

Australian Flexible Learning Framework

Supporting Flexible Learning Opportunities

Overview

The benefits of using Peer-to-Peer technology for e-learning

Peer-to-Peer technology is a new member in the range of educational technologies available today for educators, trainers and administrators. What is the promise? What are the realities?

Peer-to-Peer technology (P2P) has recently come into the spotlight through programs like Napster and Kazaa. While sharing music files has certainly created many issues in the music industry, P2P collaborative work environments are now emerging as a significant business application in the knowledge age. E-Learning researchers are now exploring the possibilities of using P2P for teaching and learning. The prospects look very exciting!

Educators and administrators today can choose from a large range of online learning products to improve the quality and efficiency of student learning and administration. These technologies range from basic email to Learning Management Systems and enterprise student administration software. Although P2P is not necessarily a replacement or evolution of these technologies, it should be seriously considered because of the benefits it can offer.

Collaboration is the key

Business has turned to collaborative systems to enable their workers to share files and ideas and to manage their projects in real and asynchronous time. The 'ping-pong' approach of sending emails with attachments is very inefficient in dispersed team environments. The correlation between a team working collaboratively at work and students learning collaboratively in their course is strong. There are many collaborative systems (Documentum eRoom, iCoher Plus & IBM Lotus Team Workplace are just a few), but most are web-based. What do P2P collaborative systems offer that web based systems do not?

Peer-to-Peer = people-to-people

Literally, P2P means computers 'talking' directly to other computers in a network. The Internet was founded upon this principle, but the concept shifted to a World Wide Web model in the mid nineties with central web servers and dissemination of rich media through the common web browser. P2P is founded on a different principle of decentralised information where content is created and stored on the edge of the network and distributed directly with other users ... truly people-to-people technology. A system from Groove Networks Inc. is a good example of what a P2P collaborative system can offer.

Simple and quick

Establishing a simple online learning environment can be straightforward and quick. After installing the P2P software on each of the users' computers, students and teachers are instantly teaching and learning. Under a typical set-up such as that used by a lecturer with a class of students, no additional support is required from specialist IT staff, and there is no need for servers or network re-configuration.

Inexpensive

P2P, in its simplest form, does not require a server. This reduces the overall cost of an e-learning setup significantly. For those who wish to set up P2P at an enterprise (institute) level, then more sophisticated hybrid systems using servers to support P2P are preferred.

Promotes collaborative learning

The value of learning communities and collaborative learning is well documented. P2P collaborative systems are designed exactly for this type of human interaction. This technology provides the ability to chat, speak, see, share and view resources, brainstorm and explore in both synchronous and asynchronous modes.

Presence Awareness & Instant Messaging

Presence Awareness (PA) is the ability of online collaborators to be 'aware' of what others are doing online as well as what files and applications have changed or are relevant to them. This feeling of 'presence' is a powerful motivational tool for education. Already there are reports of students 'swarming' in e-learning spaces as they become aware of each other. Instant Messaging (IM) is predicted to replace email as the primary internet communication tool, and it too adds to presence awareness.

Online and offline

Each group member has the option of going online to receive/send new information and also to communicate when they choose to, or working offline when Internet access is limited or privacy is preferred. Those in rural and remote areas could benefit most from this option due to bandwidth constraints, restricted range of Internet services and costs associated with continuous Internet access.

Security

Common security issues related to the implementation and use of P2P include:

- the need to protect the confidentiality of content and the activity of users.
- authentication of users.
- protection from the spread of viruses.

Further details on security are available in the operational impact statement.

Always up-to-date

Keeping everyone up-to-date with the latest version of learning resources, messages, notices or administrative changes is always a challenge. P2P collaborative systems do this automatically. When a student or teacher creates or alters information, everyone is automatically updated.

Keeping records

P2P collaborative systems are not just transient communication or file sharing applications. Sophisticated encryption for security and compressed object libraries store all content and communication on each computer, to provide both an audit trail and back-up capability.

Content management, intellectual property and copyright represent the main issues in regard to content. Management of 'administrative' and 'educational' content in institutions is a topical issue. At one end of the spectrum, teachers files and resources are mostly in a non-digital format, while at the other end, enterprise content management systems, learning object repositories and electronic documentation systems are employed. Using P2P need not compromise the control that institutes have over their content. Using Groove for example, enterprise servers are able to link the shared spaces of controlled domain users with the Institute's legacy content systems.

Those with Learning Management Systems (LMS) need not convert their existing materials or extract the content for P2P. The Web browser facility in Groove will still enable students to login to their Web-based course for resources, although it would be inefficient to then use the embedded communication features in the LMS as well as the P2P space. Early adopters of P2P have used a blended P2P-LMS approach for course design and delivery, but have then migrated from the LMS entirely to the P2P environment, electing to put web based content on a simple website with password access.

P2P platforms such as Groove could provide the missing link in the current debate around Reusable Learning Objects (RLO). The concept of creating, meta-tagging and storing 'educational' digital data for sharing and reusability has always been appealing. Although the creating-tagging-storing process is now quite sophisticated, the actual application in an e-learning context is problematic. Some researchers have built engines for both students and teachers to 'assemble' RLOs in the context of their learning, mostly within some type of LMS environment. However, most of these initiatives seem to result in a clumsy linear information/object display that is difficult to put into the specific contextual need of the user.

In a P2P environment like Groove, it is clearly possible to link to existing RLO repositories. From there, teachers could use a search function within the P2P environment or the RLO Repository to locate and then insert the RLOs in their educational 'space'. The contextualisation of the objects is then more easily managed by the teacher and by the students because of the dynamic nature of the P2P learning environment. Also, there is no reason why a more sophisticated RLO 'builder' could not be developed in the P2P platform, that could assist teachers in manipulating the RLOs for context and/or easier use,

or provide a more education-friendly interface than the current 'File Explorer' presentation.

Summary

It is an increasingly connected world, with more devices and channels appearing every day. Peer-to-Peer technology is not an edu-Napster, but it does warrant serious consideration by practitioners and educational enterprises who need to respond to the knowledge age learner.

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