

Five Thoughts on Online Learning and Preparation for the Twenty First Century

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As I sketch my thoughts, I'm mindful of the highly effective process that Jan Visser put in place to (help? nudge? force?) each of us to better prepare for this symposium. We were asked to post and share questions and perspective relevant to issues of online learning. This has helped each of us learn from one another, and will undoubtedly affect the nature of our live presentations and interactions. I personally have learned a great deal from the postings of my co-presenters, and it is noteworthy that all this learning has taken place "online".

Many of my collaborations with colleagues across the world are also made possible by opportunities for online interactions, and the advantages of these kinds of interchanges are almost certainly apparent to everyone at this conference. This brings me to several points that seem worthy of mention. Most are obvious, but they nevertheless seem to be potentially useful for helping us organize our discussions of issues and opportunities.

1. Everyday Learning vs. Formal Education

This first (obvious) point is that learning is much broader than "formal education". Most of what we learn throughout our lifetimes involves informal rather than formal learning (e.g. Bransford, Vye et. al, in press), and it seems useful to keep this distinction in mind when we discuss "online learning". The online learning that all of us have done to prepare for this symposium is not the same as taking a formal course.

Of course, even "informal vs. formal learning" is not a simple either-or distinction. For example, preparation for this symposium involves a real world task, deadlines, and even thoughts of "being graded" (by audience members). Hence our online, non-course learning contains elements of formal educational environments. Other kinds of informal learning are less focused, time limited and "high stakes". When discussing online learning and the learner characteristics associated with it, differences between formal and informal learning seem useful to keep in mind.

2. The Necessity of Developing Online Learning Skills

The point above is related to this second one; namely, that if we think about learning "writ large" (i.e. beyond formal courses), the ability to engage in online learning is fast becoming "necessary and not just nice" (Thanks to Andrew Ortony for this phrasing--he used it in the context of using metaphors to communicate).

Even if opportunities to learn online are inherently inferior to opportunities to learn face to face (which I doubt and will discuss later)--it is still the case that online environments

make it possible to learn much more than would be possible if all learning were restricted to face to face opportunities. A dramatically expanded range of ideas and perspectives become available to us when we know how to navigate in order to find the riches of the online world.

La Pointe's excellent article (this symposium) includes a relevant quote from a student who said: "*I reflect and integrate aloud when participating in class discussions and feel stifled having to reflect alone through a private journal*". This is clearly a valid concern for the student, but it seems to me--and I suspect that all the co-presenters agree--that we owe it to future learners to help them understand the importance and benefits of learning to adapt to online learning opportunities. Sometime in their lives, today's students are going to need to make use of online learning opportunities. We need to help them learn to develop the skill and courage spans (Wertheim, 1979) to learn to adapt to and embrace these opportunities--even if they still prefer face-to-face interchanges.

This does NOT, of course, mean that all of our students' learning--informal, formal or some combination--needs to be online. But we do need to help students realize that part of what they currently like is affected by what they are used to, and that "stretching current "comfort zones" by making attempts to adapt to new kinds of learning environments is a major part of developing the "adaptive expertise necessary for success in our increasingly fast - changing world" (Hatano & Inagaki, 1986; Schwartz, Bransford & Sears (in press).

3. Learning Environments

All the participants in this symposium have made the important point that we should talk about online learning environment rather than talk as if there is only one face-to face environment and one online environment. In the student quotation from La Pointe's paper that I noted above, the student prefers face to face interactions over "...reflect(ing) alone through a private journal." As many in this symposium note, private journals are not a 'necessary' component of on line environments but, instead, one of many options. As we all know, it is both possible and relatively commonplace to have online opportunities for interaction among learners (rather than only private journals). And there are many additional features of learning environments that are possible as well.

It would be a shame if our students developed either the explicit or implicit assumption that there is only one format allowed in online learning--just as it would be a shame for them to assume that all face to face learning is always lecture, or always free-form unguided small group discussion; always cutthroat competition rather than cooperation to help everyone achieve high standards, etc. Helping learners understand the potential landscapes of both face-to-face and on-line environments (plus blended combinations) seems to be a component of "learner centeredness" that is important for us to pursue (e.g., see Duffy et. al, 2004).

4. Adaptive Expertise and Guided Collaborative Design

If there is anything about online learning environments that is a certainty (for both informal and formal learning), it is that they will continue to change quite rapidly. Preparing learners to adapt to change therefore seems like a high priority. And we if create two-way feedback loops and learner-adjustable interfaces, learners can play an important role in this change.

