can text-chat, share images, and collaborate. Unlike other messaging programs, there's no software and no registration required.

83. WizIQ: This online platform connects you with your tutees from anywhere – you can even tutor completely remotely. Engage your students through live chat, shared whiteboards, file uploads and more.

84. Toodledo: Sometimes, keeping students on task is half the battle. With Toodledo, you can set due dates, outline tasks, and set time estimates for every item. Your tutees have at-a-glance access to what they need to do and when, and you see when they complete each item.

85. Vidquik: You can't beat online, free video conferencing when you need a quick face-to-face with a tutee, or just have to show something in person, even when can't actually be there in person.

TOOLS FOR SPECIAL EDUCATION TEACHERS

Special education teachers have one of the best jobs in the biz: you teach and mentor students with a diverse range of abilities, focused interests and specialized challenges. You need diverse tools to match.

86. Glogster: Chances are, your students would benefit from a multimedia approach to learning: instead of reading words on a page, they'd prefer to see, hear and watch their lessons. Glogster is a social education site that lets you collaborate with others, including your students, to create mashups of photos, video, sounds, songs and other media to create engaging learning materials.

87. TED-Ed: Yes, the incredible TED Talks have an education channel. TED-Ed lets you build special-interest lessons around TED Talks, TED-Ed originals (and they're awesome), and even YouTube videos. Or, you can view lessons other teachers have created and use them in your own classroom.

88. AbilityHub: This is not so much a collaborative tool as a collaborative website dedicated to sharing assistive technologies with the world. Discover speech recognition tools for kids who have trouble expressing their ideas in writing, or where to find a keyboard with large-print keys to help children with vision problems. Have a question or a solution? Collaborate with others to make Ability Hub an even better resource.

89. CAST UDL Exchange: This online, free resource allows special ed teachers to create, mix-and-match and share institutional resources, to create collaborative lessons and resources.

90. Mindomo: Mind-mapping is a great way to get your students thinking visually. Chat with your students about ideas, tell stories, or draft special projects. Mindomo will help your class formulate and organize ideas in a way that everyone can understand.

91. Do2Learn: This colorful, interactive site was created just for kids with special needs. You'll love all of Do2Learn's resources, including their tips and tools for social skills and behavior management, but we particularly love the song & games section, which will help your students collaborate while they have a blast.

92. BrainPop: BrainPop is another site with interactive games you can play in the classroom. This site can be especially helpful when teaching children with learning disabilities, as the featured games help break down complex concepts into distilled, easy-to-digest (and fun-to-play) games.

93. Neat Chat: Online chat has never been so easy: just create a nickname and sign on to collaborate with other special ed teachers. Share ideas, talk about challenges, and discuss solutions to everyday classroom situations. No software required.

94. Zoho: Zoho is similar to Google Drive, creating an online space to share documents, spreadsheets, presentations and files with your students and parents. Zoho also enables task management, so you can alert parents when certain goals have been achieved or projects completed. You can even open your files to collaboration, so students and parents can add to group documents.

95. MemberHub: MemberHub is an incredible tool for creating an online educational community, and it works particularly well for special education. Create an accurate, up-to-date student/parent directory, send parents and students email reminders of upcoming activities and projects, maintain your school calendar, and share photos safely, among other features.

96. ePals: Connecting with other children from around the world, especially those from different cultures, can teach children about their planet, their culture and themselves. ePals lets you connect with other special ed classrooms, helping students understand that despite all the obvious differences, we all have very much in common.

97. Edublogs: Blogging and class sites are an excellent way to build community within your classroom, keep parents updated on current happenings, and engage your students in the online world. Edublogs was created specifically for educational purposes, and guides you step-by-step through the process of creating a classroom blog.

98. Remember the Milk: To-do lists, especially when they're online and accessible from anywhere with an Internet connection, can be a really helpful learning and productivity tool. You can sync Remember the Milk with your classroom's Google calendar, get alerts sent via SMS or email, and share tasks with your students and their parents. Collaborative task management means no more miscommunications, forgotten forms or missed appointments.

99. CoSketch: Whiteboards, like chalkboards before them, are a time-tested classroom tool. Take your whiteboarding to the next level with CoSketch, which not only lets you take your lessons online, but lets your students get in on the fun. So whether you have visual, auditory or kinesthetic learners, everyone will have a chance to see, hear and participate in the day's lesson.

100. YouTube: Video is an incredible learning tool, especially for visual and auditory learners. YouTube even has a dedicated **education channel**, full of interesting videos that cater to special education students' individual interests. Want to chat about the world's roundest object or the science of parallel universes? You'll find that here.

101. FlockDraw: Most online whiteboards are just that: whiteboards. FlockDraw, while billed as a whiteboard, is more of a collaborative drawing tool. For children who learn best through creativity and art, FlockDraw is a free solution to help them create masterpieces, together or individually.

102. Mural.ly: Here's another tool that's sure to satisfy your creatives: Mural.ly, an online whiteboard where you can drag-and-drop links, documents and media-rich files.