

## **Analog vs. Digital Instruction and Learning: Teaching within First and Second Life Environments**

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### **ABSTRACT:**

Pre and post surveys were administered and analyzed regarding student knowledge of course content and attitudes concerned with the instruction for two groups of students for the same class—one taught completely in a traditional, face-to-face classroom setting and the other taught completely online with Blackboard and Second Life software products. Both groups were taught by the same instructor. Results indicate that online students learned just as much and enjoyed the teaching experience just as well as their traditional counterparts.

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*Student in a face-to-face visual communications class*

“I really liked doing Second Life. That was a lot of fun, and it was just something cool and new.”

*Student in a Second Life visual communications class*

With online, web-based instruction a popular alternative to classroom teaching, several studies have been conducted to show if there are significant differences between face-to-face and online classes. As student ask for more flexible educational experiences (being able to take classes on a computer from home or work) and as administrators concerned about space restrictions with crowded on-campus auditoria, instructors and researchers have been asked to investigate whether teaching an online class is a benefit or a hindrance to the educational experience for students.

This study adds to this growing body of research by comparing the learning experience of students in traditional visual communication courses to those taking the same course via online instruction. The course selected for this study provided a unique opportunity to explore the value of online teaching methods, not only because of it's curricular focus on visual communication, but also because the online version incorporated the use of both Blackboard, a commonly used online instruction software and Second Life, a popular virtual world website platform.

## LITERATURE REVIEW

Perhaps predictably, results from experiments and surveys exploring the effectiveness of online instruction have been mixed. Some studies report that web-assisted instruction is favored more than traditional classroom instruction. Maki, Maki, Patterson, and Whittaker (2000) found that students in an online version of an “Introduction to Psychology” class had higher comprehension scores than those in the same face-to-face lecture sections. Students who used asynchronous web-based teaching tools (such as discussion boards) produced higher quality final reports than those in face-to-face groups according to Benbunan-Fich and Hiltz (1999). Twigg (2003) reported students in sociology, chemistry, and introductory biology courses had higher grades on class and national exams if instructors employed online teaching tools than if they only used traditional teaching methods. Winsler and Manfra (2002) showed that students who used the web-based tools offered by WebCT frequently performed at a higher rate than those who used the tools sporadically. In a three-year quasi-experimental study of computer science students Connolly, MacArthur, Stansfield, and McLellan (2005) found that “the online students consistently performed better than the face-to-face students.”

However, other studies showed that traditional classroom methods are superior to online techniques. Wang and Newlin (2000) and Waschull (2001) reported that final exam grades were higher for students who went to face-to-face lectures than for students who were in online classes only. In a study that compared traditional and online class instruction for a geography class, Rodrigue (2002) reported that the online students scored less than their lecture/lab cohorts.

Finally, a third group of studies found that there were no significant differences between the two teaching techniques. In a political science course, web and traditional lectures did not make a difference in grades (Botsch and Botsch, 2001). Business students who favored web instruction did better online while those who had a positive attitude about traditional teaching performed better in that environment as reported by Sankaran, Sankaran, and Bui (2000). Hensley (2005) reported that an online version of a course “had almost identical pass and drop rates as that of a face-to-face course.” In a study conducted by Shelley, Swartz, and Cole (2006) business law students in online and traditional classroom settings reported “no significant differences between the two formats with regard to student satisfaction and student learning.”

Benoit, Benoit, Milyo, and Hansen (2006) published a three-year experiment sponsored by the Andrew Mellon Foundation that investigated “the differences between traditional and web-assisted instruction” through a longitudinal study of an introduction to speech communication course taught at the University of Missouri. During each semester from Fall 2000 to Winter 2003, eight sections were delivered via online using the WebCT program, “an integrated set of course management tools written in HTML and Java” and eight sections used the traditional lecture format with the instructor meeting with students face-to-face. Although both groups used the same “textbook, syllabus, midterm exam, and final exam,” individual instructors varied for the 100-plus classes. The researchers found no differences in learning between the two groups when the students’ grades for individual speech assignments, ratings of those speeches by invited “experts,” and end-of-the-semester overall grades were compared. However, students in traditional classroom environments were slightly more satisfied with their course than their web counterparts. Furthermore, teacher evaluations were slightly higher in lecture than in web-assisted courses. The authors concluded, “both modes of instruction were equally effective but students had a slight preference for traditional instruction.”

