

E-LEARNING: CAN IT HELP THE EDUCATION IN BANGLADESH?

Al-Sakib Khan Pathan*

CSE Laboratories
Department of Computer Science and Engineering
North South University
Dhaka, Bangladesh
E-Mail: spathan@northsouth.edu

Md. Mehedi Hassan

BRAC Education Program (BEP)
Bangladesh Rural Advancement Committee (BRAC)
Dhaka, Bangladesh
E-Mail: mehedi_27@hotmail.com

CONTACT AUTHOR

Al-Sakib Khan Pathan
CSE Laboratories
Department of Computer Science and Engineering
North South University
12 Kemal Ataturk Avenue, Banani
Dhaka-1213, Bangladesh
Phone: (880-2) 9885611~20
Ext. 119
Ext. 309
880189477533 (cell)
shatil_pathan@yahoo.com
spathan@northsouth.edu

POSTAL ADDRESS

House: 3 (Ground Floor), Road: 20/D
Sector: 4, Uttara M/T
Dhaka-1230, Bangladesh

E-LEARNING: CAN IT HELP THE EDUCATION IN BANGLADESH?

Abstract

E-Learning could be defined as instructional content or learning experiences delivered or enabled by the current advanced computer and other technologies. In many cases, especially in the developed countries, adoptions of E-Learning alongside the traditional classroom learning have shown promise for effective human learning. Being a developing country, adoption of E-Learning in Bangladesh stumbles, where many other factors come into play side by side the technological limitations. The intent of this paper is to identify the prospects and challenges for launching E-Learning in larger scale in Bangladesh. We also discuss how human learning process could be influenced by E-learning strategies and why E-Learning could be helpful for a country like Bangladesh.

Keywords – E-Learning, Human Learning, Bangladesh, ICT, Internet

1. INTRODUCTION

E-Learning refers to the utilization of information systems and information technology in educational services. Various applications and processes that could be delivered in synchronous or asynchronous format, like web-based learning, computer-based learning, virtual classrooms, digital collaboration etc. are the examples of E-Learning methodologies. E-Learning has become a widely accepted concept mostly in the developed countries. Adoption of E-learning in many of the developing countries, however, has become a real challenge [1,2]. Being a developing country with limited access to the current advanced technologies, Bangladesh is not an exception.

Education and capacity building are now being considered as the critical steps for entering into the new global economy. For a developing country like Bangladesh, E-Learning could be considered as a critical facet of basic development, an alternative medium of capacity-building and a means to people's empowerment [3]. This paper starts with a brief discussion of human learning process and influence of E-Learning on human learning process and then argues on why, how and where E-Learning could be introduced in Bangladesh. The major barriers to E-Learning for Bangladesh are also pointed out in this paper.

The structure of this paper is as follows: Section 2 discusses human learning process from the viewpoint of cognitive science and analyzes the effectiveness of E-Learning on human learning in brief, Section 3 deals with the current scenario, challenges and prospects of E-Learning in Bangladesh and Section 4 concludes the paper.

2. HUMAN LEARNING PROCESS AND E-LEARNING: AN OVERVIEW

2.1 Human Learning Process

Human learning process (HLP) is driven by the human input channels and human memories. Basic Input channels of a human being include vision, hearing, and touch or haptic perception [4, 28]. Cognitive science classifies human memories into three categories: the sensory memories, short-term or working memories and long-term memories [4, 26]. Human Input or sensory channels continuously receive various types of information from the surrounding environment, but only a portion of the total input information is passed to the human memories. In Figure 1 we show a pictorial view how iconic, echoic or haptic inputs are sent to the long-term memories for permanent storage or learning.

