A COMPARISON OF TRADITIONAL AND WEB-BASED FLORAL DESIGN COURSES

A Thesis

by

SHARON R. HENSS

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

December 2003

Major Subject: Horticulture

A COMPARISON OF TRADITIONAL AND WEB-BASED FLORAL DESIGN COURSES

A Thesis

by

SHARON R. HENSS

Submitted to Texas A&M University
in partial fulfillment of the requirements
for the degree of

MASTER OF SCIENCE

Approved as to style and content by:

Jayne Zajicek (Chair of Committee)	R. Daniel Lineberger (Member)
Gary Briers (Member)	Tim Davis (Head of Department)

December 2003

Major Subject: Horticulture

ABSTRACT

A Comparison of Traditional and Web-Based Floral Design Courses. (December 2003)

Sharon R. Henss, B.A., The University of Texas at Austin

Chair of Advisory Committee: Dr. Jayne Zajicek

As technology has advanced, corporations, government entities, and institutions of higher education have all begun experimenting with online classes and training. In colleges and universities around the world, everything from individual online classes to entire online degree programs are now offered. While many researchers and educators support this trend, many are concerned with whether online education is truly comparable to traditional, live instruction.

The goal of this study was to evaluate an online version of a floral design course in comparison to the traditional version of the class. There were 140 students in the sample, including both the online and traditional classes. All were students at Texas A&M University in College Station, Texas. During the spring semester of 2003, the experimental group was enrolled in the online version of the course, while the control group was enrolled in the traditional version of the course. Students in both groups were asked to fill out surveys at the beginning and end of the semester to collect background information and to evaluate the course. Their floral designs were evaluated at the beginning and end of the class in order to measure design skill, and grades earned in the class were also collected at the end of the semester for comparison purposes.

Statistically significant differences were noted in class grades, with traditional students outperforming the Web-based students in lecture points, lab points, and overall course grades. No statistically significant differences were noted in terms of student course satisfaction. In addition, students in the traditional class outperformed Web-based students in design skills. Besides class differences in performance, variables such as gender and distance course preparedness seemed to affect the outcome of some measures. Overall, females outperformed males in both classes. In the Web-based class, students found to be more prepared for distance learning courses fared better than students who were not as prepared. These results may indicate that certain students may do better in an online course than others, and it may be possible to screen these students in advance in order to maximize success in the online classroom.

DEDICATION

To my mother, who inspired me to get a graduate degree, and without whose support it would not have been possible to do so.

ACKNOWLEDGMENTS

I would like to take this opportunity to thank my committee members for their support throughout this project. Dr. Jayne Zajicek, it has been great working with you these past two years. You have guided me while giving me the freedom to make decisions about my work. Thank you for encouraging me to express my creative side. Dr. Dan Lineberger, thank you for teaching me HTML, and for keeping me "legal" by storing my data. I appreciate your willingness to step onto my committee when my project changed. Your support of horticultural Web-based initiatives is truly commendable. Dr. Gary Briers, your class was one of my very first classes here. Not only did you teach me many things I needed to know about research, you also made me feel right at home amongst a group of total strangers. Your input has been invaluable, I don't know how I would have navigated SPSS without you.

TABLE OF CONTENTS

Page

ABSTRACT iii

DEDICATION v

ACKNOWLEDGMENTS vi

TABLE OF CONTENTS vii

LIST OF TABLES x

CHAPTER

I INTRODUCTION 1

- Goals and Objectives 1
- Research Hypotheses 2
- Definition of Terms 2
- Basic Assumptions 3
- Limitations 3
- Delimitations 4

II REVIEW OF LITERATURE 5

- History of Distance Learning 5
- Definition 6
- Reactions 7
- Institutional Support 9
- Case Studies 10
- Course Development 13

III METHODOLOGY 16

- Statement of Objectives and Hypotheses 16
- Population 17
- Procedure and Instrumentation 18
  - Beginning of Semester 18
  - End of Semester 20
- Data Collection 21
- Design of Statistical Analysis 23
- Reliability and Validity 24

CHAPTER Page

IV RESULTS AND DISCUSSION 28

Hypotheses 28
Sample Description 29
Findings Related to Hypothesis One 34
Analysis and Results 34
Additional Findings 36
Discussion 41
Findings Related to Hypothesis Two 43
Analysis and Results 43
Additional Findings 44
Discussion 45
Findings Related to Hypothesis Three 48
Analysis and Results 48
Additional Findings 50
Discussion 51
Additional Findings Related to Objectives 51
Distance/Technology Preparedness 51

V SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS 54

Summary 54
Purpose of Study 54
Review of Literature 55
Methodology 56
Population and Sample 56
Instrumentation 57
Conclusions 57
Hypothesis/Objective One 57
Hypothesis/Objective Two 58
Hypothesis/Objective Three 58
Objective Four 59
Objective Five 59
Recommendations 60
Recommendations for Practice 60
Recommendations for Research 61

