*Proceedings published by International Journal of Computer Applications® (IJCA)ISSN: 0975 - 8887*

# Emerging trends in Learning Technology and Their potential for Learning in Rural India

Shripad K. Dixit
Lecturer
New Arts, Commerce and Science College, Wardha

Shubhangi T. Raut
Lecturer
New Arts, Commerce and Science College, Wardha

## ABSTRACT
Technology continues to change the way we live, work, and play. Technology has a striking impact on learners and learning. Learning technologies can adapt to the needs, requirements and preferences of each individual user, therefore they can provide equal access to all. Learning technologies present the opportunity to augment or replace the role which was traditionally played by the teacher. Technology is also changing education in two ways: first, by offering new resources to engage students in learning, and second, by giving them an opportunity to learn about new technological fields. We would not dispute that a blackboard is a learning technology, but it is not the kind of artifact to focus. The fundamental interest is in how technologies expand human capabilities for knowledge creation, sharing, and learning, so the interest is in the technologies for learning. Today, we have an extraordinary technologies that range from Internet games to various types of handheld devices, and some of them are well-suited for immerse learning environments. This paper provides an overview of recent trends in industry and media that have made technology-based learning such a rapidly growing phenomenon. This paper gives the benefits and challenges that are associated with providing learning via technology. This paper also presents two emerging technologies - The Next Generation Internet and Natural Language Interfaces and discusses their potential for Learning in Rural India.

## Keywords:
Cognitive system, Learning Technology, *Natural Language Interfaces*, Next Generation Internet, Technology Based Learning

## 1. INTRODUCTION
'Learning' is not new; it has existed for millions of years. Learning is intimately connected with and dependent on the human cognitive system. Learning means that the cognitive system acquires information and stores it for further use. If these processes do not occur properly, then the learners will not initially acquire the information, and even if they do, then they will not be able to recall it later, and/ or the information will not be utilized. Regardless whether the objective is learning new information, acquiring new skills, or knowledge sharing and transfer within the individuals or across organizations — the processes of acquiring, storing and applying the information are critical. The question is how to achieve these cornerstones of learning and whether technology can enhance them.

The answer is: The learning must fit the human cognition. There is a lot of scientific knowledge and research on human cognition and learning. The difficult challenge is how to translate this theoretical research into practical ways to utilize technology so as to enhance learning. By joining the basic research about learning and the brain into ways of using learning technologies, one is able to create sophisticated learning programs and as a consequence produce effective and efficient technology enhanced learning.

## 2. LEARNING TECHNOLOGY
Learning is not new; it has existed for millions of years. In fact, it is a characteristic of intelligence and of being human. In contrast, technology, and its application to learning, is a very new enterprise. So now the obvious question – What is Learning Technology? We can define learning technologies quite broadly. For example, cell phones can be a learning technology. With the right software, handheld Game devices and other types of entertainment consoles can be learning technologies, as well as elementary devices such as electronic blackboards and software for presenting information such as PowerPoint can also be a learning technology. Obviously not all technologies relate to learning. It is not simple to define which technologies are Learning Technologies. In simple words, Learning Technology is defined as: The application of technology for the enhancement of teaching, learning and assessment. It can also be defined as Learning via electronic technology, including the Internet, satellite broadcasts, audio and video conferencing, bulletin boards, chat rooms, webcasts, and CD-ROM. Learning Technology includes computer-based learning and multimedia materials and the use of networks and communications systems to support learning. Learning Technology holds the promise of substantially transforming the way learning takes place because of its numerous advantages. Among these, it promotes greater accessibility to learning by offering anytime and anywhere delivery. It is readily scalable to both large and small groups since it can accommodate larger numbers of learners at little extra cost and smaller groups of learners. From the learners' point of view, Learning Technology can be self-paced and matched to the learner's needs. It offers the prospect of promoting greater understanding and retention, particularly for complex materials, because of its clear use of simulations and game-playing. Perhaps for these reasons, TBL has witnessed marked growth in the training marketplace in government, industry, and education. Learning Technology is nearly synonymous with Technology Based Learning(TBL). Therefore, the paper uses these terms interchangeably.