With such mixed results from studies concerned with online teaching versus traditional face-to-face learning environments, perhaps concentrating on equivalency as it relates to student perception is the wrong focus. This paper attempts to show that if a broader determination of measuring analog versus digital teaching techniques is employed, instructors can improve their teaching in either world.

### **Online Teaching Tools**

*WebCT and Blackboard.* For the reported studies above, the predominant online software program used was WebCT. Developed by Murray W. Goldberg, a computer science faculty member for the University of British Columbia in 1995, WebCT at one point served about three million online students in 30 countries. In 2006 its online course rival Blackboard acquired WebCT and phased out the name (“WebCT,” 2008). Consequently, most universities around the world switched to the Blackboard program for the delivery of online classes. In 2004 Blackboard, Inc. became a publicly traded company on the NASDAQ exchange. Today the Washington, D.C.-based educational delivery business is used in more than 2,200 educational institutions in more than 60 countries (“Blackboard Inc.,” 2008). Blackboard is similar to WebCT with asynchronous features that include grade checking,

discussion board assignments, course material links, paper depository, classroom discussion recordings, and examinations as well as the synchronous feature known as the “virtual classroom.”

The virtual classroom in Blackboard, in which students meet online at a specific day and time for class discussions is an important and vital instructional tool because without it a class is not much more than a textbook. In the online classroom, slides with words and pictures, websites, and video clips can be shown to students as the text-based discussion continues (See Figure 1).



**Figure 1:** As viewed through the Firefox web browser, the virtual classroom in Blackboard can present websites, in this example the Second Life site, in the upper window and text-based discussions in the lower window.

After the initial shock from students who realize that as a participant in an online class they will never meet face-to-face, the text-based format in Blackboard is easily incorporated as a teaching tool because most students are familiar with chat room technology offered by American Online and other companies. As students are usually at home using their personal computers, class discussions are often more insightful and penetrating as students feel comfortable, can think before they type, and overcome any shyness they may experience when attempting to participate in a face-to-face classroom setting.

*Second Life*. Another “class” of online instruction in which the visual display is as important as the communicative features are those that employ online “virtual worlds” as venues for teaching. One of the most recent and popular software programs for this purpose is Second Life (SL), an avatar-based virtual social community of residents who can walk, fly, drive a vehicle, and teleport to rural and urban simulated environments to engage in all kinds of activities. With credit card information, residents can accessorize their avatars with hair, skin, and clothing. With a premiere account (SL is otherwise free to join), residents can buy land and build stores and homes and sell their creations to other users of the program. Roughly inspired by Neal Stephenson’s 1992 science fiction classic *Snow Crash* about a user-dominated virtual reality, Second Life was launched in 2003 and currently has more than 13 million registered accounts.

Although essentially an elaborate chatroom, SL combines the visual cues found in the real, analog world (color, form, depth, and movement) with an interactive communicative experience. In that sense it is possible to make the learning and teaching experience more real for online students than with the virtual classroom provided by Blackboard. Presently there are over 100 educational institutions, from Aachen, RWTH University, Germany to the University of Warwick in Coventry, England throughout the world that have a presence with many offering live, synchronous classroom instruction (“Institutions,” 2008).

During the spring semester of 2007, one of the authors learned that the Faculty Development Center on campus requested instructors to attend an orientation lecture concerned with Second Life. It was hoped that courses might be delivered using the software program. This author had been teaching online mass communications classes using Blackboard since the summer of 2000, the opportunity to experiment with Second Life as an educational tool was appealing. After an initial orientation, the author was given access to memory space in the form of an “island” and with the various tools available through the Second Life program constructed a class site during the summer of 2007. After some initial testing and feedback from fellow faculty members and users of Second Life, it was determined that for the fall 2007 semester, a mass communications class with an upper limit of 220 would be taught using Blackboard and Second Life. The two educational software packages must both be employed because SL is not set up as a teaching program. For example students cannot participate in discussion board assignments, turn in papers, and most importantly, check their grades in a secure format in Second Life.

As opposed to previous studies that compared traditional and online teaching environments, for this study the same instructor would teach the same course in a face-to-face lecture hall and with the online software products during the same semester. The course for this study is called “visual communications,” a survey class for undergraduates that details visual literacy and analysis in all manner of media. It is a popular core elective offering within a large Department of Communication program. Each semester two sections of the class are taught with approximately 700 students during a school year.

The use of a visual communications course for this study provided a unique opportunity for studying online instruction because a key purpose of the course is to educate students on how to become more engaged and critical consumers of visual media. The course includes units that specifically focus on various forms of media, including online communication. Thus, it was thought that students in this course would be uniquely positioned to evaluate their experience.

