Challenges in the Pedagogy of Virtual Classrooms

Barbara Victoria Bernal[1]

Abstract - The academic world continuously incorporates the advantages of modern technologies such as the Internet, portable computing devices, and dynamic media into the educational arena. The Internet has evolved into a global and commercial communication infrastructure with supporting applications for use at work, at home and in between. The progressive, never ending characteristics and requirements needed by both professors and students include a wide spectrum from new media expertise to new interface interaction protocols. With the use of supporting applications tailored for the classroom, professors gain a new presence and can offer new opportunities for student-student interactions. Use of mobile computing helps students instantly communicate and collaborate with each other and with their professors. These various technologies create what are commonly referred to as "virtual classrooms," i.e., instruction where mentors and learners are separated by time and/or space. [10].

This paper will review current practices in some virtual classrooms to examine key learning elements such as engaging, interactive, effective methods. Specifically, this paper explores collaborative or team-based learning, in which groups of students use computer mediated communication to work together on projects and assignments. The strength of the professor-student and student-student relationships that developed during the virtual class is discussed with thoughts towards the future.

Keywords: Virtual Classrooms, Distance Learning, Peer Learning

INTRODUCTION

Walls or specific time slots cannot contain the current classroom experience. Through transparent and virtual accessibility, internet-based systems enrich virtual classrooms through multiple avenues of communication. Virtual classroom implementers use these new avenues to transcend the former, passive student experience where the instructor was the mentor and the students were the learners. Ideally, virtual classrooms include multiple representations of the classroom knowledge, learning, and assessment. For example, a professor or student giving a presentation can combine static power point slides of the lecture with an oral presentation of those slides, further augmented by annotations in the slides, and including multiple assessment instruments for the audience's confirmation of learned outcomes.

Common outcome themes for most of the software engineering classes in our University include the ability to : 1) manage a project; 2) work in multidisciplinary teams; 3) understand issues of diversity among students and professors; and 3) maintain a strong work ethic. The now widely used distributed communication has enhanced and enabled these themes. Students and professors believe that the use of these distributed methods (such as asynchronous, online, distance, Web-based, and Web-supported learning) are a great advantage in the endeavor to engage in active learning in a 24/7 availability. But professor and students require assistance in constructing techniques that enable the successful virtual classroom experience. Beginning with a focus on the current common denominator of web maturity, this paper will also discuss the usage of web technologies that enable the distributed learning experience. The implications regarding the diverse models of virtual classroom implementations are outlined, including issues regarding the implementation/delivery of the pedagogy.

The Classroom Environment

Traditionally, professors relied on textbooks, lectures, and a board/overhead to convey the dense, hard-to-grasp information they were communicating, i.e. static representation. The current academic climate and the needs of its different types of learners demand the advantage of dynamic representation- an advantage that is a challenge to accomplish. This is radically different from a mere reconfiguration, repurpose, or redirection of existing curricula.

[1] Southern Polytechnic State University

The virtual classroom is nothing like the traditional classroom. Primary differences are geography, increased class size, and time benefits. [5] Students and professor can choose geographically where their virtual classroom will exist from one class to another, i.e. the "anyplace classroom". The fallacy of infinite limit for student enrollment to the virtual classroom is a teaching institution's dream and an instructor's nightmare. The dynamics of the classroom experience change from traditional specific time slot of classes, i.e. Monday and Wednesday, 1 pm to 3 pm, versus the 24/7 availability of a proposed web classroom. The virtual classroom communicates clear realistic availability of each component. Yes, the web site is 24/7 available. The instructor is available during office hours, i.e. Monday and Wednesday, 1pm to 3pm.

Assigning the responsibility for a successful experience to the professor, the traditional classroom dictates that the professor must lead the educational experience. In the web classroom, the responsibility has shifted more to the student's shoulders with interactivity being the continual responsibility of all classroom participants. The professor plans and creates the materials to enable the successful learning experience in which students become both mentors and learners. This ideal peer-to-peer environment is one where everyone in the educational setting participates in both roles. Moreover, the mentoring process can be both private and public. The internet-based system can provide a private portal for confidential communication between the mentor and the learner, and a public one for everyone to make comments and contribute to the teaching and learning process. [9] Take the example of an Ethics class discussing privacy. Students ask questions that an experienced working student answers with work place experience. The commentary and the answers are available for future new learners to see and use. As a result, the learning can continue beyond the session.

Therefore, the method of peer-to-peer learning is distinguished from the traditional teaching methods in that it is not hierarchical, whereby the student attends a class session taught by an expert in the field, learns from textbooks, takes tests, exams, and that's the end of the learning event. In the peer-to peer case more structures are present to empower all to be mentors and to be learners.

