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Technology Mediated Training

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Abstract
Technology has penetrated all spheres of our life today and the field of education is no exception. In fact the impact of technology and various media on education has been so impressive that the teacher is no longer the sole provider of information. This signifies a paradigm shift in the method of teaching as the teacher is taking over the role of a guide and facilitator of self directed, technology-aided learning. However, it is being increasingly realized that technology should not be used indiscriminately. Using technology should not become an end in itself but rather remain as the means to reach the goals of education. Ideally, it should be a means to maximize learning. One of the most exciting changes in teaching/training has been brought about by advances in ICT and by the availability of these technologies in learning/training environments. This is possible because of the relatively low cost of softwares, computers and the Internet availability. Implementation of technology based training programme requires a lot of planning. It is very important for a teacher/ trainer to understand how ICT technologies can be useful in different areas. This paper focuses on some of the education technologies available and their use for educational training and development. It attempts to discuss the need of ICT competencies in education system and about computer mediated communication.

Key words
Computer mediated learning, Educational Technology, WebBased Learning, E-learning, Collaborative Learning. Computer Based Training

I. Introduction

Technology is getting well trenched into every sphere of our life, be it agriculture, health, communication, defense and so on. So no wonder, the field of education has not remained insulated from it. There has been a significant and positive impact of technology on education, especially on the teaching-learning process. It has been realized that technological devices of the modern world can revolutionize education. Useof technology in training is not merely developing technological skills and competencies, it involves developing in the student teachers the ability to continuously update themselves, to ascertain the kind of technology suitable for the learning experience to be provided and use technology to optimize the process of education.The UNESCO (2002) documents Information and Communication Technologies in Teacher Education a planning guide states the importance of ICT in teacher education as follows:

"With the emerging new technologies, the teaching profession is evolving from an emphasis on teacher-centred, lecture-based instruction to student-centred interactive learning environments. Designing and implementing successful ICT-enabled teacher education programmes is the key to fundamental wide-ranging educational reforms…." Teacher education institutions may either assume a leadership role in the transformation of education or be left behind in the swirl of rapid technological change. For education to reap the full benefits of ICT in learning, it is essential that pre-service and in-service teacher have basic ICT skills and competencies. Teacher education institutions and programmes must provide the leadership for pre-service and in-service teachers and must be model in the new of pedagogies and tools for learning. They must also provide leadership in determining how the new technologies can best be used in the context of cultural, needs and economic condition within their country.

The above documentary passage clearly states the vital need for incorporating ICT in teacher education programme *i.e.* both in –service and pre-service. The document further suggests that there should be 'articulation and disseminations of a vision of how ICT fit into the broad society and education. Therefore to improve the teaching –learning process, the both policy- maker and educators can build a strong national policy regarding use of ICT.

II. Competency Development and Training Issues

We can say that "competency" is a set of related knowledge, skills, and attitudes that enables us to complete a job or a task. Competencies are achieved in different ways like, experiences in life, education, job-experience, self- learning and of course, training. Competency can be assessed and an organization can enhance the competency of its human elements through education as well as training. First of all it is necessary to decide the competency to be developed for professional development and thus fill the gap between the existing level of competence and the desired one. Thereafter an analysis of the components of the competence to be built is made, *i.e.* mapping the competence. For example, competence in assessment techniques would comprise preparation of blue print for a test, constructing a test, administering it, grading etc. it is also be ensured that the training imparted would actually lead to the building of the competencies. This requires identification of the barriers to developing a new competency, which could be the inadequate previous experience, negative attitude, etc.

We know that training can be through lectures and discussions that may or may not integrate technology and also through technology as stand alone devices that bring to the trainees the softwares prepared for imparting training. Today the demand is for life long learning and the employees need to be trained on a continuous basis for keeping pace with advancements in knowledge. Training huge number of people through face to face mode is often not feasible and may be a time consuming affair. Hence, training packages, complete with instructions and assessment are prepared and delivered through technology for self learning and training.

In the rapidly changing socio-economic scenario, teaching and learning and also training through technology is becoming common. It is essential that to remain abreast of the latest developments in one's respective field one has to undergo training regularly. In the days to come teachers and other professionals will not have to go somewhere in order to be trained. Technology is bringing training facilities to your desktops. However competence to use technology becomes the first requirement in this case. We shall now discuss about the knowledge, skills and attitude required in building basic ICT competency, which is the prerequisite for

accessing technology based training:

Knowledge : An understanding of the fundamental concepts of ICT is needed. One should appreciate the possibilities and advantages of having data in an electronic form. Knowledge about the main hardware and software components used in the field of education and their potential and especially about the changing role of the teachers/trainers is needed. An understanding of evaluation strategies through technology is also required. Also understanding of the major theories and principles of learning and their application to the use of teaching/training delivered through ICT will be helpful.

