A Review on E-learning Development and Implementation in Developing Countries (Case Study of Iran)

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ABSTRACT

E-Learning refers to the use of Information and Communications technology to enhance and/or support learning process. Today E-Learning in the context of education is a vital component. The objective of this paper is to review e-learning challenges in developing countries and specially to know what we have achieved in Iran, and what else we need to do make e-Learning as a major success which transforms Iran to knowledge society. Our finding have shown that the following factors can be attributed for hindering the success of e-Learning projects in Iran: process focus, implementation expertise, technology focus, open-source technology and one-time funding.

Keywords
E-Learning, Open Courseware (OCW), Open Source Technology

1.0 INTRODUCTION

In this paper, the discussion is about e-Learning in context of higher education in developing countries and specially in Iran. The objective of this discussion is to analyze what have we achieved so far, and what else we need to do make e-Learning a major success which transforms Iran. Why e-Learning is important to solve Iran's need for trained manpower is well documented and spoken about by various academicians, industry bodies and thought leaders. So, in this paper, we start with the fact that e-Learning is a need for Iran, to help Iran achieve its growth targets. Based on this Fact, we try to figure out how we reach there.

To start with, let us understand what exactly e-Learning refers to. Broadly speaking, e-Learning refers to the use of Information and Communications technology to enhance and/or support learning. It covers a wide range of tools and technologies including e-mail, internet, video streaming and virtual classrooms. For our discussion, we will focus more on e-Learning in context of a student connecting to a network and accessing course material, getting his queries answered and collaborating with teacher and/or students. Normally this will include asynchronous tools like usage of course management system or learning management system and synchronous tools like video streaming and virtual classrooms. The student has option to select what he wants to do, within the broad profile of his study plan.

This paper firstly shares some facts about 2 very popular overseas e-Learning initiatives – British Open University and MIT Open Courseware (OCW). The next section discusses why e-Learning has not taken off, with an analysis of factors contributing to the same. Next, it looks at how education and training is getting impacted by technology, how the student profile and preferences are changing.

The paper, finally, will review Iranian e-Learning initiatives, and shares information and statistics about their success – both real and perceived. It talks about many popular and well-known ones and refers to many other smaller and not-so-well-known initiatives. Building on it, a recommendation is made to make e-Learning projects successful, scalable and sustainable in developing countries specially Iran.

2.0 EDUCATION AND TECHNOLOGY IMPACTS

The World Wide Web and advances in Open Source Software have led to an eLearning Revolution, where students can access a plethora of learning materials, easily and conveniently. This has been propelled by the Hardware Industry where the processing power of computers is doubling every 18 months (Moore's Law) and yet the prices either reduce or remain the same.

Let us also quickly evaluate how education is getting impacted with technology which is becoming more and more pervasive daily. The impact of technology and internet can be summarized as follows:

- Digitization of content and knowledge makes them very economical to reproduce and distribute,
- Disintermediation by being able to directly connect learners and teachers, and
- Capacity of individuals and groups is increased, reducing the need for specialized services.

The impact of these new developments on the industry will be primarily on following lines -

1. Delivery of learning through direct teaching will gradually shift to learning support through mentoring and coaching.
2. Learning will become more personalized. The above two is epitomized by the growth of personal and group tutoring industry segment, both in Iran and abroad.
3. Learning service delivery will become more ad-hoc and on-demand.
4. Services will be increasingly delivered by a group of institutions at any given time.
5. Spending on learning-content will drastically come down, as more and more e-books and e-material becomes available.
6. Content classification, indexing and marketing services will gain prominence.

3.0 SUCEESS STORIES IN DEVELOPED COUNTRIES

Looking outside Iran and at the whole world gives us a much large population of e-Learning projects to look at. However, let us look at 2 very popular and well-known e-Learning initiatives in developed countries to understand more of their success and shortcomings.

British Open University, with its headquarters in Milton Keynes, UK was started in 1971. With an initial enrollment of 25,000 students it immediately became the second largest in UK, next only to University of London [9]. Today, British Open University has more than 178,000 students and is the largest in UK. More importantly, for the third year in a row, it had the highest satisfaction scores from students (95%, as measured in September 2007) [8].Further 50,000 organizations have sponsored staff for Open University courses. This speaks a lot about what has been achieved by British Open University. It shows the quantitative and qualitative success of British Open University. Considered by many to be the world's leading distance learning institution [10], it is important to analyze what makes it work so well.

One of the key factors as per analysts is that British Open University has a very strong process of collecting, analyzing and using course-correcting data about the courses and services of the university. It offers a comprehensive learning support service to students from initiation to completion of program. Further, it has experimented and used multiple technologies to make it work. Starting from TV broadcast, CD-ROMs and now

Internet based learning management systems; it has evolved and improved with latest technology as it became available. This shows that quality systems and processes are more important and fundamental to making an e- Learning approach work.