Online Learning Environment

There is an energy level in an online learning environment, an energy that is the collective effort expended by a group of students and professors, and it results in a composite of useful resources that individuals or the class at large can extract on demand. This energy requires commitment by students and the professors to be highly self-motivated, organized and efficient, as well as creative to serve as resources for each other. This energy can be felt in synchronous and asynchronous forms, but in asynchronous the added benefit is its accessibility at any time and from any place. Online learning environments offer an interactive experience that frees learners from inconvenient time schedules and travel to campus. [2]

In online settings, collective effort is needed to create a sense of presence or awareness that others, while not physically present, are committed to the ongoing virtual classroom interactivity. Course information, subject content, assignments, and assessments must be carefully planned, organized, and created in the virtual classroom. All stakeholders need to give of themselves in the roles of mentors and learners. This has to be established first in an online course if students are going to fully benefit from the resources made available in the environment. The present moment in asynchronous environments always has to be felt even though stakeholders are accessing information or participating in activity at different times. Collectively, learners and professors have to help sustain a sense of presence by way of their participation in online activities.

THE ANYTIME CLASSROOM

If you build it, will they come? And if they come, will they follow the expected learning building blocks? The goal of any course is to change the learners' knowledge, behavior, or both. The web delivery courses are sponsored by organizations for reasons that are important to those organizations. These reasons include the freeing of classroom space resources, the increase in revenue, and a public assessment of joining the ranks of "state-of-art" education. [6]

Online learning has two personas: mentor and learner. Both are contributors and participants striving towards an engaging experience. Professors experience the dramatic increase of students' understanding of complex information by offering the material in several formats rather than the single format of lecture. Multiple representations of information delivered in visual, interactive, experiential, and/or participatory formats enable learners of all types to access and reinforce the lesson. The goal is flexibility and accommodation of a wide range of learning differences. The onus is on the professor to create the initial engaging environment and protocols for the on-line classroom experience. The use of technology to achieve these pedagogical purposes is the challenge. At

what cost, effort, and timetable? For example, a recent study where instruction was supplemented with personal digital assistants (PDAs) for rapid student feedback to the professor during the classroom lecture showed no significant difference until the second year of the study. [13] A time line with expectation of no significant differences in the beginning of online learning should be planned. The investment of time and effort would not be seen until both personas, the mentors and the learners have adapted to the online experience.

Learning Styles

Most learning styles can be accommodated in an online environment if there are a variety of assignments and activities that support different manners of learning. The ability to interact with others is highly warranted in online learning. Not only do learners and professors have to learn how to use chat, email, threaded discussions, and/or forums tools, they must master the new culture. Online learners and professors must learn to be productive conversationalists in this new medium. Current frequent users of chat rooms and instant messaging are creating new communication dynamics with specified jargon, expressions, and structure. Professors must study and learn how to guide and structure the users of the environment, yet provide a flexible and open environment for effective interactivity.

Part of the responsibility of the professor is to efficiently support learners in their self-discovery of learning course content. The tremendous amount of effort into preparing materials, online resources, and elaborate messages to students does not equal the student/professor dialogue of the classroom. The training to become successful online participants includes conditions for establishing a knowledge-sharing community. Emerging electronic educational communities give opportunities for collaborative learning. [2] [4]

The National Science Foundation (NSF) advocates the use of engineering students as instructional media in a learning strategy known as “peer learning” (or “peer tutoring”). Peer tutoring, “a system of instruction in which learners help each other and learn by teaching,” [8] is a strategy which requires students to reflect on their thoughts, knowledge, and evidence of learning in a public web-based class forum for other students to comment. This moves discussions from traditional impromptu thoughts to a more careful expression, for instance discussion threads. NSF suggests that students are sometimes more successful than professors in explaining concepts to their peers because they have recently mastered the material and “are thus aware of the difficulties in understanding them and know what to emphasize in their explanations.” [11]

Logistics to Implement the Virtual Classroom

Implementing the virtual classroom remains a challenge. Professors and students spend an inordinate amount of time doing administrative tasks in the online learning environment. Both are dependent on a large number of complex technologies. The Internet and collaborative software continue to fall short of our expectations in this regard. Complexity increases capability; but it also increases the odds of breakdown. In multiple technologies delivery one small unit malfunctioning can spell disaster. [5] To minimize the risk of breakdown a backup option is advantageous. Both professors and students need a fail safe for transmitting problems, system down times, software malfunctioning, etc. Responsibility for establishing these backup procedures are usually conceived by individual professors in their on-line course set-up and development. Standard multiple backup procedures should be available and enable for distant courses. Some of the virtual classroom applications like VISTA and Blackboard, give these procedures. A constant exchange of new ideas in student-professor dialogue can point to problems or successes in classroom logistics. Ask repeatedly for ideas. Create and solicit a unanimous improvement request on the course website and/or give the students opportunities for creating the classroom experience protocol.

