Reader Response 11- Bransford
Chpt. 9 – Technology to Support Learning

Things to Remember:

Guiding question from preview notes:
If you took away all economic and curricular restraints, in what ways do you envision it could be used in the school to support learning?
Enables you to see possibilities and encourages outside the box thinking. We often begin from the point of "what we can't do" and that limits conceptions of what we "might" do.

Technology in and of itself is not a magic bullet for improving education. It's actually just another resource that has potential to be very expensive window dressing. The key is in how it is used. When integrating technology in the classroom, it is important to attend to instructional design that engages learners in higher-order thinking. As compared with more traditional print and video media, newer computer technology is unique in how it can combine the following elements:

- potential for interactivity
- visualization & modeling of concepts to make them more concrete
- access to vast stores of information
- support development of communities of practice

Good instructional design t integrating technology exploits these elements, and results in effective learning as defined by depth of understanding, transfer, and longevity.

5 ways to use technology as a productive learning resource —

1. Environment for learning experience that is problem-based. Technology enables creation of new kinds of learning environments in which students are able to engage in real-life problems. Interactivity is key to exploiting the learning potential of technology in building instruction. There is a continuum of interactivity from linear stand alone videotapes, to video combined with problem solving software, to fantasy virtual worlds, to engaging in real-life problem solving with student-professional partnerships and students around the world.

2. Scaffold and tools for learning. The essential role of technology is to increase our potential for work. "Like training wheels, computer scaffolding enables learners to do more advanced activities and to engage in more advanced thinking and problem solving than they could without such help. " pg 214. Scientists and mathematicians use visualization and modeling software for the same reason. When instruction integrates such problem-solving tools into classroom experience with attention to the conceptual knowledge that learners are forming, both performance and learning is enhanced.

3. Facilitates Feedback, Reflection, and Revision. Two important qualities in this regard are timely and personal meaningful teacher/student and peer to peer interactions. Technology can facilitate this if used well. Computer networking within a school, between schools or via the worldwide web can offer opportunities for students to collaborate on learning activities by working through a communal database, share notes and media, share visualization software, give feedback to one another, share workspaces. Computer tutors have also been developed for some fields that utilize artificial intelligence to guide student learning interactively. Such virtual classroom environments can offer provide the vehicle. The rest is up to the teacher and instructional design to exploit the potential of networks.

4. Connection with global communities of practice. Technology potentially extends learning beyond the classroom to connect with the outside world. Again, the extent of this connection is up to the learning opportunities the teacher integrates into instruction.

   Pg 226. "Three factors were associated with successful network-based communities:
   - An emphasis on group rather than one-to-one communication

- Well-articulated goals or tasks
- Explicit efforts to facilitate group interaction and establish new social norms"

Suggested Stages of Development of effective virtual community:

a. build relationships by engaging people across locations in organized dialogues and multimedia introductions
b. establish guidelines for communication and roles in virtual environment
c. scaffold activities to help all participants understand their new responsibilities
d. use dialogue to explore, refine and respond to questions posed by themselves and others.

5. Teacher Growth & Support. In the effort to integrate technology more fully into his/her own classroom, the teacher's role changes from expert to novice and knowledge dispenser to co-discoverer. The role change effectively models learning that involves collaboration, innovation, time to learn and experimentation. The role change also shifts responsibility for learning from the teacher to the student. Amazingly, just the very act of bringing computers into the classroom and using them meaningfully can affect assumption of responsibility. Pg. 226 "the transfer of the teaching role from teacher to student often occurs spontaneously during efforts to use computers in classrooms."

   In addition to affecting the teacher's role, technology can ease professional isolation of teachers working in unsupportive environments or geographically isolated contexts.

Connections:

- Re: curricula

My youngest son had an innovative and enterprising teacher in 5th grade who used Voyage of the Mimi. As a parent, not knowing what they were doing it seemed like an awful lot of time was being taken up with this project that my son said was, "just watching videos about scientists on the ocean." But I knew that my son was really engaged with whatever it was they were doing so I trusted the teacher. This is my son that has a learning disability. We didn't know that was the case at the time, but I'm sure his enjoyment of school that year had a lot to do with this teacher's emphasis on experiential learning. I think now, at 21 years of age, he remembers more from that one unit study than nearly anything else he has done in school. Now I know how soundly her teaching was based. And I'm thankful he had a year of stimulating his thinking and learning rather than killing his curiosity and feeding his dread of reading.

- Re: scaffolds and tools

Pg 215 "Some scholars assert that simulations and computer-based models are the most powerful resources for advancement and application of mathematics and science since the origins of mathematical modeling during the Renaissance."

Reflection on this comment in the text drew me into an extensive conversation with my husband (MA in Mathematics). He pointed out that there is a difference between pure mathematics and the applied math used by scientists. The modeling that Bransford refers to involves applied mathematics and is highly useful. This then, drew me to reflect on what happens in school when kids don't get enough experience with even the basics of applied math such as counting. When we introduce even simple tools like calculators too early, or apart from problem-based experience with counting, many kids are at risk of creating serious misconceptions and/or delayed learning.

