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THE PREDICTORS OF SUCCESS FOR E-LEARNING IN HIGHER EDUCATION INSTITUTIONS (HEIs) IN N-W.F.P, PAKISTAN

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ABSTRACT

The interrelationships between different perceptions and attitudes of e-Learning users are widely researched, which reveals that whatever the perception and theory of a user about the Information and Communication Technologies (ICTs) and e-Learning environment are, the same is reflected in his/her attitude towards using educational technologies for teaching and learning. The objective of this study was to measure the relationships between the indicators (perceptions about ICTs, educational technologies, development and use of e-Learning) and the Criterion variables (problems, satisfaction and prospects) among e-Learning users in Higher Education Institutions (HEIs) of N-W.F.P, Pakistan. The study found the existence of strong relationships in terms of indicators explaining the dependent variables. However, the impact is different from one variable to another. 81% of Problems, 57% of Satisfaction and 23% of Prospects are explained by the Indicators. Problems are significantly explained by all four indicators, while Satisfaction has been predicted by three of the indicators (excluding Perceptions). The study found that only two indicators (Perceptions about ICTs and Educational technologies) predict the Prospects, while Development and Use do not. The surprising finding is that Prospects are not defined by the 'Existing Development and Use Practices'. Rather, their perceptions about ICTs and e-Learning tools strongly forecast the Prospects.

Keywords: *Perceptions about ICTs, Educational technologies, e-Learning Development and Use practices; User-Problems; User-Satisfaction, Prospects of ICTs and e-Learning.*

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1. INTRODUCTION

The research indicates that the creation of an e-Learning environment is not simply a technical matter; rather, it demands the consideration of several human and social factors (McPherson and Nunes, 2004). Human perceptions about technologies determine their attitudes towards them (Aviram & Tami, 2004). Thus, the choice of education technologies should not be guided by a technologically deterministic approach,; it should be guided according to the contextual requirements related to a broad range of social, cultural, political and economic factors (Macleod, 2005). In India, for example, most of the ICT education is reportedly ineffective because it is extra-technical and incompatible with local contexts (Ezer, 2006). There is also increasing acknowledgement that in order to ensure successful completion of e-Learning projects, the developers must possess technical skills as well as soft skills of interpersonal communication and understanding of human motivation problems (Jewels & Ford, 2006).

Therefore, user behavior towards e-Learning tools is influenced by several factors. Research has identified the perceptions and beliefs of human beings as the major determinants of their practical attitude towards anything. Positive beliefs inspire individuals to take interest while negative feelings motivate them to stay away (Aviram & Tami, 2004). Based on these perceptions, every individual develops his/her own personal learning style (Sirkemaa, 2001). Researchers have also found that most of the academicians believe that the best way of teaching is to teach according to the learner's personal learning style (LaCour, 2005). For example, the learning style of new generation of students "Net Genres (Barnes et al., 2007)" is reported to be more independent than the traditional student communities. Manochehr (2007) have reported that learning style is more important for the new generation learners than for the traditional students.

Thus, 'how users perceive ICTs' determines their learning style, which is actually their practical behavior or attitude towards educational technologies. Tuning and adjustments at the perceptual level brings changes in the user attitude. A successful e-Learning project depends on the creation of a match between the user-perceptions, learning styles and the learning environment and tools. The pedagogy, learning facilities and personalized learning environments are widely reported as the critical success factors. If they are positively and favorably perceived by the users, their motivation is ensured, which ultimately leads to greater interest and involvement of users in the learning through educational technologies.

In developing countries like Pakistan, Information Technology (IT) is still in its infancy. The government is making hectic efforts for the promotion and development of IT culture in the country. For the same, government is allocating huge amount of funds especially the establishment of Virtual University and IT centers in all public and private sector universities connected with high speed internet are the positive sign which, shows government interest to infuse IT into organizational structures especially its use for e-Learning and eTeaching at Higher Education Institutions of the country.

Similarly, Pakistan is going through good and bad experiences in adoption and use of ICTs for educational purposes as there are several social, political, cultural, human and technological constraints which are impeding the adoption of this innovative technology in developing counties in general and in Pakistan in particular; furthermore, teachers, learners and developers perceive it differently due to different contextual backgrounds which play a significant role in success or otherwise failure of ICTs use in e-Teaching and e-Learning.

Two cities of the N-W.F.P province of Pakistan, i.e. Peshawar and Dera Ismail Khan, were selected as a sample population for data collection due to their unique characteristics. Peshawar is a highly dense, economically, technologically, socially and culturally advanced with a large number of public and private sector universities and degree awarding institutions besides a high literacy rate. On the other hand, Dera Ismail Khan is the second oldest city with the second largest public sector university and several private sector universities with less population, lacking the basic technological infrastructure and facilities with different economic, social and cultural background compared to Peshawar.

The objectives of this study were to examine and measure the relationships between the indicators (perceptions about ICTs, educational technologies, development and use of e-Learning) and the Criterion variables (problems, satisfaction and prospects) among the e-Learning users in Higher Education Institutions (HEIs) of N-W.F.P, Pakistan.

2. LITERATURE REVIEW

2.1 The Indicators of User Attitudes towards e-Learning

a. Perceptions and Teaching/Learning Styles

Perceptions about ICTs as a whole and Educational-technologies in particular, are widely researched as the good indicators of user problems and satisfaction and thereby the prospects of success for e-Learning efforts in HEIs. Research shows that user attitudes are the good indicators of his/her approach to the educational technologies and these approaches differentiate users from each other (Graff et al., 2001). For example, a research reports that an understanding of teachers' perceptions of technology and its impact on their job helps in technology training programs and thus technology-integration into pedagogy (Zhao & Bryant, 2006). Similarly, Bataineh & Abdel-Rahman (2006) found strong relationships between 'teachers' attitudes' and their success in using technology. Likewise, students' use of computers and the Internet depends on their perceived usefulness in terms of communication and access to information in completing their projects and assignments (Gay et al., 2006). However, very little research has been documented on students' perceptions of their computer literacy, particularly, in developing states (Bataineh & Abdel-Rahman, 2006). Furthermore, technology paradigm shifts have changed not only the way of computing but also the perceptions of society about the ICTs (Ezziane, 2007).

Perceptual differences are rooted in many grounds, the demographics of the users particularly. For example, individual differences are evident in terms of attitudes to computer-based learning and Internet use and these variations emerge from the differences of gender, nationality, and learning style (Graff et al., 2001). Likewise, new generationa of learners process information differently than previous generations, and learn best in a personalized setup (Dinevski & Kokol, 2005). Furthermore, male students have more positive perceptions about computers and information technology than female students. Older students may have a somewhat more positive perception of computers (Gay et al., 2006; Bataineh & Bani-Abdel-Rahman, 2006). Net Genres bring prior knowledge to the university, which is known to affect their way to acquire new knowledge (DiCerbo, 2007).

ICT is generally perceived as an advantage for pedagogical purposes (Sasseville, 2004) however, "by compelling instructors to collaborate with people outside the classroom (government agencies, university administrators, technical support staff etc), technology can be perceived as a threat to the private practice of pedagogy (Aaron et al., 2004)." The relevant concern should be to understand how teachers perceive and address the challenges of new-age teaching and learning (Knight et al., 2006). Based on the perceptual differences of e-Learning users, Mehra & Mital (2007) have categorized particularly teachers, into:

1. Cynics: They have negative perceptions about e-Learning, but strong pedagogical beliefs; therefore, they are unwilling to change;

2. Moderates: They like ICTs and are ready to change and adapt to new pedagogical practices with some guidance and training;

3. Adaptors: These are the intellectual leaders who use e-Learning for inner progress and external enhancements by continuously innovating their pedagogy with the latest technologies.

