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A Framework for Designing Internet-Based Curriculum

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Abstract

The increased availability and use of Internet technology within business and education is spurring an increase in the use of these tools for on-line teaching and learning. Creating a flexible learning system incorporating these technologies can maximize student understanding and retention of new information. An example of a framework for curriculum development is developed which incorporates multiple Internet tools, learner support, and encourages employees to use those tools that best meets their individual learning styles and needs.

Introduction

Using Internet technology is becoming more commonplace. As businesses continue to invest in this technology and incorporate it into everyday business practice, the need for education and ongoing training in the use of these tools is necessary (Alavi, 1995; Yaverbaum and Nadarajan, 1996). As the expenses of on-going training and education continue to rise, using these Internet systems becomes a viable option for instructional and training needs. Existing Internet tools lend themselves to a multi-faceted learning experience. The communication tools such as E-mail, listservs, the BBS, chat and newsgroups, all provide an environment useful for various synchronous and asynchronous learning. Collaborative and cooperative learning, which may be facilitated by an instructor/trainer, can be handled via these tools. Individual, self-directed learning can be accommodated through repositories such as web documents, listservs, the BBS, newsgroups and other archived materials.

The andragogical, or adult learning, (Knowles, 1994) incentives for using various approaches to maximize individual learning demand a multi-faceted and flexible instructional system. This system would incorporate resource availability, guidance through the various resources, opportunities for collaboration and problem solving, opportunities for cooperative discussions of the material with peers, and opportunity for elaboration and/or remediation for further clarification and understanding of the content. This can become a powerful learning environment (Nicol, David, et. al., 1994).

A Framework for On-line Instruction

This paper outlines a framework for incorporating Internet-based instruction for the adult learner, that capitalizes on the interactive power of the Internet. Individual self-directed learning (eg. Web-based training; Liegle and Madey, 1997), expert advice, collaboration, cooperative learning, and the traditional classroom setting would all be options in the system. Figure 1 shows the student-centered framework incorporating multiple learning experiences mediated by internet tools. Adult learning theory explicitly acknowledges the importance of content relevance, individual learning styles, and shared instructor and student control over the instructional process to facilitate deeper learning (Cranton, 1994).

Companies which have already invested capital into an Intranet may use these Internet tools to create dynamic learning opportunities for their employees. The employees can, after instruction on the system, begin the instructional process. Support for remediation and elaboration of the content will be provided through these Internet tools ultimately facilitating opportunities for deeper integration of the material to

create a more meaningful learning experience (Leidner and Jarvenpaa, 1995). This support focuses on four areas, each of which in turn is founded on theory and research:

- 1) using contact with mentors, expert users and the instructors to facilitate deeper learning of the material, (Galbraith, 1991)
- 2) creating collaborative learning opportunities among learners throughout the organization, (Alavi, 1994)
- 3) creating cooperative peer opportunities among your set of learners for the particular instruction, (Hayes, 1989)
- 4) using other resources (web based and non-web based) to give learners as many approaches to designing an effective learning experience. (Cranton, 1994)

Mentors and Other Experts

The use of mentors, designated experts and the instructor/designer of the course is an excellent way to use the knowledge base of a company to facilitate increased knowledge and skill among employees (Galbraith, 1991; Goodman and Darr, 1996). These individuals would be on a list of those whom the learner could contact for one-on-one clarification of important or confusing points within the content material. E-mail, one-on-one chat, a BBS, or listserv might be employed for this purpose, but the significant issue is that the student knows that there is someone in the organization who has a wealth of information on the topic that is frustrating them and clarification is at hand. This approach provides support and is an effective way for learners to build on prior knowledge. Each expert=s specific specialty area may be listed along with their desired mode of contact and times for synchronized contact.

Collaborative Opportunities

Collaborative learning opportunities can provide a deep learning experience (see Galbraith, 1991; Nicol and Kane, 1994). During collaborative learning, a problem is posed related to the instructional topic and teams are assigned to create solutions to the problem. A facilitator is selected to guide the group through the problem solving process. This can be a very short time span (several minutes) or longer depending on the topic and the complexity and importance of the problem. Each group could interact in real time via chat and asynchronously via a threaded BBS, listserv, and through E-mail if ongoing collaboration is necessary. Employees can practice their teamwork skills as well as deepen their understanding of the valuable knowledge that was presented to them.