I can use myself as an example of someone who really never grasped important concepts of counting. Somehow, I managed to go all of the way through to Analytical Geometry in college before I realized that doing proofs was more than "magic number manipulation". It took me forever as a kid to learn the multiplication tables and how to tell time. Both "clicked" somehow by the middle of sixth grade, as I recall. Reflecting back, I now realize that I didn't have the basic understanding of these activities as counting something. Both were just magic numbers that I finally had enough experience with to store in long-term memory. I shudder to think what would have happened for me if I had been given a calculator.

More currently, my husband was tutoring our nephew in high school algebra and discovered that he had similar thinking to what I had as a kid. Only worse. My nephew could not do any basic mathematical function without a calculator in hand and he really had no idea whether the "answers" he got were meaningful. All he knew was the order in which to punch to the buttons. This is a smart kid. Verbally gifted. He was mathematically clueless, in part, because he was allowed to depend on a calculator when he should have been learning how to count. I think these two examples emphasize the importance of using technology purposefully, having pedagogical content knowledge, and giving feedback to students.

- Re: using technology well

Pg 206 "mere presence of technology does not ensure that it will be used well"
I have witnessed some glaring examples of this. One that stands out was a pre-school program in Asia that I visited. The school was very proud of the computer lab they had where 3-5 year olds would go, sit down in chairs in front of computer screens placed about 18 inches from their faces, and watch a dancing person dressed in bright colors gesticulate and sing a de-contextualized song in English. Amazingly, the children sat there zombie-like and still.

At a small 1-12 international school where I worked once, the school managed to grow from having a single computer in some classrooms to supplying a full computer lab. I lobbied long and hard to get networked internet access so at least the kids could do online research. The school had an IT person, but he wasn't a teacher. Just a techie. So when kids came in to use the lab, he didn't know how to get them to use it as more than a glorified typewriter.

However, even when an educational tech specialist is on campus, they often are not accessed. This was daughter's recent experience in a north Texas school district where she taught grades 2-4 where she got her very first teaching job out of college. The school principal and district were foresighted enough to fund and staff a computer lab, tech resource library and training opportunities. But most teachers did not take advantage. My daughter said she learned so much from the tech specialist and had lots of personalized help because the specialist was so under-utilized

- Re: isolation & communities of practice

These are huge issues for both the students I work with and the few teachers that I consult with. Technology has enormous potential of closing the isolation gap for both students in their own learning and teachers in their need for professional development. Bransford gives a few logistics to consider. I think I really need to put some time into learning how to build effective learning communities via internet. I just need the time to figure out how to make it work.

Questions:

- Do you have an ed. Tech specialist on your campus? What services do they offer? Are they utilized? Why/why not?

- Has anyone found good resources for the practicalities of designing, building, and managing effective communities of practice? I know that "buy-in" is essential to get started. Any ideas/experience on how to facilitate?

- I really liked the idea of providing teachers with video samples of instruction presenting the same content using different instructional approaches for the purpose of comparison. Is anyone aware of ready-made modules like this available on the internet? Or other suppliers? Of course, I could do my own. But there is only so much time! Can't wait until summer when I can do some design work for my own purposes instead of meeting course requirements for uta.

- How can I effectively expand teaching parents and parents' conception of technology beyond "efficient word processor, data cruncher, fact finder, and memory facilitator"? How can I lead them to engage in the interactive aspects of technology with a view toward building learning and a learning community?

- Pg 230 "Good educational software and teacher-support tools, developed with a full understanding of principles of learning, have not yet become the norm." OK, I agree. But can we collect a list? Does anyone know of a list? There are many reviews of educational software available. But it would be great to have a collated list built on criteria gleaned from brain and learning research.

Extension:

An assortment of links about Communities of Practice

- **Articles:**

"Working with Communities to Explore and Personalize Culturally Relevant Pedagogies: Push, Double Immages, and Raced Talk" *Journal of Teacher Education* 2007; 58; 168

How a group of prospective teachers, as participants and students of a particular African American community context, begin to develop bicultural competency and personalize cultural and politicalknowledge in an effort to develop culturally relevant pedagogies.
The online version of this article can be found at:
http://jte.sagepub.com/cgi/content/abstract/58/2/168

Communities of Practice: A framework for fostering coherence in virtual learning communities "
A case study of an online professional development workshop.
http://ifets.ieee.org/periodical/vol_3_2000/e01.html

- **Paper**

"Communities of Practice: A Literature Review"
www.educationaltechnology.ca/couros/publications/unpublishedpapers/communities_practice.pdf

- **Wiki**

Community of Practice. Includes application to teacher education and professional development
http://edutechwiki.unige.ch/en/Community_of_practice

- **Example of a working knowledge network for kids**

Kidlink is a non-commercial, user-owned organization that **helps children**

- **understand themselves**, their interests, dreams, and **goals for life**
- develop **life-skills**, mature, and get better control over their lives
- develop creativity, and build social networks across cultures and borders.

www.kidlink.org