Thus, there can be three extreme perceptions and attitudes about e-Learning among the teachers community. Cynics are those who dislike ICTs to change pedagogy and love their traditional methods of teaching. Maybe they are the same type of teachers about whom Hans-Peter Baumeister (2006) notes "taking a realistic view, teaching, whether it be face-to-face or e-Learning, is not always numbered amongst the most beloved tasks in our universities." So, moderates and adapters are the catalysts who hold positive theories about the nature and role of ICTs in higher education and ready to adapt accordingly.

The multiplicity of perceptions about the nature and role of ICTs in HEIs can be grouped into two broad user-theories or beliefs, which are guiding most of the e-Learning development and use practices around the globe:

1. Instrumental theory: It is the most commonly held belief, which views technology as a 'tool' without any inherent value (neutral) and its value lies in how is it used so a one-size-fits-all policy of universal employment of ICTs (Macleod, 2005; Radosevich & Kahn, 2006). Instrumental education is based on the premise that education serves society. An emphasis is placed on the relevance and utility of education, where students are expected to apply their knowledge vocationally,

contributing to the economy. The risk of such a system is that students are encouraged to simply meet some identified need, rather than think critically with the purpose of achieving some sort of personal or communal advancement (Ezer, 2006).

2. Substantive theory: This is a deterministic or autonomous approach, which argues that technology is not neutral and has positive or negative impacts. Technological determinism encourages the idea that: the mere presence of technology leads to familiar and standard applications of that technology, which in turn brings about social change (Macleod, 2005; Radosevich & Kahn, 2006). The substantive theory matches with the 'liberal theory' of education (Ezer, 2006), which views learning as an active and interconnected experience and not simply a recollection of facts.

Teaching/Learning Styles

Students have different learning styles: Some learn fast and advance rapidly while others prefer to learn at a slower pace and through repetitio. In addition, some like working alone whereas others prefer to work in groups. Information technology allows customization of the learner's learning experience and makes it possible to accommodate different learning styles (Sirkemaa, 2001). Learning style is an individual's inherited foundation, particular past life experience and the demands of the present environment that emphasize some learning abilities over others. Researchers believe that learning style is a good indicator of an individual's preferred learning behavior. While instructors cannot always accommodate each student's need, it is important that several learning opportunities are provided. A match between learning style and teaching style reveals increases in student's satisfaction (Manochehr, 2007).

Most educators accept that ideally learning should be delivered in the manner and environment that matches the needs and learning styles of individual learners (LaCour, 2005). A research reveals that for the instructor-based learning class (traditional), the learning style was irrelevant, but for the web-based learning class (e-Learning), the learning style was significantly important. The results indicated that students with the Assimilation learning style (these learn best through lecture, papers and analogies) and the Converger learning style (these learn best through laboratories, field work and observations) achieved a better result with the e-learning (web-based) method (Manochehr, 2007).

One of the challenges facing instructional designers is in producing e-learning systems, which take account of individual differences such as cognitive learning style (Graff et al., 2001). However, new technologies like personalization, integration, and electronic portfolios help develop systems according to the user learning styles. The learners will be able to have more control over how, where, and when they experience educational and professional development in the pursuit of their individual goals (LaCour, 2005). Net Geners are independent and autonomous in their learning styles, which makes them more assertive information seekers and shapes how they approach learning in the classroom. They have an independent learning style, which has grown out of the habits of seeking and retrieving information from the Internet. Furthermore, multitasking is an integral part of the Net Generation lifestyle (Barnes et al., 2007)

Research shows that teachers don't find e-Learning environments matching with their teaching styles (Mehra & Mital, 2007) however; web-based learning is worldwide

accessible, low in maintenance, secure, platform-independent, and always current and can accommodate various learning styles. Educators and students are using the web in a variety of ways to enhance their teaching and learning experiences. E-learning can be delivered to the learners easily, in an individualized manner (Manochehr, 2007).

b. Educational Technologies

Researchers (Dinevski & Kokol, 2005) give a broader classification of educational technologies into:

1. Infrastructure (Computers, Networks; Internet, Intranet, offline/online access and user interfaces).

2. Personal Learning Environment (PLE) and Google Wave.

3. Learning Content Management Systems (LCMS) for delivery, tracking, management, and reporting of online content.

4. Learning Management Systems (LMS) for performance management, employee development plans, financial and activity tracking/reporting, and integration with other systems.

5. Learning technologies for mentoring, chatting, forums, discussions, Web seminars, online meeting and virtual classroom sessions.

6. m(Mobile)-learning technologies that enable learning anywhere and anytime.

ICTs refer to not only the modern hi-tech computers and networks but also to radio, television, telegraph, fax etc., as communication mediums to transmit information to remote places. So there are old and new ICTs where radio, television, telephone, fax, telegram, etc are now old while computer-networks, Internet, e-mail, and leading-edge mobile learning are the new ones (Hameed, 2007). At the same time, e-Learning technologies are burgeoning in terms of hardware, software and a variety of applications in education for teachers, students and administrators. Although e-Learning technologies consist of several tools and techniques, including several 'old and new' digital gadgets (Sife et al., 2007) however, computers, networking and hypermedia are the core paradigms for different roles of e-Learning (Ezziane, 2007).

i. Computer

The primary tool for e-Learning is the computer, which has traveled a long way since the 1960s when UNIVAC in the USA and Baby-Computer in the UK emerged as the pioneers of a technology, which is now controlling almost every aspect of human life. The transformation from XT (extended-technology) to AT (advanced-technology) or Personal Computer (PC) in 1980 was the second biggest innovation making computers 'a personal gadget' for everybody and anybody.

A computer is an intelligent-machine and a powerhouse for users in terms of its processing capabilities and speed (i.e., user command is executed on a click), storage capacity (hard-disk and from floppy to flash and XDrives), and graphic interfaces (i.e., graphical-user-interface GUI) to interact with different parts of the machine, like,

activating a software, using CD-drive, printing a document or picture, copying a file from hard disk on a 'data-traveler.'

However, for a long time, computers were being used as 'stand-alone' systems and the energies of this machine remained self-contained within a 'single user-single computer' format. The emergence of computers as a 'connecting-machines' was the 'innovative-explosion' which presented the PC as an 'integrating-machine' to bring all the existing technologies controlled from a single platform. Obviously, the integration between the computers themselves stand-out as the most powerful integration of machines. This gave birth to the concepts of 'networking.'

ii. Networking

Networking is connecting computers together to share resources and communicate across the network. Since networking has elevated the role of computers, a huge body of research is underway to make connectivity more and more powerful. Thus, networking is evolving from simple networks into complicated forms of Internet, intranet and extranet along with web-technologies, thereby converting the world into a 'global-village,' because networking eliminates the geographical and physical constraints in global communication and interaction. Networking technologies offer a multitude of tools and techniques based on the communication-protocol of TCP/IP, in which the Internet is anchored. According to Glogoff (2005) a network is a platform (internet, intranets and extranets) decorated with web-based tools of hypermedia and multimedia applications managed through learning and content management systems (LMS, LCMS). It is therefore evident that the Internet is becoming an indispensable tool for learning and social life (Barnes et al., 2007).

The Internet technologies like e-mail/conferencing on the Web, is usable in assisting teaching however, Web, and most recently WebCT (an online learning and content management system), remain the most popular mediums. Most education web sites provide basic course information such as syllabus, schedule, announcements, reading lists, synchronous or asynchronous communication, online testing, discussion groups, conferences, whiteboards, streaming audio, and video (Zapalska et al., 2004). Thus, increased access to and use of the Internet is making a unique contribution to the teaching and learning process and will be an important part of future strategies to provide services to increased number of students in very diverse locations (Mehra & Mital, 2007).