As noted previously, results in existing research on online instruction have been mixed. An effort was made to identify factors that might account for these differences. A primary consideration is the influence that sample selection may have on study results. In studies such as the present investigation, the concern is that self selection might differently influence the performance and perceptions of students who choose each course format. For example, students who possess greater confidence and competency regarding course material might be willing to take online courses, and it might be those advantages rather than the online instruction itself that is responsible for their success. Conversely, students selecting online courses might be less motivated students who hope that online instruction is a more convenient, easier alternative to traditional courses. In this case, performance in online classes might be lower. As a result of this concern, the first focus of this study is to determine if students who choose to take visual communication online initially possess different attitudes and competencies than those who opt for traditional instruction. With that baseline established, the second focus is to determine if students differ in their perceptions upon completion of the course. From these considerations, two research questions emerge:

**RQ1:** Is there a significant difference in the initial attitudes and perceived competencies of students who take visual communication online compared to students who choose traditional face-to-face instruction?

**RQ2:** Is there a significant difference in the post-course attitudes and perceived competencies of students who take visual communication online compared to students who receive traditional face-to-face instruction?

## **METHODOLOGY**

### **Overview**

Based on the Benoit et al. (2006) study, pre/post test survey design was used to compare attitudes toward learning experiences in traditional face-to-face and online visual communications courses. Results were analyzed in a 2x2 MANOVA design with completing the course (pre, post) and course format (traditional, online) as independent measure factors.

### **Respondents**

Respondents included 334 undergraduates, 161 in a traditional face-to-face visual communications lecture course and 173 taking the same course via online instruction. The same instructor taught both courses during the period from August until December 2007. Each class met once a week for two hours and 45 minutes.

### **Procedure**

The pre-test was administered during the first week of classes. Students in the face-to-face course completed hard copies of the survey during class time. Students in the online course completed the same survey online via Survey Monkey. Participation was voluntary. Students were told that they were participating in an anonymous survey to assess their attitudes about the course, and they were informed of their rights as human subjects. The university's internal review board for human subjects research approved this protocol.

Students in the lecture and online sections were given the same assignments and grade distributions (in percentages):

Attendance	5		
Discussion Board	12	Test One	10
Chapter Paper	18	Test Two	15
Term Paper	20	Final Exam	20

For the traditional face-to-face class, students heard lectures given by the instructor before a presentation screen with projected PowerPoint slides that included text, still images, and video clips. Papers were printed by each

student and turned in during class. Each week students had to answer an asynchronous discussion board question presented on the Blackboard course program pertaining to the reading and lecture for that week (Appendix A).

For the online, web-based class, the first four weeks was conducted using the “Virtual Classroom” on Blackboard. Since the Second Life program had to be downloaded by each student, the month-long period allowed enough time for the downloads (computers in the Department’s open lab had Second Life loaded on them as well as two computers in the instructor’s office if students were unable to access the program). The four-week period also gave students experience in the etiquette of chatting online. Once in Second Life, students were requested to find a seat on simulated rugs on the ground, sofas, or “air chairs.” Students were requested not to fly or change their appearance during class (See Figure 2).

Although it is possible on Second Life to simply speak as with a face-to-face class into a computer-connected microphone that can be heard by students through the sound system provided by their computers, the instructor typed out lectures that students could read. This strategy was employed because an archive could be saved for later review or if a student missed the class for any reason (see Appendix B). As with the face-to-face class, PowerPoint slides and video clips were shown during class (Figure 3).

Students also had the option of reviewing the slides and video clips on Blackboard if their computer connection was slow or to review for an exam. Papers were submitted electronically via Blackboard’s “Digital Dropbox.” In addition, students could check their grades anytime during the semester via Blackboard.

At the end of the semester, the same survey was administered as a post-test during the last week of the course.

### **Measures**

Using the Benoit et al. (2006) survey as a guide, students were asked their responses within four sections:

*Demographics.* Questions querying student gender, age and major were included to gain insight into the demographic make-up of the study sample and for possible use in a follow-up analysis.



**Figure 2:** The instructor's avatar stands ready in the foreground as students await the class to begin while sitting on rugs, couches and yellow air chairs. All Second Life users can modify the basic avatar supplied at the time of registration. Men and women avatars are common, but if you look closely, an animal avatar or "furry" sits on the couch in the middle.



**Figure 3:** A video clip of designer David Carson from the documentary Helvetica plays on the left screen while a PowerPoint slide displays on the right screen.

