E-Learning: Closing the Digital Gap Between Developed and Developing Countries

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Abstract: As there are many gaps between developed and developing countries, Digital Gap is one of them. Research has raised the idea and question of e-learning closing this gap. Research has identified, compared, evaluated and reviewed the issue from both the angels of literature and quantitative research. The focus has been to assess the e-learning potential to provide quality education though electronic means and review to what extent this is going to be feasible. ICT infrastructure, channels of communication, learning styles, the role of teacher and classroom and blended learning has been discussed.

Key words: Digital Divide, E-Learning, Digital Gap, Information Communication Technology (ICT), Learning Styles, Blended Learning.

INTRODUCTION

As there are many gaps between developed and developing countries, Digital Divide is one of the gaps. It refers to that disparity between individuals and /or communities who can use electronic information and communication tools, such as internet to better the quality of their lives and those who cannot (Salinas, 2003). It is the gap between individuals, households, business and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies, and to their use of the internet for a wide variety of purposes (OECD, 2001).

There are different ideas to fill this gap such as improving the ICT infrastructure. The study has focused on the idea of E-learning to close the digital gap. For this idea, research has focused on the following questions.

- Can e-learning close the digital gap between the developed and developing countries?
- Has e-learning got the potential to provide students with the same quality education in their hometown in developing countries?
- To what extent this system is going to be feasible in deprived areas?
- What are the problems faced by e-learning in developing countries?

To find answers to these questions, research has assessed the e-learning potentials based of different factors. Factors such as ICT infrastructure, gender difference, channels of communication, learning styles, the role of teacher and classroom, blended learning and potentials of e-learning, and were compared, evaluated and reviewed from both angels of literature and quantitative research components. Traditional and electronic methods of learning were compared, learning styles and theories were explained, challenges that were thought to be hindering the development of e-learning in developing countries were discussed. The implications of the research findings were discussed and avenues for future investigation were explored.

Background:

Today societies need individuals who can think critically and strategically. Members of the societies should be able to learn, think and to easily adapt the new changing environments, and to be able to build their knowledge by using new sources and different standpoint (Reich, 1992). These attributes contrast with the traditional, historical belief that learning takes places principally in the classroom and mainly with children (Cross, 1981) (Knowles, 1984). Traditional instructional models do not seem to be adequate anymore to prepare individuals to cope with the demands of today’s societies. Hence these arguments build up a scenario for the change in learning environment from traditional to more flexible one that meets today’s demands.

Businesses and higher education institutions in developed countries were familiar with the e-learning jargon since the massive developments in information and communication technologies in the late 1980s and early 1990s, since than there have been considerable improvements in the platforms and systems used to support e-learning and e-training. On the other hand developing countries have just started their projects on ICT infrastructure development which is the very first step towards the e-learning transformation.
This slow pace of development in adoption of ICT is widening the digital gap between both the divisions. Thus it is important to fill this gap by some suitable means to bridge this gap.

**Literature Review:**

**What is Digital Divide?**

Digital divide is a very complex phenomenon (Arendt, 2008). It is discussed in many disciplines including: sociology, political science, economy, business, information systems and philosophy (Hongladarom, 2003) (Kitiyadisai, 2003) (Wielicki, 2006). The term digital divide is simply defined as the gap that exists between those who have and those who do not have access to the modern ICT such as the telephones, computers, internet and related services (Ani, 2007).

The question is how to bridge this divide. Some argue that we can bridge by e-governance (Mutula S.M., 2005) and some has proposed the role of libraries to close this gap (Cullen, 2003). Research sees e-learning as solution to close this divide.

**What is E-Learning?**

Today e-learning is one of the mostly used phenomena in the internet world. Higher education institutions, businesses and trainers are increasingly going online in order to provide cheap and flexible online education and training. One can easily observe and experience this in developed countries. E-learning can be defined as the use of computer network technology, primarily over or through the Internet to deliver information and instruction to individuals (Welsh, 2003) or it is the use of internet technologies to deliver various solutions to learners (Rosenberg, 2001). It is beyond the scope of the research to discuss the definitions of the e-learning rather it will explore its potentials to close the digital gap. To do that research will discuss some e-learning related issues first.

**I. Learning Style:**

There are many learning style models such as Kolb’s (Kolb, 1984), Honey and Mumford (Honey, 1982), and Felder and Silverman (Felder, 1988). All these learning style models and other educational theorists and researchers consider learning styles as an important factor in the learning process and agree that incorporating them in education has potential to facilitate learning for students (Graf, 2008). The Myers-Briggs Type Indicator (Lawrence, 1993) classifies learners according to their preferences on four scales such as Introverts Sensors Thinkers and Judgers.

Unfortunately traditional method of teaching and learning are failing to design its learning contents according to the learners’ learning style preferences. There is less or almost no relationship between the learners learning style and the presentation of their learning content here in Pakistan. Such inconsistencies were common in traditional mode of learning and were agreed by the quantitative research participants. The traditional contents are more likely to support verbal and intuitive learners who better understood theories, thoughts and written texts, whereas half of the research participants were sensory and visual. They needed visual added tools such as graphs, diagrams, demonstrations, sights and sounds.