ICTs are used almost interchangeably with the Internet (Beebe, (2004). Most of the online education is delivered over Web and supported by a variety of technologies like e-mail, digital presentations, film clips to network geographically dispersed community where the educators are rapidly learning about the powers of Web and striving to incorporate it into e-Learning environments (Glogoff, 2005). Furthermore, the success story of the Internet - after it was given away by the Pentagon – derives from the fact that academics in the late 60ies discovered its communication potential (Baumeister, 2006). Thus, the Internet tools like, WWW, conferencing and e-mailing are increasingly making some fundamental academic skills easier, such as surfing

knowledge databases and communication as a medium of academic exchange. Roknuzzaman, (2006) asserts that as an important tool for information and communication, the Internet plays a dynamic and multifaceted role in higher education and research. Laffey & Musser (2006) note that the use of the Internet for teaching and learning has received increasing attention over recent years and 'Internet-based educational technology, can contribute to substantial improvements in education by transforming teaching and learning theories and practices.

This is true that many of the e-Learning efforts in HEIs do nothing more than delivering the traditional print syllabus via the Internet but many studies confirm that innovative applications of Web are endless (Wood, 2004). Likewise, John Thompson (2007) notes that accessing the Internet is like going to the library for a book however, Internet offers opportunities which need to be explored the technologies are designed well and used as intended (Wijekumar, 2005). Internet technologies (with Web 2.0, such as blogs, wikis, RSS, podcasting etc.), virtual reality gadgets, and mobile devices are some of the common innovations for daily life communication and entertainment is equally helpful in learning (Chan & Lee, 2007). Through such technologies, the Internet is no longer a series of isolated silos of information; it has become a platform for users to communicate and interact with one another. Web 2.0 could be characterized as a social phenomenon that creates and distributes Internet content through a paradigm of "open communication, decentralization of authority, [and] freedom to share and re-use" material (Wikipedia, 2009).

a-i. The Internet (Web 1.0)

With the Internet and computer technology available to most teachers, educational technology becomes increasingly indispensable in the field of education (Oh & French, 2004). Internet-based educational technology can contribute to substantial improvements in education (Laffey & Musser, 2006). Internet-based emerging communication tools, such as e-mails, bulletin boards, etc., provide more reflective and useful interactions among learners, instructors and resources (Arulchelvan & Viswanathan, 2006). Internet technologies are now incorporating Web 2.0, virtual reality applications, videogames and mobile devices, which are used everyday for communication and entertainment as well as learning (Chan & Lee, 2007). A major impact of the Internet has been to promote asynchronous access to online information, with traditional forms of technologies and gradually giving way to new forms of web-casting or video blogging (vlogging) (Klamma et al., 2007). Thus, the Internet is "a global system of interconnected computer networks that interchange data using standardized Internet Protocol (TCP/IP)." It is a "network of networks" which connects millions of local to global levels of private, public, academic, business, and government networks (Wikipedia, 2009).

One of the big expectations from e-Learning is to provide equal opportunities of education to everyone. The e-Courses on the Internet can reach any corner of our planet thereby delivering same high-quality education everywhere. It is expected that universities acting over the Internet can offer e-Courses to a big population of students in Third-World countries (Hvorecký et al., 2005). The success story of the Internet

began when academics, in the late 1960s, discovered its communication potential (Baumeister, 2006). As we enter the third millennium, education via the internet, intranet or network represents great and exciting opportunities for both educators and learners because the Internet is the largest, most powerful computer network in the world (Manochehr, 2007).

The use of broadband services has started to grow in homes and offices located in major cities. This trend is expected to accelerate (Hameed, 2007). Higher Education Commission 'HEC' (2008) has introduced a host of programs to establish a world-class ICT infrastructure for providing high-speed internet connectivity to universities all over the country. These digital initiatives create a platform to deliver a range of ICT-based educational services, including a Digital Library and Video Conferencing Facilities. In Pakistan, there are "17,500,000 Internet users as on March 2008 (Internet Web Stat, 2009)."

a. ii. Web 2.0

Web 2.0 is a set of economic, social, and technology trends that facilitate a more socially connected Web where everyone is able to add to and edit the information space (Sife et al., 2007). On web 1.0, adding content was the specialty of Internet designers using technical jargon of computer programming but now 'easy-to-use Internet sites' empower users to publish their data on the Internet without even knowing HTML. Through Web-based applications and services like Web logs (blogs), video blogs (vlogs), wikis, podcasts; anyone can be a part of the Web 2.0. Among all web 2.0, social networking sites, MySpace.com, Facebook.com and Google Wave are very popular because these sites let members create their own Web pages, fill them with personal profiles, photos, and blogs. MySpace community has more than 160 million members and receiving registration of over 200,000 each day (Thompson, 2007; Wikipedia, 2009).

The first Internet generation allowed easy access to a vast range of published materials. The second Internet generation allows them to contribute to it (Klamma et al., 2007). If Web 1.0 was a read-only medium, Web 2.0 is a read/write medium. Web 2.0 relies on user participation. Web 2.0 as a second generation of services available on the World Wide Web that lets people collaborate and share information with increasing role of the users as anyone can create and upload text, audio, and video to the Internet (Wikipedia, 2009).

c. Development of e-Learning Environments

The experience of introducing different ICTs in the classroom and other educational settings all over the world suggests that the realization of the potential educational benefits of these new technologies is not automatic (Tinio, 2002). It is rather raising multiple debates over the substance, trajectory, purpose, and implications of ICTs in education. For example, ICTs can become an end in themselves rather than a means to support and enhance education (Sahay, 2004). In the context of globalization,

international connectivity, instant communication through the Internet and mobile technologies, the universities of all countries are confronted with huge challenges, both external and internal (Loing, 2005).

The effective integration of ICTs into the educational system is a complex, multifaceted process that involves not just technology but also curriculum and pedagogy, institutional readiness, teacher competencies, and long-term financing, among others (Tinio, 2002). The growth of innovative practices in e-Learning has contributed to the development of new skills and competencies and novel ways of using them within project teams (Gray et al., 2003). However, the design and development principles need to be aligned with teacher and instructors understanding of student requirements (Young, 2003). Because ICTs can contribute to learning, they cannot deliver learning and thus, the integration of pedagogy and learning models within the appropriate technology is essential to make e-Learning successful (Nyvang, 2006).

A research from universities by David Lewis and Ruth Goodison (2004) reveals that those who were using successful e-Learning-initiatives, strongly perceived that the "developments needed to be driven by pedagogy, not technology." Likewise, data on e-Learning experiences in developed and developing countries provide enough evidence to understand that it is not technology (Jewels & Ford, 2006) rather human and cultural issues which can either work as critical success factors or as critical failure variables. For example, culture is a highly influential mediator in the present educational environments. The pedagogical model is also part of the culture of the organization (Nyvang, 2006).

ICTs open up new opportunities for students and teachers, but they also create new challenges (Sahay, 2004). Abrami et al., (2006) pinpoint the existing skepticism about e-Learning, that is, it is a threat to formal education from nursery to university and it is not the technology itself which is increasing learning with computers rather the instructional and content differences, or novelty effects. A survey from Uganda (Wells, 2007) reveals that despite the best of intentions, many of their e-Learning projects ultimately fail due to many reasons such as, inappropriate technology, poor project-implementation, improper use of the equipment, lack of follow-up, inadequate training of stakeholders and incompatibility of the project with a shifting social and political context.

d. Use of e-Learning

Given the differences of perceptions (Young, 2003) users behave differently while using e-Learning tools and techniques for teaching and learning purposes. A key challenge for institutions is overcoming the cultural mindset whereby departments and individuals act as silos, keeping information and control to themselves (LaCour, 2005). Moreover, the training that educators do receive does not always match with their educational needs, because the faculty is rarely involved in the decisions about technology and design of new strategies for technology-integration (Juniu, 2005). In developing countries, "ICTs have not permeated to a great extent in many higher learning institutions in most developing countries due to many socio-economic and technological circumstances (Sife et al., 2007)."

