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Health Education in a Web-based Learning Environment: Learners' Perceptions

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Abstract: The increasing utilization of the World Wide Web in higher education allows instructors to re examine pedagogical strategies and explore ways of taking advantage of the Web's potential to provide for learning experiences that go beyond that possible in the traditional classroom environment. Assumptions on how this enhances the learning experience for students require examination. This paper discusses a study which examines, among other issues, student perceptions of the learning experience when asynchronous, Web-based, collaborative tutorial activities are utilized within an undergraduate health education subject. Analysis of the study data demonstrates that students' perceptions of the effectiveness of the Web-based tutorials lie in their appreciation of opportunities for flexibility, reflection, and self-directed investigation within the learning environment.

Introduction

The increasing utilization of the World Wide Web in higher education allows instructors to re examine pedagogical strategies and explore ways of taking advantage of the Web's potential to provide for learning experiences that go beyond that possible in the traditional classroom environment. Our assumptions on how this enhances the learning experience for students require examination.

In an effort to investigate the use of Web-based instruction in the delivery of health education at the undergraduate level, the Faculty of Education at the University of Wollongong implemented Web-based learning activities as part of the tutorial component within its Health and Health Behaviour subject (a core subject for students enrolled in a pre-service teaching Bachelor of Physical and Health Education degree program). This study examined, among other issues, the perceptions of the learning experience for students engaging in these Web-based collaborative tutorial activities.

This paper discusses the design and development of a Web-based learning environment with embedded collaborative tutorial activities; methodology and implementation process, and preliminary findings of student perceptions of the Web-based learning experience.

Theoretical Background

Important components of the learning process are discourse and learner interaction. Duffy and Cunningham (1996) define learning as a "social, communicative, and discursive process, inexorably grounded in talk" (p. 181). Dialogue and discourse encourages the higher order thinking skills of cognitive conflict and resolution in providing context and a mechanism for explanation, justification and reason (Oliver, Omari & Herrington, 1997). Learners' interactions with instructors and other learners "give them perspective, place them within a community of learning, and contribute to their mastery of concepts and skills" (Price & Petre, 1997, p. 869).

This essential component of learner interaction and discussion in the learning process focused our attention on learner discourse through collaborative activities. The questions that guided the study included:

- How do learners participate in and contribute to collaborative health education learning activities within the class and Web environments?
- What knowledge, attitude and behaviour change occurs when students engage in collaborative health education learning activities within class and Web environments?
- What are learners' perceptions of the effectiveness of class and Web environments for health education?

Learning Environment Design and Development

Phase one of the study involved the development and formative evaluation of collaborative learning activities and a prototype Web learning environment.

For the purposes of investigating the impact of implementation of Web-based learning within the subject, six online learning activities were developed. During the first half of session, concurrent class and online tutorials focused on issues related to HIV/AIDS.

The literature suggests the pedagogical benefits of asynchronous communication includes the opportunity for learner reflection, self directed learning, and learner participation in topic negotiation and communications control (i.e., subject matter discussed, number of topics discussed, and, the speed at which communication about topics occurs) (Laurillard 1993; Romiszowski & Mason, 1996). With this in mind, Web-based learning activities were designed for asynchronous participation.

All Web-based and class-based learning activities were structured to allow for small group discussion and collaboration. The general format for the structure of each learning activity was to provide a stimulus to discussion in small groups (e.g., a survey to be answered, questions to be considered, etc.) with each group arriving at some consensus or shared understanding that could be communicated to the larger class during the subsequent lecture. In Duffy and Cunningham's (1996) terms, the learning strategy involves a problem which provides stimulus for an authentic activity where knowledge is developed through working on the problem.