## 3. LEARNING TECHNOLOGY'S FUTURE
The Internet holds the promise among educational technologies. On the Internet, users cannot only view all types of content from text to pictures to music; they can also interact with it, alter it, create new content, and spread it back to a wider community. In addition, the medium is well matched to the new requirements of education and training in the knowledge-based economy.

Another key feature of Learning Technology is that it emphasizes 'learning solutions' and 'learning results,' and is contextual and can be personalized. Due to this it allows a new way to integrate learning with work. For example, Rather than training workers on every possible procedure , with the help of Learning Technology, workers have access to the training module for a given process only if and when they need it delivered via a handheld computer.

Since much of TBL technology is so new, no leading paradigm has been established regarding the most effective delivery of content for the various modes that are available. In fact, a number of technologies moved to trash in just the past few years, after appearing to be tremendous breakthroughs when first introduced. To avoid this potential pitfall, the following sections will describe different TBL methodologies and their applications without trying to rank them or rate their efficacy.

## 3.1 Advantages and Challenges

Learning Technology comes with considerable benefits. It offers geographic reach and a scalability of training and educational efforts that face-to-face interaction cannot achieve. It also offers a wide range of learning modes and an ability to track progress and measure outcomes as a part of learning. However, as with all technology applications, the use of technology in itself poses some new challenges. With Learning Technology, the most significant problem is the digital divide, which splits the country into digital haves and digital have-nots. In addition, transferring learning into a technology environment creates additional challenges for educators and training designers.

### *3.1.1 Advantages*

There are numerous advantages to TBL in comparison to face-to-face learning. Some of the primary benefits are the following:

• Accessibility, offering anytime and anywhere delivery
• Training that is self-paced and matched to the learners' needs
• Full scalability
• Timely dissemination of up-to-date information
• Streamlined and effective learning delivery

### *3.1.2 Challenges*

The introduction of TBL is not without challenges. They include:

- The digital divide - caused by low computer literacy rates and lack of access to technology among some learners
- Higher attrition rates
- Accommodating individuals with disabilities
- Technology incompatibility
- High development costs
- Lack of credibility

# 4. METHODOLOGIES

Learning Technology is transforming training and education by providing new technological opportunities to address new learning needs. Technology-based learning programs come in different delivery modes and forms. They can include online tools, such as discussion boards and e-mail, and real time events, through videoconferencing and web conferencing. They can be self-paced, and have a varying focus of instruction. Technology-based learning uses a series of delivery methods and hardware and software tools to manage and deliver learning content and manage and track learner progress, as well as learner-to-learner and learner-to-instructor communication. An essential component in a Learning Technology package, is the ease with which the learner can interact with the contents. This is often referred to as the HCI, or Human-Computer Interface. Following are the most common delivery methods and tools used in Learning Technology:

- Drill and practice

Drill and practice packages offer structured reinforcement of previously learned concepts. They are based on question and answer interactions and should give the student appropriate feedback. Drill and practice packages may use games to increase motivation.

- Tutorials

Tutorials are used to teach new concepts and processes. Material is presented to the student in a structured format. Tutorial software usually includes worked examples and gives the learner the opportunity to assess their understanding with questions, answers and feedback. Intelligent Tutoring systems are capable of corrective feedback and adapt their presentations to suit the learner, based on the actions of the learner.

- Information retrieval systems

Information retrieval systems store knowledge in a structured way and allow the learner to browse or search for information as required. They include on-line databases; structured information systems such as dictionaries and Encyclopedias and also hypertext and hypermedia reference systems.

- Simulations

Simulations model an experiment or a real life or imaginary situation. The context of the simulation may be a business plan or a laboratory experiment or an animation of the working of a chemical plant. Simulations usually are based on interactive graphics and give the learner the ability to visualize a process and explore the effect of changing parameters on the operation of the system.

