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STUDENT ATTITUDES TOWARD WEB-ENHANCED LEARNING IN A MUSIC EDUCATION METHODS CLASS: A CASE STUDY

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Subjects ($N = 12$) in a music education methods class accessed course resources, quizzes, records, and communication tools through the Web. A questionnaire was used to examine their attitudes toward learning via the Web. Responses were positive toward many aspects of technologies used during this class. Subjects who could access the Internet from their own home computer indicated that the amount of time they were required to use the computer for course assignments was not excessive. Those who did not have home Internet access tended to believe that too much computer time was required ($p < .05$). The less Internet experience a subject had, the more likely they were to feel that on-line instruction was impersonal ($p < .05$).

Technology and the Internet have a prominent role in today's educational agenda. The former Vice-President of the United States stated that "Access to the basic tools of the information age is no longer a luxury for our children. It is a necessity" (Gore, 1998). There are those who believe technology needs to be a major facet of educational reform (U.S. Department of Education, 1997), with the Internet becoming a primary vehicle for instructional delivery (Pierian Spring, 1997). Hundreds of universities throughout the United States appear to be following this call for transforming the teaching and learning process by means of Internet-based instruction. According to some estimates, more than 800 college degree programs were to be available on-line during 1997 (Schlumpf, 1998). An increasing number of commercial products designed to facilitate teaching and learning online are becoming available (Gray, 1998).

Music educators also have been exploring applications of the Internet to their discipline. Bauer (1999) examined ways in which music educators were using the Internet in their professional lives and discussed ways in which the Internet might become a more useful tool for music education. Thoughts on using E-mail, listservs, newsgroups, and the World Wide Web, along with a discussion of the technical aspects of Internet connectivity were presented by Williams and Webster (1999). According to Rudolph (1996), music teachers could use the Internet to their benefit by conferring with other educators through E-mail and listservs; by exchanging text, graphics, and MIDI files with others; by selecting and purchasing music-related items online; and by conducting research related to their instructional focus. Beckstead (1996) described a project where school children used MIDI and telecommunications technologies to develop their music composition abilities. Other

MIDI and Internet-based composition projects were presented by Cosenza & MacLeod (1998) and Hickey (1998). The asynchronous nature of the Internet may enable music educators to engage in varied professional development activities that would not be possible in traditional settings (Bauer, 1997). Hanna (1998) utilized E-mail, the telephone, instructional videos, and video-conferencing to teach a bassoon student. A thorough discussion of Internet resources and musical applications of the Internet was presented by Mash (1998). Bush (1998) reported experiences using E-mail journals to promote reflective practice among collegiate music education students.

Recent studies have investigated the use of the Internet and Web-based tools as part of instruction at the collegiate level. Roberti and Davis (1998) reported that the Internet is quite popular among college students. When over 1200 students at 100 colleges and universities throughout the country were asked what was "in," 72.5% responded "the Internet." At Stanford University, students in a large lecture-type humanities course utilized a web site where they participated in discussion areas, submitted assignments, explored links to course-related resources, utilized an on-line portfolio system, and read the course syllabus and announcements (Friedlander & Kerns, 1998). Researchers found that use of these web resources resulted in students who were better prepared for lecture classes, allowing faculty to present more in-depth lectures rather than just introductory material. In addition, faculty were able to better recognize students when the students' pictures were included as part of their postings in discussion forums. Faculty-student interaction was judged to be greater than what typically occurred in a traditionally taught large lecture class. Finally, due to the on-line discussion forums, there were more opportunities for instructors to evaluate students' understanding of topics, resulting in an increased ability to clarify topics and information that otherwise might not have received further explanation.

Charp (1998) found that student reactions to a course in telecommunications conducted via interactive distance learning technologies were generally positive. Students liked that they saved time traveling to and from the university for class. They also perceived on-line discussions as beneficial because the discussions provided more opportunity for all persons to contribute when compared to traditional classroom discussions. Furthermore, students enjoyed the collaborative aspects of on-line learning. However, the students said they did not feel that they had developed a relationship with fellow classmates and their professor that was as personal as that developed in the traditional classroom. They also felt that feedback to questions and assignments was sometimes too slow, and they stated that they did not receive enough attention due to class sizes that were too large.

