

Review

Using e-learning as a tool for 'education for all' in developing states

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Accepted 7 February, 2011

There is no denial that developing countries have long-standing problems of education due to their scarce resources for providing education facilities to their masses. The provision of education for all and continuous education is impossible for these countries because they cannot afford to establish educational institutions filled with teachers and teaching facilities for every single citizen as available to the masses of developed states. Fortunately, ICTs are opening new opportunities for the developing and poor states to start planning and implementing digital opportunity initiatives and thereby address their problems including education. eLearning is emerging as a panacea for the issues of education for all, lifelong learning and globally compatible education. The purpose of the paper is to bring together the threats and opportunities, attached with digital initiatives, available to the developing countries and plot the findings into a compact theoretical model for guidance and further research.

Key words: Educational-technologies, virtual-learning-environments, education-for-all, lifelong-learning, and continuous-education.

INTRODUCTION

Education is said to be the biggest user of computer software; however, the main thrust of research on the role of information and communication technologies (ICTs) in education is to answer the question, how far these technologies have affected the learning process and outcomes (Tinio, 2002). However, educational technologies (ETS) are increasingly becoming accepted as important tools for supporting teaching, and educational and organizational learning (Drinkwater et al., 2004). Throughout the world, ICTs are changing the face of education as well as nature of work and the workplace. The knowledge revolution combined with economic globalization has created successful conditions for knowledge-based industries. These dot.com organizations require an educated workforce with digital literacy; therefore, many countries are changing the objectives of their education and adopting ICTs (Ezziane, 2007; Nawaz and Kundi, 2010c).

The same demand for knowledge-based industries is pushing the whole society to continue learning forever. The concepts of 'lifelong learning (LLL)' and 'continuing-education' are gaining currency in the research and practices of eLearning, particularly in higher education institutions (HEIs). Researchers predict that, eLearning is going to provide technical foundation on which efficient LLL will be built. Nevertheless, the eLearning has still to become inexpensive, user friendly, actively motivating, and widely accessible (Dinevski and Kokol, 2005). The demand for new approaches towards fostering lifelong learning perspectives is increasing day by day. Emergent Web 2.0 technologies (like blogs, wikis, social bookmarking etc.) are opening new doors for more effective learning and have the potential to support lifelong learning (Klamma et al., 2007).

Researchers comment that "technology can make lifelong learning a reality (Dinevski and Kokol, 2005)."

This ability for new lifelong learning communities to participate and create the new web has led to a whole generation of new 'socially based' tools and systems that are generically referred to as social software (Klamma et al., 2007). Furthermore, teachers are feeling increasing pressure to use IT, but they commonly face several obstacles when attempting to use technological teaching techniques. There is need for HEIs to strategically develop IT integration plans that help overcome these obstacles. Barriers can make the use of technology a frustrating experience for the technologically sensitive users, let alone the many who are techno-phobic (Ezziane, 2007).

ICTs have become integrated into our consciousness so instantly, that we cannot fully absorb the full range of changes (Drucker, 2006). Anyhow, for supporting the students who are facing the challenges of the twenty-first century, there is a need to transform current traditional models of education with a model that reflects the knowledge economy and the need for lifelong learning (Knight et al., 2006). Social, economic, and technological changes of the past decades are making education and training for all more crucial than ever but educational systems are still struggling to create educational opportunities for all by providing graduates with the necessary knowledge for working in dot.com organizations and prepare their citizens for lifelong learning (Haddad and Jurich, 2006; Kundi and Nawaz, 2010; Nawaz and Kundi, 2010c).

