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ABSTRACT

Internet-based, distance learning solutions are finding increased use and may prove effective in facilitating advanced study coursework for remotely located, place-bound students. Despite the current emphasis on distance learning, the conditions for promoting online learning success have not been entirely defined. This paper presents a case study that profiles the teaching challenges and benefits of an online graduate-level Instructional Design course for in-service teachers taught through Western Governors University and Washington State University. The paper addresses some of the teaching challenges for this online instructional experience, focusing specifically on how teaching styles were used to build online learning community, effectively promote productive and satisfying learning interactions, and develop student problem-solving and critical thinking abilities. Also discussed are those instructional design strategies that were repeatedly employed in multiple course sections to increase online student engagement, encourage critical thinking, and enhance student learning. The findings of this study should prove of interest to anyone currently developing or delivering online instruction. (Contains 34 references.) (Author/MES)

Effective Teaching Styles and Instructional Design for Online Learning Environments

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Abstract

Internet-based, distance learning solutions are finding increased use, and may prove effective in facilitating advanced study coursework for remotely located, place-bound students. Despite the current emphasis on distance learning, the conditions for promoting online learning success have not been entirely defined. We present a case study that profiles the teaching challenges and benefits of an online graduate-level Instructional Design course for in-service teachers taught through Western Governors University and Washington State University. This work addresses some of the teaching challenges for this online instructional experience, focusing specifically on how teaching styles were used to build online learning community, to effectively promote productive and satisfying learning interactions, and develop student problem-solving and critical thinking abilities. Also discussed are those instructional design strategies that were repeatedly employed in multiple course sections to increase online student engagement, critical thinking, and enhance student learning. The findings of this study should prove of interest to anyone currently developing or delivering online instruction.

Introduction

Online Learning Environments

Computer-mediated instructional environments, or online learning environments (OLEs), are networked learning tools that are finding increased use in institutions of higher education. Online learning environments provide an interaction space that allows students to actively engage in critical dialogue and reflect on information in a way that facilitates knowledge construction and higher order thinking (Jonassen, Carr, & Yueh, 1998). Effectively designed OLEs also provide a communal workspace for group and peer-based teaching and learning (Collis, Andernach, & van Diepen, 1996) whereby student metacognitive awareness and critical understanding can be developed (Hannafin, Hill, & Land, 1997). Online learning environments are seeing increased use in institutions of higher education that are feeling pressure for delivering educational materials to a wider student audience. Many colleges and universities are investing considerable time and money in distance delivery methods to meet the diverse needs of learners; yet in spite of the effort and resources being spent, we do not have a comprehensive understanding of what factors influence successful student learning in online domains (Brahler, N.S., & Johnson, 1999).

Online learning environments are thought to provide a venue for developing higher order thinking skills in college students (Ewing, Dowling, & Coutts, 1999; Jonassen, 1995a), and are widely assumed to have a positive impact on student higher order thinking and learning. However, opinions differ greatly on how to effectively implement online technologies into learning (Ewing et al., 1999). Technology does not of itself cause the development of advanced cognitive abilities (Jonassen, 1995a); rather, a major determinant of higher order thinking skills development is the quality of discourse that occurs within well designed, properly structured OLEs (Oliver, Omari, & Herrington, 1998). Ideally, OLEs possess several characteristics: a means of accessing, generating, and sharing information; support learner articulation of knowledge and reflection on what they have learned; represent and simulate authentic, real-world problems and contexts; provide structure for student thinking; support critical discourse among learners within a learning community (Jonassen, 1995b); promote student control of learning decisions; and integrate multiple learning perspectives (Jonassen, 1993). In reality, the promise of OLEs is largely unrealized, as many instructors use online learning environments as simple knowledge repositories (Jacobson & Spiro, 1993). When properly structured and utilized to their potential, OLEs are capable of moving education from teacher-centered, lecture-based, passive instruction to learner-centered, self-reflective, active learning (Lan, 1999). Considerable research has touted the purported benefits of OLEs (Collis & Smith, 1997; Goldberg & McKhann, 2000; Koschmann, 1994), but little work has been done specifically dealing with how instructional design and styles of teaching influence student higher order thinking in these environments.

