International Journal of Engineering Science Invention Research & Development; Vol. I Issue III September 2014
www.ijesird.com e-ISSN: 2349-6185

E-LEARNING – TOOLS, TECHNIQUES & TRENDS

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***Abstract* - This paper is about what is e-learning and studying the latest techniques, tools and current trends in e-learning. Not many people had heard of the term "e-learning" some years ago. With e-learning, the possibilities for getting knowledge and information out to the learner at her/his own pace opened a whole new world for knowledge transfer. In recent years terminology changed and it went from using such terms as "technology-supported learning, distance learning and distance education" to "online learning. and web-based training" to "e-learning". E-learning helps us to share knowledge and skills of the professionals who work in our colleges and universities, and to get the right information to the right people, whenever they need it.**

I INTRODUCTION

E-learning includes all forms of electronically supported learning and teaching, including Edtech. The information and communication systems, whether networked learning or not, serve as specific media to implement the learning process. This often involves both out-of class-room and in-classroom educational experiences via technology, even as advances continue in regard to devices and curriculum. Abbreviations like CBT (Computer-Based Training), computer-based instruction (CBI), IBT (Internet-Based Training), WBT (Web-Based Training), technology-enhanced learning (TEL) or virtual learning environments (VLE) have been used as synonyms to e-learning. Although these alternative names compositely come under the broad domain of e-learning, they individually indicate a particular digitization process [1]. E-learning is the computer and net-work-enabled transfer of skills and knowledge. E-learning applications and processes include Web-based learning, computer- based learning, virtual education opportunities and digital collaboration. Content is delivered via the Internet, intranet/extranet, audio or video tape, satellite TV, and CD-ROM. It can be self-paced or instructor-led and includes media in the form of text, image, animation, streaming video and audio.

E-learning is suitable for distance learning and flexible learning, but it can also be used in association with face-to-face teaching. In this case the term blended learning is commonly used [1].

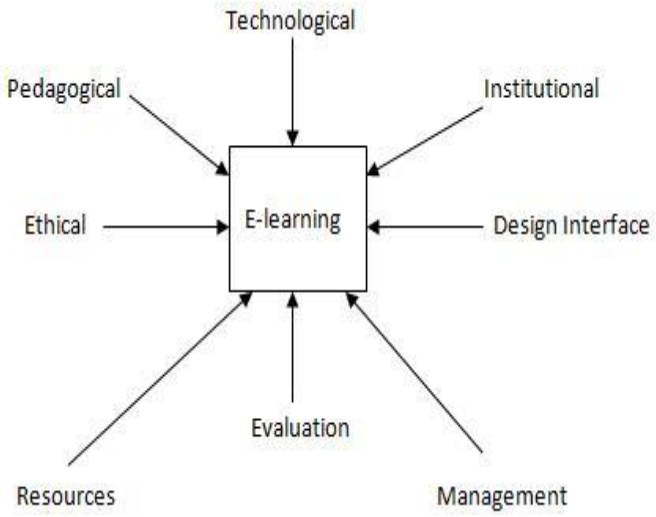

Fig 1 : Components of E-Learning

II TYPES OF E-LEARNING

There are four categories of e-learning, and three 'types' of e-learning, which could apply to the four categories. The four categories are:

1. **New information** – this is generally passive learning. The Learner will simply receive and read the information, which may be up-date from time to time.
2. **Knowledge Transfer** – this requires some participation by the Learner, who will read,
listen (if there is an audio component), and answer questions.
3. **New Skills** – this will involve more participation. The Learner will read, listen and try out the new skills, and will then be assessed for progress made.
4. **Certification** – this is the ultimate level of e-learning, because there is an examination at
the end of the course, and a certificate is awarded to those who qualify.