Once the learning activities were designed, the Web learning environment was designed and developed. A guiding factor in the design of the Web-based learning environment was consideration of the computer and Web experience of the students enrolled in the subject. Based on history with similar cohorts, it was expected that there would be a range of computer experience among the students with the majority having little experience with computers. Additionally, it was expected that there would be a range of Web use experience with the majority of the students having either none or little experience in using the Web. Brown and Thompson (1997) argue that "interface design must provide ease of navigation, a sense of human interaction, helpfulness and responsiveness to the needs of learners studying in an information rich, self-directed medium." (p. 78) As such, particular attention was paid to constructing a Web environment with a simple structure with embedded communication tools that were easy to use.

The Web site structure included four main components: (1) the subject outline which provided information such as the rationale, objectives, content, presentation, assessment, and participation expectations for the subject; (2) the subject schedule which provided, in table format, the week-by-week timetable of lecture topics and tutorial activities; (3) resources and Web links which included links to a number of Australian and international Web sites related to the topics covered in the subject; and, most importantly, (4) the Activity Centre which facilitated the learning activities for the students who were participating in Web-based tutorials.

The Activity Centre was designed using a structure based on the suggestion that Web-based learning environments should put minimal cognitive load on the student and that templates be utilized in screen design which "promotes understanding by allowing the reader to focus on new information rather than devoting time and energy to variations of format" (El-Tigi and Maribe Branch, 1997, p.25).

The initial structure of each activity consisted of two or three Web pages. The Things To Do page outlined the activity and provided stimulus to the group discussion. Examples of discussion stimuli utilized in the learning activities included: a questionnaire (e.g., In what situations can HIV be transmitted?) to be answered and discussed by the group and a narrative that provided an example for groups to develop their own story (e.g., for risk factors of HIV/AIDS). In cases where an online questionnaire provided stimuli to the collaborative learning activity, results of the individual group members were provided on a separate, Results, page. This facilitated the sharing of ideas

among group members and provided a basis for their discussion. The Discussion Area for each activity was designed to be the focal learning area. The comments submitted to this page were viewable only by group members and were displayed in chronological order on the page.

Formative Evaluation

The formative evaluation of the learning environment, with embedded activities, involved a multi-faceted approach including: review by experts in the areas of health education and instructional technology; review by instructional technology postgraduate students; and testing by undergraduate teacher trainees.

After using the Web site, the health education and instructional technology experts were interviewed and instructional technology postgraduate students were surveyed regarding: Web environment interface issues; clarity and quality of information and external links; and, perceived pedagogical effectiveness of the learning activities. Undergraduate students were asked to fill out a one-page survey of questions regarding Web site interface issues and usability.

The Web learning environment was revised, based on analysis of the data collected during the formative evaluation, with the majority of changes to the Web site focused on the individual learning activities within the Activity Centre. Specific reviewer suggestions to describe learning activities and tasks in more detail resulted in a clarification of the structure of each learning activity and thus, a proliferation of pages for each activity.

In the revised version of the learning environment, each learning activity was associated with five main areas. The This Week's Task Into page introduced the student to the activity, related the activity to the specific lecture, provided additional conceptual information and stimulus into the group activity by asking the student to respond to some initial, topical questions. Once the student submitted their response to these initial questions, they were automatically moved to the Group Tasks page. Here, the student could read a detailed description of the group task for that particular learning activity. The student also had the opportunity to view their responses and the responses of the other members in their group to the initial, topical questions by accessing the Individual Responses page. The earlier version of the Discussion Area was maintained, however, based on reviewers suggestions, an abbreviated list of the group tasks was added to the top of the page. A Submit Page form was also added, to the structure of each activity, as the area in which the group submitted their final product. All five areas of the individual activities were available to the student at all times (i.e., students are not forced to follow a particular page sequence when engaging in the activity).

Study Methodology and Implementation Process

The study was implemented in July 1998 within the Health and Health Behaviour subject. Sixty-two students were enrolled in the subject with the majority of students (57) registered in their first year of the Faculty's Bachelor of Education in Physical and Health Education degree program. The subject was conducted over a 14 week schedule.