Teaching Styles, Instructional Design, and Online Learning

Teaching styles, hypothetical constructs used to characterize the teacher-student interaction (Fischer & Fischer, 1979), are based on several criteria. An instructor's beliefs regarding teaching and learning, how these beliefs are translated into teaching practice within a learning environment (Fereshteh, 1996; Grasha, 1994), how instructors present information, interact with students, manage and supervise learning tasks, and mentor students (Fereshteh, 1996; Grasha, 1994) are all components of teaching style. Instructors' teaching styles vary considerably; unfortunately, not all variations effectively promote student learning. The question remains: which styles of teaching most effectively develop student higher order thinking skills in OLEs? Many instructors are under the impression that the same teaching styles and approaches used in their traditional classes will also work in an online classroom (Diaz & Cartnal, 2000). While it is unclear whether traditional classroom teaching styles can translate to online domains, instructors utilizing facilitative, guidance-based, interactive teaching styles more effectively create critical thinking opportunities for the majority of students (Kember & Gow, 1994). Students report greater learning satisfaction with facilitative styles of teaching as compared to traditional authoritative instruction (Friday, 1990). Concurrently, facilitative teaching approaches that promote problem solving and critical thinking can be uncomfortable for students, and may be in contrast to students' superficial approaches to learning (Andrews, 1996). Collectively, these findings indicate that teachers that use facilitative, problem solving-based instructional approaches provide thinking challenges despite student discomfort with critical thinking.

Instructional design also plays a significant role in online learning success (Winfield, Mealy, & Scheibel, 1998). While technology can enable learning opportunities, it is teachers' careful planning and incorporation of instructional strategies that contribute to student interaction, growth, and learning (Kirby, 1999). In particular, instructional designs that incorporate student-centered learning approaches in online learning environments support student reasoning, problem solving, and higher order thinking (Land & Hannafin, 1997). Furthermore, the instructor's questioning skills significantly affect student critical thinking outcomes in college courses (Bonnstetter, 1988; Elder & Paul, 1997). By using systematic questioning techniques (Hannel & Hannel, 1998) and/or research-based questioning methods (Adams, 1993) in their teaching style and instructional design, teachers can enhance critical thinking skills in student learners (Adams,

1993; Hannel & Hannel, 1998). In addition to questioning techniques, the quality of the college student learning experience (i.e. critical thinking) is partially determined through other, less tangible, instructional design components like planned social interactions, alternative, non-lecture teaching formats, student learning choices that exploit personal interests and strengths, teaching approaches that provide real-world contexts for learning, and course material demonstrating the value of diverse cultures and perspectives (Stage, Muller, Kinzie, & Simmons, 1998).

The Study

The present case study focused on the quality of student learning as a function of teaching style in an online learning environment hosted by Western Governors University and Washington State University. Student participants, a collection of technology professionals for their respective K–12 school districts, were enrolled in a graduate level "Instructional Design and Performance Improvement" course as part of the Masters in Technology and Learning degree at Western Governors University. For this content area, class size was strictly limited to 20 or fewer students, based on recent suggested benchmarks for Internet-based distance education (*Quality on the Line: Benchmarks for Success in Internet-based Distance Education*, 2000).

The Instructional Design and Performance Improvement course was comprised of an informational Web site (http://education.wsu.edu/TL/522/) and the primary communicative tool for the course, an email listserv. The course Web site contained an outline of course requirements, student evaluation criteria and grading procedures, required and recommended texts, and instructions for completing the primary assignments for the course, three problem-based Instructional Design projects. In addition, several descriptive hints for project development were included. The three projects comprised the majority of the course grade (90%) with the remaining 10% for student participation in weekly online discussions. Also included on the course Web site were email hyperlinks for direct student access to the course instructors and coordinator, as well as instructions for subscribing to the email listserv. Students were assigned readings from the required textbooks, and the instructor posed weekly questions to the listserv so that all class members could potentially participate in any aspect of any posted discussion. Questions were structured and goal-oriented but open ended, and were designed to develop student research and evaluation skills that were necessary to successfully complete each of the three projects. An email listserv format was chosen as the discussion tool as it was anticipated that all students had ready access to email technology. Hardware and software requirements for full email functionality were minimal; using more sophisticated communication systems could have limited remote student access potentially. Students were required to post at least one well-developed, thoughtful answer to each weekly question as a criterion for student course performance.

