Sunway College Journal 1, 99–107(2004)

TECHNICAL REPORT: ISSUES AND STRATEGIES OF E-LEARNING

KANENDRAN T. A.[a]
JOHNNY SAVARIMUTHU
B. V. DURGA KUMAR
Sunway College

ABSTRACT

An effective e-learning system involves a systematic process of planning, design, development, evaluation, and implementation of a meaningful learning environment where learning is fostered and supported. While there still exists some uncertainty about its role in education and professional training, there is a growing concern about the issues and strategies of e-learning that may be faced by both providers and learners of e-learning in future. This technical report addresses some of the main issues and strategies that are currently encountered in e-learning.

Key words: E-learning, technology, strategies, participation, quality.

INTRODUCTION

In today's world, a new level of commitment is required in order to educate the young generation and e-learning perhaps emerges as an important tool of imparting knowledge and information. The challenge, however, is to provide a suitable means to disseminate disparate information in a dynamic, open and distributed e-learning environment. The two areas that this technical report will address are issues and strategies of e-learning.

ISSUES

The issues of e-learning are:

- Creating an e-learning system
- E-learning technology
- Components of an e-learning system
- Learning participation
- Quality issues

Creating An E-Learning System

In setting up an e-learning system, careful attention has to be paid to the availability of skilled and qualified people. These will include database developers, web developers,

E-mail: [a]kanen@sunway.edu.my. This article is a condensed version of a paper that was presented at the International Symposium on E-Learning 2003 (ISEL-2003), University Malaya Sabah, 20–21 October 2003.

subject experts, management experts and technical experts. Within the e-learning system it is important to adhere to a total model, a segment model, a clear methodology and a test plan. In addition, the main resources required are software tools, systems database and middleware (Inglis et al., 2002).

Setting up a web server on the network requires naming the computer as well as providing it a unique Internet Protocol number. File server applications are kept on a central computer called a computer server. Security must be taken into consideration when setting up such a system. Most systems allow implementation of various levels of security. Most of the current web traffic is unencrypted. It is necessary to set up a mirror site on a powerful server to support the e-learning system.

Server partitioning is another method that makes it easy to load the server and split the facilities to different servers. Voluntary system is one that relies on users to choose a particular mirror computer. Machine selector software is another idea to allow students to access a central server, which then automatically sends them to a mirror computer. When preparing material to be used on a mirror system, it is important that all of the links are relative. If each of the links is absolute, users will always be brought to the machine associated with that link (Horton & Horton, 2003).

E-Learning Technology

E-learning technology is the infrastructure that a major shift to online delivery is likely to necessitate. Figure 1 shows the role of external function in the e-learning production

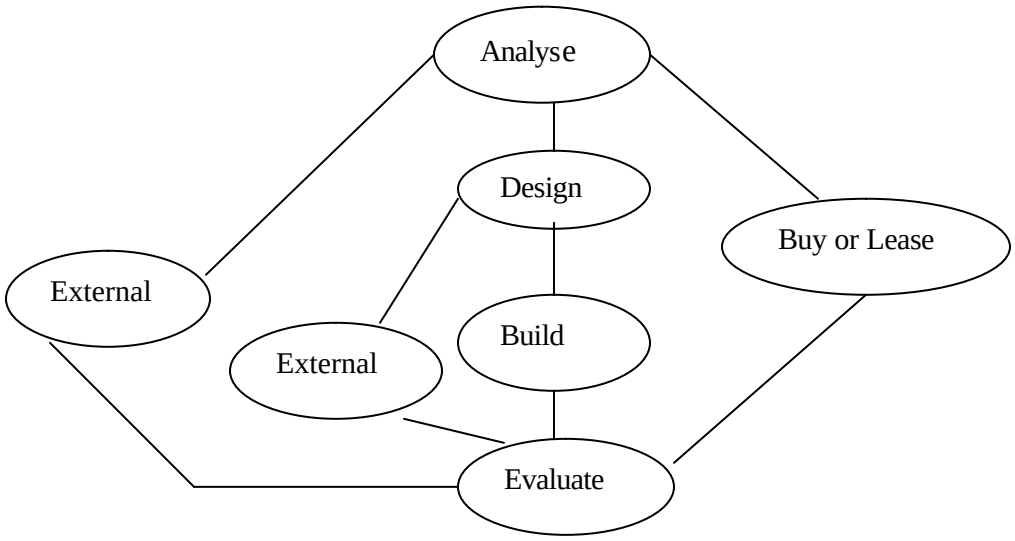

Figure 1. E-learning production processes

process. One external function is when the building of the e-learning system is passed to a firm that specializes in e-learning, multimedia or web site construction. This relieves

organizations of having to maintain a staff of technical specialists and the associated hardware and software producers required.

Another external function is the design-and-build functions. In this approach consultants are used to complete the solution. The other way is to buy or lease existing courses or other learning products from an application service provider (ASP). This approach works well when the training needs can be met by courses with generic content. The ASP maintains an e-learning library on its server.