EDUCATIONAL PROBLEMS OF DEVELOPING WORLD

Prima-facie, eLearning is a blessing in disguise, particularly for the developing countries, who are struggling against illiteracy, poverty, global isolation and disempowerment and since very long (Tinio, 2002). ICTs have, obviously, emerged as a panacea if not for all but most of these ills, which had almost paralyzed the developing states because they had started believing in their absolute incapacity in educating their masses through providing physical learning facilities. Contemporary cutting-edge technologies have opened a vista of opportunities for all the HEIs of the globe to grab as much benefits as possible depending on the capabilities, consistency of efforts and localization of technologies (Qureshi et al., 2009b). Educational technologies can solve several educational problems of the developing countries. The learning issues are:

1. Shortage of qualified and skilled teachers: It is estimated that as many as 25% of teachers in sub-Saharan Africa are not adequately qualified; ICTs can accelerate teacher training and that ICT in education has most potential in teacher training (Oliver, 2002).
2. Low level of learning achievements: Introducing ICTs

can help to counter some of the negative factors endemic in many educational institutes of developing countries, such as high student: teacher ratios, shortage of basic instructional materials and poor physical infrastructure (Wells, 2007; Nawaz et al., 2007).

3. High drop-out rates at all levels of education: ICT can be used to make the school curriculum more interesting. Studies have verified that children enjoy learning using technology (Wells, 2007).

4. Lack of opportunities for remote areas: Distance learning can help overcome the problems associated with geographical isolation and is invaluable for students in remote areas (Aaron et al., 2004). Distance learning educational software also benefits from economies of scale increasing cost efficiencies. ICT serves to counteract physical distance as teachers can maintain contact with family and friends through telephone and e-mail by serving in remote areas (Abrami et al., 2006).

5. Lack of study materials and resources: Study and teaching materials are very sparse in many schools in developing countries; ICTs can play a significant role in providing teachers and students with access to educational content and up to date resources (Wims and Lawler, 2007).

DIGITAL EDUCATIONAL TECHNOLOGIES

ICTs encompass the effective use of equipment and programs to access, retrieve, convert, store, organize, manipulate and present data and information. eLearning is defined as the use of ICTs to enhance or support learning and teaching (Gay et al., 2006). It covers a continuum of educational technologies. At one end are the applications like MS-Word and PowerPoint with little impact on education and institution while at the other end are virtual learning environments (VLEs), which have significant impacts on learning and teaching strategies as well as the organization (Sife et al., 2007). Broadly, educational technology refers to the supplemental use of technology in the classroom, through blended or hybrid uses comprising a mix of face-to-face and fully online instruction, to fully online synchronous and asynchronous distance learning environments delivered to remote learners (Nawaz and Kundi, 2010c; Kundi and Nawaz, 2010).

The exponential growth of sophisticated communication technologies has prompted universities, companies and other educational institutions to experiment with alternatives to the traditional classroom teaching methods (Favretto et al., 2003). Amongst the recent pressing issues relating to the phenomenon of globalization is an overwhelming call to address poverty and inequality in developing countries by facilitating the global diffusion of ICTs (Macleod, 2005). The use of computers in the classroom has proven advantageous in more than one

respect. It facilitates students not only in learning but also helps them in developing their ability to learn independently, manipulate information, think critically and address problems in his/her own style (Bataineh et al., 2006). E-Learning has progressed through a number of stages and transformations over the past thirty years. In the 1970s and 1980s, for example, it was referred to as Computer Assisted Learning, Computer Based Training or Technology Based Training. By the 1990s, this form of learning was beginning to be supplemented by the use of other media, particularly the introduction of e-mail, and discussion groups. Contemporary, VLEs comprise facilities for both the management of course materials and interaction with a long list of communication tools. It is growing exponentially and now includes millions of pages, sites archives, portals and databases (Gray et al., 2003). E-Learning is backed by the WWW and therefore has access to virtually unlimited information. Web-based learning is worldwide accessible, low in maintenance, secure, platform-independent, always current and can accommodate various learning styles. E-learning can be delivered to the learners easily, in an individualized manner (Manochehr, 2007).

Internet

During the past couple of decades, ICTs have been playing important roles in the innovation of education by providing more options and flexibility to the teachers and students. Furthermore, with the 'Internet' and related technologies available to most teachers, educational technologies become increasingly indispensable (Oh and Russell, 2004). E-Learning is the process supported by Internet, web applications, and end-user computing to connect people and information thereby creating an environment of social learning (Luck and Norton, 2005). Internet-based educational technology can contribute to substantial improvements in education. Digital content and networked applications will transform teaching and learning. The Internet is facilitating organizational learning by enabling improved forms of communication and sharing (Laffey and Musser, 2006). For life-long learners, the first generation Internet allowed easy access to a vast range of published materials. The second generation Internet allowed them to contribute to it (Klamma et al., 2007).