Deal (1998) surveyed her class of pre-service teachers regarding their attitudes toward technology. A majority of the students (64%) reported that they were regular Internet users. Nearly all (24/25) indicated the Internet was a valuable professional resource and felt that becoming literate with technology was important to their future career as a teacher. However, these

students did not feel that their professors were providing good models of how to use technology when teaching. Both Kubala (1998) and Kelly & Leckbee (1998) found that some students were more comfortable participating in an on-line environment than they were in traditional face-to-face discussions.

Much discourse is taking place regarding the Internet as a vehicle through which entire courses can be delivered in an asynchronous manner. Instructors are also beginning to use the same Web-based tools to enhance instruction in traditional classes. Studies such as those by Friedlander & Kerns (1998) have indicated that there may be advantages for students when courses include this type of instruction. However, more research needs to be conducted to determine the most beneficial aspects of these technologies.

The case study is a useful methodology used by researchers to study a single entity. Over time, the examination of multiple case studies may result in the identification of emerging trends, permitting generalizations to be made and theories to be built (Leedy, 1997). These theories can then be tested through other types of research designs. When any new teaching method is implemented, one important question to explore is the perception and attitude of students toward these new methodologies in the teaching/learning process. The purpose of this study was to determine student attitudes toward using Web-based materials as an integral aspect of the teaching/learning process in a collegiate music education methods class.

Method

The subjects in this study were music education majors ($N = 12$) at Ball State University who were enrolled in a music education methods class during a five-week summer term. This class dealt with topics such as budgeting, booster programs, fund raising, handbooks, public relations and advocacy, trips and travel, equipment, and facilities as they relate to the music teacher in the public schools. Included in the population were six males and six females. The mean age of the subjects was 21.7 years. Four were juniors and eight were seniors. Areas of specialization included two vocal music education majors, two general music education majors, and eight instrumental music education majors.

The questionnaires used in this study were designed by the researcher on the basis of a review of literature and the researcher's previous experience in using Web-based technologies with students. The purpose of Questionnaire #1 was to determine the background of the subjects and their previous experience with Web-based tools like the ones to be used in the course. Dichotomous responses, responses selected from Likert-type scales, and free responses were solicited. Questionnaire #2 examined subjects' attitudes toward learning via the Web-based technologies they utilized in the course. From a Likert-type scale, subjects selected their degree of agreement (1 = *strongly disagree* to 5 = *strongly agree*) with each statement given.

The class met daily for 65 minutes in a traditional setting. In addition, many class assignments and activities took place online using Web-based tools and resources. On the first day of class, subjects were administered Questionnaire #1. Following completion of the questionnaire and discussion of the course syllabus, the class moved to the School of Music computer lab where students received a hands-on orientation to the course web site and the web tools to be used in the class.

Throughout the five-week class, subjects were required to regularly use a World Wide Web browser to access resources which allowed them to check the course syllabus, complete reading assignments, take quizzes, participate in class discussions via a newsgroup, check their grade in an on-line grade book, do research, explore course related web sites, and communicate via E-mail. For example, three to five times per week subjects took quizzes on assigned course readings via *inQsit*, a Web-based assessment tool. They regularly participated in class discussions on assigned topics via a class newsgroup. The newsgroup interface also allowed subjects to send private E-mail communications to each other or the instructor. Subjects could access their course grade via a password protected program which allowed the instructor to keep track of student grades online and subjects to access their personal scores at any time of the day or night. Web sites related to the content of the course were linked from a section of the course web site and subjects explored and evaluated these sites, submitting critiques to the instructor via E-mail. Subjects also used Web-based resources to research topics related to group projects they later presented to the class during a regular class meeting time.