The course design specifically emphasized problem-based learning by requiring students to develop three in-depth research projects that were distinct but built upon one another. The first project invited each student to evaluate and assess their specific, unique instructional environment by constructing a well-developed instructional technology assessment rubric, and to preliminarily identify a pressing instructional problem particular to their environment. The second project requested that each student describe in further detail his or her specific instructional problem, and provide supporting rationale with relevant literature. The primary goal of the second project was to research and develop a proof-of-concept model for pilot testing a potential solution to the identified instructional need, and to determine the instructional effectiveness of the proposed solution via educational testing. Finally, the third project bid each student to critically reflect how their instructional practice has changed, what aspects or models of the instructional design process were most useful to them, and how they planned to implement their solution in future instruction.

Methods

Research Question and Variables

In an attempt to identify and comprehend some of the important criteria for learning online success, our research questions were: Does teaching style affect the quality of student learning and satisfaction in online courses? and 2) What impact does course design play in online learning success? For this study, our first independent variable was the instructor's teaching styles, which represented 1) instructional design content expertise; 2) provided learning structure and guidance; 3) provided a personal example for learning and instructional leadership; 4) guided, questioned, and facilitated student interaction, active learning, and critical thinking; and 5) cultivated student learning abilities so as to empower student learners to become independent, functional Instructional Designers. Our second independent variable was the course instructional design, which reflected the structure and purpose of inherent course activities. Our dependent variable was the overall quality of student learning in the online domain. Indicators of student learning quality included the frequency of interaction, the quality of weekly teacher-student and student-student discourse, the level of student writing confidence and development of content expertise, and the degree of reflection and revision indicated in student responses.

Learner Demographics

For the studied sample of online students, 33% and 67% of the class were male and female respectively. Students average age was 35, with a range from 26-46 years. Sixty-three percent of the online students used PC-format computers, 25% used Apple Macintosh, and 12% used some other format. Online students had a wide range of technology proficiency and experience; 38% considered themselves experts with word processing and sending and receiving email, 19% searching for information via the WORLD WIDE WEB, and 6% creating and editing a Web page. Many of the online students were first time graduate students, with little to no research experience.

Learning Quality Assessment

The categories of the teaching styles independent variable were determined using a validated Teaching Styles Inventory (Grasha, 1996), whereas the student learning quality dependent variable was evaluated qualitatively (Guba & Lincoln, 1982) via weekly and semester observation. In addition, students evaluated various aspects of the course, the instructor, and their learning experience with a 140-item, validated survey questionnaire (Silhouette Flashlight). Specifically, the Flashlight survey asked students: 1) the degree to which course assignments were stimulating, challenging, and encouraged student creativity; how quickly students received feedback, and how effective the reflection and revision process was; 2) the instructor's teaching effectiveness with regards to the teacher's ability to build students' confidence and promote student learning success; 3) how authentic the context and relevance to working environment was; 4) whether the instructor provided an informative, thorough evaluation of student thinking process and course performance specifically highlighting strong points and points for improvement; 5) the degree to which the instructor provided yes or no answers; 6) how well the instructor bolstered student learning confidence and stimulated excitement about course material and productive student interaction; and 7) whether students would recommend this general type of distance course, this particular course, and the course instructor to others. The survey also assessed student comfort with the course, specifically focusing on 1): student satisfaction with assignments; aspects of community building; 2) the level of thought put into responses; 3) whether students were likely to spend time on issues not related to course; 4) whether students were more likely to try and search for their own answers before approaching the instructor; 5) if they were better able to visualize course concepts; and 6) the effectiveness of the course structure and design.