Skills : Skills to apply common ICT hardware and software tools, using ICTtools to access updated information, design and revise curriculum, carry out assessment, etc. are some of the skills needed.

Attitude : In this Information age learning must be a life long process as knowledge and skills being imparted are vulnerable to rapid change. Reflective thinking has to be encouraged rather than memorizing lots of facts and theories and this is the basic requirement for technology based self learning and training. Technophobia- the fear of using technology is the major problem with many. This has to be taken care of and a positive attitude is to be nurtured towards the use of technology.

III. Technologies for Training Purposes

Todaydifferent types of technologies are available to support and enhance learning and are used for imparting training. Technologies like video, audio, digital movie making, podcasting, laptop computing, mobile and hand held technologies, etc. are being commonly used for training and teaching. It is very important for us to select the right kind of technologies and understand the fact that different technologies serve different purposes in the education system. For instance, e-mail, chat and blogging promotes the education network of students, teachers and trainers, which besides facilitating exchange of information, improves communication skills. Word processing, presentation and spreadsheet promote productivity and organizational skills. Simulations and modeling software promotes the understanding of concepts in reality. Hence, it is essential to consider how these technologies differ and what features make them important as tools for education.

IV. Hardware Technologies

Computer : In the last decade or so, the hardware technology of the computer has undergone many changes. From few kilobytes of RAM(Random Access Memory), now the PCs have huge storage space. Other drives and monitors have also emerged with better performance and lower cost. These fast changes ensure unlimited possibilities of using video, audio and stimulations in teaching and training.

Mobile and Handheld Devices: In general computers can be classified as desktop and laptop. Now small size computers that can be hand held are available. Mobile /handheld devices such as iPod, PDAs, (Personal digital assistants) and mobile devices are widely used in education both as academic administrative tools. Following are some of the possible ways to use mobile/ handheld devices in teaching/training:-

- Different activities like interviews, oral examination, oral report, presentation, group discussion, etc. can be recorded for future use, for tutor evaluation, peer evaluation, and self-evaluation.
- Learners can listen to authentic audio materials e.g. music, speech, interview, audio book, poem, etc. at their own timings.
- Learners can create and access multimedia materials e.g. movie, documentary, visual glossary, presentation, assignments, projects, etc.

Computers can be very useful for storing huge amount of data related to training such as trainee profile, results of evaluation, etc. This is stored in the hard drive of the computer.

The terms 'hard drive' and 'hard disk' are used interchangeably. Today's hard disks provide fast access and can hold several gigabytes of information as compared to megabytes on floppy disks. But the hard disk is permanently fixed in the computer cabinet; We rarely plug it out because detaching it frequently is not safe. Hence, to carry data we need some removable memory disks that are described below:

Floppy disk: It is a removable disk that stores information magnetically. We can use a floppy disk to read /write information and transfer it between computers, or to make a backup of our files. Floppy disks are 3.5 inches in diameter and have a storage capacity of 1.44 MB. Because the possibility of data loss or error from these discs is high, they are now not much in use. As compact disk technology has become cheap, floppy disks are replaced by compact disks(CD).

Zip disk: This is also a removable disk which can store 100-250 MB of data. A special 3.5`` removable disk drive is needed to retrieve the information from the computer and write to the zip disk. An external zip drive can be moved from one computer to another.

Cartridge tapes: These are magnetic tapes similar to cassette tapes used as a storage and backup device. Backup and retrieval of stored information is slower with tapes because the information is stored sequentially. The computer must search in sequential order to find the desired information, rather than by sectors. The advantage of tape cassettes is that they can be purchased with large storage capacities (1-4 GBs)allowing the entire contents of the hard drive to easily fit on one tape.

CD-ROMS : Compact disks can store approximately 650-800 MB of data or 74-80 minutes of music. Most software programs today are shipped on CD-ROMs instead of floppy disks. All computers today come with CD-ROM drives that are part of the computer's multimedia configuration. They are connected to a sound card, which provides the computer with stereo speaker capabilities,which we can have used for musical CD-ROMs to be played on our computer. These drives are read only and cannot be used for recording data.

Digital Video Disc(DVD) : It involves a type of optical disc storage technology. A digital video disc (DVD) looks like a CD-ROM disc, but it can store greater amounts of data. DVDs are often used to store a few full- length movies and other multimedia content that requires large amounts of storage space. But to run the DVD we should have a DVD drive in our computer.

