Connecting Resources in Online Learning Environments

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Abstract

This article highlights considerations for connecting resources in Online Learning Environments (OLEs). Extensive human, information, learning, and technical resources are needed to produce and manage comprehensive OLEs. The requirements and considerations for each of these resources are unique, but they should be viewed mainly as interrelated and connected to each other. Basic considerations for resources-based OLEs are discussed in this article, however future research is needed to explore the complexity of these resources and how they can be optimized for the effective delivery and management of online learning environments.

Introduction

The demand for online instructional delivery is increasing (Kroder, Suess & Sachs, 1998) as virtual learning communities are being formed to expand access to a broader range of educational opportunities for learners (Starr, 1998). Online instruction is typically delivered via dedicated Web-based hypertext systems on the Internet. Often referred to as "cyberschools", "online campuses", and "electronic classrooms" the technology is used to support interaction between learners and teachers. These types of educational Web-based systems also provide access to a variety of course information such as syllabi, examples of student work, class notes, announcements, tutorials, and other relevant information. As online instructional delivery systems advance, more comprehensive resources and structures are needed to support high quality learning and communication processes. Online Learning Environments (OLEs) will emerge to provide comprehensive support for the process of learning and instruction. An OLE is the foundation upon which an effective learning environment is conveyed to learners, faculty, and other stakeholders (Dringus and Terrell, 1998). OLEs are reachable at anytime and from any location, yet support high quality learning and communication activities as traditional campuses do (Hiltz, 1997). Layered within OLEs are online courses and activities facilitated by the use of appropriate instructional and communication technology tools. Online courses become components of a distinct, comprehensive, and pedagogically meaningful learning environment (Dringus & Terrell, 1998).

Extensive resources are needed to produce and manage comprehensive OLEs. Resources can be defined in this context as constituents -- human, information, learning, and technical, that bring the OLE to life. Human resources include faculty, administrative and technical staff, and learners.

Information and learning resources include internal and external information and activities presented, accessed, used, or performed. Technical resources include computer-mediated tools that are support mechanisms for human communication and learning activity in OLEs.

Administrators need to understand the complexities of resources that exist in OLEs. To produce and manage comprehensive OLEs, administrators also need to learn how various resources are connected to each other. Attention is often given to technical resources such as requirements, purchasing, costs, implementation, and management of hardware and software. Other technical considerations include Internet connection, network management, and computer-based tools. However, resources other than technical also should be reviewed extensively with respect to the decisions needed to produce and manage OLEs. For example, human resources, such as faculty, learners, and administrative staff have an extensive stream of requirements, roles, and responsibilities that must be supported and maintained in OLEs (Harasim, Hiltz, Teles, & Turoff, 1995). Likewise, information resources such as electronic libraries, Internet access, and database resources play a vital part in offering rich content to learners. To facilitate quality online learning, administrative systems must be in place and be fully functional from the outset of delivery (Kroder, et al., 1998). Learning resources are special activities, electronic rooms or spaces, and tools that support interactive learning and adequate learner control of environment and events.

Each category of "resources" contains its own unique set of requirements and considerations. However, each category should be viewed as interrelated and connected to other types of resources. Decisions about producing and managing an OLE should be resources-based, instead of strictly technology-based or human-based. Resources-based decisions account for influences or consequences of decisions connected to and balanced among the variety of resources being considered. The extent of support and infrastructure needed to provide a highly functional and an efficient OLE will determine the interplay of resources. This article highlights some major considerations for connecting resources in OLEs.

Human Resources

Faculty, learners, administrative and technical staff comprise the human resources that bring the OLE to life and link learners to the world of information at large. These constituents have distinct roles and responsibilities that are different from traditional on-campus environments. Roles and responsibilities need to be defined and applied to interaction and learning models that work well in OLEs (Harasim, et al., 1995). First, common roles and responsibilities that constituents will share should be identified. This may involve establishing the requirement to involve all OLE stakeholders as resources for each other, through collaboration and information exchange and distribution.