The greatest challenge in learning environments is to adapt the computer-based system to differently skilled learners. If the environment is too complex, the user will be lost, confused or frustrated. On the other hand, too simple or non-systematic environments cause motivational problems (Sirkemaa, 2001). Technology is by nature disruptive, and so, it demands new investments of time, money, space, and skills and changes in the way people do things (Aaron et al., 2004). Furthermore, face-to-face communication is critical for classroom social relationships and interpersonal processes while, online technologies have reduced support for social interaction. Although emotions can be conveyed through e-mail or chatting, it does not replace "the fundamentals of our socio-emotional well-being (Russell, 2005)." Thus, "barriers can make technology use frustrating for the technologically perceptive, let alone the many teachers who may be somewhat techno-phobic (Ezziane, 2007)."

Susana Juniu (2005) points out a very critical problem in the use of e-Learning facilities and that is the dependence of teachers, students and administrators on the ICT-department or technical support needed by the users across the using process. The faculty users do not only depend on ICT staff for technological support but also face pressures from the pedagogues to demonstrate the role of technology in supporting constructive, authentic, and cooperative learning. Research suggests that only the technology training cannot ensure better use of new tools, users also need continuous technical and human resource support for technology integration (Zhao & Bryant, 2006).

2.2 Criterion Variables

a. Problems of e-Learning

"More than half of all information technology projects become runways – overshooting their budgets and timetables while failing to deliver on their goals (McManus & Wood-Harper, 2004:3)." Similarly, "While networked learning is making its appearance in universities, its overall impact is, as yet, rather limited (Baumeister, 2006)." Several researchers have identified the problems for the development, use and integration of ICTs into teaching, learning and educational management (see for example, Drinkwater et al., 2004; Bondarouk, 2006; Vrana, 2007; Kanuka, 2007; Sife et al., 2007; Wells, 2007) such as:

1. Inertia of behavior of people, like their resistance to changes, etc.
2. Underestimation, lack of awareness and negative attitudes towards ICTs.
3. Lack of systemic approach to implementation and lack of follow-up.
4. High rates of system non-completion.
5. Lack of user-training.
6. Lack of administrative and technical end-user support.
7. User dissatisfaction with new systems.
8. Mismatches between technologies and the context, culture and work practices.

At the broader level, there are development and use problems, which need to be understood and handled at their time of emergence. Both development and use problems are independent as well as interdependent on each other. For example, user participation is important at both the development and use levels of e-Learning environments.

User Resistance to Change

The user resistance and reluctance to change is widely investigated topic in e-Learning (see for example, Jager & Lokman, 1999; Sasseville, 2004; Loing, 2005; Vrana, 2007; Kanuka, 2007; Mehra & Mital, 2007). Since teachers decide about what happens in the classroom, their acceptance plays a dominant role in the successful use of computers in classroom (Aaron et al., 2004). Although most of the teachers have adopted ICTs, like power point slides and internet into their teaching, they are still unwilling to adopt more sophisticated computer-based teaching innovations (Mehra & Mital, 2007)."

It has been found that new things are intimidating and cause resistance (Jager and Lokman, 1999). For example, if teachers refuse to use ICTs in their classrooms, then e-Learning can never progress except limited benefits. Furthermore, due to the innovative nature of ICT-enabled projects, developers must have a keen understanding of the innovation process, identify the corresponding requirements for successful adoption, and harmonize plans and actions accordingly (Tinio, 2002). In Canada, teachers are reluctant to integrate technological innovations into their daily scholarly activities and, at least in Quebec, this situation has not really changed over the past few years (Sasseville, 2004)

Within universities, the implementation of an ICT is not an easy task for instance, decision makers and academics are sometimes reluctant to change curricula and pedagogic approaches; teaching staff and instructors lack incentive and rewards in a system where professional status and career trajectories are based on research results rather than on pedagogic innovation (Bernard Loing, 2005). There are many obstacles for the implementation of an ICT in universities. Some of them are classical, e.g. inertia of behavior of people, their resistance to changes, etc. If the ICT should serve properly, it should enforce an order in all folds of the university life. People who lose their advantage of better access to information have a fear from order. Regrettably, managers sometimes belong to this category (Vrana, 2007).

Technological change is not perceived as a collective experience rather a personal challenge therefore, solutions to the problem of integrating technological innovations into the pedagogy are more focused on the individual teachers (Sasseville, 2004). Some teachers strongly advocate the technological innovation but may resist in accepting technology as an integral part of the learning process. These divergent reactions and concerns have thus created a continuum that represents various attitudes towards technology (Juniu, 2005). Similarly, "Inexperience may lead to developing learners' anxiety (Moolman & Blignaut, 2008)."

Political sustainability refers to the acceptance of a new system by the administrators handling the policy and leadership matters in the universities (Tinio,

2002). Particularly, in a bottom-up approach, the grass-roots may be better placed to understand and implement innovation, but there can be a lack of physical and political support (Aaron et al., 2004). In the case of e-Learning projects initiated at ground (bottom-up), research informs that there is a lack of feedback towards higher levels of decision and general policy, and little impact on strategy definition and implementation, thereby creating resistance on the part of administrators to help and cooperate (Loing, 2005).

b. User Satisfaction

The research indicates that users are rarely satisfied with the functionalities of new e-Learning systems and worried about the problems of integrating the system with other organizational systems (Drinkwater et al., 2004; Russell, 2005). The HEIs are constantly facing problems of "user dissatisfaction with newly introduced systems, mismatches between a new technology and the existing work practices, underestimating the technological complexity for employees, and inefficient end-user support (Bondarouk, 2006)." The individual satisfaction is closely related with the commitment of the individual to participate and contribute (Klamma et al., 2007). Similarly, "a match between learning style and teaching style reveals increases in student achievement and satisfaction (Manochehr, 2007)."

Mixed results have been reported about the user-satisfaction from e-Learning systems around the world. Irons et al., (2002) report that "users of new e-Learning systems are less satisfied than those using the traditional methods of teaching and learning." While, David Radosevich and Patricia Kahn (2006) found high levels of satisfaction (mean = 6.02 on 7-point scale). However, as discussed in the literature, satisfaction is dependent on a number of factors including the personal characteristics, environmental pressures and the e-Learning facilities available.

c. Prospects

Education determines, more than anything else, a country's prospects for human development and competitiveness. Fortunately, the information revolution offers some extraordinary opportunities in education (MoST, 2000). Universities and even smaller departments within organizations are becoming capable to afford sophisticated digital systems (Ezziane, 2007). Electronically supported processes in the teaching and administrative spheres do not seem to be displacing traditional ways of doing things. Rather, the outcomes are often a matter of the new 'virtual' and the old 'traditional' notions of the university co-existing in a tense relationship (Goddard & Cornford, 2007).

Furthermore, literature suggests a host of prospects for the increasing role of ICTs in education, in general, and educational technologies in particular. For example, global availability of ICTs (Tinio, 2002); paradigm-shifts in e-Learning (Young, 2003); free and open sources systems (FOSS) (Stephenson, 2006; Institutional, national and international partnerships (Baumeister, 2006); local ICT professionals (Bajwa, 2006; Hamid, 2007); and growth of information-culture (Klamma et al., 2007).

