Peer-To-Peer: The Next Hot Trend in E-Learning?

By Jennifer Hofmann

Video, CD-ROM, discussion boards, synchronous classrooms. It seems that every couple of years a new technology comes along that takes on the challenge of being the "next hot trend" in learning. It's hard to imagine a technology or technique that we haven't already exploited. Well, get ready. Some new kids just moved on the block--Peer-to-Peer (P2P) networks--and they plan on being major players in e-learning.

What is P2P? It's important to remember that P2P isn't a training application; it's a networking technology that enables the sharing of resource. The "peers" are individual computers that make up the network. Some examples of P2P are

- **Data sharing.** When we think of sharing resources, text, audio, video, and music come to mind. P2P accommodates data sharing by allowing a PC to link directly to other PCs on the network without first going through a file server. The most famous--or, perhaps, infamous--P2P data-sharing network is the music exchange software NAPSTER (www.napster.com). In the original NAPSTER model, music is stored on the users' machines rather than a central file server, creating a potential repository of unlimited available storage.

- **Resource sharing.** A series of computers linked together in a P2P configuration can literally share computing resources to create a distributed computing environment. Distributed computing can perform calculations that would be too intense for individual processors. Currently, this P2P functionality is being used in medical research and related fields. For example, the Intel Philanthropic Peer-to-Peer Program (www.intel.com/cure/overview.htm) allows anyone with a PC to assist in medical research. By becoming part of this P2P network and downloading a very small amount of daily data (2Mb), the network uses free computer resources to assist in computations and research. The data is automatically pushed to the desktop and the results of calculations are pushed backed to the network. Users rarely notice that their computer is being accessed.

- **Workgroup collaboration.** The creation of shared spaces, such as those made available by Groove (www.groove.net), enables groups to collaborate over space and time. The point of shared spaces, according to Andrew Mahon, Groove's director of product marketing, is to "share stuff, talk about the shared stuff, and do stuff with the shared stuff."

It's interesting to note that a P2P network doesn't care **where** a resource is located. When a peer (computer) requests a resource, the network supplies the resource from another peer that happens to have it. The more distributed the resources, the more useful P2P networks become. If all of the resources (data) are located on a few centralized servers, then implementing P2P on an enterprise level might not make sense.

But, potentially, this technology could have a big impact on the way people retrieve and act on information. P2P is the ultimate knowledge management (KM) system. Nay-sayers may demand to know how P2P can fit into an e-learning blend and actively benefit learners? P2P fans reply: The unmoderated environment lends itself to informal information exchange rather than formal training. As more peers join the network, opportunities for more information to be stored, accessed, exchanged, and learned increase.

Sound familiar? It should. The World Wide Web was built on the same concept: information sharing by anyone who wanted to take the time to post a Webpage. Like the Web, the very existence of P2P

encourages a low level of collaboration between users. Learning comes in to play when peers start to create communities of practice and make related content available across the network. For example, without P2P, if you needed to make a widget for the first time you'd have two options: start from scratch or go to a training class on how to make widgets--if one is available where and when you need it. With P2P, when you need to make a widget, you get information directly from the widget expert.

However, to actually use P2P networks as self-directed training tools requires discipline. To create a working knowledge community, users must make content available and functional, and community members must take the time to search for content, clarify information, and provide feedback as to its usefulness. That requires a great deal of motivation on the part of the learner, but it's not all that different from the motivation required to be a successful e-learner of any kind. Successful e-learning interactions, even those that are moderated (in discussion boards or synchronous classrooms), require highly motivated participants. If content isn't engaging or perceived valuable, learners often will not complete the activity. Thus, using P2P networks to facilitate learning provides us with the same challenges other technologies do, and content management is key to success.

P2P in practice

Organizations are already successfully using P2P as part of their training initiatives. Satellite Cops, a privately owned company that sells and distributes satellite television and plasma displays, is using the Groove to train its dispersed sales force. Satellite Cops CEO Carlos Romero introduced his company to Groove more than a year ago. He explained the importance of Groove to his business: "We use Groove for training sales reps in satellite TV sales, keeping them up-to-date on the latest promotions. Because we all work from home offices, we can push Webpages or Word documents and discuss new projects--all while collaborating online." Before using Groove, Romero relied on a combination of email, instant messaging, Web navigation, and telephone interaction to provide sales reps with training materials, updated advertising and marketing materials, and presentations. Now all of those adhoc interactions take place within a shared space, and any resulting data is saved with the project.

According to Groove spokespeople, P2P is starting to show up in academic environments as well. Dr. Rick

Lillie of Cal State University creates a Groove shared space for each of his classes and uses it as a primary communication and facilitation tool. A Groove representative says that Lillie uses Groove to explain problems, receive assignments, post course updates, hold group meetings, write and edit papers, and teach students how to do Internet-based research.

Potential P2P problems

Before jumping headfirst in to P2P, be sure to consider its downsides. The first questions I had were, *If anyone belonging to our network can make information available, how do we validate the content?* and *Do I assume that, if the information is on the network, it's correct and up-to-date?* People have been trying to answer the same questions for the last decade concerning the validity of content on the World Wide Web. Try asking anyone making information available on your network to include resources, background data, dates, and other information that will help to ensure data integrity. In addition accessing information, use the P2P network to communicate with the resource provider and ask clarifying questions.

Another question that needs addressing concerns the security of the user desktop. If users in the network can access these shared spaces on my hard drive, doesn't that compromise my entire workstation? I asked Andrew Mahon at Groove about the security of his system.

"When you're invited into Groove, you're sending messages only to those who are invited into that specific space. [The program] uses 192-bit encryption and is more secure than most Websites. The problem is that most end users won't work on encrypted spaces because email is so much easier. But email isn't secure. There are many products that allow you to collaborate, but they're products that have some sort of gating factor (i.e., you have to ask permission or be invited to share). People aren't willing to jump through hoops to use a product that they need to get permission for every time. That's why Groove works. People feel they have ownership of what they have on their desktops. They will actually use Groove, and they know it's secure because of the encryption. Any exchange on Groove is encrypted with your own personal key."

Sounds good. But I wasn't convinced that answered the questions about desktop security. I asked Matthew Stansel, information security officer at Yale School of Medicine, what questions he would ask before implementing a P2P solution on a secure network.

"First of all," says Stansel, "when considering implementing this on an enterprise level, you should make sure your security specialist is present from the beginning to ask the right questions. For example, 192-bit encryption sounds very secure, but I would ask some more questions. What exactly is getting encrypted? The files? The authentication (logon information)? The data transmission? And how does the data remain encrypted once it's stored on the hard drive? If sufficient protocols aren't present, then you might consider a more central, and more secure, way to transmit and store data. It's better than email, but you still have distributed the file to a PC beyond your control and then it's potentially available to other peers on the network."

If you're interested in using P2P technology, make sure your network specialist is comfortable with the security of the system. Set up usage protocols to keep sensitive data safe. That might take away from the attractive freedom of such a network, but you'll know your organization's assets are secure.

Bottom line

P2P networks combine tools that are already available, such as Internet search engines, discussion boards, and email, into shared spaces that aren't necessarily controlled by a central resource. P2P offers a great deal of potential for workgroup collaboration, communities of practice, and informal self-directed learning, but it's a tool that needs to be used by self-motivated teams in order for the advantages to be realized. For now, the jury is still out on whether P2P will become a ubiquitous collaboration tool or a trend that will fall out of favor when the next hot technology comes along.

Learning Circuits welcomes your feedback.

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