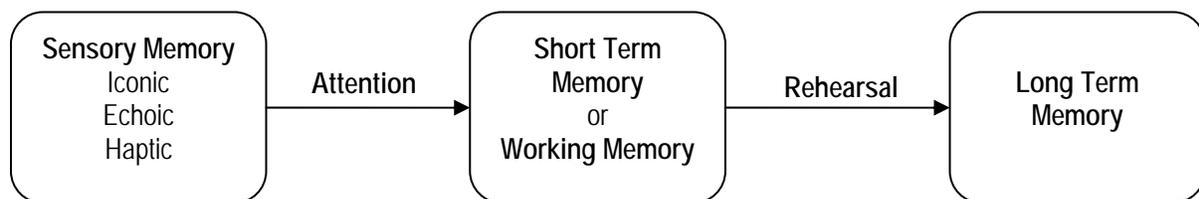


Figure 1: Human Memories for HLP

We consider *attention* (concentration) and *rehearsal* of the subject matter as; the two crucial aspects of the human learning process. Hence, we can define human learning process as the passing of input information from the sensory memory into the short-term memory by *attention* and storage of the information in long-term memories by *rehearsal*. Hundreds and thousands of neurons keep separate information segments [16], which work together for the interconnection of different information segments for retention process or learning.

HLP also depends on different learning modes and learning styles. Several studies have been made in the past on human learning process [17, 18]. William Glasser, an Educational Psychologist describes the effectiveness of different modes of learning as [5]:

- 10% of what we read is retained (R)
- 20% of what we hear is retained (H)

- 30% of what we see is retained (S)
- 50% of what we see and hear is retained (S & H)
- 70% of what we discuss with others is retained (D)
- 80% of what we experience is retained (E)
- 95% of what we teach someone else is retained (T)

Figure 2 shows a comparative picture of different learning modes.

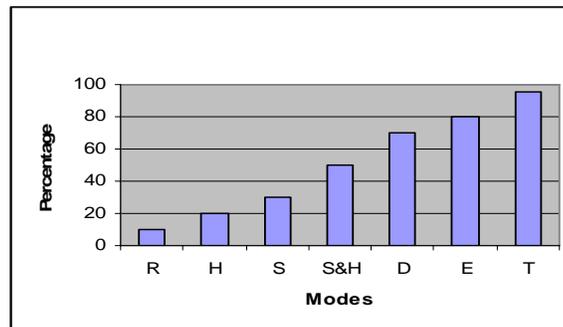


Figure 2: Comparative picture of different Learning Modes

2.2 Learning Using Technology: E-Learning

Learning with the help of technology could be really effective, if it is done properly [6, 19, 20, 21, 22]. Attention to the subject matter could easily be drawn with E-Learning as it uses visual graphics, text, images, audio and video data for presenting the learning contents. Combination of all these, not only attracts the learner but also enables the use of different human sensorial modes for learning. When a learner engages different human I/O channels for learning, it helps for the entire learning process and even for better retention in some cases.

E-learning is often termed as ‘*Learner driven-Learner Centric Learning*’ [22, 23, 24] while traditional classroom learning is termed as, “*Teacher Centric Learning*” [6, 7, 24]. We present the conceptual views of

the two learning methodologies in Figure 3 and Figure 4 which demonstrate the direction of data flow for classroom learning and E-Learning.

E-learning is a learning methodology where the learner plays the dual role of a teacher as well as a learner. If, to teach a person is the best way to retain any information and to be taught by using the technological tools and devices, it could really help the person for fastening the learning process. A dashed-curved line in the figure 4 shows the learner's personal involvement as a teacher in the E-Learning process. Again, sometimes E-Learning gets the advantage over the traditional classroom learning as; the learning process could be repeated again and again. If a learner uses a web site or a power point slide or any other E-learning material, then the opportunity arises to make frequent *rehearsals* of it. In case of a traditional classroom, it might not be always possible because; the teacher might not repeat the same topic for the second time in the class. However, E-Learning is not self-sufficient to replace traditional classroom learning [24] rather, use of a Mixed-Mode, Blended Approach [1] could be more effective for learning process.