MIT (Massachussets Institute of Technology) Open Courseware (OCW) is another very popular e-Learning initiative from MIT, USA. It was started in 2001, and today (as of January 2010) it hosts about 2100 courses. OCW is a free publication of MIT course material, covering most of the courses taught at undergraduate and graduate level at MIT. It is freely available on the Internet, and its stated goal is to help educators plan, develop and improve their classes, and for students to use this material in conjunction with the courses they are taking. Again, let us understand the impact of OCW. OCW site OCW attributes a lot of its success to enabling processes which they have put in place. Some of these include -

1. Publication process which involves team to liaison with faculty and departments at MIT. It also ensures standardization of content and works towards making content richer and deeper. OCW team has embarked on initiatives like engaging students to take notes, which are then transcribed by OCW staff. OCW staff also work with faculty to secure citation on third-party intellectual property.

2. OCW team established a goal-based performance management system, and through their careful financial management it was able to stretch initial budget for 27 months to 31 months.

3. Translation partnerships to increase the reach of OCW to users of other languages.

4. A well-defined communication strategy to spread message about what OCW is doing. It included monthly newsletters being sent to worldwide subscribers. The technology used by MIT OCW is from Sapient Corporation, Microsoft and developed internally at MIT. Technology has been recognized as a key enabler for the OCW project.

In Developing e-learning content for Australia (2003) these Key features of good online resources, from a student's perspective were introduced: accessibility (fast to download, easy to read, easy to navigate), use of appropriate online features and good content design, i.e.

- the learning content is enhanced by careful selection of appropriate and current learning resources
- is motivational and engaging
- the learning material is clearly presented and accurate, and appropriate level of instruction given
- the content is written in appropriate style and format for online, and is complemented with downloadable, printable material

This guideline also mentions several factors have led to an increased emphasis on content development as a separate and more specialized activity include:

- Communication and interaction between students is an important part of effective online learning.
- Technical issues play a far bigger role in the development on online content than in traditional print-based resources.

4.0 E-LEARNING IN DEVELOPING COUNTRIES

More than 60% of students who qualify for University or tertiary education in the developing countries are not able to join due to limited physical infrastructure. With the introduction of e-learning, these students can be admitted in extra mural programs.

E-learning has launched to incorporate in developing countries and is believed to have huge potential to meet growing demand for education while facing shortage of teachers. E-learning can be seen as a tool for raising the number of students who have access to higher education, especially groups in rural areas. In spite of e-learning advantages and goals, challenges are plentiful; in many developing countries there is a lack of vital e-learning components such as computers, electricity and skills; and the active, participative student that is required for interactive learning is also very rare in countries where the tradition is to teach in a more traditional . For those concerned with implementing e-learning in developing countries it is important to understand all challenges.

One of the problems with education in the developing world is that many teachers get very poor resources to work with. If they are lucky enough to get text books, they are usually second hand and from a developed country whose education system is quite different from their own. The high costs of producing appropriate teaching resources means that teachers often have to do without resources.

In some ways, most technologies are designed and deployed in a developed country context, and thus

have a number of limitations when trying to implement in a developing country. Additionally, many developing countries still don't have many specialists in ICT in education, and rely mainly on the precious few of enthusiastic, over-worked, pioneering teachers to drive change in their schools.

Table 1.Conceptual framework for challenges of e-learning

Categories	Subgroup	Challenges
Individual	Student	• Motivation • Conflicting priorities • Economy • Academic confidence • Technological confidence • Social support (support from home and employers) • Gender • Age
	Teacher	• Technological confidence • Motivation and commitment • Qualification and competence • Time
Course	Course Design	• Curriculum • Pedagogical model • Subject content • Teaching and Learning Activities • Localization • Flexibility
	Support provided	• Support for students from faculty • Support for faculty
Contextual	Organizational	• Knowledge management • Economy and funding • Training of teachers and staff
	Social / Cultural	• Role of teacher and student • Attitudes on e-learning and IT • Rules and regulations
Technological		• Access • Cost • Software and interface design • Localization

Andersson and Grönlund(2009) have been studied and analyzed several related papers regard to e-learning activities in different developing countries and finally they developed a conceptual framework for e-learning. They discussed on challenges of e-learning in developing countries and they found 30 challenges and summarize them in four categories: courses, individuals, technology and context. They stated that 'The overall conclusion of these challenges are equally valid for both developed and developing countries; however in developing countries more papers focus on access to technology

and context whereas in developed countries more papers concern individuals'. Because challenges are interrelated, based on their findings a conceptual framework of emerging issues for e-learning in developed and developing countries was provided by them. They suggest that this framework (Table 1) can be useful to guide both practice and research.

5.0 E-LEARNING INITIATIVES IN IRAN

Every college and university in developed countries is discovering exciting new ways of using information technology to enhance the process of teaching and learning and to extend access to new populations of students. Long sides, many universities in developing countries like Iran are investing significant capital for developing virtual universities or virtual sections in the conventional campus.