*Student Output.* Face-to-face and online students produced extra credit papers, hundreds of Discussion Board responses, an assigned chapter paper, a final term paper, and took the same three exams.

*Computer Literacy.* To assess perceived competence with computer and online technology, students were asked to rate their confidence level on six items: creating a word processed document on a computer, sending and receiving email, searching for information on the Internet/Web, using Blackboard, using Second Life, and overall computer knowledge on five point scales ranging from 1 “No Knowledge” to 5 “Expert level.”

*Attitudes.* Students were asked to rate their feelings about the course with 14 items: motivated, interested, involved, stimulated, want to study, inspired, challenged, invigorated, enthused, excited, fascinated, looking forward to it, important and useful on seven point scales ranging from 1 “Not at All” to 7 “Extremely.”

*Perceived Knowledge.* Students were asked to rate their knowledge of course content on 17 items including: visual communication; light; eye, retina and the brain; color, form, depth and movement; visual theories; visual persuasion; pictorial stereotyping; six perspectives for image analysis; typography; graphic design; informational graphics; cartoons; photography; motion pictures; television and video; computers; and the World Wide Web on seven point scales ranging from 1 “No Knowledge” to 7 “Expert Level.” Each of these items corresponded to a unit in the course.

## **RESULTS**

### **Demographics**

Overall, 194 surveys were collected including 97 pre-tests and 64 post tests in the traditional course and 86 pre-test and 87 post tests in the online course. On the pre-test, 59% (107) of the students were communications majors, however, since the course meets university general education requirements, 41% (76) of the students came from other departments and colleges. The post-test included 57% (86) communication majors and 43% (65) students from other departments. The pre-test included 35% (63) males and 65% (118) females and the post-test included 31% (46) males and 69% (103) females. For both the pre and post-test the average age was 23.

### **Student Output**

*Grades.* Students in both the face-to-face and the online classes were given an attendance mandate as well as the same assignments.

*Each Average is from a Grade out of 100 Points and Weighted*  
Classes

Class Requirements	Face-to-Face	Online
Attendance	95	85
Discussion Board Responses	90	83
Chapter Paper	84	78
Term Paper	88	82
Test One	79	78
Test Two	78	77
Final Exam	80	78
<b>Overall Average</b>	<b>84</b>	<b>80</b>
	<i>n=108</i>	<i>n=130</i>

Overall, the average grades for the face-to-face students were slightly higher than for the online students.

*Attendance.* Each week attendance was taken. For the face-to-face class, a sign-in sheet was passed around the class. For the online students on Second Life, they were asked to type their actual names during the discussion so that attendance could be checked after reviewing the recorded archive of the class. If a student missed a class for any reason, a student from either class could write a two-page paper related to the topic of the missed class to make up the attendance grade for that week.

*Discussion Board Responses.* For each of the 12 Discussion Board questions, students answered the instructor's question, responded to at least one other student's answer, and posted their responses by the deadline.

*Chapter Papers.* Students for both classes were randomly assigned a chapter and wrote a three-page paper elaborating with outside sources any topic they wished.

*Term Papers.* Using a six-point analytical method that features personal, historical, technical, ethical, cultural, and critical perspectives, students wrote up to ten pages detailing their analysis of a photograph.

*Exams.* It is beyond the scope of this article to include a comparison of the answers to the three examinations for both sets of students. The exams were the same for each class and were composed of 25 multiple-choice questions that assessed the students' comprehension of the material within three time periods: From the beginning of the class until the chapter on pictorial stereotypes, from the chapter on typography until the chapter on cartoons,

and from the chapter on photography until the end of the class. In addition to the multiple-choice questions, the final exam also included short answer questions related to the information from the entire semester. Below are the standard deviations for the scores for each exam by class:

	Test One	Test Two	Final Exam
Face-to-Face	15.56	16.56	13.81
Online	15.67	18.06	13.17

### Data Reduction

Principle component analysis (PCA) with Kaiser Varimax rotation was conducted to reduce and analyze the reported data on *computer literacy*, attitudes and perceived knowledge. Only scales that loaded .5 or greater on a given factor and less than .5 on all other factors were retained. The Eigenvalue accepted criteria level was 1.0.

*Computer literacy.* Two factors were retained for computer literacy. The first factor labeled computer literacy had an eigen value of 2.77 and accounted for 46.15 of the variance. It was characterized by high loadings of five of the six items including: creating a word processed document on the computer (.73), sending and receiving email (.83), searching for information on the Internet/Web (.81), using Blackboard (.52), and overall computer knowledge (.52). Cronbach's alpha was .76. The single item, using Second Life (.91) loaded separately on a separate factor labeled *Second Life literacy*. It had an eigen value of 1.08 and accounted for 17.96 of the variance.