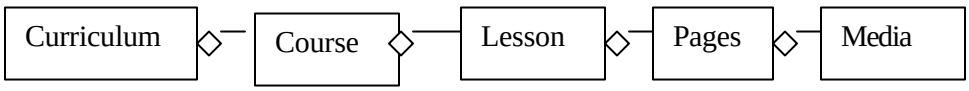

Figure 2. Categories of tools

Figure 2 shows the categories of tools for developing e-learning technology. The curriculum is a collection of learning products. The course is typically composed of clusters of smaller lessons, each organized to accomplish one of the major objectives of the course as a whole. At a lower level are the individual pages, each designed to accomplish a single low-level objective that answers a single question. At the bottom level are media components. These are the individual pictures, blocks of text, animation sequences, and video passages that contribute to the page.

Figure 3 shows how the learner uses a web browser to access content offered on a web server. A big part of that content may have come from a web site authoring tool. Choosing a browser may also be based on what media players will be used or not used for the kind of content e-learning will contain. Web servers are core technology for e-learning.

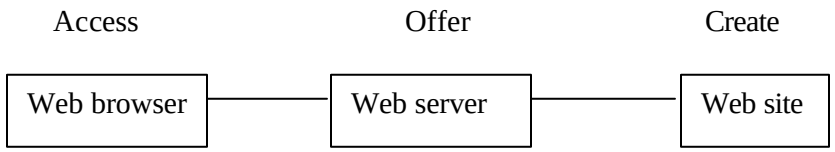

Figure 3. Product and process

Figure 4 shows the collaboration tools used in e-learning. These usually consist of a server component that routes messages among learners and collaboration clients that run on the computers of the individual learners. The collaboration server (CS) can work directly through the browser.

The collaboration tools include common online meeting products and services. Sound, animation, video and other media may require specific authoring and editing tools. Video and sound may also require special media servers to ensure that they play efficiently over the network. All projects reuse existing documents and spreadsheets. Content converters help producers make existing documents and other content available online.

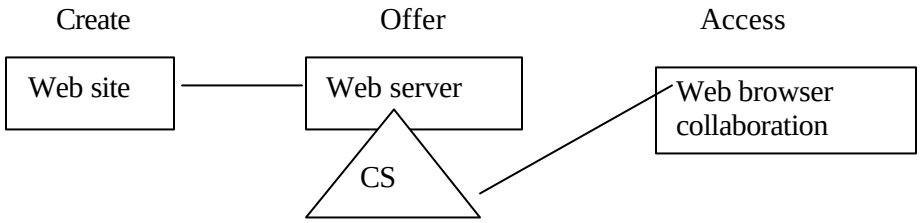

Figure 4. Collaboration tools

Hardware

The main component is a processor having sufficient speed, bandwidth, generation model internal cache and memory. In addition, a video camera and pointing devices are also required.

Tools to Access E-Learning

The choice of tools is crucial as most of the time one may have little control over these components. Of these, web browsers are perhaps the most important. Internet Explorer is very popular in business, especially the ones that have been standardized on the Windows operating system. Netscape Navigator was the first full-featured browser. Mozilla is an open source browser available for Windows and Macintosh Linux. Amaya is the World Wide Web consortium test-bed. AOL (America Online), the world's largest ISP, provides its users with a customized version of the Internet Explorer browser. Opera browser prides itself on being small, fast and standard. Lynx is a well-established text-only browser.

Components

The major components of an e-leaning system are:

- Subject experts
- Instructors
- Designers
- Media developers
- Editors
- Technical experts

The other components are:

- Well-defined learning objectives
- High-resolution graphics
- Video clips
- Animation
- Interactivity
- Voice-over, music, sound effects

- Authoring or programming
- Simulations
- Testing and scoring
- Course management to track individual records and bookmarks

Learning Participation

Learning participation—an integrated part of e-learning—must be user-friendly and easily accessible. The subject content must be clear with detailed descriptions that can be understood without difficulty. It should contain updated activities, assignments and assessment data. Including a help desk and technical support will enhance the user benefit of the system (White & Weight, 2000).

Recommendations for increasing participation and satisfaction in e-learning include:

- Use targeted dynamic and continuous marketing activities, including traditional marketing methods, such as face-to-face discussion and print advertising.
- Provide time and space to learn on company time.
- Create a learning culture that encourages and appreciates e-learning.
- Develop an environment where peer support is widespread.
- Ensure that frustration with e-learning technology is not a barrier to successful e-learning.
- Develop incentives beyond candy bars and meaningless certificates to those who provide valuable benefits. Examples of such incentives are peer recognition and career advancement.
- Continue to implement and develop synchronous, collaborative courses that fuel the learner's fundamental desire for interaction while more closely simulating the classroom experience.
- Blend e-learning with other complementary forms of instruction to attract those who may be uncomfortable with learning via technology.

Quality Issues

High quality interactive learning materials exemplify potentially new and exciting ways of approaching education and training. The demand for excellent education and training programs has never been greater. Students, governments, funding bodies and communities expect education systems to deliver high quality products, services and graduates (Abby, 2000).