Results

The results of the Teaching Styles Inventory (Table 1), which was used to characterize the course instructor's instructional approach, and an online interaction profile for the Instructional Design and Performance Improvement course is displayed below. In addition, qualitative survey assessments that measured student perception of online learning effectiveness and course satisfaction are portrayed, as are examples of student course evaluation.

Table 1: Instructor Teaching Styles profile

	Teaching Styles Inventory				
	Expert	Formal Authority	Personal Model	Facilitator	Delegator
TSI Score	4.2	4.2	5.3	6.6	5.1
Standard Score	-0.27	-1.08	0.13	1.83	1.67

Table 2: Instructor Interaction with Online Students over the Course Term

Term	Total Responses	Instructor Responses	Instructor / Total Responses
Spring 2000	916	229	25%
Summer 2000	904	345	38%

Students were asked to complete a survey regarding their perception of various aspects of the online learning experience, specifically focusing on how effective they perceived the online learning to be, and how satisfied they were with specific components of the online discourse. The survey used a variety of Likert-type assessment scales in addition to fill in the blank and open-ended questions. Seventy-five percent of students enrolled in the course participated in the survey. Of the students that responded to the survey, the majority strongly perceived the course instructor to give highest priority to building students' confidence in their ability to learn difficult subject matter, was concerned with the academic success and assisting all course participants to learn, provided detailed, useful comments on assignments within a short time (24 hours), and in general encouraged meaningful communication between the instructor and the students. In addition, students perceived the course instructor to be genuinely interested in what they had to say, and knew something about the instructor as a person, not just an instructor. With regards to course content, the majority of students strongly felt that course activities and assignments were stimulating, had authentic, real-world contexts and effectively promoted learning, and that the online course experience helped them to manage large, complex tasks, work through a process to solve problems, and exercise their creativity. Student respondents also reported that they looked forward to working on assignments for this online course, and that student development from the online learning experience would have direct relevance to and impact on their professional lives.

A collection of student quotes regarding the effectiveness of online instruction and utility of the online learning experience are included:

> "Given the fact that the facilitation was online and we never talked face to face, I feel it covered all the needed areas and provided the feedback and information needed as well. Answers to questions were prompt and to the point. You gave useful feedback and insight into the instructional design field."

"Overall this course has been a very good experience. I have learned a great deal. Thank-you for letting me make this course relevant to my day job. Being able to do that has been invaluable."

"This was my first experience with a listproc, and it was very helpful to be able to read all the comments and submitted assignments. The weekly assignments did a great job guiding us into the different projects. I now feel I have a very good understanding of the instructional design process. The personal and professional growth attained through participating in this class has made me a better professional educator."

"I did appreciate your comments, and took them to heart whether it was on a weekly question, or as part of evaluating my projects. Your sense of humor kept things in proportion, but still deadlines were deadlines, etc. I always want to know where the line is and with your reminders, there was never a doubt."

"[I] wanted to say that although I didn't think that operating through a listserv was the best way to take this class, I've changed my mind over the last month and a half... this class has been straight forward and I think that the listserv has actually drawn us into the class more effectively than using Web boards."

Discussion and Conclusions

Online learning, for better or worse, appears to be a trend that will continue for some time as educational institutions look for innovative ways to provide a quality learning experience for their students (Brahler et al., 1999). This qualitative case study provides some insight into the distance learning process, and identifies some factors that may partially determine learning success for students in online domains.