**II. Communication Channels:**

The use of electronic communication and collaboration channels play important role towards building an interactive e-learning environment. The e-learning model is described as an asynchronous web-based solution that is self-paced and supported by collaborative tools such as online instructors, email, chat rooms, or threaded discussions (Hall, 2002). Both ‘Synchronous and Asynchronous Methodologies’ require some form of communication channels between the learners and instructors to communicate with each other. It synchronizes and creates interactivity in learning process and keeps them up to date with learning activities.

Though there are arguments about the tools used in the e-learning communication such as e-mail and discussion board. Such as, an all-inclusive supply of multiple communication possibilities does not guarantee precise and successful communicative performance of E-Learning participants (Manfred, 2002). Still it is obvious that e-learning requires some forms of e-communication channels to share information with each other. Quantitative research has gone to compare the usage of such tools among traditional learners to find their e-readiness (Figure 3).

**III. Role of Teachers:**

In traditional environment learners totally depends on the teachers’ initiatives and ideas (Broadbent, 2002). In conventional classrooms, a teacher’s job is to “tell”, and students’ tasks are to “listen” and the learning objectives of students are set by the teacher and institution. As a result there is a less interactive environment in the class, which makes the students less involved (Li W., 2010).
The impact of e-learning on the role of traditional teacher was obvious and they are now named e-teachers or ‘expert learner’ by Joann Harrison (Harrison). Their role has become far more challenging than ever before. From course ‘teller’ now they have become course designer, developer, organizer and coordinator.

**Quantitative Research:**
Evaluation of issues in literature review was carried out by the statistical research project. Research questions were designed to cover key research objectives. Research participants were university students in Pakistan and 87 students participated in the research. Analysis of questionnaire data was conducted and findings were reviewed and compared to the literature where appropriate. Clear implications for e-learning development in developing countries were produced from this project which was a crucial output and evaluative target of the research. Following is the research findings and discussions.

**I. Access to ICT Infrastructure:**
Research participants had a mixed reaction over the critical role of ICT infrastructure whereas the literature review named it as one of the major challenges to the e-learning adoption because most of the participant had access to computers either at home or at their educational places. It created some doubt about the ICT infrastructure as a major barrier. It can be derived that investments into educational institutions for ICT infrastructure are more productive rather than helping on individual bases (Figure 1). From now on in Pakistan we must not call ICT infrastructure as a major problem for e-learning.

![Graph: 1 Access to PC](image1)

**II. Gender Issue:**
Interestingly research found a relationship between the access to ICT infrastructure and gender issues in developing countries. 35% of the participants had no access to internet at home and 71% of them were female (Figure 2). In developing countries people are more willing to spend for educating male rather than female.

![Graph: 2 Gender without Internet Access](image2)

**III. Learning Style:**
By comparing the quantitative research results about the learning style with the research in literature, there were differences of ±33% among both the studies. But still both researches observed that educational background had impact over the learning styles. As participants had traditional learning background therefore they showed tendency of having verbal style rather than visual.

Fig. 1: Computer Access.

Fig. 2: Internet Access.
IV. Communication Channels:
Discouraging results were found over the use of multimedia and communication channels. Only one quarter of the participants had used some form of communication channels to communicate with their co-learners or teachers (Figure 3). Bearing in mind that most of the participants had access to computers or mobiles and some had access to internet.

![Graph: Communication Channel Usages](image)

Fig. 3: Communication Channel Usage.

V. Self-Paced Learning:
Interestingly research participants neither agreed to self-pace independent learning nor they agreed to be traditionally taught by a teacher. Bearing in mind that majority of the participants had traditional learning background and was used to with the supervised work. It was unusual and weird for them to imagine learning without a supervisor so they disagreed with the idea of self-paced learning (Figure 4).

![Graph: Self-paced learning](image)

Fig. 4: Self-paced Learning.

VI. Blended Learning:
87% agreement was found over blended method of learning which was defined as a blend of self-paced and instructor led learning (Figure 5). High agreement level over the issue of blended learning meant that unacceptable self-paced learning was only acceptable when it is blended with the instructor led learning or supervised learning.
Conclusion:

Despite cultural, language, ICT infrastructure and many other challenges and gaps between developed and developing counties, participants remain optimistic about e-learning. It is good to be optimistic but the time is too short and pace of development is too slow. Time factor should be kept in mind that developing countries are already lacking behind and as the time passes by very fast the gap widens. Though generally people in developing countries have access to computers by now but they are unable to take its full advantage without a reliable internet infrastructure and healthy training. If a reliable infrastructure takes another 10 years to be built by that time developed counties might have moved forward too fast and gap would have been further widened. Positive and solid steps need to be taken as soon as possible to close the digital gap.

There was a great scope for further research to uncover the areas in details. Also there was difference in male and female response nature as one sex might be more sensitive and curious on some issues than the other and that would make a lot of difference on the research results. Point needed to be considered for any future research. Further research was required in the area of learning theories and their relationship with the learners as it has a significant impact.

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