

**The Classroom of the Future:
Professional Development
And a
Constructivist's Classroom**

By

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May 3, 2008

INTRODUCTION

A challenging problem arises when you need to develop a meaningful learning experience for a large number of learners who will have very limited time to interact in the learning environment. I was presented with this problem when I was faced with planning an interactive learning environment for a conference of independent school administrators and teachers at a large national conference. The conference provided an opportunity for approximately 7000 head administrators of independent schools from around the nation to gather for two days and hear world-renowned speakers, attend workshops and visit the featured project-The Classroom of the Future.

The challenge was to develop a learning environment where these educators could not only hear presentations about contemporary pedagogy but experience learning in a constructivist's classroom supported by appropriate current and emerging technologies. It was important that these educators could hear and experience learning in the 21st century. Yet, the temporal limitations of the conference environment were significant and not conducive to constructivist approaches.

Many discussions surrounding the classroom of the future focus on the physical space and not the pedagogy. This paper however, focuses on what goes on in the classroom rather than the configuration of the physical space. Therefore, this paper presents a *form follows function* approach to designing the classroom of the future. The literature presented next led guided the design for this project: The Classroom of the Future.

LITERATURE REVIEW

Theory Supporting Classroom Pedagogy

In looking to develop the classroom of the future, we must first turn our eyes to the classroom of today. The literature is rich with information talking about how the classrooms of today are similar to the classrooms of the past (Langer, 1997; Riel & Fulton; Tapscott, 1998). The traditional classroom is teacher centered with the teacher delivering the knowledge to the students (Riel & Fulton; Schank, Berman, & Macpherson, 1999). Teachers often teach the way they were taught (Langer, 1997) with teaching being equated with telling, and learning being equal to listening (Riel & Fulton).

Methods and learning devices employed in these traditional classrooms include textbooks, worksheets, linear student generated text, and independent solo work. The teaching model has expertise flowing from the teacher to all of the students (Riel & Fulton). Frank Smith wrote about how today's classroom follows the official theory of learning. You learn through hard work, memorize facts and assessment of learning is accomplished through testing (Smith, 1998). "Sometimes students who have done well on such [traditional] assignments- and believe that they are learning-are unpleasantly surprised when they take tests in which problems from the entire course are randomly presented so there are no clues about where they appeared in a text"(Bransford, 2003) (43). Schools that teach in this official learning model where the focus is on the individual student abilities actually inhibit knowledge building (Jonassen, 1999).

When looking at the use of technology in these traditional classrooms, we find a pattern of trying to do the *same things* only faster (O'Neil, 1995). We continue to write

papers and develop presentations without really utilizing the computational and cognitive powers of the computer (Cuban, 2001; Papert, 1993).

The literature is rich with examples and evidence supporting the claim that knowledge is constructed and not transferred. This approach to learning has become known as constructivism (Jonassen, 1999; Riel & Fulton; Schank, Berman, & Macpherson, 1999). Learning takes place in every classroom. The problem is that it is often not what we expected would be learned (Smith, 1998). The constructivist paradigm dates back to John Dewey who linked learning and education with experiences (Dewey, 1997). Dewey also believed that all classrooms had experiences but that these experiences seldom led to learning that was meaningful.

Classrooms employing a constructivist approach to pedagogy would be student centered (Bransford, 2003; Riel & Fulton), inquiry based and interdisciplinary (*Maximizing the Impact: The pivotal role of technology in a 21st century education system*, 2007). Students are assigned ill-defined problems (Jonassen, 1999) that have relevance to their lives and collective experiences (Schank, Berman, & Macpherson, 1999). The constructivist learning environment contains a problem that is central to the domain of study, models of the learning process by an expert, and is scaffolded by a coach or more expert learner that extends the ability of the learner (Jonassen, 1999).