3. RESEARCH DESIGN

With the advent of computers and particularly networking (first Internet and now Web 2.0), supported by a global availability of ICT gadgets, it is increasingly becoming possible for the developing countries to adopt new models of education, particularly in HEIs to resolve long standing issues of mass education that have become surmountable due to the miraculous opportunities of new technologies. Thus, "ICTs are a mainstream issue in higher education (Valcke, 2004)" where efforts are being made to answer the question "has the use of ICT really affected the learning process and outcomes? (Drinkwater et al. 2004)." For this purpose, a wide research is being done in almost every state to understand the role of ICTs in HEIs to position their institutions in a competitive stance by digitizing their pedagogy, learning and educational management (Maddux et al., 2005).

Given the fact that innovative applications of ICTs in education requires to first understand a number of factors related to the government policies, available educational technologies, development and practices and on the top contextual aspects of the e-Learning system including demographic factors of the users and organizational context – this research aims at understanding the context of e-Learning in HEIs of NWFP, Pakistan with data in the above cited variables for analysis and interpretation to reach a set of domesticated guidelines for e-Learning development and use in the native environment. The data have been collected about both the qualitative and quantitative aspects of the issue to triangulate the findings to "ensure that results provide deeper and more insightful information (Sirkemaa, 2001)." Similarly, "through a mixed methods approach, an evaluator can employ triangulation by collecting both quantitative and qualitative data and yield more decisive findings (Radosevich & Kahn, 2006)."

3.1 Indicator and Criterion Variables

The following research variables were extracted after literature review in which the theoretical frame work of the study is based:

Table 1 List of the Research Variables

		Variables	Working Definitions	*Code*
Indicators	1	Perceptions	Perceptions about the overall Nature and Role of ICTs.	*PRC*
Independent Variables	2	Educational Technologies	Views about the available educational technologies (computers, networks, internet and software tools).	*ETS*
	3	Development	Attitudes about different aspects of the eProject management for developing e-Learning environments.	*DEV*
	4	Use	Volume of use, Perceived ease of use (PEU), Perceived usefulness (PU).	*USE*
Criterion	1	Problems	The problems of developing and using e-Learning.	*PRB*
Dependent Variables	2	Satisfaction	The user-satisfaction from e-Learning.	*STF*
	3	*Prospects*	*The future of e-Learning (expectations).*	*PRO*

3.2 Theoretical Framework

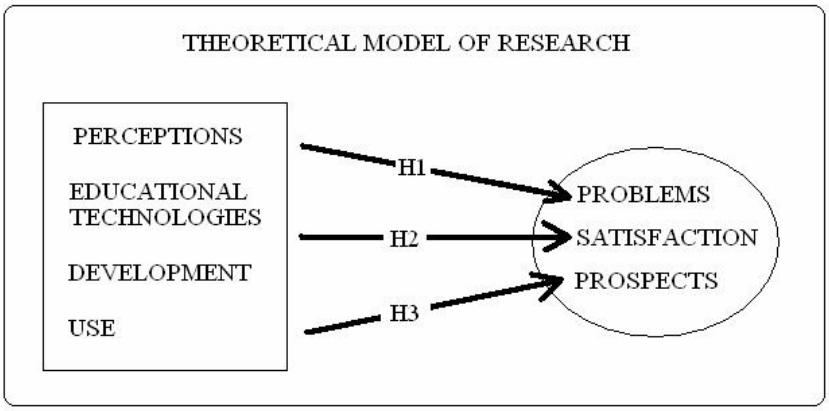


Chart 1 Theoretical Model of Research

3.3 Survey Approach

There is a huge body of studies both in developed and developing countries about the theories and practices of e-Learning in HEIs both from qualitative and quantitative perspectives. The quantitative studies, which used survey approach to access the problem situation are many for example, by Irons et al., 2002, Luck and Norton 2005, Marcella & Knox (2004), Abrami et al., 2006, Johnson et al., 2006, Radosevich & Kahn (2006), Bataineh & Abdel-Rahman (2006), Thomas & Allen 2006, Mehra & Mital (2007), Martin & Dunsworth 2007, Garcia & Qin (2007), & DiCerbo (2007) – which are a few from a long list. Likewise, there are qualitative studies based purely on the secondary sources, for example, studies by Sasseville (2004), Valdez et al., (2004), and Davey & Tatnall (2007) are good examples.

3.4 Population and Sampling

The main stakeholders in e-Learning are the teachers, students and education administrators in any educational setup. Similarly, HEIs have these three constituents for the development and use of ICTs in their respective functions in the background of higher education. These computer-users have different academic backgrounds particularly with reference to their digital literacy. Those who have a certificate, diploma, bachelor, masters, MPhil and PhD in computer science or any stream of ICTs and those whose subjects are either physics, chemistry, medical or public and business administration, economics, journalism or Islamiyat. The second group of users either has some formal training in computer applications or learning them informally. The research reveals that most of these users are adopting computer technologies informally and learning from friends, peers and themselves (Roknuzzaman, 2006).

There are twenty one HEIs in NWFP, Pakistan, including universities and other

educational institutes. These institutes are offering education in all the subjects of pure and social sciences as well as degrees in computer-literacy. All the university-constituents (students, teachers, and administrators) are using computers to their respective levels of computer-proficiency. The 'Target-Population' of this study consists of twenty (20) higher education institutions with seventeen (17) universities and three higher degree awarding institutes (HEC, 2008) in NWFP, Pakistan. There are about 3401 teachers and 7791 administrators in the higher education of NWFP.

The 'Sample-Population' for the study included all the HEIs in the cities of Peshawar and Dera Ismail Khan. These two cities were selected on the basis of their following unique attributes for being selected as true samples of students, teachers and administrators from the HEIs in the province:

a. Peshawar representing the big city while DIKhan as an example of small city but strong educational base in the province.

b. Both the cities host two of the oldest universities of the province (University of Peshawar – 1950 and Gomal University - 1974).

c. The cities have both the oldest as well as new universities (pre-2000 and The post-2000)

d. The cities also host both the public and private sector institutions.

e. These institutions are populated with students, teachers and administrators from almost all cities and areas of the province.

Prior to full scale, a pilot study was conducted to test the instrument and research variables and determine the appropriate sample size using a standard procedure. The detail is given in Table 3.1.

Table 3.1 Population, Sampling Procedure and Sample Sizes

		N	Sampling-Procedure	n
1	Teachers	3401	$[\sigma^2/((E^2/Z^2)+(\sigma^2/N))]$	131
2	Administrators	7791		147
3	Students	Infinite	$[(\sigma^2 Z^2/)/E^2]$	110
			Total	388

Since low response rate was expected therefore over 388 questionnaires were distributed to the teachers, students and administrators. The response rate was: teachers 137; students 132 and administrators 85 = 354 (92%). The number of subjects in the teacher and student groups was increased to include the representation from more subjects that were not included in the pilot study, particularly from social sciences.

3.5 Data Collection and Analysis

a. Literature Survey

Literature survey was conducted to examine the existing research on the topic and extract variables, the relationships between the variables as identified by the researchers. Literature survey also helps the researcher in adopting the appropriate research methodology for the topic. As discussed in the literature review, FOSS has opened a flood of knowledge resources to the world researchers by giving access to the world libraries, databases and data sources. Following data sources were used to conduct literature survey for the topic:

1. Books (hard copies)
2. eBooks (off-line on CDs and online particularly, Wikipedia eBooks)
3. Free and Open Source Systems (FOSS), i.e., eJournals. We used the 'Directory of Open Access Journals' (doaj.org) as a search-engine to locate and access open-sources.
4. The websites of United Nations e-Learning Programs for higher education.
5. The websites of Universities around the world.
6. Social software websites. We used Wikipedia.org, Blogs and facebooks.
7. The websites of the Government of Pakistan
8. The websites of the Universities' in NWFP

b. Questionnaire

A structured questionnaire was developed after a thorough analysis of the literature capitalizing on the documents including research papers, documents from UNO, Universities, Government and FOSS web-sites as well as Books and eBooks. The instrument included questions about demographics (11 variables), perceptions, educational technologies, development, use, user, issues, opportunities, satisfaction and prospects (8 variables and 38 items on 7-point scale).