Cooperative Peer Interaction

Cooperative peer interaction is similar to collaborative learning but is not structured around a common problem solving exercise. The opportunity for sharing information about a topic allows individuals in one=s organization to express their understanding of the content and allows others to reflect and share in return. Often an individual doesn=t know how much they really do understand about a topic until they have taken the time to express it to someone else. This cooperative sharing can be done via chat, listserv, E-mail or BBS as well. Chat can be a very dynamic environment in which to communicate and learn. Communication among peers may increase overall understanding of the subject matter compared to traditional environments (Hampton and Grudnitski, 1996).

Other Resources

Other resources include web-based documents, computer based tutorials, books, videos, and audiotapes, to which one conventionally turns for elaboration on a topic. A web-based system does not need to be the sole

resource for information and may only stimulate the need for more information for some learners, who prefer a self-directed learning approach to the material (Jones and Kember, 1994). Providing a library if possible, certainly a bibliography of texts, books, audio and video tapes and how to order them locally or through the organization is an excellent way to support employees' ongoing learning.

The use of this type of system, which supports and facilitates solutions to a company's expanding training needs and employee learning needs, can be helpful. Employers send the message that they will support and encourage continued education (especially work related). Employees, once they have become accustomed to the system, will hopefully come to expect and rely on that support. As changes within businesses and expected growth of worker's skill level continues, these challenges need to be addressed as efficiently as possible while at the same time allowing for individual needs for maximum learning.

Using the Framework for Developing a Curriculum Model

Part of the strength of this framework is that it is based on adult learning theory concepts such as collaboration, cooperation, mentoring, self-directed learning, and individual learning styles. Another strength is that this framework uses basic Internet tools and allows for maximum useability within the organization. It is not dependent on proprietary software, but can incorporate web-based client server software if the designer wishes. The framework is to be used by the curriculum designer and instructors to build a workable model of instruction. A model would be specific to the population of learners, content and training needs, instructors, and even the educational culture of the organization.

One such model might focus on supervisor skills development. The curriculum designer may decide that because the content involves complex decision making skills, this particular instruction would need to have a strong constructivist approach, in which the learner creates meaning from the information presented based on his or her own perspectives (Cranton, 1994). Students may start out in the traditional classroom setting to learn the on-line system and move from there to a variety of options within the system which would engage them in learning these skills. Some students may prefer to focus on reading content about the skills and the processes involved via web-based documents, and then practice them within a facilitated on-line session of role playing. Other students will feel most comfortable engaging in problem solving exercises posted on a bulletin board and then receive feedback from mentors located throughout the company. Both sets of students are learning according to their own styles and strengths with a system that is convenient and flexible.

Important Considerations

Although such a framework may be beneficial for organizing and implementing a training system for employees, it is important to consider several aspects for any given population of employees and type of training.

1. Learners may have difficulty making the adjustment from in-classroom training to on-line training, and it is likely many will need help understanding how to use these tools. Building into the system a guide to on-line learning particular to the system will be necessary. (Hillman, Willis, and Gunawardena; 1994: Igbara, Parasuraman, and Baroudi; 1996: Press; 1994: Dyrli and Kinnaman; 1996)
2. Training content varies. Using the framework's flexibility, the designer can decide which aspect of the system lends itself most readily to the content. For example, if teamwork skills training are the content, then the designer can focus that particular training on the collaborative problem solving features of the system to emphasize teamwork experience (Alavi, 1994).
3. Audio, high resolution graphics, and video files place heavy demands on a network. Although they can bring added value to some instruction (Ayersman, 1996), as of now many networked systems are not equipped to handle them efficiently. These should be used when instructionally viable with care.

4. Although instructional research is fairly extensive in many areas, research specific to using on-line systems which incorporate a variety of learning experiences are not very widely available and much needs to be done to correct this gap. Ultimately, theory and incidental application cannot supplant rigorous analysis of the efficacy of such a system.

References available upon request from
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