Open source systems

The key feature of the open source products is that, their source code is made public and freely accessible. It is published for and discussed by computer-geeks. Open source products can become public domain without necessarily being for free. In some cases, service providers charge for the dissemination of the software or for

its installation and maintenance. However, these charges are supposed to cover the respective costs, and are no usage fees (Pfeffer, 2004). Open source software offers the potential to reduce the cost of the software while providing the universities greater control over its destiny. Elimination or reduction of license leaves more budgets available to invest in adapting and managing the software; offers reliability, performance and security over proprietary software due to the availability of the source code, which allows vulnerabilities to be identified and resolved by third parties and it is easy to customize. 'Claroline and Moodle' are some of the widely used open-source eLearning software (Sife et al., 2007).

Social software

The social software tools enable a different way of using the web within an educational context. E-Learning tools include discussion forums, chat, file sharing, video conferences, shared whiteboards, e-portfolios, weblogs and wikis. Such tools can be used to support different activities in the learning process. The question of organizing e-learning tools involves the problem of integration vs. separation. On the one hand, it is possible to integrate different tools in a single stand-alone system, a learning management system, also called virtual learning environments or eLearning systems like Blackboard, WebCT, Moodle (Dalsgaard, 2006; COST, 2007). Social software can be broadly defined as tools and environments that support activities in digital social networks. Digital social networks are social networks mainly realized by means of computer-mediated communication. Most social software research concentrates on the relations between social entities in digital social networks and their interaction, while community information systems contain and group social entities (Klamma et al., 2007; Kundi and Nawaz, 2010).

Wikis

A Wikis is a web page which can be edited dynamically directly from the web page itself so every user can make the changes. One can either edit a current page or create new ones through new hyperlinks. A wiki is used to keep track of changes, which means that you can view previous versions of each page on a wiki. The most famous implementation of a wiki is wikipedia (<http://www.wikipedia.org/>), an online encyclopedia which can be edited by anybody. Wikis support collaborative construction, development and production (Dalsgaard, 2006). Thus, new internet services or Web 2.0 technologies such as wikis, blogs, RSS, and podcasting are some of the many tools that are already used for communication and entertainment; however, they are best suitable for learning (Chan and Lee, 2007).

Furthermore, the use of web technologies in eLearning is further enhanced with the web 2.0, which is a set of economic, social, and technology trends to facilitate a more socially connected Web where everyone is able to add and edit the entries. These technologies consist of blogs, wikis, multimedia sharing services, content syndication, podcasting as well as content tagging services (Sife et al., 2007). The new learners called Net-Genres have a learning style of using wikis. Wikis, or open-editing sites, are as much a part of the Net-Generation's learning landscape as blogs. Educators are increasingly using wikis as collaborative writing spaces however; they can also use them "to change the individualism culture of traditional instruction to one of collaboration and a shared construction of knowledge (Barnes et al., 2007)."

Blogging

Basically, a weblog is a log file with dated entries listed on a web page in chronological order. Maintaining a weblog means continuously posting new entries which can be categorized under different headlines. A weblog in itself is not a social or collaborative tool, but is rather individual and also personal. It is often maintained by a single individual and it does not support discussion. It is, however, possible for readers of a weblog to write comments on the entries (Dalsgaard, 2006). Blogs are a class of software often used in organizations nowadays, e.g. corporate wikis, social bookmarks, and RSS web feeds. The term 'Blog' is a contraction of 'Weblog' and the act of 'Blogging' is the making of such logs (that is, visit www.blogger.com). Some businesses are coming to understand that 'real' news isn't just a ticker-tape-like news feed from Reuters or the BBC. In business, the most significant news is what you and those you have reason to care about, did yesterday, are doing today, and plan to do tomorrow (Klamma et al., 2007).