Arguably, the most talked about Iranian e-Learning project is the NPTEL project. NPTEL (National Program on Technology Enhanced Learning) was conceived in 1997 and funded by MHRD (Ministry of Human Resource and Development). Under the project, 7 IITs (Iranian Institutes of Technology) and IISc (Iranian Institute of Science) Esfahan worked on the 160 million Toman (160,000$). From 2003 to 2006, to create 112 video courses and 116 web courses. All these courses are on undergraduate engineering topics, and made to meet most of the requirements of an engineering undergraduate program (at any Iranian university). These courses are available to students, working professionals and colleges (both government-aided and private) at virtually no cost or very low cost.

Coming to the usage of NPTEL resources, here are some interesting statistics – Number of visitors – In the initial 10 month period since September 2006, there were 580,000 visitors to the site and of which 160,000 registered.

NPTEL video course details from YouTube – As per YouTube site, it is YouTube Iran's most subscribed Channel with 10,148 subscribers and 353,632 views of the channel.

One of the observations is that there is lot of interest (more so during initial launch period), but it is not getting converted into results. The students/ institutions still need to be able to convert this into a usable experience, and improve their learning.

Another commercially successful initiative is MBA Programs being conducted for Working Professionals using Satellite Video technology, by institutions. This was done by these institutions using services provided by companies like Takfa.

1. Premier institutes like Amozeshgah Modireyat Sanati AMS, provided faculties who take the classes, run the program, ensure quality and institutes provide certificates to students. Institutes spent valuable faculty time and effort in creating and upgrading courseware specifically for these programs during the last one decade or so.

2. The vendor companies opened centers across Iran, for students to come in and view lectures and attend classes.

Normohamad ya'qubi this initiative launched in 2004 uses satellite technology to connect 4 campuses of Sharif University located in 2 cities of Iran. There is collaboration with

1. Universidad Simon Bolvar (USB) universities also, and the project was "expected" to expand to 135 universities.

2. BITS Pilani – It has established a virtual university, with DIT sponsorship. BITS has been one of the pioneers in distance education. BITS has been providing courses for working professionals in distance education mode leveraging technology [5].

3. Isfahan University of Technology – It started a new inter-disciplinary "Masters in Multimedia Development" course in 2000-01 as a distance education course using print material, CD ROM, and web-based learning environment. Technology was provided by CDAC Kolkatta and CMC.

4. Allameh University – It worked on a project in 2006-07 to take its distance education program online, starting with a few courses which are industry-relevant.

5. Central Institute of English and Foreign Language, Ghazvin – It had a project for online learning software set-up and usage in 2006.

6.0 DISCUSSION AND CONCLUSION

Many developing countries don't have high speed internet access, due to a myriad of factors including but not limited to intermittent electricity, use of expensive low bandwidth satellite technology, and inadequately trained personnel. Internet access is less than 10% in Africa alone.

Fortunately many countries have started deploying nationwide backbone ICT infrastructure, built on high speed fiber cables. Several countries in East and Southern Africa have also invested in undersea cables to tap the global Internet super highway. In order for developing countries to accrue the benefits associated with e learning, they need to think of

innovative ways to deliver online content on the national backbone, instead of relying on the unreliable and expensive Internet. Another challenge for implementing eLearning is training of academic staff in the use of ICTs to deliver online training. With academic staff over burdened by large student numbers, the introduction of eLearning is prone to face staff resistance.

E-learning in Iran is still in its infancy stages and there are only a few online programs. The history of e-learning in Iran at present time did not exceed more than 7 years, yet from a realistic point of view we might say that e-based learning in Iran has had a 6 year experience and even younger. E-learning in Iran is delivered by both the private sector and government organizations. There have been risen a plenty of virtual universities or centers like Amirkabir University of Technology, Iran University of Science and Technology, Shiraz virtual University and some Islamic virtual collages and centers like Islamic virtual centers and Faculty of the Science of Hadith.

Based on above finding, it seems the bottleneck to growth of e-learning in Iran can be explained here. Following factors can be attributed for hindering the success of e-Learning projects in Iran:

1. Process focus – To make an e-Learning project successful, enabling processes are very essential. These processes are required to determine learning path for students, feedback collection and using the same for changes, quality control and student support. In Iranian context, lack of organizational alignment process is also a major impediment. Pedagogical processes also need to be much stronger to make the project successful.
2. Implementation expertise – Iran lacks individuals and organizations with successful e-Learning project implementation expertise. This is true in both the Academician and in private sector organizations serving the academic community. Lack of this expertise, leaves most projects to the fate of experimentation. Coupled with other factors mentioned here, most projects are doomed to fail.
3. Technology focus – Iranians by nature, are technology-oriented. This has been accentuated by the phenomenal growth of Iranian IT industry. The by-product of this growth has been the presence of many small and large Iranian IT companies almost across the country. At the last count, we estimate there are more than 45 such e-Learning companies in Iran
4. Open-source technology – Iranian academics are very enthused by the availability of open-source software and technology for e-Learning.

In fact many small e-Learning projects are running on open source technology.
5. One-time funding – Almost all e-Learning projects in Iran, are funded with one-time grants from central government bodies and/or institutions. The project team never ever evolves a sustainability model to keep the project running, once the initial funds are over.

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