Page

LITERATURE CITED 62

APPENDIX A: INFORMED CONSENT FORM 65

APPENDIX B: DEMOGRAPHIC QUESTIONNAIRE 68

APPENDIX C: STUDENT SELF-EVALUATION CHECKLIST 70

APPENDIX D: SURVEY OF STUDENT TECHNOLOGY EXPERIENCE 72

APPENDIX E: DESIGN SCORE SHEET 75

APPENDIX F: COURSE EVALUATION SURVEY 77

VITA 83

LIST OF TABLES

TABLE		Page
1	A comparison of traditional class students' lab points in HORT 203, Floral Design, when separated by lab sections	25
2	Reliability tests for both the individual sections of the course evaluation survey and the overall course evaluation survey taken by HORT 203, Floral Design, students	26
3	Spearman's rho correlations between the sections of the course evaluation survey and the overall course evaluation survey taken by HORT 203, Floral Design, students	27
4	Gender demographic information broken down by number and percentage of each gender within each HORT 203, Floral Design, class	29
5	Student classification demographic information broken down by number and percentage of each classification within each HORT 203, Floral Design, class	30
6	Age demographic information broken down by number and percentage of each age within each HORT 203, Floral Design, class	30
7	Ethnicity demographic information broken down by number and percentage of each ethnicity within each HORT 203, Floral Design, class	31
8	Student self-report of whether or not they had any floral design experience prior to enrolling in HORT 203, Floral Design, separated by number and percentage within each class	32
9	Student report of whether they had taken a Web-based class prior to enrolling in HORT 203, Floral Design, separated by number and percentage within each class	32
10	Self-report of location of computers students used to access the Internet for HORT 203, Floral Design, broken down by number and percentage within each class	33

TABLE Page

11 Type of connection students used to access the Internet for HORT 203, Floral Design, broken down by number and percentage within each class 33

12 A comparison of traditional and Web-based students' GPAs, SAT scores, and ages for students enrolled in HORT 203, Floral Design 34

13 A comparison of HORT 203, Floral Design, students' overall grades in the traditional and Web-based classes 35

14 Relative difference of traditional and Web-based students' points earned in lecture and lab for students enrolled in HORT 203, Floral Design 35

15 Lecture grade, lab grade, and overall course grade comparisons between genders for students enrolled in HORT 203, Floral Design, combining both Web-based and traditional classes 36

16 Lecture grade, lab grade, and overall course grade comparisons between genders, using only the traditional class students enrolled in HORT 203, Floral Design 37

17 Lecture grade, lab grade, and overall course grade comparisons between genders, using only the Web-based class students enrolled in HORT 203, Floral Design 37

18 Lecture grade, lab grade, and overall course grade comparisons between traditional and Web-based class females enrolled in HORT 203, Floral Design 38

19 Lecture grade, lab grade, and overall course grade comparisons between traditional and Web-based class males enrolled in HORT 203, Floral Design 38

20 Comparison of students' GPAs and SAT scores, based on gender, for students enrolled in HORT 203, Floral Design 38

21 Comparison of students' overall course grades, based on students' pre- and post-course statements, for students enrolled in HORT 203, Floral Design 40

TABLE Page

22 Spearman's rho correlations of various measures to student overall course grade for students enrolled in HORT 203, Floral Design 40

23 Comparison of traditional and Web-based students' self-reported time (in hours) spent studying for both lecture and lab in HORT 203, Floral Design 41

24 Comparison of participating traditional and Web-based class students' course evaluation (CE) scores in HORT 203, Floral Design 44

25 Comparison of course satisfaction, as determined by course evaluation score (mean), based on post-course statements, for students enrolled in HORT 203, Floral Design 45

26 Spearman's rho correlations of various measures to course satisfaction, using study participants from both the traditional and Web-based classes of HORT 203, Floral Design 45

27 Comparison of participating traditional and Web-based students' first and second design scores in HORT 203, Floral Design 49

28 A comparison of traditional class students' design scores when separated by class sections in HORT 203, Floral Design 50

29 Comparison of first and second design scores by gender of students enrolled in HORT 203, Floral Design 50

30 Comparison of participating traditional and Web-based class students' technology experience (TE) scores in HORT 203, Floral Design 52

31 Distance preparedness score comparisons of participating students within the Web-based class, separated by gender, in HORT 203, Floral Design 53

CHAPTER I

INTRODUCTION

Though skeptics were initially wary about distance learning, it has proven itself over time, by providing benefits such as the opportunity for lifelong learning, and the chance to educate a greater number of students with relatively fewer instructors (Belanger and Jordan, 2000). Great advances in information technology have caused rapid growth in distance learning initiatives around the world (Simpson, 2002). The explosion of the Internet has added a whole new dimension to the concept of distance learning and education.

As with any educational method, it is important to evaluate its effectiveness compared to more traditional methods. Care should be taken when implementing new methods of learning (Van der Perre, 1999). It is vital to evaluate online learning continuously, in order to ensure that students are handling both the course content and technology well (Meyer-Peyton, 2000). If done well, integrating technology into traditional courses may provide a good fit for students' needs and preferences (Connick and Russo, 1995).

