Content Presentation in a Four Factor E-learning Model

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ABSTRACT

E-learning has received significant attention as organizations attempt to reduce costs and streamline operations. A four-factor model is proposed to describe the critical elements in the e-learning environment. The four elements are product, service, channel and synergy. The traditional learning environment viewed learning as a function in a social context that involved a variety of components such as teachers, learners and tools. This paper focuses on the way that the content is presented in the e-learning environment with a focus on the organization. The focus on the content presentation addresses issues pertaining to the individual user needs, and argues that there needs to be a fit between the content presentation format and the user's cognitive description of the problem. Content presentation is not the single factor that affects the success or failure of an e-learning strategy. However, discussion of content presentation can provide a basis to examine the underlying components that are relevant to successfully selecting and implementing e-learning initiatives.

E-LEARNING ENVIRONMENT

There are many challenges and issues facing the organization in today's environment. Efficient management and accountability; revenue generation; competition and global responsive; are a few of the issues that come to mind. In a technology driven marketplace new issues are emerging and need to be addressed. Once such item that has received increasing interest and relevance over the last few years is organizational e-learning initiatives.

A skeptic can argue that by placing an "e" in front of an established idea or construct does not automatically make it a new and innovative one. However, the e-learning landscape presents and environment for discussion and development that would not have previously been relevant, in the context of traditional learning.

In the most generic sense, a *book* is the tool most frequently associated with learning. Books vary in many different dimensions including topic, type, context and overall function. The book, teacher and student represents the traditional context of learning, with the book viewed as the technological component (Bruckman 2002). In the e-learning environment, shifts have redefined this traditional structure and now placed a network with supporting material as the main technological component.

E-learning is defined as learning that has a significant involvement with computers and interactive networks simultaneously (Tsai et al. 2002). The world-wide-web is the prototypical example of an interactive network involving computers. The definition of e-learning also encompasses learning on local networks such as Intranets.

In an attempt to reduce costs associated with employee training and education several businesses today are investing in e-learning technologies (Dorai et al. 2001; Goodridge 2002; Pantazis 2002). However, many organizations are realizing that cost reduction cannot be the major determinant for the implementation of e-learning. The new focus of e-learning includes increased worker productivity, improved operational efficiency and streamlining corporate training (Goodridge 2002).

There must be a careful assessment of the needs of the organization in terms of its training needs, and an honest analysis of what can feasibly be transferred to this platform. It is unrealistic to suggest that all training needs within the organization can at some point be transposed to an e-learning envi-ronment. The selection of e-learning tools involves consideration of factors such as: functionality, customization and support.

This paper identifies four critical factors that affect the choice of the e-learning tool that will be implemented in an organization. These four factors are: product, service, channel and synergy. E-learning consists of both product and service components.

The product component can be viewed as largely a function of the design team. However, just as schools, colleges and other learning institutions invest time and effort into selecting the best books, the product that supports the e-learning environment also needs attention. Learning is a social artifact that involves many different elements. These combine to create a "learning environment". This paper pays particular attention to the product component of the e-learning environment.

E-LEARNING COMPONENTS MODEL

The organizational super highway is littered with companies that attempted to introduce new technological initiatives and failed. For the successful implementation and adoption of any new technology the correct infrastructure must be in place.
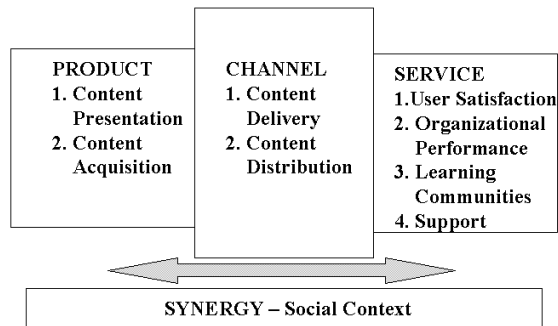
The infrastructure that must exist to support the successful implementation of the e-learning product includes personnel and a commitment by the organization to support its implementation. There is a strong dynamic with e-learning initiatives that links learning, people and organizational performance (Pantazis 2002). This triad highlights the social context of e-learning.

Moving one step beyond the social phenomenon and service, is the discussion of the product. One of the strong selling points of the e-learning product is the promise of customization. In the traditional learning environment, the teacher, the tools and the methods were usually immutably fixed. There is now a shift from the classroom group mode in the traditional environment, to the individual learner mode in the e-learning environment. The learners can access material on their own time and develop a Just-In-Time delivery format for training (Pantazis 2002).

The three main components forming the e-learning environment are the product, the channel and the service. The product is created from knowledge acquired for the particular topic. The channel refers to how the material is delivered and distributed. The service refers to all the promises that the product will deliver. The service components include user satisfaction; improved organizational performance and the creation and development of learning communities. The three components converge to establish organizational synergy – derived from within a social context.

Figure 1 (The E-learning Components Model) illustrates the four main components of the e-learning environment. The primary component of the product is content presentation. Consider the similarity as we look at two textbooks that cover the identical topic. The large difference between how users react to the content will be based on how the material is presented. With the absence of a live teacher or trainer content presentation becomes more critical.