*Attitudes.* All 14 attitude items loaded together on a single factor, labeled attitudes, including motivated (.81), interested (.83), involved (.81), stimulated (.90), want to study (.74), inspired (.85), challenged (.64), invigorated (.86), enthused (.90), excited (.86), fascinated (.84), looking forward to it (.90), important (.71) and useful (.76). This factor had an eigen value of 9.33 and accounted for 66.66 of the variance. Cronbach's alpha was .96.

*Perceived Knowledge.* Two factors emerged for perceived knowledge. The first factor, labeled general knowledge of visual communication had an eigen value of 10.53 and accounted for 61.96 percent of the variance. It was characterized by high loadings on visual communication (.78); light (.80); eye, retina and the brain (.77); color, form, depth and movement (.79), visual theories (.84); visual persuasion (.82); pictorial stereotyping (.78); six

perspectives for image analysis (.86); typography (.84); graphic design (.74); informational graphics (.75) with a Cronbach's alpha of .96. The second factor, labeled field knowledge had an eigen value of 1.92 and accounted for 11.30 percent of the variance. It was characterized by high loadings on cartoons (.65); photography (.72); motion picture (.84); television and video (.87); computers (.78); and the World Wide Web (.82) with Cronbach's alpha at .92.

*Analysis of Variance.* The reduced factors were analyzed in a 2x2 MANOVA design with completing the course (pre, post) and course format (traditional, online) as independent measures. Observed power for main effects as calculated by SPSS ran no lower than .84 and observed power for interaction effects ranged no lower than .66. Simple effects for interactions were calculated via t-tests. Mean comparisons for these tests are in Table 1.

**Table 1. Mean comparisons of attitudes and perceived competencies pre-test and post-test by course format.**

	Course Format	Computer Literacy	Second Life Literacy	Attitudes	General Knowledge	Field Knowledge
Pre-test	Face-to-Face	4.2280	1.38	5.2218	2.9186	4.2378
	Online	4.1714	1.53	4.9910	2.8492	4.2490
	<b>Pre-test Total</b>	<b>4.2011</b>	<b>1.45</b>	<b>5.1179</b>	<b>2.8866</b>	<b>4.2430</b>
Post-test	Face-to-face	4.4000	1.52	4.5987	4.6487	5.2323
	Online	4.3837	2.91	5.0370	4.7908	5.2980
	<b>Post-test Total</b>	<b>4.3907</b>	<b>2.31</b>	<b>4.8478</b>	<b>4.7318</b>	<b>5.2797</b>
Total	Face-to-face	4.2981	1.44	4.9790	3.5771	4.4922
	Online	4.2788	2.22	5.0143	3.8259	4.7798
	<b>Total</b>	<b>4.2881</b>	<b>1.84</b>	<b>4.9968</b>	<b>3.7054</b>	<b>4.6549</b>

.08, such that, on average, students felt significantly more computer literate at the end of the visual communication course ( $M=4.40$ ) than they did at the beginning ( $M=4.20$ ) regardless of the course format. An analysis of perceptions of *Second Life literacy* revealed an interaction between completing the visual communication course and the course format,  $F(1, 263) = 26.28$ ,  $p < .01$ , Partial Eta Sq. = .09. Not surprisingly, those who took the course online rated themselves as significantly more competent in Second Life ( $M=2.91$ ) at the end of the course than did those who took the course face-to-face and did not use the Second Life program ( $M=1.52$ ). Those who took the course online also rated themselves as slightly more competent in Second Life prior to the start of the course ( $M=1.53$ ) compared to traditional students ( $M=1.38$ ) although this difference was not significant.

*Attitudes.* Analysis of the attitudes factor also revealed a significant interaction between completing the course and course format,  $F(1, 263) = 5.70$ ,  $p < .02$ , Partial Eta Sq. = .03. Students who took the course face-to-face indicated more favorable attitudes at the start of the course ( $M=5.22$ ) than students taking the course online ( $M=4.99$ ). At the end of the course, however, this trend was reversed. While online student attitudes toward the course remained about the same ( $M=5.03$ ), the favorable attitudes of face-to-face students had actually dropped ( $M=4.59$ ).