It is particularly important that stakeholders assume responsibility for participation and engagement by proactive demonstration of accountability, accessibility, and visibility. Generally, such responsibility is enacted through the timely response to electronic mail, timely and meaningful posting of information on Web sites or links, preparing and participating in online meetings or gatherings, and following through on requests and deadlines. Learning "on demand" in online settings requires an inordinate concern for organization and communication stability. Therefore, stakeholders must accept that their actions or non-actions may influence the online experience or produce consequences for other stakeholders. In addition, clear lines must be drawn that establish decision-making authority and accountability, ownership of information and presentation, and the degree of involvement in the learning process on an individual and group level.

Faculty

Faculty members assume new roles of participation and management in OLEs. Schrage (1997) and Marsden (1996) question whether the teacher's primary role is as a leader or as a resource in the classroom. In OLEs, faculty members are often geared toward being mentors and guides by focusing on problem-based learning versus lecturing (Rasmussen, Northrup and Lee, 1997). As faculty members become resources to learners, teachers and learners become equal learning partners in the educational process. Sherry and Wilson (1997) believe that a "transformative communication" process occurs when learners become resources to teachers. Learners become resources to teachers by providing newly discovered information or student work that can be used as examples for future work. Teachers become resources for learners when providing dynamic content information resources that learners can access and use at their own convenience and learning pace.

To prepare adequately and deliver interactive online courses, teachers will be concerned with issues related to efficiency, organization, management, scheduling, and time demands of delivering course content and activity in OLEs. Devotion to these issues may involve a mix of asynchronous and synchronous actions that need to be performed in appropriate time frames and sequences that learners could adapt to easily. According to Marsden (1996, p. 226), distance learning instructors assume the role of "a mediator between the text and the student, to motivate and explain." However, Bork and Britton (1998) warn about the confusion between delivering information and delivering learning. An overemphasis on posting information may not be sufficient or meaningful to support interactive learning. Therefore, faculty members need to achieve a balance between posting information, encouraging interactive discussion, and providing learner control of activities (Dringus and Terrell, 1996). Teachers must also address learners' levels of anxiety and misunderstanding concerning course requirements. Expectations and directions for participating in an online course must be clear and comprehensive. Concurrently, teachers must maintain flexibility in the face of addressing students' problems and concerns (Berge, 1996). Ultimately, Brown (1997) notes that instructors in electronic settings have greater potential to serve as role models of thinking by connecting learners to a wider experience of expertise that may not be readily accessible without the added benefit of electronic community exchange.

Learners

OLEs have the potential to support a learner-centered paradigm by which individuals assume a more active role in the learning process. For instance, in OLEs, learners often initiate communication with their instructors through the regular use of electronic mail and other computer-mediated communication tools when assignment clarification is needed or when content questions are raised about a course topic. In addition, learners can assume control of their learning experience by initiating discussion groups with peers during critical periods in an online course. Increased responsibility and accountability for learning are required of online learners (McGrath, 1998). They become active seekers and producers of information (Hedberg, Brown, and Arrighi, 1997), anytime and from any location, by sharing information with or retrieving information from various resources such as instructors, other students, electronic libraries and databases, and other internal and external information resources.

As the roles and responsibilities of the faculty are altered to some extent in OLEs, the roles and responsibilities of learners change as well. The faculty is responsible for the conceptualization and establishment of the OLE course structure. Yet, it is the learner's responsibility to generate meaning through the information resources provided and instructional events planned (Land and

Hannafin, 1996). To achieve this, learners must become managers of their own learning process and realize an internally focused causality for their learning (Terrell, 1994). Essentially, learners must become self-immersed by initiating interaction and communication with faculty, fellow peers, and instructional events. Naidu (1994) suggests that the quality of the experience is dependent on the quality of materials development. Also, as typical in a traditional classroom, immersion and participation in an OLE depends upon the degree to which learners feel comfortable and familiar with the learner-centered paradigm and the environment through which self-directed learning is generated (Naidu, 1994). Keeler (1996) reports that as faculty assist learners in making this kind of transition, learners exhibit positive attitude changes and instructors discover a new freedom to learn along with their students.