All of these Web-based tools and resources could be accessed from the student's home, the university, or anywhere in the world where there was access to the Internet. The Web tools used were designed by the university for use by faculty in their classes. A home page was constructed for the class which allowed students to access all of the Web tools from one location. At the final class meeting, the subjects were administered Questionnaire #2 which examined their attitudes toward learning via the Web-based tools used throughout the course.

Results

Questionnaire #1

On the initial questionnaire, eight of the twelve subjects indicated they owned a personal computer. Of these, six subjects said they were able to connect to the Internet via their personal computer. The most frequently used computing resources for completing school assignments listed by the subjects were the computer lab located in the School of Music (n = 12), followed by other university computer labs (n = 9), and personally owned computers (n = 8) (see Table 1).

A Likert-type scale which ranged from 1 (*very inexperienced*) to 4 (*very experienced*) was used to determine subjects' experience levels in using the Internet. Subjects indicated they were moderately experienced Internet us-

Table 1

Frequency of Use of Computing Resources for Completing School Assignments

Computing Resource	Number of Subjects Responding Affirmatively
School of Music Computer Lab	12
Other University Computer Labs	9
My Personal Computer	8
Friend's Personal Computer	6
Parent's/Relative's Computer	0

ers (M = 2.6). The comfort level of the subjects when using E-mail, the World Wide Web, and newsgroups was also examined through their responses on a Likert-type scale ranging from 1 (*uncomfortable*) to 4 (*very comfortable*). Subjects were quite comfortable using E-mail (M = 3.7) and the World Wide Web (M = 3.6), but indicated less comfort in using newsgroups (M = 1.9).

Subjects also were asked what types of Internet and Web-related tools and resources they had used in previous classes (see Table 2). The most frequent way subjects had used the Internet was to conduct research (n = 10). Eight students had checked their class grade on the Web, and seven had used the World Wide Web to access course information and materials. Five subjects had taken courses in which they used the Internet in other ways such as completing assigned on-line readings, publishing assignments to the web, constructing their own personal web page, and helping develop an on-line portfolio for the class.

Questionnaire #2

At the final class meeting, Questionnaire #2 was administered to examine the subjects' attitudes toward the Web-based tools and activities used in the class. Subjects responded to 14 statements on a Likert-type scale which ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). Because of the nature of the data gathered in this small, non-randomized sample study, only descriptive statistics and nonparametric tests were used in the analysis of the data gathered.

Descriptive statistics were calculated for the subjects' responses to each of the items on Questionnaire #2 (see Table 3). By inspecting the mean, median, mode, and standard deviation of the responses to each questionnaire item, the items were categorized as (a) statements with which the

Table 2

Subjects Use of Web Resources and Tools in Previous Courses

Resource or Tool	Number of Subjects Responding Affirmatively
Conducted Research	10
Checked Grades	8
Accessed Course Information and Materials	7
Used Internet for Other Aspects of Course	5
Participated in Class Newsgroups	4
Read Course Syllabus	3
Took Quizzes/Tests	1

subjects agreed, (b) statements on which the subjects were neutral, and (c) statements with which the subjects disagreed. Although only the means are listed in the following narrative, the median, mode, and standard deviation also were considered in placing each item in a category. See Table 3 for the mean, median, mode, and standard deviation of each item.

The subjects moderately or strongly agreed with the following items: "The Internet contains valuable resources for music education" ($M = 4.7$), "I like being able to access course materials at a time that suits my own schedule and preferences" ($M = 4.2$), "Participating in newsgroups as part of class instruction allows me to learn from my classmates" ($M = 3.8$), "I like being able to check my current grade online at any time I desire" ($M = 4.5$), "On-line instruction is impersonal" ($M = 3.6$), "Using Web-based technologies helped me to better understand the content of this course" ($M = 3.7$), "I would like to take more courses that use Web-based technologies as part of the instructional process" ($M = 3.6$), and "The on-line quizzes helped motivate me to complete reading assignments on time" ($M = 3.4$). Statements toward which the subjects were neutral included: "I feel more comfortable communicating with my instructor via E-mail than face-to-face" ($M = 2.7$), "I have a greater opportunity to participate and contribute to on-line discussions than in traditional classroom discussions" ($M = 2.8$), "I receive better feedback on my class performance through on-line assignments than through traditional assignments" ($M = 3$), and "Having course materials and assignments on-line requires me to spend too much time using the computer" ($M = 3.1$). Subjects tended to disagree with: "I feel more comfortable participat-