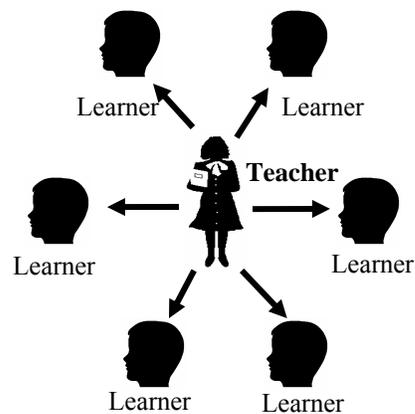


Figure 3: Conceptual view of a real Classroom

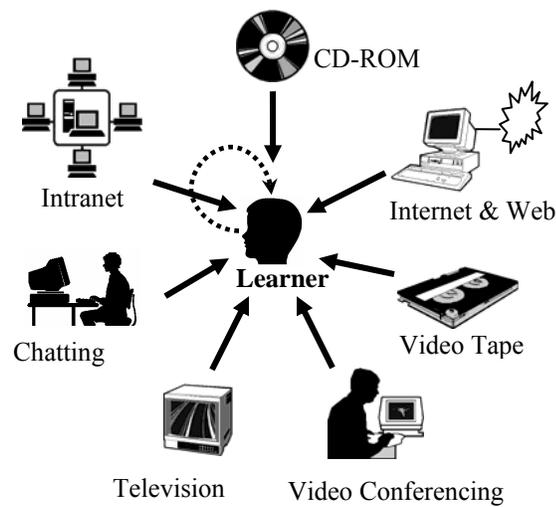


Figure 4: E-learning Scenario

3. E-LEARNING IN BANGLADESH

3.1 Is E-Learning fit for Bangladesh?

Knowledge has become the currency for future. The '*Anytime, Anywhere and by Anyone*' nature [8] of E-Learning makes it an attractive tool for dissemination of skills and knowledge of the developed countries to the developing countries. It could also be useful for the portion of the population in a developing country, which cannot enroll in the formal educational programs. In case of Bangladesh, the teaching resources are also very limited. Compared to the number of students, the number of teachers is really very small. In this situation, E-learning could be a very effective way to deliver quality learning-materials to all the learners. When illiteracy is one of the major issues in Bangladesh and the goal of 'Education for All' is being vigorously pursued [9], employment of E-Learning could be a good solution for attracting the learners for ensuring attendance in the primary schools. While attracting the learners is necessary mainly for the primary level; for secondary and tertiary level, E-Learning is sometimes more than necessary to ensure the quality of education. Already some of the universities in Bangladesh have started to offer online courses as

well as virtual classrooms via web sites and in the form of audio-video tapes under experimental basis (for example, East West University, Asian University of Bangladesh etc). Many of the university teachers have realized the importance of using E-materials alongside their class lectures. However, large-scale implementation of E-Learning in all the educational levels is a challenging task in Bangladesh. The following section identifies the barriers and challenges that are hindering the growth of E-Learning in Bangladesh and also suggests some feasible solutions.

3.2 Challenges and Prospects for Employing E-Learning in Bangladesh

3.2.1 Information and Communication Technology (ICT) Infrastructure and policy

Information and Communication Technology (ICT) encompasses the broad fields of data/information processing, transmission and communications by means of computer and telecommunication techniques [10]. For successful implementation of E-Learning, a strong ICT infrastructure is the pre-requisite. The present state of ICT infrastructure in Bangladesh does not include even the most basic services and information on an institutional level. As E-Learning is a complete technology based learning strategy, without a robust ICT infrastructure adaptation of E-Learning is a difficult task. A good ICT infrastructure could definitely promote E-literacy skills for all; for example, by designing and offering courses for public administration, taking advantage of existing facilities such as libraries, multipurpose community centers, public access points or by establishing local ICT training centers with the cooperation of all stakeholders [11]. It could be very helpful to eradicate adult illiteracy as well.

At present there is an ICT policy as part of the overall national plan [10], and the government has declared ICT as a "Thrust sector"[12]. Enacting the friendly ICT policy has opened the door for introducing the advanced technologies for the education sector.

3.2.2 Bandwidth of Internet Connections

Greater Bandwidth of Internet connection helps the designers and online tutors to provide and design the learning materials in a better way. It enhances their thinking and designing capabilities. The standard today used in developed countries is of high transmission rate for transmitting roughly a page of text, a medium sized image, or even a few video frames. On the contrary, in Bangladesh, the bandwidth is shockingly low to handle audio and video data in most of the cases and even only text data in some cases. Bandwidth limitations preclude the use of different multimedia applications; flash driven applications, Java applets, video, and videoconferencing, which are important tools of E-Learning. Within a short time Bangladesh is going to be connected to the international submarine cable network and the government is thinking about the expansion of the fiber optic cable networks for the telephone networks in Bangladesh¹. Yet, it will take some time before the bandwidth problem could be well diminished.

