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Using online tools for communication and collaboration: Understanding educators' experiences in an online course

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ABSTRACT

This case study explored educators' experiences in an online course to better understand how course design and pedagogical delivery can support student learning. Using the Cognitive Apprenticeship Model (Collins et al., 1987) as a theoretical lens, researchers investigated the following: 1) What methods of instruction assisted educators in learning how to use technology to support online communication and collaboration? How were these methods introduced and used? and 2) What were students' views of educational technology and of their own learning after participating in an online educational technology course? Interviews and course artifacts were collected from one online course instructor and 11 graduate students from various fields of study. Findings highlight specific methods of instruction that can inform educators' uses of Web 2.0 tools in online courses, illustrating how the Cognitive Apprenticeship Model can be used to inform online course development.

1. Introduction

Recently there has been an explosive growth in online learning that is "rapidly transforming post-secondary education" (Moller, Foshay, & Huett, 2008, p. 66). A growing number of distance education initiatives are in the field of education and rely on the Web "as a primary medium for delivery" (Dickey, 2008, p. 507). As universities expand offerings of online courses, however, they are finding that one of their greatest challenges is how to design and implement courses that "provide a sense of community with constructive feedback and provide open forthcoming communications as well as recognizing membership and feelings of friendship, cohesion, and satisfaction among learners" (Desai, Hart, & Richards, 2009, p. 333). Citing the work of Daviault and Coelho (2003), Dickey (2008) argued that all too often, "Web-based instruction is reduced to uninspiring content presented in a linear text-based format" (p. 506). Research studies indicate that teaching online requires a different pedagogy and a unique set of skills from that of traditional classrooms (Fetherston, 2001; Hardy & Bower, 2004). Researchers argue that educators in the distance medium "are faced with new pedagogical issues surrounding student interactions, course content design and delivery" (Moller et al., 2008, p. 67). As a result, researchers have observed a systemic lack of awareness when it comes to appropriate uses of technology in the field of education (Desai et al., 2009).

The purpose of this study was to explore educators' experiences in an online course to better understand how course design and pedagogical delivery can support student learning. More specifically, the study explored how the Cognitive Apprenticeship Model (CAM), which was used to inform course design, helps shed light on the learning opportunities that were offered to students who took the course. Using the CAM as a theoretical lens, researchers investigated the following questions: 1) What methods of instruction supported educators in learning how to use technology to support online communication and collaboration in their respective fields of study? How were these methods introduced and used? and 2) What were students' views of educational technology and of their own learning after participating in this online educational technology course?

2. Theoretical framework

Researchers used the Cognitive Apprenticeship Model (CAM) to inform the design, development, and implementation of the course and its influence on participants' online experiences. The CAM is a framework that is situated "within the social constructivist paradigm" (Ghefaili, 2003, p. 9). The Cognitive Apprenticeship Model, as described by Ghefaili (2003), is "representative of Vygotskian zones of proximal development" in which student tasks are "slightly more difficult than students can manage independently, requiring the aid of their peers and instructor to succeed" (p. 9). Furthermore, the CAM states that when students are learning in an academic environment, they do not usually have access "to the cognitive problem solving processes of instructors as a basis for learning through observation and mimicry" (Collins, 2006, p. 48). Before apprenticeship methods can be applied by students to learn cognitive skills, the learning environment "has to be changed to make these internal thought processes externally visible"

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(Collins, 2006, p. 48). The CAM is designed so that these cognitive processes can be brought into the open where individuals can "observe, enact, and practice them" (Collins, 2006, p. 48). The CAM is a design framework that "holds relevance for both modeling the effective use of technology for pre-service P–12 teacher education students and as a method for the design of a Web-based learning environment" (Dickey, 2008, p. 507). A number of researchers have already begun to explore the integration of technology using cognitive apprenticeship methods, but further research is needed to inform the pedagogy of online teaching and learning (Hendricks, 2001; Liu & Hsiao, 2002; Liu & Pedersen, 1998; Pahl, 2002; Schrader et al., 2003).

According to the model, there are four dimensions that constitute an effective learning environment: content, method, sequencing, and sociology. Content identifies the types of knowledge that are required for expertise, including subject matter knowledge, knowledge of learning strategies, and knowledge of how to direct one's own learning. Method refers to the teaching methods associated with the cognitive apprenticeship, including such things as modeling, coaching, and scaffolding. Sequencing covers the ordering of learning activities and illustrates how tasks can increase in both complexity and diversity. Sequencing can describe how learners conceptualize tasks and move from global to local skills (Collins, 2006). Finally, the sociology of learning, as defined by Collins (2006), highlights various social characteristics of learning environments.

