Blending Technology with Inquiry-Based Pedagogy: Implications for Learning and Teaching in Online Environments Designed for Graduate Level Teacher-Education Courses

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ABSTRACT: PURPOSE OF THE STUDY

This study is intended to further inform the construct for teacher-learners' transfer of technology first to their teaching dogma, secondly for their pedagogical praxis and ultimately for the paradigm of teaching and the students' learning environment. Although much has been written and reforms mandated about the professional development of teachers and the need for technology rich instruction more discrete information is needed about the teacher's learning being situated in technology learning environments. What evidence does the situated praxis of online discussions in the teaching of teachers offer to further the research of meaningful technology transfer into their classrooms?

Keywords: distance education, teacher education, online teaching, Web-based instruction, blended classes, inquiry-based pedagogy

INTRODUCTION TO THE STUDY

We are examining data accumulated from blended course online discussions with in-service and pre-service teachers. The data accumulated from these blended course online discussions includes topics of threads, content of responses, identification of originator (instructor versus teacher-learner) of threads, and occurrences of collaboration in forming meaning. Our in-depth evaluation of the online interactions and subject of discussions will contribute to creating a potential model for teachers as participant practitioners in online learning in order to demonstrate the transfer of technology into their pedagogy.

LITERATURE REVIEW

Angers and Machtmes' (2005) qualitative study identifies the "adoption and use of technology in the classroom is determined by teachers' attitudes and beliefs." (Angers, 2005, p. 780). Their findings regarding that "Teachers beliefs about classroom practice appear to shape their goals for technology, " (Angers, 2005, p. 789). In our study we look at how these intrinsic beliefs can be expressed, changed over time and influenced by participating in online classes, thereby guiding the students to become expert-practitioners. How can the instructor design the learning experience to get these results? We are also adding to the body of literature by studying the mechanism for the eventual transfer of technology learning to the classroom.

Stephenson's (2002) work is a collection of articles by many authors on how to transit from theory to practice, create effective online learning environments using theoretical frameworks and evidence-based research and pedagogy to help learners to make the optimum use of online learning. The articles all lead to the transformation from instructor-managed to learner-managed pedagogy for best online learning. Several features that are most relevant to both instructors and learners include the following: access to resources, heuristics, attention to different learning styles and needs, access to experts, both online and offline, tracking and recording of dialogue, transactions among students, teachers, student-student, a variety of types of engagement, including synchronous and asynchronous, feedback, good design of the web environment, easy links to multimedia, universal design, opportunities for telementoring and interaction with experts both within and outside of the institution, an the opportunity to work in collaboration with peers and groups online and globally. These features should be flexible and learner-controlled. Learners should be able to utilize all of these features online and go to other resources. Importantly, students must perceive the difference in the online environment as offering more than a lecture delivered online, be encouraged to use the interactivity, and to take responsibility for his/her own learning and participation in order for this transformation to occur. These are the goals of our online course development, to encourage transfer from the blended component of the class to the teacher-learner's own pedagogy and practice.

While Kozleski (2004) emphasizes the economic contribution of technology as being imbedded in education, she identifies changes to teachers' dogma and pedagogy as critical for the transference of technology in education. Our efforts to identify discrete teacher learning underscore, "rather than harnessing the curriculum, understanding education as a technology transfer activity opens the dialogue about how and what to teach." (Kozleski, 2004, p.191).

Borko (2004) identifies elements of a situated analysis of teacher learning as a learning program, with teachers as the learners, the instructors as the guides for the teachers as they construct new learning along with the context in which the teachers learning occurs. While many researchers have studied some combination of these relationships and the factors that influence them our study will further our understanding of what and when meaning is being situated in the teachers understanding of the new role technology will now play in their teaching for their classrooms.

CONCEPTUAL FRAMEWORK

The impetus for this study came as a response to the meta-analysis done by Mary Tallent-Runnels, Julie A. Thomspons, William Y. Lan and Sandi Cooper (2006).

Their research suggests that courses taught totally online are called "online courses" and those taught partially online be labeled "blended courses." As part of their findings and recommendations for future research, the authors suggest that there are few existing studies focusing on pedagogy and learning online, which type of format fits which particular class and instruction, what the online roles of instructors and students play, and how the depth of online interactions that occur can lead to and encourage higher-order, critical thinking and constructivist learning.

To achieve higher order thinking, Wakefield (1996) suggests three pedagogical approaches; 1.) Stand-alone instruction in thinking independently, 2.) Dual agenda

combining the first approach with some subject discipline content 3.) Authentic task approach, students are required to apply higher order thinking skills in performing some task. Our research pulls from this later approach suggesting that scaffolding discourse online is an authentic pedagogical approach to promoting higher order thinking outcomes for student learning.