Table 3

Student Attitudes Towards Using Web-based Technologies

Statement	*M*	*Mdn.*	mode	*SD*
The Internet contains valuable resources for music education.	4.7	5	5	0.49
I like being able to access course materials at a time that suits my own schedule and preferences.	4.2	5	5	1.27
I feel more comfortable communicating with my instructor via E-mail than face-to-face.	2.7	3	3	0.78
I feel more comfortable participating in class discussions on-line via newsgroups than in traditional classroom situations.	2.4	2	2	1.00
Participating in newsgroups as part of class instruction allows me to learn from my classmates.	3.8	4	4	0.94
I like being able to check my current grade online at any time I desire.	4.5	5	5	0.67
I have a greater opportunity to participate and contribute to on-line discussions than in traditional classroom discussions.	2.8	3	multiple	1.36
On-line instruction is impersonal.	3.6	4	4	1.16
I receive better feedback on my class performance through on-line assignments than through traditional assignments.	3	3	3	1.13
Having course materials and assignments online requires me to spend too much time using the computer.	3.1	3	3	1.44
Using Web-based technologies helped me to better understand the content of this course.	3.7	4	4	1.23
I would like to take more courses that use Web-based technologies as part of the instructional process.	3.6	4	5	1.44
The on-line quizzes helped motivate me to complete reading assignments on time.	3.4	4	4	0.97
I would like to take a course that was conducted completely over the Internet.	2.3	2	multiple	1.29

Note. 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neutral*, 4 = *Agree*, 5 = *Strongly Agree*

ing in class discussions online via newsgroups than in traditional classroom situations" ($M = 2.4$), and "I would like to take a course that was conducted completely over the Internet" ($M = 2.3$).

To determine if there were differences in the dependent variables (data from Questionnaire #2) by gender, a Wald-Wolfowitz runs test was calculated using the Statistica Mac computer program. No significant differences by gender were found. A second Wald-Wolfowitz runs test was calculated to see if there were differences in the dependent variables according to

whether or not subjects had access to the Internet via their home computer. One dependent variable, "Having course materials and assignments online requires me to spend too much time using the computer" was significant ($z_{adj} = 2.11, p_{adj} = .03$, runs = 3, ties = 1). Subjects ($n = 6, M = 3.83$) who did not have Internet access from their personal computer indicated greater agreement with this statement than subjects ($n = 6, M = 2.33$) who could access course materials from their personal computer.

A Spearman rank order correlation was calculated between the subjects' self-ratings of experience in using the Internet and each of the dependent variables. Significant relationships were found between Internet experience and two of the 14 dependent variables. A significant positive correlation ($r_s = .60, t(10) = 2.39, p < .05$) was determined to exist between amount of experience and "I like being able to check my current grade online at any time I desire." The greater experience level in using the Internet, the more the subjects agreed that they liked being able to check their grade online. A significant negative correlation significant ($r_s = -.58, t(10) = 2.29, p < .05$) was found between amount of experience and "On-line instruction is impersonal." Here, the greater experience level in using the Internet, the more subjects' disagreed that on-line instruction is impersonal.

Discussion

The subjects in this study appear to be fairly typical of many of today's college students. They have grown up in a society where computer technology is increasingly becoming a part of the fabric of everyday life. They are experienced using the Internet and feel comfortable using basic Internet tools like E-mail and the World Wide Web. A growing number of students have their own computer and are able to access the Internet from these machines.