The three 'types' of e-learning are:

A. **Traditional**: these courses have depth of content and preparation, and are usually produced by experts, and to give the Learner a real understanding of the subject.
B. **Rapid Self-directed also called Asynchronous**. This is usually related to one specific aspect of the subject, and the courses are produced rapidly and liable to change. The Learner works at his or her own pace. It could be based on CDs, DVDs, Networks, Intranet or Internet and may include access to instructors through bulleting boards or discussion forums.
C. **Rapid, controlled, also called Synchronous**, because it is conducted at set times, for example in phone-ins or internet classrooms. It is conducted in real time, with a live instructor. All Learners log in at the prescribed time and can speak to the group under the control of the instructor, by raising a cyber hand. The course may last weeks or even much longer.
Some projects are well-served by the Rapid types of courses, especially when the budget is limited, or when new ideas need to be introduced quickly. Other projects, with longer lead times and higher budgets, need the Traditional e-learning approach, especially when it involves new, original content [1].

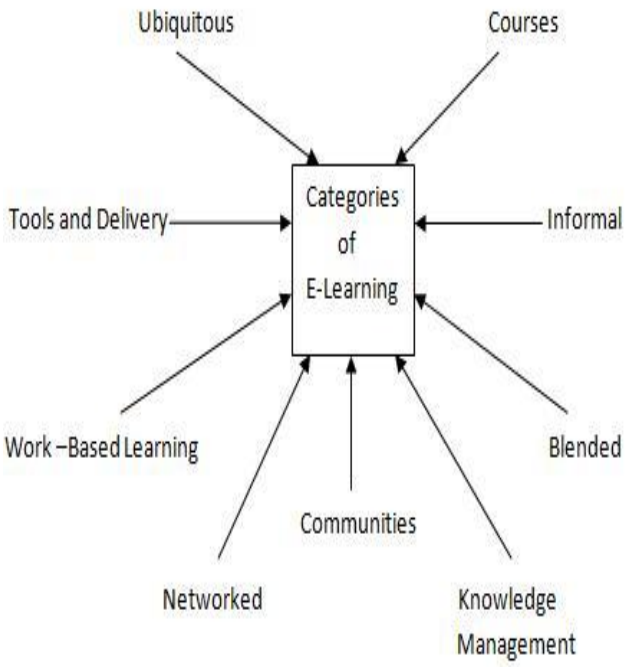

Fig 2 : Types of E-Learning

III WHAT MAKES E-LEARNING EFFECTIVE?

Successful web-based training (WBT) is built through careful analysis, user-centered design, and iterative development and testing. These same principles apply to the design of any user interface or online information product, and are already familiar to many technical communicators. We'll discuss them briefly here as they apply to WBT [2].

A. Analysis

The first question to ask when considering any training project is: What problem are you trying to solve? Typically, this is a performance problem in a work situation. For example, customer service representatives need to handle calls quickly and satisfactorily. If you work for a product vendor, the problem may be product-centric: network administrators have to install and configure our software without having to call support. Whatever the problem, a complete understanding of it involves understanding the audience, the tasks they must perform, and the definition of success for these tasks. Investigation of these issues yields audience and task analysis documents and helps determine:
1. Whether training is the proper solution to the problem *and*
2. What kind of training module is needed [2].

B. Design

In *Designing Web-Based Training*, William Horton offers this encapsulation of "50,000 years of instructional design:"
1. Show them.
2. Tell them.
3. Let them try.
4. Repeat.2
While tongue-in-cheek, this description does present key guidelines for designing web-based
training. Effective WBT teaches by both describing and demonstrating. It provides learners with opportunities to practice what they learn, and it encourages repetition of both the presentation and the practice.
E-learning authority Michael W. Allen lists three priorities for the effectiveness of any training:
1. Ensure that learners are highly motivated to learn.
2. Guide learners to appropriate content.
3. Provide meaningful and memorable learning experiences.3
The Techniques section of this paper will look at ways to implement these design principles in
WBT projects [2].

C. Development

Finally, WBT projects are best developed through a process of rapid-prototyping and testing. This allows you to test all aspects of the design with representative learners and to refine the product on an ongoing basis. Allen refers to this process as "successive approximation." He suggests dispensing with

design specs and paper storyboards in favor of building and testing working prototypes [2].