Learning becomes a social endeavor (*The horizon report: 2006 edition*, 2006) where students draw from shared expertise and distributed knowledge (*The horizon report: 2006 edition*, 2006; Lave & Wenger, 2003; , *Learning for the 21st century*, 2002). This level of collaboration takes the form of a learning community or knowledge community (Bransford, 2003; Lave & Wenger, 2003). Learning best occurs in teams

rather than in isolation (Jonassen, 1999). Learning communities work to advance the collective wisdom of the group. This is the community goal. It is through this goal that individual knowledge growth is supported (Bielaczyc & Collins, 1999). Like all communities, there are differing levels and abilities. There are “apprentices, young masters with apprentices and masters some of whose apprentices have themselves become masters” (Lave & Wenger, 2003)(p. 53).

This type of environment leads to a change in how teachers and students view learning. Teachers develop “new habits of mind to go with their new cognitive understanding, and simultaneously develop new habits of work-habits that are collegial and public in nature” (Meier, 2002)(p. 140). Learning in the constructivist classroom is active. Shank (1999) states “there is only one effective way to teach someone how to do anything, and that is to let them do it” (p. 164). This principle applies to the teachers as well as the students as they are all members of the same learning community. Smith (1998) describes this as the *classic view* of learning and forgetting. The classic view is characterized by learning through life experiences, learning clubs- effortless and continuous learning through club membership or participation in the community of learners.

New Student, New World

While it might not be correct to state that, we have a new breed of student in our classrooms today, most teachers who have been teaching for over 20 years would agree that something is different. Here we briefly look at literature pointing to some possible differences.

Mark Prensky has written extensively about what he calls the *digital native* and the *digital immigrant*. While I do not agree with the way he defines these terms, I do feel it is important to consider the possibility that the way we consume our media today has an impact on our cognitive process and the way we work with others. Over the past several years, the PEW Internet & American Life Project has tracked the way we use the Internet. They have found that 93% of American teens use the Internet with 64% creating content that is posted on the Internet. 39% of American teens who use the Internet share personal art while 26% of Internet teens participate in remixing existing content (PEW, 2007). In another report by PEW that looked at teens and social networks, they reported that 55% of American Internet teens maintain an active social network such as Facebook or MySpace (PEW, 2007). All of these activities have been tracked over several years and each represents continued growth.

In another study conducted by the Kaiser Family Foundation looking at media usage of children 8 to 18, they found that television was still the top form of media consumption followed by music, computers, video games and reading. When they looked at the average number of hours spent with each form of media, they found that the majority of the day was spent consuming media. Top forms of media consumption included (1) television-3:51 hours, (2) music- 1:44 hours, (3) computer 1:02 hours, (4) games 0:49 hours, and (5) reading- 0:43 hours. This indicated that teens were using the media differently, they were multitasking (Roberts, Foehr, & Rideout, 2005). In his article 'Growing Up Digital', Brown adds that "kids are always multiprocessing-they do several things simultaneously-listen to music, talk on the cell phone, and use the computer, all at the same time" (Brown, 2002) (n.p.).

CLASSROOM OF THE FUTURE

Philosophy

This project started at the request of a national association supporting independent schools in the United States and abroad. The Classroom of the Future (CoF) was designed as a demonstration classroom highlighting pedagogies and technologies for effective teaching in today's classrooms. While billed as the classroom of the future, it was realistically what classrooms of today could be. The plan was to take cues from the literature and develop an environment where top administrators and educators could personally experience learning in a 21st century constructivist model, a place where all participants could experience Frank Smith's classical theory of learning.

While there is considerable discussion in the literature and in educational environments about the use of physical space, the focus of this project was on pedagogy, new skills and new tools for teaching and learning. Working within the physical and temporal constraints of a conference, the program was designed to maximize interaction and dialogue while leaving room for serendipity. We attempted to balance the transmission of information with learner selected and controlled exploration of concepts within environments new to most participants.

There were three distinct parts to the CoF project: (1) Workshops, (2) Demonstrations, and (3) Hands-on Exploration Stations. The workshops took place in a large room capable of seating 250 to 300 participants while the other two features shared a common rotunda shaped room.