Subjects in this study were positive toward many aspects of the use of Web-based technologies in this music education methods class, concurring that there are many valuable resources for music education on the Internet. They liked the asynchronous aspects of these technologies, that is, the fact that course materials, assignments, and resources could be accessed at any time and in any place, allowing completion of assignments at times that fit their personal schedules and lifestyles. The greater the Internet experience level of the subjects, the more positive they were about being able to check their grade online at any time they desired. The on-line reading quizzes appeared to help motivate the subjects to complete assigned readings on time and may have helped them come to class better prepared for discussion and amplification of course content. The subjects stated that using the web-tools helped them better understand the course content.

It is interesting that despite the fact the subjects in this study were required to spend a great deal of time in front of a computer, they did not express strong positive or negative opinions regarding the amount of computer usage mandated by the assignments in this course. Perhaps extensive computer use has become accepted as part of collegiate student life. How-

ever, when this issue was examined in terms of comparing the responses of those subjects who had access to the Internet (and hence the on-line course tools and materials) from home with the responses of those subjects who did not have home Internet access, there was significant disagreement. Those individuals who could access materials from home indicated that the amount of time they were required to use the computer was not excessive, while those who did not have home Internet access tended to believe that too much computer time was required. The latter individuals probably had to make a trip to one of the campus computer labs to complete on-line activities, making the nature of their involvement less convenient and highly asynchronous. Persons with home Internet access conceivably could complete assignments at all hours of the day and night from the comfort of their own room. Ease of access to on-line tools and materials conceivably may conceivably impact users attitudes toward these resources.

The subjects also were fairly neutral regarding a preference for communicating with the instructor via E-mail versus face-to-face communication. It may be that certain instructional factors, in this case a preference for communication with the instructor by E-mail or in person, may depend on individual characteristics of students such as personality type or learning style. While an entire class, when looked at as a whole, may be fairly neutral on this issue, there may be strong individual preferences due to learning mode or personality type.

There are some aspects of traditional classroom instruction that the subjects in this study appeared to value over on-line instruction. Many subjects felt that on-line instruction was impersonal. However, a significant negative relationship was found between the Internet experience level of subjects and their attitude regarding this issue. The less Internet experience subjects had, the more likely they were to feel that on-line instruction was impersonal. It may be that there is a period of adjustment when first experiencing the cyber environment of the Internet/World Wide Web. The types of interaction possible on the Web are different than those in the traditional classroom. To less experienced users, the differences presented by this new environment may lead to feelings that on-line instruction is impersonal. Perhaps, however, as a person gains experience in the on-line medium, they come to the realization and understanding that on-line instruction is not necessarily more impersonal than traditional instruction, it is just different with alternative ways of interacting and building personal relationships.

Subjects were not more comfortable participating in discussions via on-line newsgroups than in traditional classroom situations. This may be another area where the individual differences among people, such as personality type or learning style, might result in varying attitudes. Previous research (Kubala, 1998; Kelly & Leckbee, 1998) has indicated that some students were more comfortable participating in an on-line environment than they were in face-to-face discussions. It appeared that most subjects in this study were not ready to abandon the traditional classroom in favor of a course that was conducted completely over the Internet. It may be that a

combination of Web-based instruction and traditional classroom procedures complement each other well, resulting in teaching and learning that is very appealing to and beneficial for most students.

Although the small, non-randomized sample of this study precludes drawing generalized conclusions, the findings from this investigation may shed insight on student attitudes toward Web-based learning in a music education methods class. Web-based tools appear to have positive benefits in the instructional process. In particular, the asynchronous nature of these technologies may be appealing to some persons. The degree of accessibility to Internet resources, along with the individual characteristics of students who use these resources, may be related to student attitudes toward this instructional methodology. This possible relationship should receive further examination. As more studies are conducted, trends may begin to emerge that will enable this new teaching paradigm to be utilized in the best possible manner. Music teacher education is no longer limited to instruction at only certain times of day, or by the physical confines of an individual classroom. The Internet, and the resources associated with it, provide an additional tool to help prepare collegiate music education students for successful careers as music teachers.

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Footnote

[1]In August 2001 the author will join the faculty of Case Western Reserve University.