D. Techniques

Tell Them First - Overview and Concept Pages One venerable formula for instructional design reads as follows: "Tell me what you're going to tell me, tell me, then tell me what you just told me." This sequence of preview, presentation, and review helps reinforce learning and retention. WBT often needs pages that simply tell facts or present information. These include overview pages that introduce each lesson and list the contents. They may also include pages that explain or illustrate concepts, in a way similar to online documentation. These techniques help make overview and concept pages effective:

• Keep text short.and precise. If more text is absolutely needed, present additional pages.

• Illustrate ideas with pictures and diagrams. Learners are typically conditioned by the Web to expect graphics. If at all possible, hire a graphic designer for your project. If there is no budget for this, make optimal use of available artwork and clip art.

• For Overview pages, provide links to all topics. This is recommended in addition to the typical Next and Previous buttons, to let the learner choose the path through the content [2].

(i) Show Them – Demonstrations- Demonstration pages allow learning by observation. For example, learners can watch an animation representing a task being performed in a software interface, or read and listen to an example conversation between a customer service representative and a customer.
Here are some guidelines for demonstration pages:

• Keep them simple. If the demonstration is long or complex, divide it over several pages.

• Test the timing of animations on various computers, browsers, and with as many learners
as possible.

• Be sure to provide a text version for learners who may not have audio available [2].

(ii) Let Them Try – Interactivity: A hallmark of successful WBT is a high degree of interactivity. Adult learners usually learn best by doing, and interactive exercises take advantage of this. Question-and-answer quizzes placed at the end of a lesson represent the most elementary form of interactivity. These may include multiple-choice, fill-in-the-blank, drag-and-drop questions or other methods. Done well, quizzes can reinforce the learning of concepts. However, they are not useful for teaching skills, are not particularly engaging, and are ignored by many learners. Effective WBT uses other methods to foster interaction. These may include:

• Layering information on concept pages. For example, an illustration of a machine, a computer network, or a software diagram can include hotspots on specific components. When a learner clicks or points to the component, additional information pops up in a dynamic layer.

• Software simulations. For software application training, WBT often includes a simulated interface that allows the learner to enter data and perform transactions. This
works best when the simulation requires the learner to solve a real-world problem and displays realistic results.

• Problem-solving scenarios. For soft-skills training, scenarios present learners with problem situations and various options for solving them. Each option may lead to a different path for the learner to explore [2].

(iii) Engage the Learner – Stories: • Ensure that learners are highly motivated to learn.

• Provide meaningful and memorable learning experiences.
Stories engage the learner's emotions and make the learning experience memorable. Also, because the characters and situations relate to the learner's real-world challenges and problems, stories enhance motivation. Here are some examples of WBTs that effectively use stories.

• To teach the use of a communication application, a story was created involving a space station. Surgeons on earth needed to treat a critically-ill patient on the station through telemedicine. But first the learner had to set up the communication apparatus [2].

(iv) Provide Maximum Learner Control: Allen's second priority is to "Guide learners to appropriate content." This makes WBT content easy to find. It does not mean providing only one path through the content. Horton recommends providing WBT courses with multiple access methods, which may include a table of contents or menu, an index, a course map, and even a search function. Each page should provide Next and Previous links, as well as links to the start of the current lesson and the course home page or main menu. Each lesson overview page should allow the learner to jump to any topic in the lesson [2].

E. TOOLS

Despite a shakeout in the market in the past few years, many authoring tools are available that will help you create effective WBT. These range from general-purpose tools designed for presentations and web-authoring to dedicated e-learning applications. The tools cover a broad range in terms of price, sophistication, and how easy they are to learn [2].

(i)Macromedia Dreamweaver: Dreamweaver is an excellent starter tool for WBT and general web-page authoring. Essentially, Dreamweaver automates the authoring of web content by generating HTML and JavaScript code through a WYSIWYG interface. Among its many capabilities, Dreamweaver makes it easy to create animations and show/hide layers for WBT pages. If you have Dreamweaver, you can download free extensions for e-learning. Once installed, these added modules become available through the

Dreamweaver interface. They allow you to create quizzes, including drag-and-drop exercises, and also to track learner results and output them to standards-compliant learning management systems (LMS). Dreamweaver is fairly quick to learn and develop on. However, it is not as powerful for WBT as many other tools. It's capabilities are limited to what can be supported through the of native HTML and JavaScript functionality of web browsers [2].