Working with deadlines is another challenge of the virtual classroom is It is logical to presume that professor and individual students will have deadlines, time windows for deliverables, etc. The online participant must respond clearly and quickly. The "24/7" is a good marketing scheme, but it is an impossible expectation for online learners and professors for response. [6] Instead of response, availability is the key marketing scheme. Dynamic lectures, interactive assessment practices, etc. are on a “24/7” availability to both the professors and the student.

MAXIMIZING THE BENEFITS

In a survey to our Computer and Software Engineering undergraduate students, the convenience of the “anyplace & anytime class” was the primary reason students quoted for signing-up to online classes. This perspective has not built a substantive online culture or a community of scholars. The additional time and effort needed to obtain the

learning in the virtual classroom is a realization most students are unaware of at the sign-up time. The realization of the self-discipline needed to achieve excellence in the "anyplace & anytime class" was the factor students quoted for not repeating the experience. Convenience may be main factor for those electing online learning as a primary delivery medium but it would be beneficial to communicate the needed self-discipline, time devotion, and different effort from a regular classroom setting at the sign-up time. Flexible engagement affords students and professors to share a continuum of instructional productivity on demand, given that rules and policies are clearly established and that all stakeholders have consensus on what is possible and what is expected. Asynchronous conversations allow students to participate in class discussions without being forced to an immediate response, without being interrupted by another student (or the professor) or being cut off by the end of the class session. [1] These conversations do not contain the mix of sensory cues from speaker or audience which are part of human interaction. Conversations are governed by human responses that we use to gauge understanding and participation. [5] Flexible engagement is essential to quality asynchronous learning. All stakeholders have to understand their roles and responsibilities and be given access to the appropriate technology resources to carry them out. There has to be a common definition of flexibility so that opportunities and boundaries are equally understood.

A current common myth is to increase the total courses when they are online, thinking there will be more time to complete more courses since no classroom "seat time" is required. As a result, many of these online learners have not made steady progress in their courses because they cannot handle the assignment load. These students miscalculate the extent of flexibility given. They also misconstrue convenience for easy work. [4]

Conversely, there was an initial perception that online professors will have an easier classroom than those who teach traditional campus-based classes. Those who taught more than two online courses per term with more than 20 students per online class discovered the time consuming process of creating a sense of presence for their class and the heavy time management for the administrative and academic chores of online course work. Universities are currently devising methods to minimize the burnout and unmanaged stress typical of online professors with heavy course loads, thereby putting quality at risk and reducing the professor's chances to grow in the environment. [12] These methods include paying specialized personnel with one professor in the subject matter to plan, develop and create a standard online course used by the professors teaching. This standard online course has most of the on-line elements built for the course, i.e. hypertext subject material, animations, chat rooms, videoconferencing, etc. The professor teaching would only need to customize the standard course elements like the syllabus, due dates, etc.

CONCLUSION

The total success within the virtual classroom is a challenge. No magical formula exists to guarantee success. The current pedagogy demands continuous improvement of online learning environments and successful ventures of educating online. We need more formative designs of online learning environments to bring to the surface the invisible tasks and activities we actually do. Hopefully, collaborative learning designs will soon advance with faster communications technology, wireless and handheld computing, and with the integration of software agents. Innovations in online learning environment interfaces and advancements in online pedagogy should evolve together, and should no longer be handled as separate directions for development. [1] [4]

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Barbara Victoria Bernal

Barbara Victoria Bernal is a Professor of Software Engineering at Southern Polytechnic State University (SPSU), where she has worked since 1984, serving as undergraduate coordinator for software engineering (2002-2005); undergraduate coordinator for information technology (2004-2005); and chair of software engineering (2005-6). She was awarded the SPSU Outstanding Faculty Award in 1995. She received her M.Ed. and B.S. from Georgia State University (1979, 1981). Prof. Bernal teaches the User-Centered Design, Ethics, and Software Engineering courses at SPSU. She is a co-founder of the SPSU Usability Research Lab (ULAB) and is directly involved in corporate-sponsor ULAB projects. She has given numerous papers, tutorials and presentations locally and internationally on User-Centered Design, Usability and Software Engineering topics. Barbara is engaged in educational support through her company Software Education and Support (SES). She does specialized software development and evaluation as a consultant.

Barbara has been an active member of ASEE for the last 11 years at both the section and national levels. In the ASEE Southeast Section, she has served as Southeast Section President in 2008-2009. Currently she serves as the Software Engineering Division Chair (2001; 2006; 2011); Conference Proceeding Editor (2003-present); and website developer for the Section paper submission/review (asee.spsu.edu). She was awarded the ASEE Southeastern Section Tony Tilmans Award in 2007.