Consideration of quality in software should address the following issues:

- Bug-free
- Does what it is supposed to do
- Usable for intended audience and tasks
- Aesthetic quality

- Provides a satisfying learner experience
- Only valid in context
- Appropriate for learners' ability
- Framework setting

STRATEGIES OF E-LEARNING

The main purpose of a strategy is to make out a set of proposals to show how education leaders, teachers, learners and commercial suppliers may contribute to the process of change. The questions that need to be considered include these:

i. How may *teacher educators* turn a traditional educational institution—whether school, college or university—into one that blends the best of the old and the new?
ii. What would it mean for *general teachers* to mix e-learning with traditional methods, enabling them to offer more active and creative ways of learning in all subjects, disciplines and skills?
iii. How do we make sure that the personal needs of the *learners* are met and that the way they are assessed keeps pace with these new kinds of learning?
iv. How may *commercial suppliers of ICT system, software publishers and service providers* support these new approaches that will, after all, provide them with graduates possessing highly employable skills?

The Strategy Document

An e-learning strategy needs a clear and precise strategy document containing the following areas:

- Vision
- Success benchmark
- Learning value chain
- Technology
- Content
- Culture
- Transition

Vision in E-Learning

The first step in e-learning is to have a vision. A careful introduction and implementation of e-learning can empower learners immensely irrespective of age and allow them to take full responsibility for what they learn. It can make teaching more creative and innovative, offer a more flexible and responsive educational system, generate greater professionalism and empower educators to develop their own capacity by integrating e-learning with class-room teaching methods.

At the heart of the strategy, of course, is the objective to realize the full potential of digital technology and include it in all learning and teaching processes. The proposed action

areas are four: leadership and management, transforming teaching/learning, prioritizing learners' needs and learning outcomes, and enabling e-learning to work better for users and suppliers.

E-learning strategies should provide a consistent framework within which education leaders can discuss the direction and pace of change as they develop their own e-learning strategies. A favourable environment must be created for the teachers to take greater responsibility for the way in which teaching and learning is carried out and encourage them to become innovators in the learning process. Also, a team of committed and skilled academic staff may be required to realize the potential of e-learning in a fast changing learning environment. Educational organizations, agencies and services will also need to focus on linking with each other to meet personal learning needs at every stage. Moreover, e-learning can provide the means to assess the new kinds of e-learning skills. Teachers and learners must be able to access, use, create and share high quality learning materials

Success Benchmarks

A strategy with a clearly defined vision is likely to be successful. The following are some of the areas that provide benchmarks of success:

- Key performance results
- Management
- Resource availability
- Environmental fit
- Ease of implementation

Success in the above areas requires a significant initial investment in resources and a continuing commitment by the host organization to long-term sustainability. Identifying the benefits and determining the role of e-learning are crucial for the development of future policies and strategies.

Learning Value Chain

The purpose of this value chain is to provide a commonly understood language for digital learning content market. It represents the value that is added to digital learning content through the key stages from conception to use. It also depicts the key roles undertaken by organizations involved in these stages. The learning value chain is an important element of the learning strategy. Learning channels that currently exist and those that need to be added have to be identified.

The design, a hybrid of a value chain and process diagrams, follows the evolution of raw content through various phases of value-add to finally reach a finished stage when the core meaning within the content is transferred to learners as knowledge, skills and understanding.

Technology

The pace of technological change is so phenomenal that a strategy for technology can be outdated even before the final decision on choice is made and executed. There is always a time lag between decision-making and implementation which makes it difficult to fit technology into the overall e-learning strategy. This issue needs to be seriously addressed in the strategy document.

Content

The content of e-learning experience needs be learner-centred and integrated into the learning value chain.

Culture

There is no doubt that an e-learning implementation will have an impact on corporate culture and vice versa. To be successful, an e-learning implementation needs to manage the impact by anticipating its effects and creating mitigations where necessary. In addition, implementation also needs to recognize the difficulty of changing human behaviour.

Transition

Change and transition are realities within organizations today. Management is always concerned with the changes and transitions that take place over a period of time. Therefore, any strategy should include a plan for transition from the content to the proposed level of learning (Rosenberg, 2000).

CONCLUSION

It is clear that e-learning is not about digital technologies any more than classroom teaching is about chalkboards. E-learning involves people and it is about using technology systems to support constructive social interactions, including human learning. The e-learning concept may work best when it is combined with some face-to-face classroom experience. An eventual goal may be for students to have their own notebook computers to support both in-school and at-home learning.

REFERENCES

Abby, B. (2000). *Instructional and cognitive impacts of web based education.* New York: Wiley.
Horton, W., & Horton, K. (2003). *E-learning tools and technologies.* Indianapolis: Wiley.

Inglis, A., Ling, P., & Joosten, V. (2002). *Delivering digitally (Managing transition to the knowledge media)*. London: Kogan Page.

Rosenberg, M. (2000). *Technologies and knowledge management*. New York: Wiley.

White, K. W., & Weight, B. H. (Eds) (2000). *The online teaching guide: a handbook of attitudes, strategies and techniques for the virtual classroom.* Boston: Allyn and Bacon. 13–23.