(ii) Macromedia Flash: Though it was initially designed for creating small and fast-loading web animations, Flash has evolved into an industrial-strength tool for web applications. More and more, it is becoming a development tool of choice for WBT. With Flash, you can do everything you can do in Dreamweaver plus much more. While Dreamweaver's output is limited to what a native web browser can support, Flash's output is practically unlimited. This is because Flash creates its own application file (SWF file) that runs inside the browser window but does not depend on the browser's native capabilities. Flash is excellent for creating animations, exercises, and simulations of all kinds. It supports rich media, including audio and video. Added to this, its modest price makes it a very attractive tool for even low-budget WBT projects. The only drawback of Flash as opposed to some other tools is its complexity. The learning curve can be steep. And, while many effects can be attained through the user interface, you need to write code to unleash Flash's full power. Flash's Action script language is very similar to JavaScript [2].

(iii) Other Tools: Depending on your project and budget, here are some other tools you might want to investigate:
• RoboDemo by e-Help
• Microsoft PowerPoint
• Macromedia Director
• Macromedia AuthorWare
• Macromedia Breeze [2].

(IV) ADVANTAGES OF E-LEARNING**:**

Flexibility, Accessibility, Convenience Learners can proceed through a training program "at their own pace and at their own place at any time, and only as much as they need [3].

(A) Cross-platform Support

E-Learning courses are accessible by Web browsers on any platform: Windows, Mac, UNIX, OS/2, Amiga, etc. You can deliver your training program to any machine over the Internet or intranet without having to author a program specifically for each platform.

(B) Browsers and Internet Connections are Widely Available

Most computer users have access to a browser, such as Netscape or Internet Explorer, and are connected to a company's intranet and/or have access to the Internet.

(C) Inexpensive Worldwide Distribution

No separate distribution mechanism is needed. E-Learning courses are accessible from any computer anywhere in the world, which keeps delivery costs low.

(D) Ease of Updates

After the e-Learning course is released, any changes can be made on the server hosting the program and everyone worldwide can instantly access the update. Courses can be designed to access designated current information, such as the latest new product specifications, from any other server worldwide for an on-the-fly update whenever the e-Learning course is run.

(E) Savings in Travel Cost and Time

There are no travel costs for bringing remote employees to a centralized workshop because the Web is available from all desktops. According to some analysts, the actual time required for training by computer averages about 50% to that of instructor-led training, further saving money [3].

(V) TRENDS IN E-LEARNING

Based on research from the Gartner Group, the University of Pennsylvania, and other prestigious think tanks, we can identify the vital trends that will influence the growth of e-learning over the next ten years .

*(A) Application Service Providers offer more quick start options***.**

Governments, companies, and learning institutions that don't want to reinvent the wheel can lease or purchase turnkey e-learning systems. As e-learning processes become more standardized, clients benefit from shared research and development expenses, lower costs, and fast deployment. Even organizations on low budgets can implement open source e-learning platforms like Moodle on third party servers in a matter of hours.

*(B) Companies integrate e-learning into their infrastructure***.**

As more organizations deploy departmental or company-wide intranets to increase communication and productivity, savvy managers use the same tools to release e-learning programs into the wild. Professional development directors can easily integrate learning modules into staff communications, while

human resources directors can add similar tools to web-based benefits and payroll systems.
Innovative E-Learning Deployment
E-Learning via Podcasting
Self-Service Professional Development

(C) Churning skill sets require e-learning initiatives.
With job descriptions and daily tasks evolving faster than schools can produce qualified job candidates, many employers rely on constant, on-the-job training to remain competitive.
Workflow Learning Gets Real
Rapid E-Learning

(D) E-Learning cuts the cost of high quality content.
By developing classrooms without walls, e-learning programs can reduce the costs of participation without negatively affecting the compensation for renowned lecturers, researchers, and presenters.
Staffing and compensation issues at one e-learning university.
Abandoning cookie-cutter courses.