One can subscribe to weblogs using RSS feeds. Rich Site Summary (RSS) feed is a subscription system which alerts the user on the availability of new content in a blog, a wiki page, or a particular tag in a distributed classification system (Mejias, 2006). Software tools such as Bloglines (<http://www.bloglines.com/>), BlogBridge (<http://www.blogbridge.com/>), and Feedburner (<http://www.feedburner.com/>) support subscription of several weblogs meaning that you do not have to visit every weblog to find out when new entries are written. The theory behind social bookmarking is to bookmark your web pages on the web, instead of doing the same in your browser. Del.icio.us (<http://del.icio.us/>) and Furl (<http://www.furl.net/>) are examples of different kinds of social bookmarking sites (Dalsgaard, 2006). Being social means that bookmarks can be viewed by other people. You can also see who else has bookmarked the same pages (Drexler et al., 2007).

ROLES OF ICTS IN EDUCATION

Technology can be used in education in multiple ways. It starts from information delivery and ends with cognitive tools. Information delivery is the use of technology primarily to access and deliver digitally formatted information. A digital library system is an information delivery system. The cognitive tools refer to adaptive technology or systems that are developed to support and improve the learning process (Sirkemaa, 2001). Furthermore, ICTs offer possibilities to the students, teachers such as computer-aided applications which can individualize learning according to the user requirements (Ezziane, 2007; Nawaz and Kundi, 2010c; Kundi and Nawaz, 2010). Information technologies have significant potential in education (Sirkemaa, 2001). These are increasingly becoming accepted as important tools for supporting educational and organizational learning and teaching (Drinkwater et al., 2004). However, its meaning has to be understood at the very outset in the sense that ICTs have political, economic, and educational connotations whose understanding is a key to its successful applications anywhere. The political meaning covers the idea of modernizing the whole range of education. The economic meaning defines e-Learning as a sector of e-business. The educational meaning, which places e-Learning in an environment of teaching and learning as a particular approach for designing new instructional environments or new areas for research (Aviram and Eshet-Alkalai, 2006).

Over the past three decades, models and approaches of digital literacy have evolved; for example, it is obvious that technology paradigm shifts changed not only the way of computing but also how the technology itself is perceived by society. Universities and even smaller departments within organizations found themselves able to afford dedicated computing power (Ezziane, 2007). E-Learning is essentially the network-enabled transfer of skills and knowledge. The internet is the largest, most powerful computer network in the world. E-Learning applications and processes include web-based learning, computer-based learning, virtual classrooms and digital collaboration (Manochehr, 2007; Nawaz and Kundi, 2010c). Whatever the name, e-learning can help and is helping the developing countries to address their dashing educational problems.

Education for all (EFA)

Education for all (EFA) is the long standing dream of every nation; however, the scarcity of resources has always been the problem (Oliver, 2002). However, when used appropriately, different ICTs are said to help expand access to education, strengthen the relevance of education to the increasingly digital workplace, and raise

educational quality by transforming teaching and learning into an engaging and active process of continuous learning (Tinio, 2002). One of the claims of ICT professionals is that, eLearning can provide much better education for people from developing countries (Hvorecký et al., 2005). Furthermore, working cooperatively with tools that facilitate the aggregation and organization of knowledge while at the same time demonstrating that the diversity of individual research interests enhances learning for all (Mejias, 2006; Nawaz and Kundi, 2010c; Kundi and Nawaz, 2010).

UNESCO suggests four distinct strategies to the member states for implementing eLearning systems which aim at education for all and lifelong learning (Sanyal, 2001). The strategies are:

1. Every country must create an education whose contents and methods are geared to your social and cultural realities. But this education must also be modern and geared towards strengthening the autonomy of each individual in a globalized society.
2. Develop basic education services accessible to the poorest, illiterate, children outside the school, and adults at work, in the street or refugees. The strategy should be of using both the formal education system and newly emerging digital alternatives for informal learning.
3. Harness the modern ICTs for all by broadening the reach of basic education, particularly for the excluded and underprivileged groups and enhancing teaching.
4. Replace the costly, rigid and culturally alienating educational structures with less expensive, more flexible, more diversified and universally affordable.