The results of this study suggest that specific teaching styles can be used to promote effective student learning in online learning environments. In this distance learning experience, Facilitator and Delegator teaching styles were used extensively by the instructor, and were characterized by such activities as problem-based project development, guided student exploration, online group discussion, self-discovery exercises, learning debates, case studies and independent, student-designed research, and using the instructor as an independent resource (Grasha, 1994). In addition, the Personal Model style was used by the instructor to illustrate alternatives, demonstrate ways of thinking, outline the thought processes involved in research-based project development, and to share personal viewpoints (Grasha, 1994). Finally, both Expert and Formal Authority teaching styles were used to provide a modicum of content expertise; however, the primary instructional goal for this online course was to begin with graduate students with little or no research or instructional design experience, and guide them on a path of self-discovery to a point of autonomy and independence within the Instructional Design field. Accomplishing this goal meant that students needed to develop their own content to a large extent. Collectively this meant that the instructor had to nurture student confidence and guide student development of independent research and individual critical thinking skills; thus the high scores for Facilitator and Delegator teaching styles. In this case, Expert and Formal Authority styles were utilized to provide structure within the independent learning environment, and to emphasize the high learning and performance standards set for the students.

For the graduate Instructional Design and Performance Improvement course offered through Western Governors University and Washington State University, we found that interplay between the teacher's and students' personalities was essential to productive learning. These findings were consistent with previous research that states teachers' personalities must be built into online courses (Winfield et al., 1998). Initially, it was essential that the WGU instructor establish a level of trust, professional credibility, and community with the students. Since the students were unable to 'see' any physical expressions of the instructor, it was vital that the teacher's initial responses were confident and competent, and that students felt part of a larger community of learners. As teacher

confidence and competence was conveyed, the students expressed more trust and confidence in learning from a teacher in an online context, and shared more personal information in initial community building exercises as a result. When one has a class of 20 students, small, collaborative subgroups may spontaneously form. This phenomenon was also observed in the online classroom. Much research has shown the benefits of small group collaborative learning in online environments (Collis et al., 1996; Hiltz, 1998; Newman, Johnson, Webb, & Cochrane, 1997); however, in this context, small online groups served the purpose of community cohesion rather than collaborative learning.

Despite the high demand for this course, the course coordinator strictly limited the number of students to 20, a number that ensured a reasonable teacher/student ratio and was consistent with professional recommendations (*Quality on the Line: Benchmarks for Success in Internet-based Distance Education*, 2000). In addition, it was important that student learning become the focus of the course, not the teacher. In this case, the simple technologies used for this course and the design of the instruction allowed the technology to blend into the background and become more transparent; as a result, the students spent more time engaged in rigorous discourse and developing research abilities and critical thinking skills. In this scenario, the technology was a convenient, effective means to an end, not an end unto itself.

Several interesting trends were observed over the course term for this online teaching and learning experience. One intriguing observation was how student perception of other's work led to increased performance expectations. In traditional face-to-face classrooms, student work is generally not publicly displayed, and the instructor is many times limited to teaching to students with the worst performance to try and increase average class performance. In the online classroom, students were encouraged to submit works in progress to the listserv as project development proceeded. This had the unexpected effect of increasing average class performance, presumably because less motivated students were exposed to high-quality projects and were prompted to increase their efforts by class overachievers. In this case, the instructor was not limited to teaching to the lowest performing students; instead students tried to emulate the project quality of the best students. It is unclear whether this shift in student perception would have occurred in a traditional classroom. A second, inadvertent discovery was how consistent the number of total responses was for two successive course terms was, differing by only 1% between the first and second times the online course was offered. The implications of this are not totally clear, but it appears that it may be possible to predict the number of responses that will be generated in any online, listserv-managed course based on number of students participating, course duration and teaching style.

The Instructional Design and Performance Improvement course relied on an email listserv. This asynchronous method of communication allowed students to contemplate their submitted comments prior to submitting them for perusal by their class peers and the course instructor. Face-to-face interactions, such as those that occur in a traditional classroom, tend to be more spontaneous and unstructured. As a result of the asynchronous method, student responses in the online classroom tended to be more structured and well thought out.

In conclusion, we maintain it is the quality of human interaction that determines online learning success. We conclude that online instructors can use teaching styles to achieve instructional goals and provide rich, satisfying learning experiences for online students. The results of this study are intriguing; however, this study is not without limitations, and the conclusions drawn by the authors are speculative and preliminary. Only a small sample was used for this qualitative investigation, and as such there are limitations to how far these findings can be generalized. Additional studies in this area are necessary to more definitively support these conclusions.

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