At present, keeping the E-Learning materials as simple as possible could face the problem of bandwidth. It is better to develop E-Learning materials with the absence of audio-video data or flash driven applications to deliver them over the web. Using text based web pages with a limited use of relevant images could be helpful in this context.

3.2.3 Internet Access

Internet access is still limited for several reasons like poor electricity networks, high cost of computers, weak telephone networks, lack of knowledge of Internet etc. Internet connections are available mostly in the major towns and cities with limited penetration to the rural or sub-urban areas of the country. The positive aspect is that, Internet usage in Bangladesh has increased rapidly over the last few years. The numbers of Internet Service Providers (62 ISPs) and Cyber Cafes have also increased [13]. As a result of

¹ Science and ICT ministry, Bangladesh

their competition, prices have fallen greatly and several ISPs are now offering flat monthly rate. Browsing habit among the learners for learning various topics from the Internet has also increased to a great extent.

Our survey on some cyber cafes shows that, the average number of users has increased dramatically throughout the year 2004. The output of our survey is shown in the Figure 5. We targeted three cyber cafes in three different places in Dhaka city. Two cyber cafes (CC1, CC2) with the capacity of 10 computers and one (CC3) with 8 computers and each of them remain open for 12 hours in a day. We started to check the log books of the cyber cafes from January, 2004 and continued the work with two months interval. So, for the months of January, April, July and October in 2004 and January 2005 we got the following data sheet.

Table 1: Number of individual users in different months in the selected cyber cafes

	Jan-04	Apr-04	Jul-04	Oct-04	Jan-05
CC1 (10 PCs)	210	285	290	351	417
CC2 (10 PCs)	207	250	250	310	435
CC3 (8 PCs)	280	296	312	340	378

Our survey shows that, when the average number of individual users in these cyber cafes was only 232.33 \approx 232 in January 2004, it has been increased to 410 in January 2005; which is approximately 77% increment in a single year.

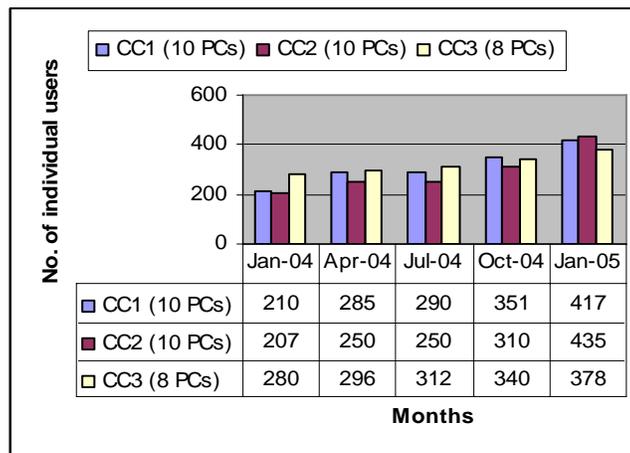


Figure 5: Number of individual users in the cyber cafes in different months

Though the growth is mostly in Dhaka and in the major towns, we believe that, this trend is also growing among the learners and students of other areas of the country. Now-a-days, in some universities and institutions, some of the teachers are using their personal websites for delivering assignments and classroom lectures. Despite a huge reduction in cost and increasing use of Internet, to the majority of people, Internet is still inaccessible or unaffordable.

3.2.4 Audio, Video Tapes and CD-ROMs

Audio-video tapes and CD-ROMs could be some handy alternatives to Internet for delivering E-Learning materials in Bangladesh. In particular, the use of audio cassette players is quite wide spread in Bangladesh. Many people also use video technology. Again many of them have computers without Internet access. In this situation, audio-video tapes and CD-ROMs could be considered as the primary tools of E-Learning in Bangladesh. We consider that, E-Learning is basically the technology driven or technology based learning. So, involvement of the web or the Internet is not always applicable, rather use of the information and communication technologies for learning purpose could be termed as E-Learning in this case.