Lifelong learning (LLL)

Lifelong learning (LLL) is "all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective" (Dinevski and Kokol, 2005). Life-long learning is a critical issue for the knowledge society. With social software systems, new kinds of technology based informal learning are available for life-long learners. Those learners who are not inside the educational institutions now access the knowledgeable social communities of experts who are together emerging into a new web 2.0 (Klamma et al., 2007; Nawaz and Kundi, 2010c; Kundi and Nawaz, 2010).

The lifelong learning covers the whole area of education including initial, basic and university continuing education (Dinevski and Kokol, 2005). Life-long learning refers to a society in which learning possibilities are available for those who want to learn. Learning is not restricted to the classroom and to formal learning inside learning institutions; rather it happens throughout life, at work, play and home. In the modern knowledge-intensive

life, lifelong competence development has become a major challenge to our educational systems that have not yet developed or modified their policies and pedagogical models to support life-long learning (Klamma et al., 2007; Qureshi et al., 2009b; Nawaz and Kundi, 2010a, 2010b). Continuous learning (CL) or education has become possible due to the educational technologies (Sirkemaa, 2001). 'Continuing education is also defined as any form of education like vocational or general, resumed after an interval after the continuous initial education (Dinevski and Kokol, 2005).

Students' comprehension of material increases significantly when multimedia facilitates learning objectives. These studies suggest that technology can transform the educational environment and motivate students toward lifelong learning (Radosevich and Kahn, 2006). UNESCO adopted lifelong learning as a master concept in 1970 in recognition of the relationships between investment in education of whole populations and economic and social outcomes of lifelong learning. It is noted somewhere that in the 21st century, learning will be essential as human capital becomes to the information revolution what fixed capital was to the industrial revolution (Davey and Tatnall, 2007).

MAJOR ISSUES OF E-LEARNING

The trajectory of e-learning projects around the world is confirming that success of these new systems is not automatic, rather a complex and multifaceted process that includes technology as well as curriculum, pedagogy, institutional readiness, and teacher competencies, among other things (Tinio, 2002). For example, teachers feel that they become merely controlled by machines where human aspects of work are disappearing and they are losing their privacy (Vrana, 2007). Furthermore, contextual and demographic impacts on user perceptions and attitudes have widely been investigated and reported as critical points for the decision makers to consider when planning and implementing e-learning solutions in higher education. Likewise, research is frequently pinpointing the incompatibility of e-learning models with contextual requirements of certain countries, particularly in the developing countries like Pakistan (Nawaz and Kundi, 2010a, 2010b).

Universities are now expected to contribute to society by widening access to higher education, continuing professional development, applied research, contributing to local economic impact, and improving social inclusion (Beebe, 2004). There are many obstacles for implementation of the ICT in universities for example, peoples' resistance to changes, etc (Vrana, 2007). Higher education has been on the rollercoaster for the last couple of decades with the advent of the first personal computer in the 1980s and then the Internet in the 1990s and not only

explicitly in terms of using innovative digital gadgets, but also implicitly in perceptions about and approaches to e-learning from behaviorism through cognitive to social constructivism or more specifically, from transmitted knowledge to negotiated and then harvested knowledge (Qureshi et al., 2009b; Kundi and Nawaz, 2010; Nawaz and Kundi, 2010b).

There are a number of challenges that face universities in developing countries as they seek to implement the e-learning systems. For example, African universities which should be in the forefront of ensuring Africa's participation in the ICT revolution, they are themselves unable and ill-prepared to play such a leadership role. This is because of the information infrastructure of African universities which is poorly developed and inequitably distributed (Sife et al., 2007; Nawaz et al., 2007). Implementation of ICT in universities is not an act but it is a long lasting process, which includes:

1. Building a communication and network infrastructure,
2. Providing adequate hardware and software,
3. Implementing transactional information system to record transitions,
4. Implementing MIS for different roles of managers,
5. Establishing computer centers to help users while using e-learning facilities,
6. Organizing high-performance computing for special research tasks,
7. Organizing training of all categories of users (Vrana, 2007).