Drawing from the literature, we selected workshop topics that featured the use of 21st century skills, collaboration, creativity, distributed cognition and reflection. These characteristics were also used to assemble the demonstrations and the hands-on exploration stations.

Workshops

The workshops took place in a large room capable of seating approximately 250-300 participants. The room was set in rounds in an attempt to avoid the traditional feel of rows and facilitate participant interaction. We felt this would create an atmosphere more conducive to exchanges of dialogue between participants. Four of the six workshops were selected from those submitted for general presentation at the conference. These proposals demonstrated various aspects of theory and practice found in the supporting literature. The remaining two workshops were designed specifically to reach target audiences. These included head administrators and communication officers of independent schools across the nation.

While our desire was to make these workshops a hands-on experience, temporal factors as well as numbers of participants limited us. Therefore, these workshops served to introduce concepts, pedagogies and technologies highlighted in the literature. Participants could then explore these concepts further in other aspects of the CoF project. All of the workshops presented a constructivist or social approach and presented the need for new ways of teaching and learning. However, we were not successful in modeling these constructivist pedagogies as part of the workshop.

Students are different and the skills they need to work in today's information rich world have also changed. These were also aspects covered in these workshops. All of the sessions emphasized collaboration, relevancy and authenticity. However, they did not all emphasize technology rich learning environments. One session on design technology was actually focused on problem solving in a design environment where the technology was actually in the products of design. Pedagogy was emphasized more than physical space or tools. Workshop topics included:

- (1) Design technology
- (2) Introduction to emerging Internet technology
- (3) Use of emerging Internet technology to communicate with current alumni
- (4) 21st century communication tools
- (5) What games can teach us about teaching and learning
- (6) Wikis and other social software tools in the classroom

Demonstrations

The demonstrations were designed to be less formal than the workshops. Each presenter was instructed to include approximately 20 minutes of presentation of a concept followed by approximately 20 minutes of open dialogue with the participants. The remainder of the time remaining was for *serendipity*- the ability to follow the desires and interests of the *group*. This concept directly related to the literature placing the student at the center of the learning experience and making the learning experience relevant to the learner.

There were eight planned demonstrations and several impromptu demonstrations. Each demonstration took place in the rotunda room where the hands-on exploration stations were also placed. The vision was that participants would feel free to enter this space and participate in either the demonstration or the hands-on exploration stations.

Demonstrations focused on the use of new technologies and pedagogies in teaching today's students. The demonstration sessions were more focused than the workshops and were designed specifically to demonstrate learning affordances available with specific new technologies and pedagogies. Participants were encouraged to participate in shaping the form and direction of each demonstration.

Demonstrations Delivered:

1. 1:1 in the 21st Century: Student & teacher tablet PCs in the classroom
2. Increasing interaction through interactive whiteboards and student response systems
3. 21st Century Literacy Skills- A Panel Discussion
4. An Introduction to web 2.0: Where the Jobs Are, Where the Kids Are, Schools in the Middle
5. Share your story with the world: Digital storytelling with simplicity
6. Authentic Doing: Student Production of Knowledge for a Global Audience
7. Bridging the Gap: Using technology to archive and share classroom learning and continue the conversation
8. Creative Explorations with Google SketchUp

Like the workshops, each demonstration was scheduled taking into account the topics of general sessions and featured speakers both preceding and following.

Hands-On Exploration Stations

The third feature of the CoF was the Hands-on Exploration Stations (HES). The HES was set up around the perimeter of the rotunda room in the same space as the demonstrations. The intent was to provide individual adventures at each station where participants could personally experience learning with and about different tools available for use in 21st century classrooms. The space was to be informal so that participants would feel free to enter and interact with displays and other participants. We also planned for synergy between the demonstrations and those participating with the HES. The HES was divided into 10 stations using 20 laptops and 4 tablet computers. Each station was preset to a different start topic. However, all stations had access to the complete set of 12

Adventures. The adventures included:

1. Adventures in Information Literacy
2. Adventures in Blogs
3. Adventures in Wikis
4. Adventures in Social Bookmarks
5. Adventures in Interactive Whiteboards
6. Adventures in Podcasting
7. Adventures in RSS (Real Simple Syndication)
8. Adventures in Digital Storytelling