USB/Flash Drive : USB drives are one of the popular removable disks in current time. It is a plug-and-play portable storage device that uses flash memory and is lightweight enough to attach to a key chain. These drives can be used in place of a floppy disk, Zip drive disk, or CD. When the user plugs the device into their USB port, the computer's operating system recognizes the device as a removable drive. Unlike, most removable drives, a USB drive does not require rebooting after it is attached. It also does not require batteries or an external power supply, and is not platform dependent. Several USB drive manufacturers offer additional features such as password

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protection, and downloadable drivers that allow the USB drive to be compatible with older systems that do not have USB ports. USB drives are available in capacities ranging from 032 MB to 8 gigabytes, depending on the manufacturer, in a corresponding range of prices.

V. Software Technologies

In contrast to the hardware, softwares are the non-physical components of the computer system like concept, idea or procedure, generally a set of instructions called programs and a set of programs which give a finite output. These software tools include those for word processing, spreadsheets, graphics, communications tools, multimedia, simulation, etc.

Word processing Tools: Word processing is an ability to create, store, and print documents using a computer program called a word processor which provides special capabilities beyond that of a text editor such as the WordPad program that comes as part of Microsoft's Windows operating systems. Their basic functions include typing, saving documents, and opening documents, copying, printing and checking spelling. As mentioned above there are many different names of software for different operating systems like Microsoft Word, Word Perfect, WordPad, Apple Works, etc.

Presentation Tools : In today's world, it is very important for us to present our ideas effectively; one way is the use of graphical presentation tools. We have different presentation tools available and among these, a popular one is Microsoft's Power Point Presentation tool which is a part of Microsoft Office like Microsoft Word. It allows the presenter to create high quality presentations. It is provided with options for consistency in design and colour. Different Power Point templates are available with thousands of color schemes available and a complete set of easy-to-use tools assures you have everything you need to get your point across and share information with others. A PowerPoint presentation is a collection of slides, handouts, speaker's notes, and outlines, all in one presentation file.

Data Analysis Tools : Electronic databases and spreadsheets are popular computer tools for teachers and for students/trainees. Students/trainees need skills in locating, evaluating, analyzing, classifying, comparing, calculating, and drawing conclusions based on a set of information. Teacher/students at the beginning level may use them for classification of data, at the next level for comparing and contrasting trends, at the expert level, they can use what-if feature and carry out activities like plotting graph for trigonometry questions. Some popular spreadsheet products are Filemaker and MS-Excel, and database products are MS-

GraphicalTools : A picture can communicate a message that sometimes a thousand words cannot do because we live in a visual world; and the human mind can comprehend and retain concepts learnt through visual description for longer time. That's why using graphics in teaching can play a very important role. Paint brush which is available with Windows Operating System is one of the graphical tools. However some more graphical tools are available which provide better options, better graphical user interface, libraries, etc. to design better graphics such as Adobe Systems Incorporated, Corel Corporation, Live Picture and Macromedia Incorporated. However, there are several sites on the Web that can assist the creation of graphics.

Multimedia Tools : Multimedia is the term for different media like text, graphics, animation, sound, and video all wrapped in one interactive package. The basic idea is to manage and co-ordinate the various devices of communication and entertainment electronics with the computer. Multimedia tools can help us in creating presentations, games, animations, which further promote the interactive ways of learning. Multimedia has emerged as an effective way for students to develop projects that incorporate text, graphics,sound, and video. We can use Microsoft PowerPoint as a multimedia tool to create presentations, multimedia projects, etc. Some Multimedia tools for primary class students are also available like Kid Pix Studio and Jump Start, which provide tools for students to paint pictures as well as add text, animation, video, sound effects, and music to create an exciting multimedia project. Some tools are available for trainees interested in creating, manipulating, and editing visuals such as photographs as for e.g. Adobe's Photoshop. Some tools are also available for audio and video production such as imovie, practicaMusica, songworks, and KidMusic.

Simulation : The idea behind using simulations as pedagogical tools relies on the idea that experience is the best teacher. Use of simulations include animated narrative vignettes(ANV). ANVs are cartoon like video narratives of hypothetical and reality- based stories involving classroom teaching and learning. In one way or another, simulations of real-time environments have been used as a tool for teaching and training in many areas and disciplines. This has been the case especially in areas like medicine or in training soldiers, where practice in real-time environments involves risks and high costs. Simulations for training typically come in one of three categories, the first one is Live-Simulation in which real people use simulated equipment in the real world. Next is Virtual-Simulation where real people use simulated equipment in a simulated world or "virtual environment" and last one is Constructive-Simulation in which case simulated people use simulated equipment in a simulated environment. Online simulation web sites allows trainees to conduct and perform actual experiments.

The use of simulated activities in training is becoming common. Following are some advantages of using simulations in education and training:

1. Simulations give hands-on experience so that trainees become participants, not just listeners or observers.
2. Simulations are virtually real; they simulate some activity so well that real learning takes place.
3. Simulations motivate the learners as it involves them in the learning activity.
4. Simulations can be designed so that learner's inputs can be embedded into the learning activities.

