Principle-Based Technology and Learning Environment Design


Technology that supports and enhances learner-centered practices is a key theme and an important research area for the NLII and one of the reasons Margaret Haughey, editor of the Journal of Distance Education and Professor in Educational Policy Studies at the University of Alberta (http://www.ualberta.ca/), was asked to tackle three questions at a plenary session of the NLII 2003 annual meeting.

What do we know about learning and cognition that should be applied to the online environment?

Learning itself cannot be designed. It can only be designed for through the design of learning environments that catch learners’ attention, incorporate their experiences, demand practice, follow their growing understanding, and provide feedback in order to avoid the cracks they didn’t see and to help them avoid falling into new ones.

Research tells us that learning occurs best in an environment that is resource rich. It should support active and collaborative learning; incorporate authentic, real-world problems; and provide ongoing assessment. Fundamentally, learning is about moving from a state of disequilibrium and into a state in which we are searching for new resolutions, new meanings, and new connections. It is about making connections—both within our brain and among ideas—through experiences with others and with the help of learning materials.

What stimulates learners to want to seek the connection? As far as we know, it is some disjuncture, whether among the new ideas we are hearing or with our own prior knowledge. The desire to seek resolution must balance opportunity and challenge, and it must provide the opportunity to apply and reflect. Learners need to be directly involved through discovery, construction, transformation, and transfer. Learners must also be encouraged to go beyond the information itself. The possibilities for new learning (1) must be kept open in order to deepen what learners understand and (2) must encourage them to be lifelong learners. Such learners know how they learn and in what areas they
need support. They know how they approach new knowledge and how to assess their own learning.

*How can existing technologies be used in the design of effective teaching and learning experiences?*

At a minimum, existing technologies can provide a visual architecture to the information associated with a course that is not always evident from a course outline: in other words, make evident the structure of the information of a course and how it’s related to the discipline. However, if technologies were simply for providing and structuring information, they wouldn’t be all that learner centered. Information in the form of facts and ideas isn’t what we seek as learners; we look for meaning and understanding by making connections. Technologies enable us to choose authentic issues and problems. They enable learners and teachers to enhance their learning and to learn different things in different ways. Technologies make it possible for us to envisage different strategies that help learners learn and to organize learning experiences that address areas likely to be difficult to master. This is why we bother with technologies: they have the potential to expand choices about how we teach and learn.

Now that we know that learning is socially constructed, we can begin to see the importance of interaction between teachers and between learners and learners and their peers. Networked environments inspire community, which is the context for social learning. As we think about designing new learning environments, the social context forces us to consider the identity of learners, their histories and present cultures, how they communicate with others in that culture, whether they are receiving frequent feedback, whether they practice in supportive environments, and whether they’re engaged in intellectual inquiry.

Often, when institutions of higher education look at designing change, they focus on the faculty part of the equation. Out of that have come some successful strategies, including partner programs; departmental-level task forces; decentralized, discipline-related centers; student guides and helpers; and pushed mailing lists. One of the common
characteristics of successful faculty-focused strategies is immersion, whereby ongoing, sustained contact in a community of learners is supported.

Other change strategies focus on the curriculum: specific areas get targeted by discipline, department, program, or niche. This provides students with better services and a more-integrated learning experience because design occurs outside the course box, and it maps more naturally to a body of knowledge. Still another set of strategies focuses on students. These are strategies that focus on learners and on providing learners with an effective learning environment. It may take the form of universities that provide students with laptop computers and wireless classrooms, online student records, and e-access to library resources from anywhere on campus. One likely result of such a strategy is additional pressure on institutions to accommodate technology-based learning.

Based on learning principles and the challenges the academy faces in changing the learning environment, one way of thinking about designing for learning is to look at four different approaches to the use of technology.

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<th>Approach</th>
<th>Designs for Learning</th>
<th>Technologies</th>
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<td>Information based +</td>
<td>Provide for the course through one of the following (but none of these are interactive) a visual architecture that is not always evident from a course outline. Emphasize situations in which the learner interacts with ideas and information through the technology by using guided practice, comparison, and</td>
<td>• Web pages</td>
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<td>Interaction</td>
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| Interaction based + Information | Enhance individual understanding or group cooperation (but not typically designed for collective understanding). Enhance collective understanding through negotiation and mutual agreement (requires significant pedagogical support). | • Hypertext  
• Critical analyses of materials  
• E-mail  
• Conferencing (online discussion, role-play, debate, expert opinion, panel)  
• Collective understanding (synchronous, asynchronous)  
• Collaborative knowledge building (Knowledge Forum, Whiteboard) |
| Knowledge construction + Interaction through collaborative work | Provide information resources that are reusable, accessible, and interoperable and that include content. Provide information resources that focus on and guide process, including pedagogy. | • Knowledge (learning) objects  
• Repositories  
• Metatags  
• Learning Shells  
• Templates  
• Can be built into the course management system |
| Integrated + Learner centered | Organize and orient the institution around learners rather than faculty. | • Fully multimedia-based courses  
• Fully online supporting systems (registrar through library) |
Organize around teams to create a seamless experience for students.

Ensure that all supporting systems are in place.

What are the next challenges higher education will face in moving from the transfer model of learning to the design of rich, Web-based learning environments?

The process of designing for change brings with it countless challenges, but there are also things we can do.

- Set quality standards.
- Foster interinstitutional collaboration to encourage best practices.
- Build our understanding of learning based on evidentiary research.
- Reinvent the rewards for teaching, whether in design, facilitating learning, or pedagogical research.
- Manage workload issues.
- Promote partnerships in research and development and in learning provision.
- Be clear about our choices and why we are making them.
- Support the shift to active, authentic, resource-rich, supported e-learning environments for faculty as well as for learners.