During implementation of the study, a crossover factorial design was utilized where students were randomly assigned into two tutorial groups and each group then randomly assigned to one of two learning environments (class or Web) for the first half of session. In the second half of session, groups crossed over to engage in their tutorials within the alternate learning environment. Both tutorial groups were further, randomly, divided into working groups (seven working groups in each of the two tutorial groups) consisting of four or five students.

All tutorial sessions (conducted either in the class or in the Web-based environment) were associated with an assessable activity task for which each working group was required to submit a final group product prior to the next lecture.

During the first week of session, students were advised of the subject Web site and its location (<http://www.immll.uow.edu.au/UG/EDUP144/>). At that point, all students could access the subject information and resources but could not access the Activity Centre where Web-based tutorials were located.

The first Web-based tutorials were implemented in the fourth week of session while the second set of

Web-based tutorials were implemented in the eleventh week of session. This time frame allowed students to develop a working relationship with their tutorial work group; become accustomed to the process of completing and submitting their group work within the weekly time frame; and, complete three weeks of Web skilling exercises within a Information Technology subject. During the week prior to commencing Web-based tutorials, students were provided with a brief presentation as an introduction to the Web site and the structure of the learning activities. At this time, students were also given an individual username and password to access the Activity Centre.

Pre-tests and post-tests for knowledge, attitude, and behaviour related to the health topics covered by the learning activities (HIV/AIDS and nutrition), and computer literacy and computer comfort, as well as a post-test which included items related to perception of the learning environments were administered to students. The collaborative learning activities were recorded (via audio tape and electronic Web logs).

Once learning activities were complete, a representative of each working group was chosen, at random, and asked to engage in an in-depth interview regarding their experience and perceptions of the class and Web learning environments. Specifically, the interview sessions gathered information from the students regarding: how their group process was managed during weeks when tutorials were held in the classroom and when they were conducted within the Web-learning environment; their perceptions of engaging in group-based tutorials within the Web learning environment in general and the individual learning activities specifically; their perceptions of the effectiveness of the Web-based tutorials compared to class-based tutorials in terms of their own learning; and, their experience in terms of group interaction in both the Web and classroom environments.

Findings

An analysis of the in-depth interviews conducted with students who engaged in the Web-based learning environment during the first half of session (seven students representing each of seven tutorial working groups) is presented as preliminary findings.

All students expressed positive opinions on their experience of engaging in the Web-based tutorials. While one student had previously experienced a subject which was supported with Web-based learning materials, none of the students had previously engaged in collaborative group learning activities using the Web. They felt it was a "novelty"; a "...buzz to sit down and talk to three other people in different places"; and that "... it intrigued you because it was new and because it was different." All the students mentioned the benefit of the "convenience" and "flexibility" of engaging in the Web-based tutorials.

Most students (six of seven) felt that the Web-based tutorials were more effective in terms of facilitating their own learning than the classroom-based tutorials. Some suggested that this was due to the fact that, in the Web environment, they had time to research the information (either in texts or via external Web sites) and reflect on the group task. One student's explanation of the experience is indicative of that expressed by many of her peers, "... when you're all rushed, you won't concentrate . But ,when you've got time for it, you can sit down, think about it . A couple of times I'd go off and read some books that I had at home to help me a bit and make me think more about the answer. Then I could come back to it whereas, when you are in the class you've got to know straight away, right there. I mean, I'd go onto the Internet and try to find some information to give me some ideas and then I'd go back on and write my answers... so I thought that was good."

Each student was asked to comment on and compare the participation and interaction among their work group members in both the class-based and the Web-based tutorials. Only two students reported that, during class-based weeks, their group actually worked on the entire task as a whole group. The other five students reported that their group tended to separate the task into small parts and assign those parts to individuals. Then, one member of the group would be responsible for pulling together the individual parts into a final product.

This did not seem to be the case for the weeks in which the tutorials were conducted in the Web-based environment. All students noted that, during these weeks, all group members contributed by completing the individual introduction page and interacting within the Discussion Area on all aspects of the task. To complete the group Submit Page, three of the seven students noted that their group met around one computer and completed the page together. The other four students noted that their group delegated the responsibility of synthesizing the group discussion to one group member.