Kotik and Redman (2005) examine the "Extent of Technology Integration In Instruction By Adult Basic Education Teachers," researching how much adult basic education teachers integrate technology into their curriculum and have learned how to use technology themselves, recommending the four methods cited by Ginsburg, (1998). These methods include considering technology as specific curriculum learning digital literacy skills, technology as an instructional delivery system, as another component to instruction for learning skills, and as a tool to enhance heuristic skills, write, and comprehend. The authors cite the process of learning to integrate technology from learning to adapt to using technology to construct new learning environments. There are several discreet barriers for adult learners such as teachers: how to integrate technology, including the lack of opportunity to learn from their peers, ask and answer teaching-related questions, and actual practice in online discourse. Teacher-learners do not generally get to use technology on a higher level, and lack the opportunity to make innovative integrative use of it in their practices. According to this study, not much progress has been made since a 1995 Office of Technology Assessment report.

This study is relevant as the online component of blended courses offers greater opportunity for teacher-learners to participate in discourse, learn from the instructor and their peers, and gain knowledge along with insights on how to better integrate technology into their curriculum, thereby overcoming these barriers.

As opposed to how teachers are facing impediments to technology integration, Ertmer, Ottenbreit-Leftwich and York (2006-2007) have examined "Exemplary Technology-Using Teachers: Perceptions of Factors Influencing Success". This study looks at teachers who actually use technology meaningfully in their classrooms despite internal and external challenges, including lack of time, resources, technophobia, access and institutional support. While other articles cite the barriers that lead to full implementation of technology, this study looks at the most important indicators that help teachers overcome these known obstacles. Interestingly, one of the findings suggests that digital immigrants, those teachers with more than five years of teaching experience, but less technology savvy and confidence, are actually more likely to direct their students to use technology in a more effective, meaningful way to enhance learning than their less-experienced, digital native colleagues who have more technology experience and confidence, but lack the expertise and management skills of more seasoned educators.

The more experienced teachers appreciated the value of the use of technology more than the more novice teachers who felt more at ease using the technology, but used it less effectively. This supports the data-analysis of the Introduction to Technology MD 400 course section with fewer digital natives, but more experienced teachers who are digital immigrants and a larger number of transactional postings.

The study also examined what intrinsic and extrinsic factors affected the use of technology to find which characteristics were more determinant. The results of the study indicated that the teachers who used technology in the most exemplary way felt that the factors such as confidence and experience (intrinsic) rather than extrinsic factors such as availability, quality of resources and their own time were most influential in their effectiveness.

For our purposes, giving teacher-students experience online will increase their confidence and expose them to collaborative learning from their peers and instructors. As engagement deepens, the teacher-learners become more effective in the planning of curricula using technology for their own students. These are all intrinsic factors which will influence their success regardless of their access to resources, time availability and other extrinsic factors which they cannot control.

Examination of the data includes three primary areas:

I. Sample Population- characteristics and description
The sample population is comprised of adult students who are participating in a Graduate Teacher Education Program at a Jesuit university. Some are majoring in educational technology, while others are taking their required educational technology course and electives. The teacher-learners range in age from recent graduates of a Bachelor's program, to older, returning students who are making career changes or enhancements. The majority of the students are either pre-service or in-service teachers pursuing a Master's Degree.
Combined population demographics include a total of 188 students (some of which are ESL, 14 blended classes, conducted from Fall 2002 through Summer 2006. Both authors have been teaching on-site, online and blended courses in educational technology for graduate-level teacher education from 2001 through 2006.

II. The Role of the Instructor
Along with the designing of the course, we examine the instructor's pedagogical praxis and paradigm choices. As an example, both instructors have made use of inquiry-based teaching methods in class and online.

III. Online Discussions
The online postings will be examined in terms of topics, and content. We will pay particular attention to teacher-learners' references to prior experiences and knowledge in connection to their new learning within the content and topics of the online discussions.

Do particular categories of discussion topics provoke teacher-learning level of engagement with technology learning?

INITIAL FINDINGS

Identification of characteristics for online pedagogical practices:

Pedagogical implication of online postings allows for more in-depth assessment of learners' levels of engagement with material as well as analysis of learners' construction and integration of meaning for learning.

Initial analysis of the data suggests the Instructor/Teacher-Mentor's pedagogical approach to the online setting shows movement from leading to some combination of modeling online behavior and heuristics for teacher-learners.

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