Furthermore, high-quality digital teaching requires the administration to provide support by adequately funding the staffing of IT services, so that they can accommodate the demands of users (Ezziane, 2007). University computer centers view themselves as the center of excellence in all issues concerning e-learning. However, the question is not capability but efficiency of completing different tasks. For successful e-learning system university stakeholders have to share capabilities and resources between self-development of some solutions and their ordering from an external supplier (Vrana, 2007). The university sector has remained a leader in promoting the lifelong learning of its academic staff; however, recent changes in the universities have slipped away from this goal and academics interviewed from the USA, UK, Europe and Australia all report a decrease of resources for academic support (Davey and Tatnall, 2007).

DISCUSSION

Though there is multiplicity of factors in successfully capitalizing on the contemporary ICTs for education purposes; however, it is squarely anchored on the

'strategies and their implementation' in eProjects of higher education. The users must never forget that ICTs can contribute to learning but they cannot deliver learning. There is need to integrate technologies with pedagogy and learning models. Each institution implements its own models of learning; therefore it needs to ensure that the technology adopted is compatible (Drinkwater et al., 2004). For mass education, networked preparation of teaching is an appropriate and practical way of navigating the Internet based data sources but this collaborative approach requires new views on organizational behavior and communication (Aviram and Eshet-Alkalai, 2006). Thus, adaptivity and personalization are the key issues for implementing mechanisms to foster and increase activities in lifelong learning networks (Klamma et al., 2007; Nawaz and Kundi, 2010c).

Research tells that there is a perceived conflict between the requirements of industry for graduates trained in the specific tools, and the ability of universities to teach students in a broader and theoretical way, so that they are ready to use futuristic technologies (Hagan, 2003). Today's lifelong learners are in constant need to update knowledge and expertise therefore online, distributed lifelong facilities can be designed that cater for the lifelong learner requirements. However, merely introducing such facilities are not enough rather the learners should also be motivated to actually use and actively contribute (Klamma et al., 2007). A number of communities have an interest in and perspectives on the relationship between people and ICTs. These include industry, academia, designers, policy makers and other institutions (COST, 2007; Qureshi et al., 2009b).

It is therefore important to create an environment which helps students to "learn how to learn" effectively. The environment should also be customizable to fit personal preferences. Typically, students have different learning styles: Some learn fast and advance rapidly while others prefer to learn at a slower pace and repeat. In addition, some like working alone whereas others prefer to working in groups. ICTs also allow customization of the learning environment and accommodate different learning styles (Sirkemaa, 2001). The social grounds for an information system development project cannot be neglected in a serious research undertaking (Ågerfalk et al., 2006). In the context of developing countries, the conditions are quite similar to developed states in many ways, but different at the broader level (Qureshi et al., 2009; Nawaz and Kundi, 2010a; 2010b).

Figure 1 is the theoretical model representing the whole story discussed in this paper with regard to the current educational requirements of the world. Developing states are facing education-related problems since very long and had accepted that education for all the masses is not possible, so they were dragging with problems. Fortunately, ICTs have done the unprecedented in all sectors of life particularly education. Like advanced countries,