*Perceived Knowledge.* Main effects for completing the course were found for both the *general knowledge*,  $F(1, 263) = 205.43$ ,  $p < .01$ , Partial Eta Sq. = .15 and *field knowledge*,  $F(1, 263) = 46.84$ ,  $p < .01$ , Partial Eta Sq. = .44, factors. After completing the course, students felt that they had more general knowledge ( $M= 2.89$  pre,  $M=4.73$ , post) and field knowledge ( $M=4.24$  pre,  $M= 5.28$ , post) of visual communications.

*Student Written Comments.* As with most universities, instructors are required to conduct end of the semester student-generated course evaluations without the teacher present. As a part of the evaluation process is the opportunity for students to write written comments. For the traditional class setting, students wrote their comments on printed sheets that were taken up by a proxy. For the online class, students were directed to a web link where they could fill out the evaluation online. These comments were qualitatively reviewed and excerpted anecdotally to provide additional insights into student perceptions of the course formats.

For the face-to-face class comments related to the technology used in the class included, "Made semi-boring course content interesting with examples (videos, cartoons, etc)," "too many examples for some points. We would spend 30 minutes or more on some points/topics and my interest would be lost. (Computer animation is one example)," and "Well presented and engaging for students. Active examples that clearly demonstrate course material."

For the online class, comments related to Second Life included "Did not enjoy the class through Second Life, not a good way to lecture," "The semester got off to a rocky start. But once everything was figured out and organized it all seemed to work out and I had a lot of fun in Second Life. Very interesting idea," "I did have a little difficulty with the Second Life avatar based classroom," "I enjoyed the online course, though I might have to upgrade my computer to make things work smoothly in Second Life," "I

have never had a more easy yet challenging experience with an Internet course. Working with Second Life is amazing and a great feature for students who work 40+ hours a week and can make it online to every class,” “Frankly, this class was a headache and I think it is a terrible idea to use Second Life to teach a class,” and “I really liked doing Second Life. That was a lot of fun, and it was just something cool and new.”

## **DISCUSSION**

The survey results suggest that students' experience in a visual communications online course compared favorably with traditional face-to-face instruction. First, we were interested in determining if students who chose to take the course online might initially differ from students who took the traditional course. It was speculated that students who considered themselves more computer literate or more knowledgeable about the course content might be more willing to take the course online, while those who were less confident in their knowledge and skills might be more inclined to stick to traditional instruction. Results, however, did not uncover any notable initial differences in perceived competencies between online and traditional students. Students in the online course did report a slightly higher initial competency with Second Life, but this difference was not statistically significant.

Traditional students did report more favorable attitudes toward the course initially than did the online students. Not surprisingly, students in the online course may have been more cautious in their attitudes toward the course initially because of its unusual format. Interestingly, however, the attitudes of the online students remained fairly constant from the beginning of the course to the end, while the attitudes of the face-to-face students actually dipped slightly. The fact that attitudes toward the online course remained constant is an encouraging sign that student expectations can be met by courses delivered in an online format.

As we would hope, both face-to-face and online students reported significantly more knowledge of visual communications at the end of the course than they did at the beginning. Course format appeared to have no impact on perceived knowledge gained. The averages were virtually identical for both online and face-to-face students. Once again, these results are encouraging for online instruction, suggesting that online students at least feel that they are learning as much as students in traditional classes.

As with any learning and teaching experience, students will have differences of opinion. An anecdotal review of student evaluations taken at the end of the course suggested some polarization of opinion in both class formats regarding the way the material was presented. In the traditional course, the abundant use of examples, video clips, etc. was mentioned, while in the online course, the comments predominantly focused on the Second Life format. In both courses, some students strongly objected to the format that was used while others praised it. There did appear to be somewhat more students who were critical of the format in the online course; however, many of the criticisms seemed focused on technical glitches that may be overcome as the online tools improve and students become more comfortable using them.

### **CONCLUSIONS**

This study shows that for two nearly identical sections taught by the same instructor within a large auditorium and on a virtual island in Second Life, students overall reported that they enjoyed the experience, and they appeared to learn the information on a comparable basis. With students requesting more flexible teaching schedules and more creative learning environments and administrators concerned about the shortage of halls for large lectures, experiments in teaching with such software products as Blackboard and Second Life are necessary in the development of the teaching profession.

This study joins a compelling body of research suggesting that online instruction can compare favorably to traditional instruction. However, studies also show that the success of these strategies is not guaranteed. Perhaps the teaching tips offered in Appendix C will be helpful to those considering using Second Life as an additional teaching tool. Whether an instructor's digital avatar is a man, woman, or furry, knowledge can be communicated about a course's topic in a comparable way as in an analog auditorium for motivated students who choose to click their way through higher education.