Learners have special needs that must be supported in OLEs. These special needs may include the need for informative feedback (Naidu, 1994) from the instructor and the online system; for orientation sessions that train users how to use OLEs (Rasmussen, et al., 1997); for activities that reduce learner tendencies toward procrastination (Naidu, 1994); for remedial writing or communication skills assistance; for logistical or troubleshooting support from help desks, administrative personnel, and information providers; for special interfaces, tools, and support for physically challenged learners, or the need for assistance in acquiring or altering time management skills in online settings. In addition, distance learners may experience greater degrees of isolation than in traditional classrooms (Naidu, 1994). It is reasonable to expect that some learners entering an OLE may be confused and apprehensive about adjusting to an OLE. To reduce these types of problems, teachers should develop and implement strategies to invite learners to participate and assume an active role in the learning process (Naidu, 1994).

Administrative, Staff, and Technical Support

Readily accessible and informed administrators, staff, and technical support are essential to helping learners and faculty to acclimate to online learning environments. Technical assistance should be provided within a 24-hour period of request. Substantial and comprehensible online documentation that explains OLE navigation procedures, troubleshooting issues, and instructions for using a variety of computer-based tools should be current and conspicuously posted in an OLE. Besides providing Web or Intranet links that post special announcements or tutorials on technical issues in an OLE, a substantive help environment (Rasmussen et al., 1997) should be designed and conveyed to all OLE stakeholders. In addition to establishing an OLE help environment, technical and administrative assistance should be made available largely by telephone access. Just-in-time support is essential to keeping stakeholders on-task in OLEs. In addition, extensive training or orientation programs, both delivered by computer-based and face-to-face methods (if possible), should be offered to new and long-term OLE participants. Administrators, in particular, need to develop guidance and support mechanisms that are sensitive to reducing faculty and learner discomfort with the delivery medium (Hardy and Olcott, 1995).

A substantial infrastructure is needed of administrative, staff, and technical support to offset administrative burdens of the faculty, and to provide proactive advising, assistance, and information to OLE stakeholders. Some major administrative and staff support tasks to perform in OLEs will include the timely posting of term and course schedules, policies and procedures, registration information, textbook requirement details, and special announcements regarding new program developments and other developments of interest to the electronic learning community. Frequent planning and production meetings should be held to address logistics or concerns, expressed by OLE participants. Planning and production committees should include broad membership from all categories of OLE stakeholders so that equity is given for advocate needs

and concerns of OLE participants.

A major consideration for providing adequate administrative, staff, and technical support in OLEs is comprehending the extensive electronic work required of producing quality OLEs, along with extensive office and paperwork that is concurrent to electronic work. This suggests that administrators and technical support staff overhead are generally large and costly. According to a document entitled, "Guiding Principles for Distance Learning in a Learning Society," (American Council on Education, 1996), distance learning providers should develop a plan and infrastructure for using technology. In addition, ACE (1996) reports the necessity for distance learning initiatives to be backed by an organizational commitment to quality and effectiveness in all aspects of the learning environment. This includes an investment of resources and effort in professional development of both faculty and staff involved in distance learning activities.

Information and Learning Resources

Information and learning resources include internal and external information or activities presented, accessed, used, or performed. Hansen and Frick (1997, p. 299) define information as "the content made availably for learning during the course. Information can be as printed text, lectures, videos, demonstrations, and simulations." With the increased use of the Internet to provide information on course content, course information in OLEs can be viewed as dynamic and instantaneous (Siegel and Kirkley, 1997) and can be organized in multiple ways to support a variety of learning styles. Wilson (1995) suggests that information can be organized in the form of information banks as sources or repositories of information. Hackos and Stevens (1997) categorize information according to procedural, conceptual, reference, instructional, and combined types.

Currently, the arrangement and management of information often place time consuming clerical and technical production burdens on the faculty to provide seamless access of information to learners. Venturino (1997) notes that a tremendous effort is required of individuals to keep track of continually changing information on the Internet. Memory capacity for static information should be distinguished with memory capacity for dynamically changing information. A well designed and organized OLE can reduce memory loads of participants who frequently sift through information sources. To accomplish this, however, an important distinction must be made between providing information abundance (Shneiderman, 1998) and information richness (Heeren and Lewis, 1997). Butler (1997) suggests that it is not clear if students benefit from having access to large unstructured collections of information. Windschitl (1998) questions how learners find and validate electronic information, and in what context is the Web useful as an inquiry tool that influences direct learning outcomes. Consequently, teachers would need to decide how and when information resources are posted and accessed. They would also need to decide whether information is intended for time sensitive use by learners or as archives of previous group discussions or student work.