In comparing the nature of the interactions that took place in the two environments, most students (five

out of seven) felt that more detailed contributions were made within the Web-based environment. One student noted that, "I think it makes you express what you think more because you're not talking. When we would meet to talk... one person would say what they think then the others would just say, 'yeah, I agree'." Another student felt this detailed contribution in the Web-based tutorials was due to the fact that the Web takes away the pressure of the face-to-face environment, "Some people would be sort of afraid to come out and say things. But on the Web, people aren't directly looking at you and you're not the focus of attention. On the Web, in great detail, you can tell someone about something. But in the classroom you don't tend to go into a lot of detail... I think for people who are reluctant to let everything out in the classroom, [the Web] is a really good opportunity, you don't have any pressure on you."

This student went on to explain that she noticed a difference in her own contribution, "I think I contributed a lot more on the Web than I do in the classroom, I tend to sit back and listen and just throw something in every now and then... In the classroom, if you've got very talkative people in your group, chances that you'll sit back and let them run the show. But when you're on the Web you're free to make a huge contribution if you want to, so you write as much as you want ... you say a lot more on the Web than you would in the class."

When asked what, if anything, the classroom tutorials provide that was unavailable in the asynchronous Web-based environment, some students mentioned the ability to ask questions of the tutor or another student "there and then".

The students were asked to think about their own skills in using computers and the Web and the appropriateness of the introduction to the Web-based environment which they had received. Four of the seven students interviewed said that they felt competent about using computers and the Web prior to engaging in the Web tutorials. These students noted that the brief introduction to the Web site was enough to get them started on the Web-based tutorials. They all felt that the structure of the Web-based tutorials was very easy to understand. The other three students who were novice computer and Web users also felt that the structure of the Web environment was very easy to understand and that they were adequately equipped by the prior Web skilling exercises in the Information Technology subject to be able to engage in their Web-based tutorials. These students felt that the experience of engaging in the Web-based tutorials not only increased their computer and Web skills, but also allowed them to feel more "relaxed" using the technology. One of the students expressed her feelings in this way, "I was a bit nervous, I mean, I know computers are going to be important so I've wanted to do it, but I haven't had the confidence... actually using them for something constructive, I've got the confidence now... a big positive."

Students commented that they would benefit from suggestions on how to better manage the group process when engaging in Web-based, asynchronous tutorials. Some students mentioned instances when they were unsure when their work group members would be logging on to the Web site or how the final group product was going to be organized. However, it is interesting to note that many students also reported that they experienced similar process issues in the class-based tutorials.

Discussion

Analysis of this sample of data demonstrated a degree of perceived effectiveness for the implementation of the Web-based collaborative learning activities within an undergraduate health education subject.

The majority of students perceived Web-based tutorials to be more effective for learning than class-based tutorials. They suggested that contributing factors to their learning process in the asynchronous Web-based environment was the opportunity to research information using print and electronic resources and reflect on their ideas and the contributions of their work group peers. This supported the literature (Laurillard 1993; Romiszowski & Mason, 1996) on the pedagogical benefits of learner reflection and self-direction afforded by asynchronous learning environments .

The students' perceived that the quantity and quality of participation and interaction among their work group was higher in the Web-based environment. This reinforced the literature on computer-mediated communications (CMC) which suggests that collaborations within this environment can be more powerful than face-to-face encounters (Romiszowski & Mason, 1996).

Full quantitative and qualitative measurement of the effectiveness of the of the Web-based tutorials in terms of learning will be substantiated with comparisons of the pre and post knowledge, attitude and behaviour

tests and with in-depth content and discourse analysis of the recorded learner interactions in both class and Web environments.

Final analysis of the data from the study are expected to provide a fuller understanding of: effective Web-based teaching and learning strategies for health education at the tertiary level; the efficacy of the World Wide Web in delivering health education; how discourse-based knowledge construction and attitude development is supported in a Web-based learning environment; and, design issues for Web-based learning environments.

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