Recent advancements in graphics and computer processing powers have allowed for the creation of more realistic simulations that closely replicate the actual environment.

VI. Implementation of Technology Based Training

One of the most exciting changes in teaching/training has been brought about by advances in ICT and by the availability of these technologies in learning/training environments. This is possible because of the relatively low cost of softwares, computers and the Internet availability. Implementation of technology based training programme requires a lot of planning. It is very important for a teacher/trainer to understand how ICT technologies can be useful in different areas. Only then we will be able to implement teaching and training through them. A few applications of different software technologies in some areas for which training is imparted are as follows-

Mathematics : There are numerous ways for applying ICT in mathematics to miotivate students and to demonstrate the utility of mathematics in real life. A few applications are-

Spreadsheets : It can be useful in mathematics. From calculations to showing patterns in certain number manipulations. With spreadsheets, one can manipulate variables or parameters to observecertain properties clearly and promptly. Learners can also ask for different types of charts to be plotted from data in a spreadsheet. Teachers can design templates which have values previously entered in order to demonstrate effects from changing variables. At a more advanced level, spreadsheets can be designed by students themselves in order to help to solve realistic and contextual problems.

Internet : Learners can utilize applets that are freely available on the Internet for performing different mathematical activities and solving certain mathematical problems.

Modeling and Simulation : Learners can use simple modeling packages, such as Mathematica and MATLAB to gain insight into mathematical functions. Graphic calculators can also be used for this reason. Modeling and simulation can also be used with special software for geometry to give students a better understanding of figures in 2 or 3- dimensional space.

Sciences : Some of the areas in which training may be required so that ICT can be used effectively in the teaching of science subjects(Physics, Chemistry, Biology, Geography etc.) are illustrated through the following examples.

Spreadsheets : Spreadsheets can be used to tabulate and results of experiments. The use of spreadsheets is a better way to demonstrate how changing a particular variable gives definite effects. Its implementation in natural science is similar to mathematics; various types of charts can be plotted and we can also design templates that have values already entered to illustrate effects of manipulating variables.

Databases: Databases can be useful for storing variables such as the characteristics of chemical elements in the periodic table, characteristics of plants, insects, and mammals; and then interrogate these databases to find relationships and commonalities.

Word processing and presentation: These softwares can be used in preparing learning/training resources, reports and presentations on the results of experiments or research. Learners can add ready-to-use graphics, or graphics that they create themselves. They can also use data and graphs created from measurement software.

Internet: It is useful in communicating with other students/ teachers. In research or project assignments, information accessible on the Internet can be used. Online data can be to simulate all types of natural processes can be used. Hence, training to use the internet is needed.

Modeling and Simulation: A natural calamity like the Tsunami can be s

VII. Summing Up

The emerging communication and information technologies are graduallycovering the entire span of human activity.Technology in all forms, new and outdated or simple and complex, can be effective tools that make individuals rethink their old beliefs, knowledge, and understandings.Convergence of emerging communication and information technologies is taking place thesedays, thus maximizing the strengths of individual technology. Telecommunication clubbedwith computer technology has revolutionized the area of human communication. The capabilityto exchange information on a global basis is possible through a powerful communication tool:.the satellite. Computer technology has provided tremendous capacity to store and exchangeinformation. The human-computer interface has made communication further efficient, interms of cost, time and reliability. This is the reason why communication technologies arebecoming popular in receiving and transmitting messages, data, voice and images.The computing and telecommunication technologies are not leaving the education sectoruntouched. These are enabling the teachers to develop multimedia in which text, voice,pictures, simulation, etc. can be integrated and delivered through computers as an interactivelearning package. The technologies will enable us to develop what are often called virtualclassrooms, virtual universities, virtual conferencing, virtual laboratories, etc. Emerging technologies appear to offer the opportunity to gain access to knowledge and closerto real life. This would lead us to a learning society. This is a single new development thatcan revolutionize the future of education. Virtual reality and simulation will provide the abilityfor people to enjoy experience that we could not get otherwise. This is an experience withoutrisk and promoted learning in a new way. So, communication technology will provide a newstrategy for education, for training experience. To compete and survive in the competitive world of education it is essential to create, adoptand utilize new technologies, which will allow efficient flow of data, voice and images to allthose who want to remain updated in the fast changing world. With this, education will crossthe country's border and will change the world into a 'global village'.To cater to and be responsive to the education and training needs of the people in the countryand also to reach out to them, we can depend on innovative communication technologies. Fortunately, these days due to rapid developments in the area of digitization, signalprocessing, compression, miniaturization, VSATs, etc. communication technologies are becoming available to the general public. In this way more and more people (students in this case) would he benefited by the new technologies. In our view,technology has the potential to revolutionize training and learning.

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Author's Profile

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