The components proposed in the e-learning model are relevant irrespective of if the product is being custom designed or purchased off-the-shelf. A four-step method for the selection of an off-the-shelf product involves 1. Iden-

Figure 1 (The E-learning Components Model)

PRODUCT
1. Content Presentation
2. Content Acquisition

CHANNEL
1. Content Delivery
2. Content Distribution

SERVICE
1. User Satisfaction
2. Organizational Performance
3. Learning Communities
4. Support

SYNERGY – Social Context

tifying selection criteria and constraints; 2. Select shortlist of vendors; 3. Select and Test Courses; 4. Package and Implement (Lewis et al. 2002). Each of these steps involves or relates to components that have been outlined in the four-factor e-learning components model. A customized product involves more input on accurate content acquisition.

CONTENT PRESENTATION

E-learning includes the use of various tools such as video conferencing, satellite delivered learning and virtual educational networks (Pantazis 2002). This paper takes a very focused view and concentrates primarily on web-based instruction.

The management of content in the e-learning infrastructure is a major issue that must be addressed when such systems are to be adopted and implemented (Goodridge 2002). Content management involves determining what format is best for the needs of different users. The presentation of the content provides a great opportunity to customize the product to fit the specific needs of the end-users.

The media transfer channel has historically limited presentation of content on the web. The emergence of broadband has helped to significantly minimize the channel distribution problem. With web-based instruction material is downloaded to the user machines. The speed of downloads is a key design factor that can discourage many first time e-learners from returning to the system (Hartley 2002). The use of broadband introduces more options to support non-text content presentation for the e-learning environment.

The e-learning environment presents a great opportunity for more use of stunning two and three-dimensional visualizations. A main strength of three-dimensional graphics is that it can be used to impress a user and bring more "real-world-effects" to the desktop. Presentation formats affect a user's decision-making process and the attitude that they have towards the product (Tractinsky et al. 1999).

THEORETICAL FOUNDATIONS

The cognitive fit theory states that for a general problem-solving mode there must be a "fit" between the problem representation and the problem task (Vessey 1991). The initial application of the cognitive fit theory dealt with users that were completing problem-solving task with both graphical and tabular data items. This discussion applies the foundation concepts of that theory to the e-learning environment, with the goal of completing a learning task. It is proposed that in a learning environment there must also be a fit between the data representation and the learning task.

The content must be presented in a manner that will be coherent with the user's underlying mental model and understanding of the material. One of the main principles adhered to in this paper is that the e-learning environment primarily supports the individual learner or trainee. For the user to obtain the best results, and continue to user the product, there must be components that they can relate to on the interface level.

Some of the seven intelligences (Gardner 2000) can be easily applied to content presentation on-line. However, in the attempt to bring about a fit between the content presentation and the user, a determination of the users intelligences and learning preferences can be a step in that direction.

Graphical content in the e-learning environment can be a very attractive feature. Knowledge represented for the purpose of learning can be either presented in a literal or figurative format (Boland Jr. et al. 2001). The figurative component for learning encompasses graphical items in one, two and three dimensions. The argument that is purported here is that for effectiveness in our e-learning environment a critical building block from the individual perspective is that the content presentation matches the user's learning model. The ability to present data in a variety of formats supports this objective.

FUTURE DIRECTIONS AND IMPLICATIONS

This paper presents a four-factor e-learning components model. The main objective of this model is to isolate the constituents of the e-learning environment. The categorization of these four factors provides a framework for further work to be developed in each of the four groups.

The focus on the product and the content presentation of the product was necessary. Too many discussions about e-learning have focused on the end result and promised service that was not delivered, and ignored some of foundation items that are critical. A textbook is taken for granted in many academic and learning environments. However, it receives significant negative attention if it does not present the material in a manner that can easily be understood and assimilated by the student.

E-learning is still in its infancy and many advances have already been made E-learning provides a window of choices to all involved and can transform learning from an organizational domain to an individual domain (Wallhaus 2000). Cognitive issues become relevant in a discussion about individual domains in the e-learning environment. Different cognitive characteristics can influence the user's decision to return to the product and continue to use it in the manner for which it was designed. This research can be further extended to actually test the influence of the different content presentation formats and how users respond to the different environments.

CONCLUSION

E-learning can be a formidable alternative to some traditional learning environments. E-learning initiatives, when successfully implemented, present many advantages and opportunities for an organization. These benefits range from tangible cost reductions to more intangible items such as streamlining organizational training.

Computer training has had a long history in supporting organizations. Behavior modeling, when compared to lecture training and independent study produced better results with respect to knowledge retention, transfer of learning and end-user satisfaction in an experimental setting (Simon et al. 1996). Behavior modeling involves combining elements of the lecture mode and the independent study mode with individual user characteristics. The e-learning environment is a hybrid for behavioral modeling that can potentially recoup substantial gains for the learning organization.

The components model proposed in this paper highlights some of the main concerns involved in defining the e-learning landscape. The selection of content presentation as a focal point highlights the need for users to be able to relate to the content they must learn and assimilate. Presentation format of the content can have an impact on whether the individual user is motivated internally to re-use the system. Many business users view the use of graphics as a way to disseminate an idea and convince an audience about the product (Tractinsky et al. 1999). The use of two and three-dimensional visualizations in the presentation can also enhance the user's experience.

This paper in no way makes the case that the content presentation component of the product is the most significant factor. However, this issue might be overlooked as there is a very strong focus on the organizational needs of e-learning and to a lesser extent the needs of the individual user. Focusing on content presentation addresses the concerns of the individual that will be responsible for using the tool.

For future studies it would be very helpful to empirically test these ideas and isolate each of the four factors presented in the model. E-learning has many areas to explore and it will continue to be an issue of interest and relevance to organizations.

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