9. Adventures in 1:1 Tablets and Laptops
10. Adventures in Virtual Worlds: Second Life
11. Adventures in Social Networking
12. Adventures in Course Management Systems

Each adventure was created as a webpage and posted on the Internet. This made the adventures available to all participants beyond the conference dates. Each adventure provided multiple entry points to scaffold to the level of interest and ability of each participant. They were designed to provide an entry to the concept or tool and modeled a scaffolded constructivist approach to learning. This served to model one of the teaching styles that need to become more prominent in the 21st century classroom. All of the adventures are available through the NAIS conference site for Classrooms of the Future. They are currently housed at: <http://www.dlp4success.com/nais/cofindex.htm>

Synergy

The entire space was designed and programmed to with the intent to maximize interactions in the learning environment. Workshops and demonstrations were planned and scheduled to support speakers and functions in the larger conference context. Setting the workshop space in rounds increased the chance for interaction within the space by placing participants in conversational settings. Demonstrations featured small concentrated presentations of technology and pedagogy discussed in workshops and other areas of the conference. The demonstration space was configured with cocktail rounds and provide an informal conversational space. Almost every aspect presented in the

hands-on exploration stations was an element also presented by a speaker or discussed in a workshop or demonstration. The hands-on exploration stations were placed in the same space as the demonstrations to increase energy and interaction in the space. In short, the classroom of the future was designed from a gestalt (see Figure 1) perspective where all aspects of the conference experience were considered maximizing the possibility of participants making connections from one concept or experience to another.