Of the four dimensions described above, this study looked specifically at method. When describing and analyzing teaching methods that were used to support online instruction, we considered how Collins, Brown and Newman (1987) categorized six different methods into three groups. The first group consists of three methods of instruction that serve as the "core" of the cognitive apprenticeship. These methods include modeling, scaffolding, and coaching, all methods of instruction that are "designed to help students acquire an integrated set of cognitive and metacognitive skills through processes of observation and of guided and supported practice" (p. 15). The second group of methods includes articulation and reflection. These methods were "designed to help students both to focus their observations of expert problem solving and to gain conscious access to (and control of) their own problem-solving strategies" (p. 15). The third and final group includes instruction that prompts student exploration. Collins and his colleagues defined exploration as a type of instructional method that encourages "learner autonomy not only in carrying out expert problem solving processes, but also in defining or formulating the problems to be solved" (p. 15).

3. Methodology

This case study was designed to document the experiences of one instructor and 11 graduate students in an online, educational technology course. Researchers who conduct case studies explore a "bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information" (Creswell, 2007, p. 73). In this study, the "case" consisted of participants (instructor and students) in an online, educational technology course. According to Yin (2009), case studies are the preferred method for research when "how and why questions are being posed," when investigators have "little control over events," and when the focus of the study "is on a contemporary phenomenon within a real-life context" (p. 2).

"Introduction to Web 2.0 Tools" was an online, graduate level course designed to help educators develop proficiency in educational technology. The course addressed the challenges of preparing learners for the demands of the 21st century classroom. In this course, students explored collaborative Web 2.0 tools, addressed issues related to Internet safety, critiqued lesson plans for their use of educational technology, and created individual projects that incorporated technology integration. Many students chose to create teacher websites for their projects. Students had various opportunities throughout the semester to engage in both individual and collaborative project-based activities that emphasized inquiry-based learning. This occurred through online discussion forums, working in collaborative groups, and giving feedback to one another on project drafts using various types of multimedia. Some of the tools that students used to communicate and collaborate online included wikis, Thinkfinity.org's online discussion forums, and recorded screencasts. In addition to collaborating on projects, students explored theories of learning based upon how they inform the effective uses of technology in educational environments. Additionally, they investigated what the latest research has to say about the integration of technology in educational settings.

Students participating in "Introduction to Web 2.0 Tools" came from a variety of educational backgrounds, including preservice teachers majoring in language arts, secondary English education, middle school math education, and middle school science education. Some of these students were entering the field of education as a second career. Practicing teachers included two individuals who were working toward doctoral degrees in science education. Students could agree to different levels of involvement in the study. Eleven students gave consent for their course related documents, surveys, and online discussions to be used for the study. In addition, three out of these eleven students also gave consent to be interviewed at the middle and end of the semester. Individuals who were interviewed included an education doctoral student who had more than ten years experience teaching science and language arts at the middle school and high school level. Another participant was completing her final year in an English Secondary Education program. The third student was also in his final year of a teacher education program. This student, however, was studying Math Education, had substitute teaching experience, and had been recently hired to teach a small enrichment class with nine 8th grade students who were preparing to take an Algebra I class.

All eleven students gave researchers access to their online course discussions, course blog postings, and all course assignments. Students also gave researchers access to a course survey that they completed at the beginning and end of the semester. The International Society for Technology in Education (ISTE) Technology Competence Survey was used to inform these survey questions. ISTE's Research and Evaluation Department created and extensively tested their survey instrument with both preservice and inservice teachers to investigate both "basic technology competencies and technology integration skills" (Nets Project, 2003, p. 4). The original survey instrument was "proven to be reliable and valid (with coefficient alpha approximately .90 and inter-item correlation in the .45 to .75 range)" (Nets Project, 2003, p. 4). A shortened version of this survey was given to participants in the study, with additional open-ended questions being added to obtain background information about each student.

Interviews with the instructor and students lasted approximately 40 minutes each, were audio recorded, and transcribed. In addition, summaries were immediately written after each interview and were included as research data. Interviews with students and their instructor were conducted at the beginning and end of the 15-week semester. The course instructor also participated in ongoing, informal discussions with the researchers throughout the semester. Instructor data sources included written summaries of informal conversations and formal interviews that were recorded and transcribed.

Document files containing all data and research notes, which included comments from informal conversations with the course instructor, were uploaded into the qualitative software program NVivo. Data were deductively and inductively analyzed using constant comparative methods (Glaser & Strauss, 1965). Quantitative data collected from participant survey responses were used to triangulate and inform qualitative research findings. Yin (2009) argues that a case study's unique strengths are its ability to deal with multiple sources of evidence "to converge in a triangulation fashion" and its use of "theoretical propositions to guide data collection and analysis" (p. 18). With this in mind, researchers deductively coded data using the four dimensions of the CAM. Particular attention was given to instructional methods as defined by this model (Collins, 2006).