In most of the ICT-related surveys in HEIs, several scales have been used to measure the responses through questionnaire. For example: Irons et al., 2002 and Radosevich & Kahn (2006) used 7p scale; Marcella & Knox (2004) and Bataineh & Abdel-Rahman (2006) recorded the response on 6p; Sirkemaa 2001, Thomas and Allen 2006, and Mehra and Mital (2007) applied 5p scale in their instruments; and Johnson et al., 2006 Martin & Dunsworth 2007 Garcia & Qin (2007, and Luck & Norton 2005 used 4p scale to classify the responses. Given that most of the researcher are using lower scales for disagreement and higher for agreement therefore, the same mode has been used in this research with seven point Likert-scale representing: 1 = Strongly Disagree, 2 = Mildly Disagree, 3 = Disagree, 4 = Neutral, 5 = Agree, 6 = Mildly Agree, and 7 =

Strongly Agree.

c. Data Analysis

1. Qualitative data collected from a wide array of literature was analyzed using 'argumentative-method' to extract variables and material for supporting references, surveys, hypothesis and results of the same type of studies around the globe.

2. Primary data from Questionnaire was keyed into SPSS 12.0 to create a database. Data was analyzed into descriptive tables and charts. Furthermore, for testing of Hypotheses, Multiple-Regression analysis Procedure was run to measure regressions of the Indicators in every Criterion variable one by one.

d. Instrument Validity

The overall reliability of Cronbach's alpha was estimated at 0.9288, with 354 cases and 38 survey items. This value exceeds the required minimum threshold suggested for the overall reliability test, i.e. 0.7 (Koo, 2008).

4. DATA ANALYSIS AND RESULTS

The classification of the respondents according to their major demographic characteristics is found below:

1. Type of Respondents: Students = 132, Teacher = 137, Administrators = 85
2. Subject: Computer = 101, Non-Computer = 253
3. Sector: Public Sector = 180, Private Sector = 174
4. Gender=GDR): Male = 241, Female = 113
5. City (code=CTY): Dera Ismail Khan = 145, Peshawar = 209
6. Experience with Computer (code=EXP): (>=5) = 163, (<5) = 190

4.1 Correlation between the Variables

Table 3 Correlations Table

	PRC	ETS	DEV	USE	PRB	STF	PRO
PRC	1	.651(**)	.440(**)	.611(**)	.746(**)	.486(**)	409(**)
	.	.000	.000	.000	.000	.000	.000
ETS	.651(**)	1	.758(**)	.746 (**)	.834(**)	.732(**)	455(**)
	.000	.	.000	.000	.000	.000	.000
DEV	.440(**)	.758(**)	1	.577(**)	.745(**)	.665(**)	334(**)
	.000	.000	.	.000	.000	.000	.000
USE	.611(**)	.746(**)	.577(**)	1	.708(**)	.506(**)	.372(**)
	.000	.000	.000	.	.000	.000	.000
PRB	.746(**)	.834(**)	.745(**)	.708(**)	1	.718(**)	.431(**)
	.000	.000	.000	.000	.	.000	.000
STF	.486(**)	.732(**)	.665(**)	.506(**)	.718(**)	1	.203(**)
	.000	.000	.000	.000	.000	.	.000
PRO	.409(**)	.455(**)	.334(**)	.372(**)	.431(**)	.203(**)	1
	.000	.000	.000	.000	.000	.000	.

**Correlation is significant at the 0.01 level (2-tailed). (n=354)

The correlation between Indicators and criterion variables are significant:

1. The PROBLEMS are highly correlated with the Indicators (PRC=.746; ETS=.834; DEV=.745; USE=.708) and thus stand on the top of correlations with Indicators.

2. Similarly, SATISFACTION comes second (PRC=.486; ETS=.732; DEV=.665; USE=.506).

3. The lowest correlations exist between the Prospects and Indicators (PRC=.409; ETS=.455; DEV=.334; USE=.372). Though these are significant in broader terms as they stand greater than the common threshold of significance (3.0) in social sciences, but insignificant in relation to the correlation scores of other criterion variables with Indicators.

4.2 Testing of Hypotheses

The objectives of testing hypotheses are:

1. Hypothesis # 1: How far are the User-Problems explained by the Independent Variables? (H_{a1})

2. Hypothesis # 2: Is User-Satisfaction determined by the Indicators? (H_{a2})

3. Hypothesis # 1: Does the Prospects of e-Learning in HEIs depend on the Indicators? (H_{a3})

Hypothesis # 1 Problems are predicted by the Independent Variables (H_{a1})

Table 4 Regression of Indicators on PROBLEMS

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
.901(a)	**.812**	.809	.20946	375.627	.000(a)

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	.675	.110		6.135	.000
PERCEPTIONS	.283	.025	.363	11.413	.000
EDUCATIONAL TECHNOLOGIES	.251	.039	.301	6.415	.000
DEVELOPMENT	.284	.033	.309	8.611	.000
USE	.068	.030	.083	2.312	.021

a Indicators: (Constant), PRC, ETS, DEV, USE

b Dependent Variable: PROBLEMS

Table 4 tells that R^2 is 0.812, which means that 81% of variation in the dependent variable is explained by the indicator variables. Similarly, the *p-values* of ANOVA and Coefficients of Regression are highly significant and mostly score beyond 0.00, indicating significant levels of interdependence between indicators and the problems faced by users of e-Learning in HEIs of NWFP, Pakistan. The problems are determined by all four indicators.

Hypothesis # 2 Satisfaction is determined by the Indicators (H_{a2})

Table 5 Regression of Indicators on SATISFACTION

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
.756(a)	**.571**	.566	.42909	116.203	.000(a)

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	.142	.225		.628	.531
PERCEPTIONS	.071	.051	.067	1.397	.163
EDUCATIONAL TECHNOLOGIES	.644	.080	.570	8.050	.000
DEVELOPMENT	.338	.067	.271	5.016	.000
USE	-.130	.061	-.117	-2.151	.032

a. Indicators: (Constant), PRC, ETS, DEV, USE

b. Dependent Variable: **SATISFACTION**

User Satisfaction from e-Learning is 57% with R^2 of 0.0571 (in Table 5). Three of the Indicators (educational technologies, development and use) determine the variations in user satisfaction. Surprisingly, perceptions are playing no role in explaining the variance of criterion variable (*p-value* = 0.163, which is well above the required alpha (0.05) for significance)

Hypothesis # 3 Prospects are predicted by the Independent Variables (H_{a3})

Table 6 Regression of Indicators on PROSPECTS

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
.478(a)	**.229**	.220	.79227	25.885	.000(a)

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	1.874	.416		4.501	.000
PERCEPTIONS	.278	.094	.191	2.972	.003
EDUCATIONAL TECHNOLOGIES	.493	.148	.317	3.335	.001
DEVELOPMENT	-.003	.125	-.002	-.022	.983
USE	.030	.112	.019	265	.792

a. Indicators: (Constant), PRC, ETS, DEV, USE

b. Dependent Variable: **PROSPECTS**

The most unexpected and research-provoking finding of the study was that the Prospects variable is very poorly defined by the Indicators (R^2 = 0.229). Only perceptions and educational technologies were measured having impacts on the Prospects with *p-values* of 0.003 and 0.001 respectively. Both development and Use have no connection whatsoever with the Prospects of e-Learning in HEIs of NWFP, Pakistan with very powerfully negating *p-value* of 0.983 for Development and 0.792 for Use of educational technologies.

