

## **ICTs FOR HIGHER EDUCATION COMFORTABLE AND UNCOMFORTABLE ZONES**

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### **ABSTRACT**

There is no escape for higher education from using Information and Communication Technologies (ICTs) for all learning, teaching and administrative purposes of the institutes. UNESCO calls it a necessity and a panacea for many global problems like education for all. Higher educational institutions in developing world face somewhat similar problems like their counterparts in the developed world. However; shortage of resources and political instability adds a serious dimension to this agenda in the developing countries. These technologies offer several opportunities, which are conditioned with several factors mostly related to the indigenous environment. Pakistan is digitizing very quickly however, there are several threats, which are either impeding the progress or slowing it down to miserable levels of performance. Given the existence of uncomfortable zone in use of ICTs, there is need to ensure adequate management of ICTs projects right from the policy formulation through participative requirements, analysis, design, implementation, and timely up-gradation of the ICT-based systems. Unless a customized comfortable zone is created, there cannot be an aggregate uptake of ICTs into the economy.

### **INTRODUCTION**

Countries all over the world are now increasingly using information and communication technologies (ICTs) in education (Sife *et al.*, 2007) both as a necessity and opportunity and as a main strategy to achieve EFA (Education for All) goals (UNESCO, 2006). These new developments especially the emergence of new global economy has serious implications for educational institutions (Tinio, 2002). Information is not knowledge. Education transforms the "information society" into a "knowledge society" (Cornu, 2006).

ICTs are "diverse set of technological tools and resources used to communicate, and to create, disseminate,

store, and manage information. These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephone (Tinio, 2002; Sife *et al.*, 2007)".

Given the spreading nature of ICTs, the modern educational teaching processes have to develop innovative learners' capacity, operate independently, identify and solve problems and handle huge information in a wide range of media (Warwick, 2002). Conventional teaching has emphasized content and course that revolve around textbooks. Teachers in the past concentrated to impart knowledge through lectures and presentations with learning activities which was basically developed to

consolidate and rehearse the content. However, presently such curricula are favored to promote competency and performance with more concerns about *how to use* information rather than to know it (Oliver, 2002).

There is acute need to measure ICTs literacy because: ICTs are changing the overall culture of education and information and influencing the way we live, learn, and work. It is not only a matter of technical skills rather the proper application such skills in an information society. Despite such importance the lack of information about the ICTs literacy on the part of students is well reported and the debates are on that how to address this issue in academic curriculum (Rockman *et al.*, 2007).

The development and use of ICTs in higher education has both threats and opportunities or what researchers call 'uncomfortable' and 'comfortable' zones (Valcke, 2004). However, this new technology is very possible 'to harness' in tune with the local requirements and it is noted somewhere that "when used appropriately (Tinio, 2002)" ICTs can help achieve a lot of, so far unimaginable objectives of education, such as, education for all, anywhere and anytime (UNESCO, 2006).

Since the introduction of ICTs in the higher education institutions, literature is emerging on the development, usage, problems and solutions of ICTs projects. There is mounting literature on the role of ICTs in the education sector of developed, developing and poor

countries. During the last couple of years, higher education institutions all over the world are making all out efforts to adopt e-Learning environments to stay compatible with the international trends. The material has been assembled primarily from the online resources including online journals, web logs, and websites of the research institutes, universities and government agencies. Efforts have been made to bring together different views of the researchers into an understandable format to comprehend the role of ICTs in the higher educational institutions in their true perspective.

The use of ICTs in education means e-Learning. E-learning is the development and use of information and communication technologies (ICTs) in teaching and learning practices. Furthermore e-learning is a mechanism where online access to courses, teaching and learning is provided to the students (Sife *et al.*, 2007). E-learning in higher education (both formal and informal) refers to the use of information network such as internet, intranet (LAN) and extranet (WAN) for both teaching and learning. Many others also views e-learning as online learning. Online learning refers to learning through the use of Internet browser such as, Netscape or Internet Explorer (Tinio, 2002; Sife *et al.*, 2007).