In order to accomplish this, we need to move from tacit “trait theories” of learning styles and preferences to “momentary state theories” that encourage people to become metacognitive about what is working at the moment and why. Based on the learning sciences literature (e.g., National Research Council, 2000), my bet is that people’s need to see, hear, touch, feel, interact personally, etc. will vary depending on the subject matter being taught and their level of expertise within that subject matter. For example, novices typically need visuals--often dynamic ones--to learn about plate tectonics whereas more advanced learners can read or listen and generate their own images. Our society sets the stage for prompting people to adopt “trait-like” theories of themselves as learners when, in reality, peoples’ needs and preferences are much more situative depending on their current knowledge, goals and learning context. Overall, we need to help students develop the habits of mind to continually adapt, adopt, and even invent offline and online “smart tools” that will help them as they progress through life and along various expertise trajectories (e.g. Bransford, Zech, etc. 1999); Schwartz, Bransford & Sears, in press). As noted above, this needs to be a lifelong quest--it’s not a one-time task of finding a single learning style and sticking with it for a lifetime.

5. Special Affordances of Different Kinds of Learning Environments

Whether face-to-face, blended, or primarily online, particular features of learning environments have special affordances that affect learning. Sometimes it helps to be able to feel objects (weight, smoothness, etc.) manipulate them and so forth (e.g. Brophy, '99). In the movie Apollo 13 for example, engineers are shown solving a problem that actually occurred in the Lunar Landing Module (LLM)--they received a box of parts and were told to “make this from these”. Without the actual 3D parts, it is doubtful that they would have succeeded in a timely manner. Computer-based 3D models of the parts would probably have been less effective. In other cases, of course, seeing a 3D simulation (e.g. at the level of nano-technology) can be uniquely advantageous for helping people learn. Similarly, some people are more likely to participate in discussions when they are live; others prefer online discussions. As Stirling so clearly explains, these often involve differences in high-context versus low-context communication systems. Plus they can involve high or low affect--students who have problems in my courses (e.g. with grades or with other students) often prefer to discuss them first over E-mail because they are afraid of crying if we meet face-to-face. Overall, there are different affordances of various environments that fit different needs. And of course, multiple affordances can be available in any environment--especially blended ones.

A number of symposium participants mention comments from colleagues suggesting that online environments are inherently inferior to face to face environments (see especially, Spector). Ongoing work suggests that there are affordances of online environments that provide advantages that can be hard to duplicate in mere face-to-face classrooms. For example, my colleague John Bourne (2001) created “knowbots” that knew when an assignment was due and nicely reminded students that a deadline was approaching (it might say, “Are you feeling OK? I notice you haven’t posted your assignment yet and it’s due in an hour. Let me know if you need some special help”). This greatly increased the degree to which students posted on time. For this symposium we had our own “knowbot”--Jan Visser--who did an excellent job of nicely reminding us when things were due. However, for people with large classes, electronic knowbots make the task of politely reminding students much easier to achieve.

The VaNTH Center for Bioengineering Education Technologies (<http://www.vanth.org>) has developed the CAPE system, which can be used in blended or totally online settings. The program makes it easy for instructors to create challenge-based lessons and build in a set of formative assessments that allow students to take particular paths depending on how they answer. Students can stay connected to one another as well. One of the nice features of the system is that it can be used to connect homework assignments with students’ performances in classes. Keeping close track on what each student understands and needs on a frequent (e.g. class-by-class) basis – and providing appropriate out-of-class follow-ons, is--of course--very difficult in traditional instructional contexts.

The ability to connect the Internet and handheld devices (iPods, Palms, etc.) provides additional advantages for learning. For example, students can have access to materials while driving in the car, waiting in lines, etc.; hence we can help them open up new spaces for learning to occur. It is exciting to keep an eye on affordances of online environments that allow us to surpass the levels of learning that have occurred in the past.

Summary

Overall, the preceding thoughts (developed in part by having the opportunity to read the great thoughts of my co-presenters) help me address the issues and questions I posted several weeks ago; namely: (1) why the idea of lifelong learning means that all of us must become “adaptive experts” who must frequently be willing and able to step out of existing comfort zones and give up old ways of doing things in order to adapt; (2) how online environments (especially blended ones) can improve on traditional classroom instruction; (3) how appropriately designed online environments can encourage problem solving and knowledge building (e.g., see CAPE at VaNTH.org; Bransford et. al, 19); (4) how opportunities to connect to new handheld devices opens up new spaces for learning that tend to be wasted otherwise (e.g. while waiting in lines, driving in the car).

I look forward to the live interactions that represent the next step in this journey.

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