**APPENDIX A**

*Discussion Board (DB) questions students must answer each week. To get full credit a student must answer the question, respond to at least one other student's comments, and get both DBs in on time:*

***Visual Cues***

Which is your personal favorite visual cue: color, form, depth, or movement? After reading this chapter, pick an example from the textbook and tell us why you like that visual cue over the others.

***Visual Persuasion***

Come up with three reasons why “shock advertising” using graphic visual messages can be justified as a legitimate advertising tool?

***Stereotypes***

“There is always a little truth in a media stereotype,” is a common defense. Regardless, tell how the Jerry Lewis Telethon might be different if those on the show who use wheelchairs were treated like everyone else who had able-bodied legs.

***Typography***

Why do you think in surveys most admit they know the least about typography? What do you think is the importance of typography?

***Graphic Design***

Name a movie you have recently seen and describe the opening title credits. What did you like and/or dislike about the sequence?

***Informational Graphics***

Television weather segments are sometimes criticized for their light-hearted, perhaps unprofessional comments and displays. What is the funniest or oddest moment you have seen a weather person do? If you don't watch TV, can you tell us about an example of “chart junk” you have seen in a printed medium.

***Cartoons***

Tell us your favorite cartoon (and I would prefer if it is a printed, rather than an animation example). When did you first see it and why do you like it so much?

***Photography***

If there were a fire where you live and no one was hurt but you lost all of your photographs, how would you feel? What are you doing to make sure that doesn't happen to you?

***Motion Pictures***

Do you think characters engaged in smoking in motion pictures should be banned from G and PG-rated movies or should any movie with actors

smoking be given an R rating? Why?

***Television and Video***

Television is often criticized for its many low quality programs that seem to respond to the base instincts of many individuals. Can you name one or two TV shows that you think are of the highest quality and that we should know about and watch?

***Computers***

When was the first time you used a computer and how has your use changed over the years?

***Web***

It's the year 2058. Please describe for us what using the World Wide Web is like for the rest of us still stuck in 2007.

**APPENDIX B**

*In order to reduce the number of students online, only those who were assigned to write chapter papers for the week are required to attend the class.*

With 17 students in attendance, the discussion concentrated on photography:

You: OKAY...

**["You" is how the instructor is identified in Second Life]**

**[The convention "... " is used to tell the rest of the class not to interrupt—more text is on the way]**

You: Before I start the lecture...

You: I want to talk a little about the DB...

**[DB is the Discussion Board in Blackboard. Students were asked: "If there were a fire where you live and no one was hurt but you lost all of your photographs, how would you feel? What are you doing to make sure that doesn't happen to you?"]**

You: What did you come up with when thinking about losing all of your photographs?

You: Anyone?

Sabina Jetcity: that i never want that to happen to me.....

**[Students must use their avatar names. When taking attendance, students are asked to state their actual name]**

thepaultheory Enoch: I would be devastated

**[Spelling and grammar has not be changed]**

Sabina Jetcity: that now a days we are lucky with the technology we have

ktann Doobie: how to avoid it

Christopher216 Burger: It would really hurt that fact that I lost all my photos

STEFNY Nightfire: TRAGIC! and i really feel for those going through it as we speak...

You: All those memories!

Jager Burger: computers are amazing

You: Yes.

Sabina Jetcity: exactly !

Kristen Gibbs: that it's a good idea to have them stored many pllaces

thepaultheory Enoch: yes! alot of memories

You: A reminder to back up your computers!

Hopey Back: I figured out that I wouldn't be able to recover those wonderful memories and I better get a fire proof safe

ambie Heartsdale: have photos put in a photo album....not all scattered around the house

urquizu Aeon: We have copies in several different places.

Jager Burger: put them in a album dont just throw them around

Sabina Jetcity: especially what our state is going through now....

Jessie Lutrova: I'm happy I have most of my recent photos online

Hopey Back: that's a very good idea

STEFNY Nightfire: save pictures to disks easier to store

Sabina Jetcity: its sad we lost that castle with all tht memorabilia

You: Right. Having a virtual space somewhere not on your computer is a good idea, ala myspace or flickr?

urquizu Aeon: We have an external hard drive.

Hopey Back: yeah, I think most people have pictures saved on photobucket

Basic Chair: Right click me and choose 'Sit Here' to sit down

**[A student's avatar is sitting on an object in the classroom]**

Jager Burger: facebook it

You: Just a reminder how precious these images are, yes?