ICTs are not mainly a matter of technology. Core and fundamental trends are now at the centre of the evolutions: Networks and networking, collaborative work and collective

intelligence, e-Learning and ethical questions and globalization (Cornu, 2006). It is the process of using advance technologies, communication techniques and networks to gather, store, manage, evaluate and disseminate information in order to operate in a knowledge society (Rockman *et al.*, 2007). One should be careful about the fact that “ICTs are either becoming education or destroying the essence of education (Sahay, 2004)”. On the basis of a rigorous literature review, Leinonen (2006) identifies four major phases of computer usage in education. The last phase is still to come. The phases are:

1. Late 1970's - early 1980's: programming, drill and practice;
2. Late 1980's - early 1990's: computer based training (CBT) with multimedia;
3. Early 1990's: Internet-based training (IBT);
4. Late 1990's - early 2000: e-Learning;
5. Late 2000: Social software + free and open content.

The traditional teaching heavily depends on instructional learning methodologies to teach and obtain desired learning outcomes. It was based on planned transmission of knowledge with little interaction with the students to consolidate the knowledge acquisition. Where as contemporary learning theory suggests that learning is not only the acquisition of knowledge rather it is a process of knowledge construction and

the instruction would be used to support knowledge construction rather than confined only to knowledge transmission (Oliver, 2002).

For instance, education management information system (EMIS) is a mechanism that helps the executives to select, organize, present, and communicate indicators that can make difference in educational decision-making. Likewise an educational decision support system (EDSS) is a decision making tool that by combining the data of EMIS with analytical models generate maximum possible alternatives for the decision makers to select the best one to improve the educational system (UNESCO, 2006) thereby taking a broader perspective e-Learning.

Thus, number of socio-economic and pedagogical factors such as easy access to information, rapid electronic communication, increased cooperation and collaboration, synchronous learning, cost effectiveness, simulation, virtual experiences and graphic presentations shifted higher learning institutions to e-learning (Sife *et al.*, 2007).

The western countries have been using Information and communication technologies (ICTs) in every aspect and in every sector of government especially in logistical, organizational and educational processes of higher education (Valcke, 2004). The use of ICTs in education is more student-centered learning oriented, which may create some tensions for some teachers and students (Oliver, 2002).

**Table 1 Traditional vs. ICT-Based Higher Education**

	Traditional Education	ICT – Based Education
1	Teacher-Centered Delivery	Student-Centered Delivery
2	Content-Centered Curricula	Competency-Based Curricula: Concerned more with <i>how</i> the information will be used than with <i>what</i> the information is.
3	Course have been written around <u>Textbooks</u> ,	access to a variety of information sources and a variety of information forms and types
4	Teachers taught through <u>Lectures</u> , <u>Presentations</u> , and Tutorials	Teachers as coaches and mentors [experienced & trusted advisor] rather than content experts
5	Requirement was to Consolidate and <u>Rehearse the Content</u>	Student-centered learning settings based on information access and inquiry; problem-centered and inquiry-based activities
6	Classroom Learning	Any-place, any-time Learning: Work-based settings with students able to access courses and programs from their workplace

Adapted from Tom Oliver (2002)

Research shows that modern education is based on four pillars: 1. learning to know, 2. learning to do, 3. learning to live together, and 4. learning to be – and ICTs may help achieving each of these pillars (Cornu, 2006).

ICTs are setting into university environments ranging from developing course web pages to offering complete courses, or program modules, or even entire degree courses online (Sahay, 2004). The appropriate use of ICTs may help to facilitate an easy access to education, empower relevance of education to digital workplace, enhance quality of education and make teaching and learning more connected with real life (Tinio, 2002). However, it is well documented that ICTs have not yet practiced to a full extent in many higher learning institutions in most developing countries due to many socio-economic

and technological factors (Sife *et al.*, 2007).

Numbers of factors are impeding the overall uptake of ICTs in education across all sectors. These are (1) Financial constraint for purchasing required technology, (2) lack of both pre-service and in-service training among teachers and (3) absence of motivation and need assessment among teaching community to adopt ICTs as teaching tools (Oliver, 2002). It is highlighted that the exploitation of full potential educational benefits of ICTs is not automatic (Tinio, 2002). The research indicates that there are either uncomfortable (problems) or comfortable (prospects) zones of reality in using ICTs for higher education (Valcke, 2004).