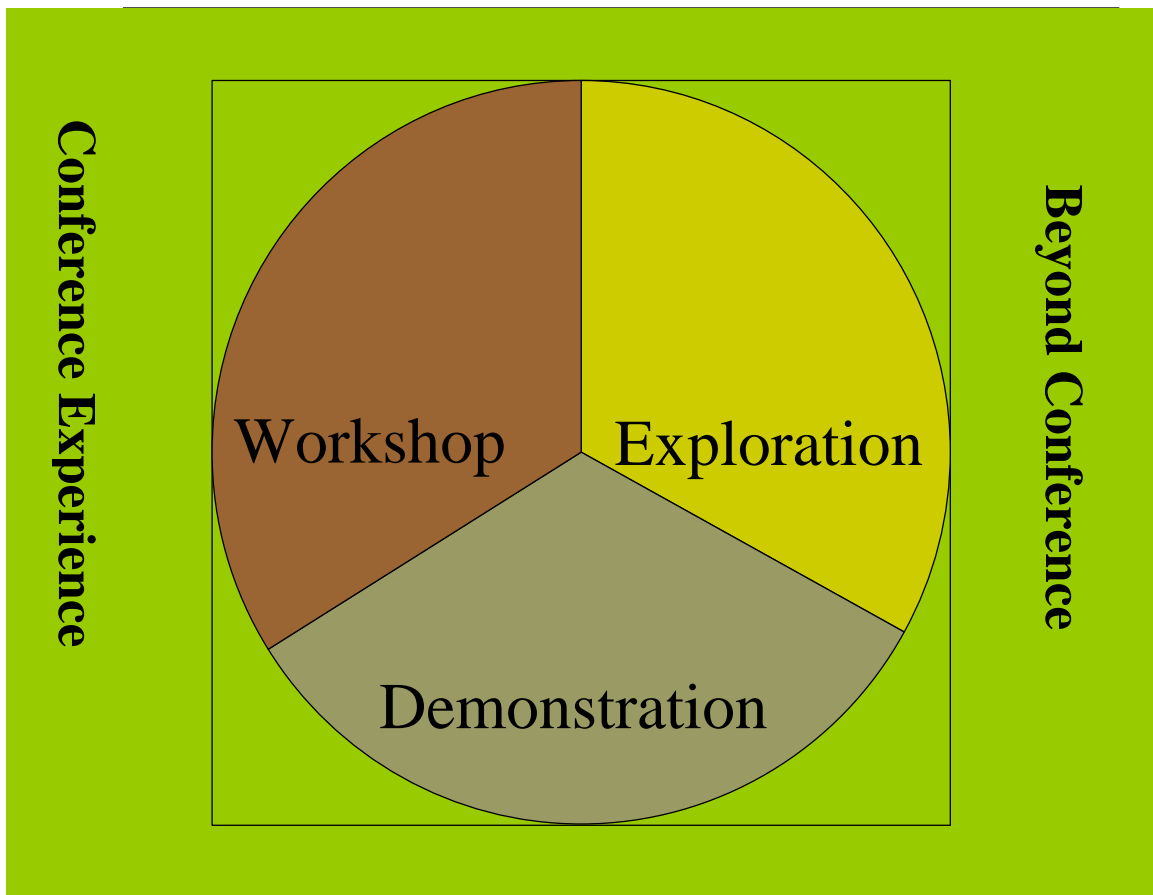


Figure 1. Gestalt perspective of the Classroom of the Future project in context with the conference experience.

RESULTS

Evaluations, interviews, collected comments and Internet traffic suggest that the Classroom of the Future project was very successful. However, not everything resulted in expected or desired outcomes.

Scheduling of the space did help participants make connections to concepts presented throughout the conference. However, there was a general need to increase the hours of the classroom. It turned out that a considerable amount of time was scripted and the interaction of the scripted time in an unscripted space did not provide the synergistic learner-centered experience of a constructivist's classroom. When demonstrations were scheduled, the participants stopped working on the hands-on stations. This was an unexpected outcome of placing these two elements in the same space and time. Since there were demonstrations scheduled throughout the conference, the hands-on stations saw decreased use during the conference.

The hands-on exploration stations have proven to be a key element in taking the experience beyond the space and time of the conference. They continue to get traffic as participants continue to explore them. This may prove to be one of the better tools for actively moving the Classroom of the Future experience beyond the conference experience.

The docents did not work as planned. The concept of docents serving as *more expert learners* in a technology rich learning environment did not play out. The fact that most participants seemed compelled to stop what they were doing at the stations every time a demonstration started limited the interactions of docents and participants. By placement of the hands-on stations within the demonstration space worked to decrease

rather than increase interaction. I can only speculate to why and suggest that we are so conditioned by traditional learning models and classrooms and feel the need to stop and listen anytime information is being delivered by a perceived instructor. This might be mitigated next year by making these two spaces unique yet proximally close. A change in the structure of the demonstrations may also help people feel more comfortable exploring the hands-on stations independently. A challenge arose in that many who attend conference expect to be given information rather than having to construct knowledge and understanding. This is a good challenge to have as it goes to the heart of the constructivist classroom. It is possible that short ten-minute demonstrations of an aspect of a hands-on station could be followed by a semi-guided experience at the hands-on station.

While there has been activity beyond the conference, we would like to work to increase this interaction both before and after the conference. This would demonstrate the idea that the learning is beyond the classroom and prepare participants for what they will experience when they arrive as well as allow them continued interaction beyond the conference. We have experimented with the social network Ning as a way to continue the conversation. However, there has been limited membership. This is in part because of the last minute addition of this experience to the post conference experience. Those who have joined the group have generally limited their engagement to introductions. I believe that this will have a much greater role in next year's project as we can leverage this technology to increase dialogue and knowledge construction beyond the immediate experience of the conference.

CONCLUDING THOUGHTS

The classroom of the future is a conceptual construct for teaching educators about learning technologies and pedagogies of the 21st century. The classroom was designed as an experiential space. However, participants did not interact within the space as expected. It is clear that today's educators need additional guidance to bridge years of traditional teaching and learning with experiential constructivist professional development learning environments. While there is a rich literature on constructivist learning environments, there is little on the use of these environments as means of professional development for educators at conferences. There is clearly a need for more research in the area of adult learning within the context of conferences and experiential learning.

RESOURCES

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