(E) E-Learning levels professional playing field around the world.
Workers in niche industries once had to travel to specialized learning centers to discover the best practices in their field. Today, e-learning connects students in rural communities to urban experts, and vice versa. We are only starting to see the effects that quality education is having on business and industry in developing countries. Likewise, small businesses can access the same caliber of high-level information and insight that was once only available to Fortune 500 companies with large human resources budgets. Empowering Employees Through Training Supporting Learning in Small Business (.pdf)

(F) Gamers bring interactive skills to e-learning.
Human beings love to learn through experience. Many e-learning providers have discovered that they can use video game technology to develop fun, engaging, effective simulations. Industrial employers can train workers to handle sophisticated tasks without risking injury or production quality. Fun e-learning programs help boost staff morale while reducing the time it takes for team members to integrate new skills and ideas. Better A Little Fun Goes a Long Way

(G) Governments deploy e-learning at all levels.
In addition to the obvious business uses for e-learning, governments around the world have discovered that e-learning programs can dramatically improve the quality of life for citizens while reducing the financial burden on taxpayers. Local schools in underserved rural areas or dangerous urban neighborhoods can rely on e-learning to offset the lack of skilled teachers in their districts. Government Departments Embrace E-Learning Systems

(H) Partners and collaborators use e-learning to get everyone on the same page sooner.
As conglomerates unbundle themselves into smaller, more tightly focused companies, the connections between these operating units determine the success or failure of projects and products. Strong e-learning systems allow team members at collaborating companies to understand shared objectives. Adapt or die. E-Learning Return on Investment

(I) Wireless technology helps e-learning initiatives "cut the cord."
Until distance learning programs brought specialized skills and best practices to far-flung corners of the world, professionals often had to travel to urban centers to benefit from innovative research. Today's wireless technology allows educators and development specialists to reach even further into rural areas, farms, deserts, and rainforests.
Wireless E-Learning Teaches Hygiene to Refugees

(J) E-Learning's Movers and Shakers.
Brian Alger wrote "The Experience Designer," one of the first comprehensive guides to modern e-learning, in 2002. Alger explores the connections between the way we learn through storytelling and experience and the kinds of technologies we can use to emulate the learning process online. To keep readers and colleagues up to date on current developments in e-learning research, Alger posts new findings and links to his Experience Designer Network weblog.
Amy Jo Kim has spent more than two decades of her career studying effective online community design. As the founder of her creative studio, NAIMA, Dr. Kim has collaborated on many of the e-learning industry's groundbreaking products and platforms. In addition to lecturing at e-learning conferences around the world, she continues to develop innovative new community systems for clients in the public and private sectors [4] [5].

(VI) FUTURE DEVELOPMENT IN THE SECTOR OF E-LEARNING SUPPLIERS

The evolution of e-learning supplies can be characterized as follows:
a) Many small e-learning operators in all product areas (technology, service and content) will have disappeared, merged with others (both international and national) or evolved into a different sub sector. Those that survive will have identified a valuable niche or built strong ties to a loyal customer base [5].
b) New operators could emerge either in niche areas (game based learning, simulations, open source integration) or by complementing their current offerings with e-learning services. In the future telecommunications operators and professional associations are expected to enter the market as suppliers of e-learning services for their customers.
c) The international (predominantly US and Canada-based) e-learning operators can be expected to continue their strong

market presence and in some areas they will increase their dominance. Firms offering L(C)MS and enterprise suites include companies like IBM, Oracle, SAP, SumTotal and SABA, all mainly addressing the needs of large o rganizations. Within education segments, they will include companies like WebCT, Blackboard and Microsoft. Within live e-learning platforms, they will include Centra, Interwise and Webex.

d) Strong international entrants can also be expected within emerging segments such as game based learning. US-based operators like Horn Interactive, Digital Mill, Socratic Arts, Breakaway Games, ACLS Interactive could be tempted to enter the European markets [5].

(VII) CONCLUSION

For organizations of all sizes, putting training on the Web has many well-known advantages in terms of accessibility, efficiency, and cost. The key to realizing these advantages is effective design that motivates learners and gives them accessible and memorable learning experiences. With their existing skill sets and the tools and techniques discussed in this paper, technical communicators have the opportunity to create effective e-learning.

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