Recently Bangladesh Rural Advancement Committee (BRAC), a well-reputed NGO (Non Governmental Organization) has taken an initiative to produce learning materials using CD-ROMs for the secondary level learners in the country². The production of such materials will need resources, technical know-how and time. Cooperation and collaboration in this area among E-Learning providers will surely be extremely useful for the expansion of E-Learning in the country.

3.2.5 Technical Knowledge of the Learners

² Source: BRAC Education Program

According to the latest estimation, only 43% of the total population in Bangladesh is literate [14]. However, very small portion of this literate population is aware of the technologies. Though the first main frame computer came to Bangladesh in 1964, the usage of PCs became popularized very late to the common people [15] and also Internet came late with UUCP (Unix to Unix Copy Protocol) email beginning in 1993 and IP connectivity in 1996 [27]. Computers and other technical devices are still accessible mostly by the middle, higher middle, and rich class of the total population. Nevertheless, proper technical knowledge is often missing among the major portion of the overall population. It is in fact, a great hindrance for introducing E-Learning in larger scale.

To cope with the global boom in ICT education, the government has taken necessary steps to introduce computer education in the secondary and higher secondary levels throughout the schools in different areas in Bangladesh. Many of the public and private universities are also offering computer science related degrees. Still the number of quality graduates in computer related subjects is very low [12].

3.2.6 Learner's Participation in E-Learning

In Figure 4, we have shown how the learner plays the dual role of a teacher as well as a student in the E-Learning process. In this case, the person playing the dual role should have the capability to understand the learning contents delivered through different electronic media for self-teaching. Most of the E-Learning materials available in the web or delivered using other technologies are produced in English or other foreign languages. In case of Bangladesh, the major portion of the learners comes out from Bengali medium. As a result, most of them suffer from poor knowledge in English. Hence, even if the E-Learning contents are made very much available to them, it will be very hard to get the maximum benefit from it. A good solution to this could be the use of the native Bengali language. In fact, use of native language is preferable for any kind of learning [25].

Developing such Bengali-based E-learning materials has become possible as already some Bengali word processing software (Banglaword, Bangshee etc) have been introduced which have reduced the burden of typing Bengali electronic articles using complex key strokes. Again, some Bengali websites are also developed which could be inspiring examples for spreading E-Learning using the native language. Using of the native language could be a feasible solution for ensuring greater participation of the learners in the E-learning programs.

3.2.7 Cost of E-Learning Contents

E-Learning contents could be expensive, especially when they are customized. A country like Bangladesh, where poverty is one of the major issues, the high cost of using E-Learning would discourage the learners to use E-Learning. So, the costs should be minimized to an acceptable level for the common users, while the content is expected to be of high quality for attraction. If the people find them useful within an affordable cost, it certainly would get the popularity in Bangladesh. Usage of animations often increases the cost, hence, using little or no animation in E-Learning materials could be a good idea for keeping E-Learning accessible to the common people.

4. CONCLUSION

The title of this paper is basically a question. The quest for the appropriate answer has generated some interesting and crucial information that could be helpful for launching large-scale E-Learning programs in Bangladesh. The ultimate goal of E-Learning is to bring the learning to the learners, not to bring the learners to learning. This could be the major point to make E-Learning acceptable to all in a developing country like Bangladesh. Another critical challenge still remains. By its very nature, E-Learning is easy to sign up but the completion rate is not always satisfactory [29]. For a country like Bangladesh, when the drop out from the formal education programs is very high, the question eventually arises; Can E-Learning

change the trend? Most probably the simplest answer is; not only more research and evaluations of the pilot E-Learning projects remain to be done, but also it is too early to tell.

REFERENCES

[1] Bose, K. "An E-Learning Experience: A written analysis based on my experience with primary school teachers in an e-Learning pilot project", IRRODL, Volume 4, Number 2, October 2003

[2] "Asia-Pacific e-Learning Alliance", Report on e-Learning and Best Practices, January 2002,

http://www.ovta.or.jp/en/pdf/files/apec2001_cs_5.pdf

(Last accessed March 2004)

[3] Sehrt, M. "E-learning in the Developing Countries", UN Chronicle, Digital Divide into Digital Opportunities, 2003

[4] Masum. M. A., presentation slides on cognitive science and HCI, Islamic University of Technology, found at, <http://www.iutoic-dhaka.edu/~mamsheikh> (last accessed 2nd February, 2003)