- Cognitive tools for learning

Cognitive tools for learning are based on the constructivist principle that learners need to construct their own understanding of new concepts. These tools give the learner a way (often graphical) of representing their understanding of new knowledge and concepts and how they relate to existing knowledge and concepts. Expert systems and authoring tools can also be used in this way, allowing the learner to present his/her understanding in a way that can be accessed by other learners.

- Productivity Tools

Productivity tools include applications such as word processors, spreadsheets, databases, graphics, desktop publishing and presentation packages. Whilst these tools are not specific to Learning Technology, if used within a pedagogical framework, they can support learning by enhancing the quality of the learning process and by improving student productivity.

- Communication tools

Computer-mediated communication takes several forms including electronic mail, electronic conferencing, video conferencing and the World Wide Web. These tools allow learners to share ideas and information, to cooperate, to collaborate on joint work and can also be used for submission and publication of students assignments and of tutors' comments on students' work.

*Electronic mail (e-mail)* is an asynchronous communications medium, not requiring the recipient of a message to be co-ordinate in time or place with the sender. Further, e-mail can be used one-to-many, as well as one-to-one.

These characteristics are helpful in maintaining communications between tutor and student, tutor and students and among students since they overcome constraints of distance and time. E-mail is also a useful tool for course managers particularly where distance or open learning components are involved.

A further category refers more to learning about computers rather than learning with computers.

# 5. BLENDED LEARNING

The experience with CD based and online learning has shown educators and trainers that learning that is delivered via technology is not the remedy to teach students and train workers. In the past few years many educators and trainers have begun to consciously mix different elements of Learning Technology and face-to-face learning into a blended learning model.

Blended learning, also known as hybrid or integrated learning has recently become the dominant paradigm for TBL success among training designers and experts. Blended learning typically refers to a training approach that combines a mix of online and face-to-face training for improved engagement and better retention. Blending face-to-face with online activities also has the potential of bringing the best of both worlds together in a single course. In its most basic form, it combines a synchronous face-to-face lecture with some online follow-up activities, such as discussion forums or chats. While blended learning does not represent a new concept, it is having an effect and changing training design in the market. There is also evidence that blended learning is more effective than non-blended approaches.

Technology-based learning can be implemented in a wide array of forms including blended learning, distance education, instructor-led classes, or just-in-time training. Learning Technology can offer a variety of applications in government, industry, and education.

# 6. LEARNING TECHNOLOGY FOR RURAL INDIA

Technologies to enable learning have tremendous potential for India. However, the benefits of these technologies must be made available to the rural masses of India; otherwise, they will only widen the Digital Divide. Various technologies have been used over the years to propagate Distance Learning including the Radio, TV and now the Internet. There are several problems which affect Rural India but amongst them, a major problem is that literacy amongst farmers and rural folk of India is very low. Emerging technologies such as The Next Generation Internet and Natural Language Interfaces will enable several innovative applications in learning and enable parallel learning by helping to break the cycle of literacy followed by computer literacy.

## 6.1 The Next Generation Internet:

The Internet has grown so fast and wide that there is tremendous happening on the Net. The Next Generation Internet hopes to rectify that by providing higher bandwidth and better quality audio and video to enable Multimedia as well as a high amount of interactivity which is so essential in learning. The basic purpose of the Next Generation Internet is to increase bandwidth and quality of service so that a new generation of applications could be possible on the Net. Learning is extremely easy when it is in the form of Virtual Reality, Multimedia and Collaborative interactivity. The Internet in its current form is unable to handle such heavy loads to enable such high quality distance learning to the Rural masses. Furthermore, as more and more users get on the Net, the Net is unable to provide the level of quality needed for high-end interactive learning applications. Applications which can be enabled by this technology include Virtual Laboratories and Digital Libraries. The student based in Rural India will be able to access the best Libraries and Laboratories in the World.

The Next Generation Internet will also permit Virtual Laboratories by which students using Laboratory instruments connected to the Advanced Internet will be able to conduct a Laboratory experiment remotely. The Ministry of HRD Govt. of India's VLab project is already a step in the direction of Virtual Libraries. Therefore, a student in a Village in India will be able to virtual access the best Laboratories in the country.