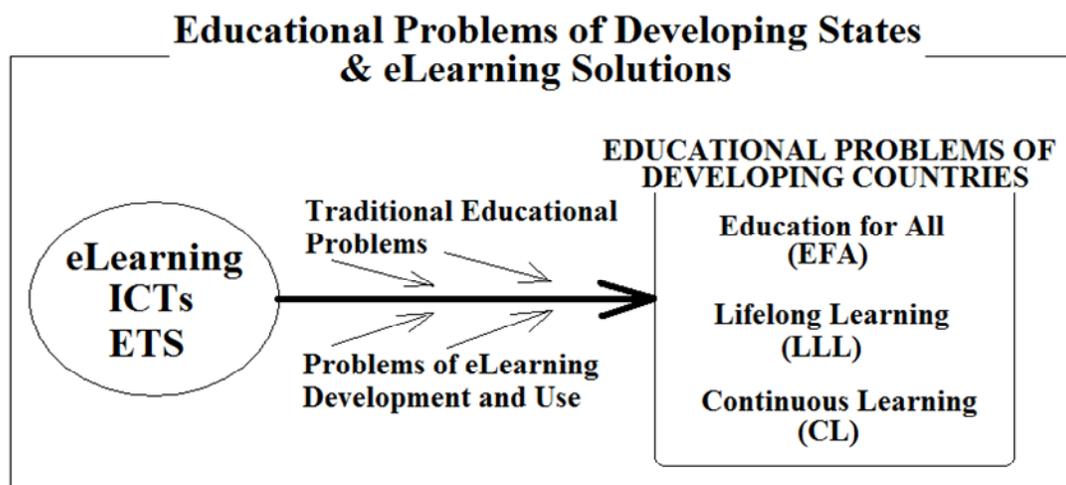


Figure 1. Showing the educational problems of developing countries and their eSolutions.

developing states are logging onto globalization, international connectivity, and global-resource-sharing but they are reported confronting challenges in this regard. They have to handle traditional issues (that is, shortage of resources) as well as manage problems of e-learning and development and use for strategically applying ICTs to address their educational problems.

The model shows the current situation (as it is) but it also suggests how the things should be viewed and handled (to be model). The objectives of EFA, LLL and CL can be realized very effectively provided the governments and institutions of the developing states conduct a rigorous local research to identify contextual determinants and then focus on the traditional and e-learning issues simultaneously.

Conclusions

The rapid growth of e-learning is occurring without our understanding of the differences between how students learn in an online environment and in the more traditional setting (Luck and Norton, 2005). Integrating technology into the teaching-learning transaction has been found to transform the teacher's role from being the traditional "sage on the stage" to also being a "guide on the side", and student roles also change from being passive receivers of content, to being more active participants and partners in the learning process (Mehra and Mital, 2007). People acquire their digital literacy in either or both of two ways: formally through courses or in the workplace, and informally, at home, from friends, and/or by themselves (Ezziane, 2007).

The higher academic institutions of a country are pioneers in adopting and using ICTs (Roknuzzaman, 2006). Appropriate use of ICT could enhance many

aspects of life in developing countries from health to education to economic growth. ICT lends itself to adopting a more people or learner-centered approach to education. They can facilitate a pedagogical shift entailing an educational interaction between teachers and learners. ICT, if used correctly, can encourage and support a meaningful two-way, informational flow between teachers and learners, moving away from the old "banking" method of teaching where knowledge is simply transferred from teacher to student without any space for critical analysis on the part of the learner (Wims and Lawler, 2007; Kundi and Nawaz, 2010; Nawaz and Kundi, 2010c).

Despite the theoretical benefits of e-learning systems, difficulties can occur if systems are not designed in accordance with the learner attributes, for example, differences in terms of nationality, gender, and learning styles (Graff and McNorton, 2001). On the one hand, there have been huge investments by the educational sector on the establishment and maintenance of educational media for students. On the other hand, there has been very little and sporadic knowledge about the usage of such media in education (Arulchelvan and Viswanathan, 2006). Despite research and testimony that technology is being used by more faculty, the diffusion of technological innovations for teaching and learning has not been widespread, nor has IT become deeply integrated into the curriculum (Mehra and Mital, 2007).

The developing countries have to consider all the aforementioned aspects of e-learning and plan everything in their true perspective. Both technological and human factors must be explored, analyzed and fed into digital plans so that true benefits of ICTs could be realized. The experiences around the world, as explained in the aforementioned pages, clearly suggest that availability of technology is not the guarantee for successful e-learning

systems. Psychological, social, cultural, and political dimensions of e-learning development and use must always be taken on priority and never ever ignored or skipped as irresolvable. Collaborative technologies like social software and blogging are very helpful in addressing human issues of resistance, lack of interest, etc because today not the user rather technologies can adapt according to the personal teaching and learning styles of the users in education.

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