Kristen Gibbs: it's a good way to share photos too

You: Good.

Jessie Lutrova: Yeah, external drives and online sites...but it sucks for all the older photos that were before the digital age

thepaultheory Enoch: i'll stick to cds and external drives

You: Scanners are fairly cheap!

Hopey Back: very good reminder, I never thought about just how priceless those memories are

urquizu Aeon: I took all of our older photos and scanned them.

You: Great idea!

Ajay Proto: i just scanned some pictures of my great great great grandparents

You: Wow.

Jessie Lutrova: yes...but imagine all the time spent..its worth it but thats a lot of work

urquizu Aeon: It is important to keep those.

You: I wish I could find a picture of my great grandmother.

You: She lives in my mind!

thepaultheory Enoch: Having a scanned picture saved my mom from a heart ache because she ruined the original

Ajay Proto: yeah and it was a amzing how well they came out when a printed them

urquizu Aeon: My mind too with mine.

You: OKAY. Should I get started?

urquizu Aeon: That is neat when all you have is photographs

ambie Heartsdale: yes

Sabina Jetcity: sure !!

thepaultheory Enoch: Yes please

Hopey Back: ready

urquizu Aeon: yup

You: Okay...

You: This chapter starts off...

**[With the discussion about the Discussion Board question concluded, the lecture on photography begins]**

STEFNY Nightfire: i cant see the powerpoint its to small how do i zoom in?

You: with one of the most famous images ever taken...

You: Think of all the images taken since...

Ajay Proto: right click, edit, zoom

**[Students often help each other]**

You: photography was first invented...

You: to say that ONE is one of the best is an amazing thing to say...

You: but as with all great works of art...

You: there are always three aspects...

You: the back story...

You: how the image was made and by whom...

You: the image itself...

You: and what happened to the picture after it was made...

You: With this one...

You: all three stories are interesting...

You: But the main thing I want you to remember...

urquizu Aeon: She got nothing for it.

You: is that the image you see on the screen...

You: "the Migrant Mother"...

urquizu Aeon: No

You: an icon of America's Great Depression...

urquizu Aeon: I see a worried mother

Ajay Proto: i think so

You: was a product of something that would be unethical today...

You: and would probably get the photographer fired!

You: Dorothea Lange, the photographer...

Sabina Jetcity: why ?

urquizu Aeon: Yes, because she did it without permission

You: "stage managed" the people in the picture...

You: In other words...

You: she told them where to be and how to act...

You: for news images...

You: that's considered unethical today...

You: but back then...

Christopher216 Burger: True

You: it was acceptable...

urquizu Aeon: That takes away the authentic art about it

You: that's why ethics is interesting to study...

ktann Doobie: but doesnt that still happen?

You: it changes over time...

Hopey Back: ethics evolves as society evolves

**[The lecture and class discussion continues for 32 single-spaced pages.]**

## APPENDIX C

### *Second Life Teaching Tips*

- *Ownership.* If possible, the instructor should be the so-called owner of the Second Life (SL) space where the class is to be conducted. Such a designation allows the instructor to show QuickTime video clips available from a website, restrict the class space to only registered students, restrict building on the site, and eject or ban troublesome participants.
- *Money.* Instructors need some funds in their account if nothing more than to upload PowerPoint images for class presentations (\$10L per upload). One US dollar roughly equals 250 Linden dollars.
- *Presentations.* Make screen saves of PowerPoint (or equivalent) slides, convert to .jpg files, and upload to the class site. For presentations, build a flat screen comparable to one in an auditorium. In Edit, select Texture and use the PowerPoint images as overlays for the screen.
- *How-to.* Produce a guideline for students for learning how to create a SL account, complete the orientation tasks, and teleport to the class site.
- *Avatars.* For guest speakers or students with access issues, create a male, female, and “furry” avatar that can be used.
- *Alternatives.* For students without computers or with access issues, an open lab during class time should have SL installed.
- *Speech.* Since not all students have computers with a speech-capable feature, classes should be taught in a text-based mode.
- *Archive.* The instructor should set the preferences so that a recording is made of the text-based discussion. The chat.txt file should be uploaded to the External Links section of Blackboard (BB) for student access. In addition, make the entire collection of PowerPoint slides and video clips available in BB.
- *Etiquette.* Students should learn not to chat all at once and respect when some other student or the instructor is texting. Students must also stand off to the sides or sit down so others can easily see the screen. Students should also not change their appearance or fly during class.

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