## 6.2 Natural Language Interfaces

Natural Language Interfaces is another area, which could be of great use in learning. The technology, though in a budding stage today, has a tremendous potential for Rural India. There is already a lot of work going on in this technology in India - prominent among them being the projects at CDAC, NCST, and at IIT Madras, Kanpur, Bombay. Natural Language Interfaces is a way by which humans can communicate with the machine in a language that is natural to them. The Interfaces to Natural Languages can be to various areas including Intelligent Tutoring systems and Virtual Reality systems. In an e-learning environment these technologies could be of great use to build various customized training applications for the Rural Indian. Natural Language Interfaces along with touch screen technology and voice enabled inputs could be a way by which the National Literacy mission could be achieved through a process of learning. In addition, automatic translation systems are available today on the Web, which enable automatic translation of messages and content from English into several International languages. Developments can be made by which our villagers will be able to access the Net in their own language and hence dependency on an English translator will be reduced.

The Ministry of Information Technology is already involved in several projects such as Bharat Bhasha Kosh, Web based learning system in Indian languages, IIT Madras have developed an Indian Language word processor which has been tested at an NGO in Madras. These technologies have great potential for Rural India, especially speech based systems since learning can actually be voice enabled through this technology and the villager will be freed from his lack of literacy and therefore inability to communicate.

# 7. CONCLUSION

Learning Technology offer a great and powerful tool which can enhance learning. Considering the learners, we note that when the learning material is simply presented to the learners, they are passive and so learning is minimal. In contrast, when learners are active and motivated, when they are involved, participating, engaged, and interacting with the material, then learning is maximized. It is maximized because it activates and correctly taps the cognitive mechanisms of learning, such as attention, depth of processing, and other processes. Given the great importance of achieving the active participation of the learners, can Learning Technology help accomplish this?

The answer depends on utilizing technology so as to promote the three C's of learning: Control, Challenge, and Commitment. Each of these is not easily achieved, but if technology can support them, then it can offer great gains and benefits that make Learning Technology worthwhile. At the same time, a number of accounts of high drop-out rates and lack of user

satisfaction suggests that TBL is by no means a sure-fire strategy.

The new level of learning using technology is more sophisticated, superior, and can achieve short and long term objectives that otherwise are not possible. New horizons and opportunities are now presented by learning technologies, but let us use them wisely, based on scientific knowledge. Otherwise, these technologies are doomed to failure, taking with them those who use them.

There are several technologies available to enable distance learning today. Two such emerging technologies which have great potential for learning in Rural India are The Next Generation Internet and Natural Language Interfaces. Both these technologies are still at a very early stage both in India as well as abroad, however, our Industry and policymakers can take advantage of these technologies and utilize them for the benefit of the rural masses of India.

## 8. REFERENCES

[1] Allen, M. 2002. Discovery learning: repurposing an old paradigm. Learning and Training Innovations.

[2] www.aic.nrl.navy.mil

[3] www.ai.about.com/compute/ai/lib

[4] Nilay M.[ 2000] E-Learning for Rural India

[5] Gibbs, G. [1993] Improving the quality of student learning, Bristol, TES

[6] Greitzer, F. 2002. A cognitive approach to student-centered e-learning. Human Factors and Ergonomics Society 46th Annual Meeting.

[7] www.internet2.edu

[8] International Society for Technology in Education — National Educational Technology Standards http://www.iste.org/

[9] Itiel E. Dror University College London. Technology enhanced learning:The good, the bad, and the ugly

[10] Kindley, R. 2002. Scenario-based e-learning: a step beyond traditional e-learning. Learning Circuits

[11] Strudler, N., & Hearrington, D. (2009). Quality support for ICT in schools.

[12] Technology and Learning Online — Research Forum http://www.techlearning.com/intervie.shtml

[13] Tucker, B. (2009). Beyond the bubble: Technology and the future of educational assessment.

[14] Vinz Koller,Sandra Harvey,Micheline Magnotta. Technology-Based Learning Strategies