Table 7 Overall Significance of the Coefficients of Regression (*p-values*)

		PERCEPTIONS *p-values*	EDUCATIONAL TECHNOLOGIES *p-values*	DEVELOPMENT *p-values*	USE *p-values*
1	PROBLEMS	0.000	0.000	0.000	0.021
2	SATISFACTION	**0.163**	0.000	0.000	0.032
3	PROSPECT	.003	.001	**.983**	**.792**

Table 7 gives a Birdseye view of the regression analysis.

Examining the Columnar Information:

1. The Perceptions about '*Educational-Technologies*' are explaining all the dependant variables with very high p-values of 0.000, 0.000, and 0.001 on Problems, Satisfaction and Prospects.

2. The rest of all the Indicators (Perceptions, Educational-technologies, Development and Use) are predicting two of the criterion variables each.

3. Existing 'Development and Use' is NOT Predicting the Prospects (*p-values are* 0.983 and 0.792 for Development and Use respectively)

Examining the Information in Rows:

1. Problems are Predicted by All FOUR (4/4) the Indicators.

2. Satisfaction is Determined by THREE (3/4) of the independent variables. The Perceptions about the overall role of ICTs do not predict satisfaction but the views about existing educational technologies, development, and use practices are the strong Indicators of User-Satisfaction.

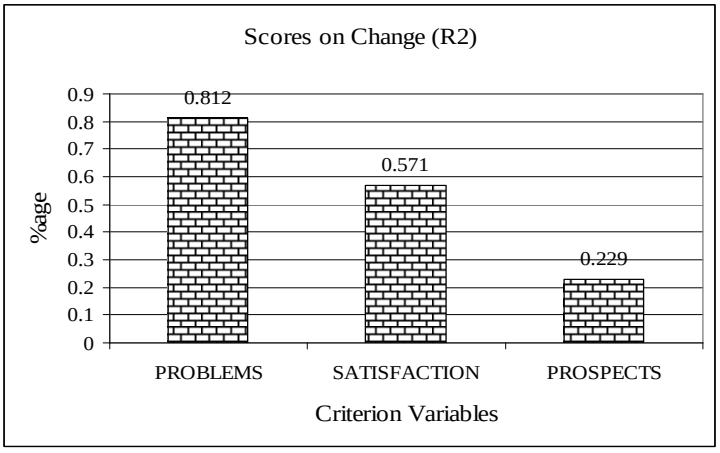
3. Only TWO variables (2/4) are explaining the Prospects.

Table 8 Correlation of Indicators with Criterion Variables

	PERCEPTIONS	EDUCATIONAL TECHNOLOGIES	DEVELOPMENT	*USE*	*Avr.*
Problems	.746(**)	.834(**)	.745(**)	.708(**)	0.7582
	.000	.000	.000	.000	
Satisfaction	.486(**)	.732(**)	.665(**)	.506(**)	0.5972
	.000	.000	.000	.000	
Prospect	.409(**)	.455(**)	.334(**)	.372(**)	0.3925
	.000	.000	.000	.000	

In Table 8 Problems are significantly associated with all the Indicators with r-values well beyond 0.7 to 0.8 with the average of 0.76. Likewise, Satisfaction has powerful association with Use, Development and Educational technologies, respectively with a comparatively low association score with Perceptions of ICTs as a whole. It shows that perceptions about ICTs are less related to the satisfaction from the educational technologies, their development and use practices.

Figure 1 Summary of Hypothesis (R^2 Values)



The above figure shows that 81% of Problems is explained by the Indicator variables. 57% of User Satisfaction is determined by Independent variables. But surprisingly, only 23% of prospects is explained by the Indicators. This trend indicates that user views about ICT-related problems and satisfaction is dissociated with their perceptions of the Prospects. However, this situation can also be explained in a different manner, namely, the users are 'optimistic' about the future role of ICTs, despite their

negative feedback on their experiences with ICTs, educational technologies and the development and use practices of e-Learning in HEIs. Following are the conclusions about the Indicators and criterion variables.

5. DISCUSSION

There are potential gaps between the perceptions and practices of all the stakeholders in the e-Learning matters of HEIs including governments, institutions, groups and individuals. The research suggests that "when formulating policy, administrators tend to favor the reformist approach, but in practice they are generally technocratic (Sahay, 2004)." Similarly at the broader level "there is a gap between the rhetoric about information society and knowledge economy on the one hand, and the practical approach to ICT and its implementation at institutional level on the other hand (Loing, 2005)."

In this study, students, teachers and administrators have positive attitudes towards e-Learning and see many opportunities and prospects in these technologies; however, their practical attitudes are different. Their scores on the Development (4.3082), Use (4.7961) and Satisfaction (4.4030), are far lower than Prospects (5.7359). It also indicates that the existing facilities are contradictory to whatever is expected by the users from ICT-enabled pedagogy, learning and educational management.

It is widely argued that "e-Learning offers a complete information technology support to these innovations (Dinevski & Kokol, 2005)" in teaching and learning. Similarly, ICTs are different from all the so far introduced technologies in the sense that they are integrative in their nature. For example, TV, Telephone, Fax technologies did not connect with each other until the computer and networking sciences came out. Today one can telephone, send a message in multimedia, fax or watch a movie all through a single PC on network. However, the key element in all of this is not the access to infrastructure (bridging the hardware-divide); the access should also help users in getting knowledge, skills, and consistent support of organizational structures to achieve social and community objectives (Macleod, 2005; Ågerfalk et al., 2006).

The research indicates that users are rarely satisfied with the functionalities of new e-Learning systems and worried about the problems of integrating the system with other organizational systems (Drinkwater et al., 2004; Russell, 2005). The HEIs are constantly facing problems of "user dissatisfaction with newly introduced systems, mismatches between a new technology and the existing work practices, underestimating the technological complexity for employees, and inefficient end-user support (Bondarouk, 2006)." The individual satisfaction is closely related with the commitment of the individual to participate and contribute (Klamma et al., 2007). Similarly, "a match between learning style and teaching style reveals increases in student achievement and satisfaction (Manochehr, 2007)."

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learning." While, David Radosevich & Patricia Kahn (2006) found high levels of satisfaction (mean = 6.02 on 7-point scale). However, as discussed in the literature, satisfaction is dependent on a number of factors including the personal characteristics, environmental pressures and the e-Learning facilities available.

6. CONCLUSIONS

- Lack of Local Research: The main reason for the gap between theory and practice is the lack of research about the domestic environment to record the local context, user views and requirements and thereby plan accordingly. Ghulam Rasool Memon (2007) notes that the issue of lack of research in Pakistan is frequently discussed in academic institutions with lack of funding and facilities are presented as the major reasons for the problem. Whatever the reason, it is not possible to harness new ICTs without first measuring the pulse of local context. Tahir Hameed (2007) places "Lack of local research and content' as one of the most significant hurdles" for Pakistan in creating national and international partnerships for economic, technological and educational purposes. The researchers report over and over that technology integration in any context depends on how the technology fits into the existing social purposes and practices of a community (Koo, 2008).
- Borrowed Models of e-Learning: when we do not have any research or domestic models, we naturally look around for 'off the shelf' solutions or 'borrowed models of e-Learning.' The research shows that de-contextualized e-Learning projects have always underperformed and ultimately failed to produce any added value for the teaching, learning and administrative purposes in HEIs. In developing countries, there is a common trend to follow the tracks of development in the developed world. However, copying also requires some intellectual considerations relating to 'what should be copied, what should be modified and what should be self-generated?'
- Perceptual and Demographic Differences: Given the differences of perceptions (Young, 2003) users behave differently while using the e-Learning tools and techniques for teaching and learning purposes. A key challenge for institutions is overcoming the cultural mindset whereby departments and individuals act as silos, keeping information and control to themselves (LaCour, 2005). Moreover, the training that educators do receive does not always match with their educational needs, because the faculty is rarely involved in the decisions about technology and design of new strategies for technology-integration (Juniu, 2005). In developing countries, "ICTs have not permeated to a great extent in many higher learning institutions in most developing countries due to many socio-economic and technological circumstances (Sife et al., 2007)."
- Complicated e-Learning Environments: The greatest challenge in learning environments is to adapt the computer-based system to differently skilled learners. If the environment is too complex the user will be lost, confused or frustrated. On the other hand, too simple or non-systematic environments cause motivational problems (Sirkemaa, 2001). Technology is by nature disruptive, and so, demands new

investments of time, money, space, and skills and changes in the way people do things (Aaron et al., 2004). Furthermore, face-to-face communication is critical for classroom social relationships and interpersonal processes while, online technologies have reduced support for social interaction (Russell, 2005)."