[5] Brogan, P. "Using the web for interactive teaching and learning", aCEDemia, Volume 1 Issue 06, August 2003

[6] Pathan, A-S. K. and Islam, H. K., "A study on the key factors for effective E-learning", Asian Journal of Information Technology, Volume 4, Number 1, 2005, pp. 49-52

[7] What is e-Learning?, found at <http://www.internettime.com/itimegroup/forum/tilt.htm>

(Last accessed 5th September, 2004)

[8] <http://www.aunwesh.com/elearning.htm> (Last accessed 29th December, 2004)

[9] “Education of Bangladesh”, <http://www.discoverybangladesh.com/meetbangladesh/education.html>
(Last accessed 1st January, 2005)

[10] National Information and Communication Technology Policy, Ministry of Science and ICT,
Bangladesh, October, 2002

[11] Draft Plan of Action, World Summit of Information Society, Geneva, 14th November, 2003

[12] Bangladesh Software Industry Survey Report, Japan External Trade Organization (JETRO), 2004

[13] Rahman, S. “An Overview of ICT and OSS in Bangladesh”, 3rd Asia Open Source Software
Symposium, Hanoi, Vietnam, March, 2004

[14] Education Sector of Bangladesh, Ministry of Education, Bangladesh, 2004

[15] Rahman, H., “Internet in Bangladesh: A Millennium Perspective”, Nepal IT Conference : Kathmandu,
Nepal, Jan 27 - 28, 2001

[16] Cassily, J. F., “Theory of Sequentially Timed Learning”, retrieved from
<http://www.accd.edu/sac/psychol/2301.090/sequentlearn.htm> (Last accessed October, 2004)

- [17] Dunn, R. and Dunn, K.,. “The Complete Guide to the Learning Styles”, Inservice System, Allyn & Bacon, 1999
- [18] Caine,G. and Caine, R., “Making Connections: Teaching and the Human Brain”, Innovative Learning Publications, Addison-Wesley Publishing, Menlo Park, CA, 1994
- [19] Bersin, J., “Measuring E-learning’s Effectiveness”, LTI Magazine, March, 2002
- [20] Barron, T., “LoD Survey: Quality and Effectiveness of E-Learning”, May, 2003 found at <http://www.learningcircuits.org/2003/may2003/qualitysurvey.htm> (Last accessed 21st June, 2004)
- [21] Villiers, R. D., “Usability Evaluation Of an E-Learning Tutorial: Criteria, Questions and Case Study”, Proceedings of SAICSIT 2004, ACM, pp. 284-291
- [22] Kapp, K. M., “E-learning basics: essay: The e-learning market: it's about the learner, not the instructor!”, eLearn Magazine, Volume 2003, Issue 6, June, 2003, ACM, p. 1
- [23] Hiltz, S.R. and Turoff, M. “What makes learning networks effective?”, Communication of the ACM, Vol. 45, No. 4, Sept, 2002,pp. 56–59
- [24] Zhang, D, Zhao, J. L., Zhao, L, and Nunamaker, J. F. Jr, “Can E-Learning replace Classroom Learning?”, Communications of the ACM, Vol. 47, No. 5, May 2004. pp 75-79
- [25] “Best Practices: The Use of Native Language During Instructional & Non-Instructional Time”, pp. 1-4 found at http://www.doe.state.in.us/lmmp/pdf/native_language_use.pdf

[26] Information Process Theory of Learning, from <http://tiger.coe.missouri.edu/~t377/IPTheorists.html>

(Last accessed 24th September, 2004)

[27] Press, L., “Against All Odds, The Internet in Bangladesh”, The MOSAIC Group, Fairfax, VA, March 1999

[28] Roco, M. C. and Bainbridge, W. S., “Converging Technologies for Improving Human Performance”, Kluwer Academic Publishers, London, 2003

[29] Martinez, M., “High Attrition Rates in e-Learning: Challenges, Predictors, and Solutions”, The eLearning Developers’ Journal, July 14, 2003, pp. 1-9

<http://www.elearningguild.com/pdf/2/071403MGT-L.pdf> (retrieved 3rd November, 2004)