Learning resources may also include internal and external information resources and adds the dimension of activity, such as interactive tutorials, live or recorded demonstrations or simulations, and specially designed electronic rooms that bring learners and faculty together to collaborate on projects. In some cases such as asynchronous tutorials or form-fill in examinations, learners should be given a certain envelope of freedom and control to access or complete work, that are in-line with specific learning styles or time schedules of learners. Finally, computer-based tools may also serve as learning resources that enable learners to prepare papers,

presentations and demonstrations. Computer-based tools should also enable learners to seek remedial assistance as necessary.

Technical Resources

Technical resources include computer-mediated tools that are support mechanisms for human communication and learning activity in OLEs. First, faculty and staff will need access to and perhaps training in using Web development tools to create course pages and robust online learning environments overall. Second, technology resources should provide a variety of services in electronic form that are typically provided in a traditional campus environment. These services may include library facilities, databases, archives, online testing rooms, laboratories, and communication capability to faculty, administrative, staff, and technical support and services (Huang, 1997; Dringus and Terrell, 1996). Other technology resources typically include providing hyperlinks to faculty Web sites and online materials (Huang, 1997); links to student transcripts or grade reports (Brand, 1997); and providing access to other learners via newsgroups, listservs, E-mail lists, synchronous and asynchronous conference tools (Dringus and Terrell, 1996), and other resources.
Generally, learners should be given an abundance of multimedia resources (Land and Hannafin, 1996) and reference materials to choose from. Some multimedia resources could include online text files, pictures, video, audio, databases, archives, library catalogs, course notes, relevant links to various Web sites and easy access to search engines available on the Internet. Huang (1997) contends that offering access to databases from remote locations is necessary, along with the ability to borrow texts or articles offline and have materials delivered electronically or through postal service. Synchronous resources such as telephone access to faculty, Web-based conferencing systems, electronic whiteboards, 24-hour technical support online or by telephone are needed to connect people within OLEs. Policies are needed to specify what kinds of technical resources will be available to OLE stakeholders (such as those mentioned above). Policies are needed also to specify technical resources that will be required to be purchased by stakeholders (such as personal computer hardware and software and Internet Service Providers (ISPs) and other equipment or materials).

Essential Considerations for Connecting Resources in OLEs

In summary, some essential considerations of resources-related decisions include:

- Determine the extensive stream of requirements, roles, and responsibilities that must be supported and maintained in OLEs by faculty, learners, and administrative staff.
- Recognize the various roles that teachers will assume in OLEs -- teacher, moderator, advisor, mentor, etc. (Harasim, et al., 1995).
- Complete a substantial analysis and review of a variety of resources needed to produce an OLE.
- Determine short-term budgetary needs (one to two years) and long-term budgetary needs (three to five years) for the variety of resources needed to support the projected number of students adequately who will enroll in online-delivered courses or degree programs.
- Give all OLE stakeholders extensive external links to the world of information.
- Determine technical resources needed such as requirements, purchasing, costs, implementation, management of hardware and software, Internet connectivity, etc.
- Review technical resources concurrently with other resources to produce and manage OLEs.
- Determine essential information resources needed in an OLE such as electronic libraries, Internet access, and database resources (Huang, 1997).

- Determine essential learning resources needed in an OLE such as special activities, electronic rooms or spaces, and tools that support interactive learning and adequate learner control of environment and events.
- Evaluate the interplay of resources related to the degree of support and infrastructure needed to provide a functional and efficient OLE.
- Provide for training and development needs of all stakeholders to serve as resources (Cravener, 1998; Rasmussen, Northrup, & Lee, 1997).

In addition, future research is needed to determine the unique contributions of resources in online learning environments. What is different about how resources are managed in online learning environments in comparison with how resources are managed in traditional learning environments? What adjustments are needed to optimize resources in OLEs? What new or different administrative and academic strategies are needed that are resources-based to produce effective OLEs? Reflections on these and other related questions will increase awareness for administrators and academics about the complexity of resources and how resources are connected in meaningful ways to the delivery and management of online learning environments.

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