- Dependence on Technical Department/Support: Susana Juniu (2005) points out a very critical problem in the use of e-Learning facilities and that is the dependence of teachers, students and administrators on the ICT-department or technical support needed by the users across the using process. Research suggests that only the technology training cannot ensure better use of new tools, users also need continuous technical and human resource support for technology integration (Zhao & Bryant, 2006).
- Multiplicity of Digital-Divides: The multiplicity of perceptions, theories, and attitudes of users towards ICTs creates digital divides within the environment of higher education (Juniu, 2005). Those who support technology, they seek for it and therefore reduce the impacts of digital divide for them. But users who do not support technology, adopt ICTs passively, thereby widening the digital divide for them. The digital divide classifies the individuals, communities, cultures and nations in terms of access to ICTs, Internet and online resources (Moolman & Blignaut, 2008). The digital divide in higher education refers to the "division of knowledge, expectations, and needs that, in turn, influences the access to information about how technology works, what technology is needed, and how such a technology should be integrated in the classroom (Juniu, 2005)."
- Failure to Catch-up with Paradigm-Shifts: Connected with the preceding point of digital divide, we are still stuck with the old methods of teaching, learning and educational management. Our teaching is still teacher-centered and student-centric pedagogy is yet in the documents and theory or at the most in discussions. The market is changing fast but our education system, particularly higher education, is not catching up with the emerging demands of information society. Nasir Afghan (2000) notes that in Pakistan the distance between the new economy and the traditional education institutions is widening in the sense that HEIs are not producing what is required by the market. A possible reason to this, in the view of a researcher, is that "the traditional institutions are obviously not in a position to cope with this growing demand in any systematic way (Baumeister, 2006)." However, in the perspectives of Pakistan, the biggest challenge, according to Dr. Rashid Amjad, Director Policy Planning, ILO, Geneva (2006) is "to change the mindset and develop institutions which recognize the value of investing in education and skills."
- Lack of User Participation: As research suggests, the biggest hurdle in contextualizing the e-Learning environments is the lack of participation in the development trajectory of e-Projects. The projects mismatch the context because the users are not contacted thoroughly to explain different aspects of their context before the developers who can then embed these user requirements into the new digital systems. Lack of user is reported around the world. Users lodge complaints about their deprivation from having a say in the e-Learning systems which are supposed to be used by them. The problem is more sensitive and touchy in

developing countries where demographic differences are far more tense and implicative.

- Poor User Training: The gap between user and ICTs is possible if user training is not undertaken effectively. Almost every research recording the perceptions and attitudes of e-Learning users reports the dissatisfaction with the training facilities, contents and duration with regard to e-Learning tools for teaching, learning and administrative purposes (see for example, Gray et al., 2003; Loing, 2005; Johnson et al., 2006; Wells, 2007; Mehra & Mital, 2007). User training includes the training of both the developers or ICT-professionals and Non-ICT users. Both groups need different levels of computer literacy. "A large body of literature supports the idea that technology training is the major factor that could help teachers develop positive attitudes towards technology and integrating technology into curriculum (Zhao & Bryant, 2006). The developers need such a 'computing-curriculum' which covers not only the technological aspects of computer hardware and software, but also the human and organizational dimensions of these tools when placed in use.
- Instrumental Computing Curricula: On one hand the computing curricula of the developing countries is borrowed, which mismatches the local market requirements and, on the other hand, courses, contents and frequency of training the non-ICT users are not taken seriously. The respondents have disclosed problems with the incompatibility of training practices with what they require to command the digital machines.
- Global Availability of ICTs: The Internet and World Wide Web have opened a wide range of learning opportunities for both the developed and developing countries. This is particularly significant for developing countries that have limited and outdated learning resources. Likewise, these new technologies also offer access to resource persons— mentors, experts, researchers, professionals, business leaders, and peers around the globe (Tinio, 2002). The developing countries are not supposed to produce hardware because firstly, hardware is becoming inexpensive as well as a huge number of 'Branded Computers' are transported to the developing and poor countries, which are hi-tech but very cheap in comparison to the new computers of same model and specifications. So availability of hardware is not a big deal in the developing world.
- Global Paradigm Shifts in e-Learning: As the learning technologies are mushrooming and becoming more and more inexpensive and widely accessible, the modes of teaching, learning and education delivery are going through significant changes. There are paradigm shifts in different dimensions of e-Learning and the environment around it. For example, the teacher's role has shifted from being 'a sage on the stage' to 'guide on the side' (Tinio, 2002; Young, 2003; Mehra & Mital, 2007). Modern eTeacher is mentor, coach or facilitator for the successful integration of ICTs into the pedagogy (Blázquez & Díaz, 2006). Likewise, contemporary students are called "Millennials, Electronic Natives, the Net Generation" who are brought up digitally; therefore, they possess absolutely new learning habits like independence and autonomy in their learning styles and multitasking due to the availability of new gadgets (Garcia & Qin, 2007).

7. RECOMMENDATIONS

1. Local ICT Industry and ICT-Professionals: ICTs are no more meant for the elite or privileged classes of the world. These are available, accessible and affordable to a wide range of nations and world citizens. The developing countries are said to be the major beneficiaries of these technologies provided they effectively plan their integration into their economies. The biggest opportunity available to them is the growth of local ICT professionals who are basic to the successful use of new technologies. Pakistan can capitalize on its 'local ICT resources' to bring digital revolution. During the last decade Pakistan is taking visible steps in this regard. A huge amount of money has been invested in computerizing the HEIs to produce local ICT professionals, which are indispensable like infrastructure (Bajwa, 2006; Hamid, 2007).

2. Educational Partnerships: The use of new collaborative technologies requires team work more than we are used to. Networking and social software help users in working collaboratively while still preserving their personal preferences and styles (Juniu, 2005). The collaboration requires partnerships between the university constituents (teachers, students and administrators) as well as at the national (partnerships between the universities and public and private sector) (Baumeister, 2006) and international partnerships between world organizations and states (Tinio, 2002; Kopyc, 2007). For example, the emergence of a strong Indian IT industry happened due to concerted efforts on the part of the Government, and host of other factors like private initiatives, emergence of software technology parks, and public private partnerships (Mathur, 2006).

3. Growth of Information-Culture: ICTs have created new societies, which are discussed under different concepts including 'information societies' (Sasseville, 2004; McPherson and Nunes, 2004); knowledge societies (Aviram & Eshet-Alkalai, 2006; Klamma et al., (2007); and open information society (Bajwa, 2007) with knowledge economy (Hameed, 2007). The higher education commission (2008) aims to ensure that a comprehensive ICTs strategy is implemented to develop a knowledge-society in Pakistan.

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