Given this, there are problems relating to the training and IT education of teachers,

students and administrators along with the issues of curricula (Ojo, 2003) in the e-Learning environments. For example teachers complain the support available; students are objecting present situations and do not have positive attitude towards ICTs related educational innovation while administrators are of the opinion that due to unclear role and responsibilities both the top management and lower management is little bit confused and unable to decide that who is responsible for defining ICTs related policies (Valcke, 2004).

The existing literature reveals that the field of education has been mysterious; less influenced and less change when compared with other fields. Furthermore, in the field of education ICTs have only a presence but has very limited use when compared with other fields (Oliver, 2002). The research reveals that the introduction of different ICTs in higher educational institutes in both developed and developing societies over the past several decades suggests that the integration of ICTs into the system of education is not so simple rather too much complex which involve not only the technology but also many other important dimensions like pedagogy, curricula, readiness of institutions, teacher competencies, and long-term

financing (Tinio, 2002). Likewise, much more failure than success has been resulted after computerization the education system in developing countries. Furthermore, technologies in general have fewer impacts on the way people learn (Leinonen, 2006).

The technological advancement have emerged number of issues like modifying the makeup of teacher pool, amending the profile of learners, revising and computing curriculums and changing the patterns of course delivery through introducing more cost effective strategies (Oliver, 2002; Ojo, 2003).

There are problems with the ICTs projects even at the level of development. For example, research shows that teaching staff have complaints about the level of their participation in the policy development. Likewise, due to unclear role and responsibilities both the top management and lower management have so far confused to decide that who is responsible for initiating ICTs related policies. Top management usually is responsible for making policies while the middle management is responsible for the implementation of policies and the lower level management deals with operational activities of an organization, all needs knowledge and skills of ICTs

to realize organizational objectives (Valcke, 2004). However, computer centre at university level are the centre of excellence to deal with all kinds of issues relating to the development and use of ICTs. Their long operational experience of ICTs is sufficient enough to generate self confidence and required capabilities to handle complexities of ICTs but the question is not of capabilities but the efficiency to complete their task with in a given time frame. Furthermore, these centres are capable enough to compete with specialized software houses and are silent about hardware manufacturers (Vrana, 2007).

Higher education institutes are still struggling to come up with a computing curriculum which is compatible with local, national and international challenges and demands. At the initial stages of computing curricula the term 'Computing' refers to the labels 'Computer Science' [and] 'Computer Science and Engineering' but do not have specific program programs in other computing disciplines such as information systems (Ojo, 2003).

In Pakistan, the present education delivery system is not customized with the needs and requirements of the society which is real threat to the

provincial and local level governments in the 21st century. Lack of required finance and political will over decades are the main factors responsible for the production of weak and poorly performed higher education institutions which is neither compatible with the national objective nor sufficient to develop competitive society (Shah, 2003). The absence of compatible management information system (MIS) and networking are the real obstacles to the development and use of effective ICTs in higher educational institutions. Although educational MIS (EMIS) exists at the federal and provincial headquarters' level but such system has not been developed and adopted at district level. Furthermore, the integration of MIS with the entire education network is imperative to prepare realistic planning capable enough to remove prevailing disparities and wastages (Hassan, 2007).

When used appropriately, ICTs help in expanding access to education, strengthening the compatibility of education to digital workplace, raising educational quality, and extending more realistic and active teaching and learning process closely connected with real life (Tinio, 2002). Furthermore, customized learning approaches of ICTs will enable

the higher educational institutions to provide many opportunities for learning through their provision and support for resource-based, student centered settings and by enabling learning to be related to the context and to practice (Oliver, 2002). The adoption and use of ICTs in higher educational institutions will enable national policy making agencies to plan, manage and improve the level and efficiency of the prevailing education system through adopting culture of proper data collection and utilization in decision making (UNESCO, 2006).

Valcke (2004) suggests macro and meso level strategies to create comfortable zones. Macro-level strategies are: collaboration between institutes; huge budgets to start up innovations; the application of standard of industrial sector; appropriate training of the staff; proper monitoring and evaluation strategies; reinventing educational innovations based on ICTs; and defining of an internal and external quality assurance cycles. At the meso-level: defining clearly the educational and ICTs policies; collaboration in the higher educational institutions; taking scalable initiatives; extrapolating the administrative, logistics, and technical consequences of ICTs projects; set up an

internal quality control cycle; and discuss the use of educational ICTs for human resource management through incentives for workforce, workforce development, specialization and new job profiles, etc.

The shift from traditional to performance-based curricula must have been fully supported and encouraged by emerging instructional technologies. Such new curricula will require: easy access to different information sources; quick and easy access different information forms and types; student-centered learning environment with an easy access to information and inquiry; learning environments should be problem-based and inquiry-based environment; and teachers should be an expert in coaching and mentoring rather than content experts (Oliver, 2002). These changes in computing curriculum are vital from many standpoints; for example, “the incorporation of ICTs into the educational curriculum has been promoted as a key step in bridging the digital divide (Wims and Lawler (2007).”

In recent years, number of factors have been evolved which enabled the adoption and use of ICTs in to the classrooms and learning environment.

These factors consist of: consistent demand of efficient program delivery system; more adjustable and flexible delivery system provided by ICTs; customized educational system to meet the needs and requirement of individuals learners, and the excessive and increasing use of Internet and web as a tools for information access and communication (Oliver, 2002).

Although it is obvious that both traditional and virtual higher education will continue to exist and mutually reinforce each other (Sadlak, 2004); however, contemporary trends suggest that the world will soon see remarkable changes in the ways and patterns of plan and deliver education due to the opportunities and affordability of ICTs. ICTs are playing very important role in education and such importance of ICTs will continue to grow and develop in the 21st century (Oliver, 2002). For the developing countries like Pakistan, the ICTs because it is capable to do the miracles:

1. have the potential for increasing access to and improving the relevance and quality of education;
2. represent a potentially equalizing strategy for developing countries;

3. greatly facilitate the acquisition and absorption of knowledge;
4. offer unprecedented opportunities to enhance educational systems;
5. improve policy formulation and execution; and
6. widen the range of opportunities for business and the poor.

People in the poorest countries feel a sense of isolation, which may be reduced through the adoption and use of new communications technologies as these technologies will provide open access to knowledge in ways unimaginable not long ago (Tinio, 2002).

The discipline of computing is continuously growing and all its important aspects are under continuous change process. Consequently, computing curricula of the highest learning institutions need frequent updating to remain update and effective (Ojo, 2003). The frequent and easy access to higher bandwidth, more direct forms of communication and easy and affordable access to sharable sources will definitely improve knowledge and skill of the teachers and students which



will enhance the capabilities to maintain quality learning settings (Oliver, 2002). However, UNESCO (2006) has directed the attention to some basic points, which must be borne in mind as one pursues ICTs,

1. First, ICTs are only a part of a continuum of technologies, starting with chalk and books, all of which can support and enrich learning.
2. Second, ICTs, as any tools, must be considered as such, and used and adapted to serve educational goals.
3. Third, many ethical and legal issues intervene in the widespread use of ICTs in education, such as questions of ownership of knowledge, the increasing exchange of education as a commodity, and globalization of education in relation to cultural diversity.

Taking account of the above facts and emerging themes, it is discernable that despite being miraculous, ICTs do not offer automatically by simply purchasing hardware and software artifacts. It rather calls for skillful treatment right from the very start of the ICTs project, through its development process, user training and use and ongoing maintenance/ up

gradation of the new electronic learning environment (ELE).

The universities and other higher education institutions are left with no option but to switch-over to ICT-based learning, as quickly as possible, to protect against becoming obsolete in the very near future. It is obvious from the above analysis that it is not the hardware and software which makes or breaks the future of ICTs applications in higher education. Conversely, it is a choice; harnessing and using of the new technologies, which determine the level of contributions a technology can possibly make to an educational institute.

Future research may include the exploration of the typical conditions and problems of ICTs projects, their development, usability etc in the higher education institutes in NWFP, Pakistan with empirical data to test the global hypothesis in the local environment.

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