Goals and Objectives

The goal of this study was to examine performance and satisfaction of students in traditional and Web-based versions of a floral design course, designated HORT 203, which is offered at Texas A&M University (TAMU). HORT 203, Floral Design, is

---

This thesis follows the recommended style and format of HortTechnology.

unique as an online course in that it has both a lecture component and a hands-on visual art lab component. The objective of this study was to determine whether there was a difference between students in how well they perform in the class, both in terms of academic and artistic performance, and how satisfied they were with the classes. In order to meet this objective, the following question was examined: Is there a difference between performance and satisfaction of students in a Web-based course when compared to a traditional course?

Research Hypotheses

This study used the null hypothesis that there is no difference between student performance and satisfaction in the Web-based and traditional versions of the floral design course. Specifically, the following hypotheses were tested:

H_{01}: There is no difference between student academic performance in the Web-based and traditional floral design classes.

H_{02}: There is no difference between student course satisfaction in the Web-based and traditional floral design classes.

H_{03}: There is no difference between learned student design skills in the Web-based and traditional floral design classes.

Definition of Terms

In this study, terms were operationally defined as follows:

Distance learning: learning that takes place when students and instructors are separated by distance or circumstance, and technology is used to bridge the communication gap (McVay, 2000); also called distance education.

Online learning: classes that are mostly to entirely conducted via a computer and the Internet; also called online education, Web-based learning, Web-based education.

Academic performance: measured by student grades.

Course satisfaction: responses to the course evaluation survey, quantified by an average of the numbers assigned to each response.

Design skills: measured by student design evaluations using modified Pi Alpha Xi criteria (MacAlpine, 2002), quantified by an average of the scores assigned to each category.

Basic Assumptions

In this study, it was assumed that all students treated this course as they would any other course, and put in the same amount of effort and study they would in any other course. It was also assumed that all students answered all surveys honestly, and performed in the course to the best of their ability. It is assumed that students who signed up for the Web-based course knew that it was at least partially Web-based. However, it should be noted that some of the students in the Web-based course may not have realized that the course was conducted entirely online, since a lecture time was listed in the course schedule.

Limitations

This study, by its very nature, does not allow for a random sample. Besides the fact that intact class groups were used, the study required students to volunteer to participate, and many students chose not to do so. In addition, the amount of students

evaluated for design scores in the traditional class was limited by availability of experienced teaching assistants to grade the designs.

Delimitations

The available study population was delimited to students enrolled in the open sections of HORT 203 during the spring semester of 2003. These included the 93 students in sections 501 – 505 of the traditional class, and the 73 students in sections 508 – 511 of the Web-based class.

CHAPTER II

REVIEW OF LITERATURE

This chapter reviews literature related to distance and online learning. History and definitions of these constructs are given. Advantages and disadvantages of these learning methods are discussed. Components of a successful online course are examined, as well as steps to creating an online course. Case studies of online courses are also examined.

History of Distance Learning

Although many people may think of it as a new technology, the concept of distance learning has been around since at least the 1870s, when the first college correspondence courses were offered (McVay, 2000). The methods of distance learning have evolved as technology has evolved. Radio and television began to be used in education as early as the 1930s and ’40s. Computer efforts began in the 1970s, but waned in the ’80s, until the advent of the World Wide Web, in the 1990s, made the Internet available to Americans in their households (McVay, 2000).

Traditionally, distance learning served the needs of those who could not receive an education otherwise – people who were placebound, whether due to illness, incarceration, family duties, or who were geographically isolated from institutions of higher education. But now a shift is occurring, where distance learning is not only an essential option for these populations, but more often merely a convenient option for a broader range of individuals (Primary Research Group, Inc., 1997). The distinction between distance and traditional students has blurred, and students are now taking

charge of their options to determine what type of class is best for them (Beyth-Marom et al., 2003).

Institutions such as the military and the corporate world have latched onto the concept of online learning and training. Educational institutions have followed the trend by expanding traditional courses to make them either partially or completely online (Schrum, 2000). Public colleges have taken the lead in academia by exploring distance learning as a way to control costs, as larger numbers of students are enrolling in college (Primary Research Group, Inc., 1997). New technologies, as well as population growth, have resulted in a demand for flexible learning opportunities that are easily accessible (Beyth-Marom et al., 2003).

As the purpose of distance education has evolved, so have people's perceptions of it. In the past, distance learning has had a reputation as inferior to traditional learning. Many factors have recently started to reverse this opinion, including the explosion of the Internet, and governmental and corporate forays into the field of distance learning. Indeed, distance learning, especially via the Internet, is rapidly becoming the "academically sexy thing to be involved with" (Primary Research Group, Inc., 1997).

Definition

In order to more clearly understand distance learning and its evolution, some definition is required. According to McVay (2000), "Distance Education takes place when a teacher and student(s) are separated by physical distance, and technology (i.e., voice, video, data, and print), often in concert with face-to-face communication, is used to bridge the instructional gap" (p. 1). There are basically four approaches to distance

learning – broadcast, videoconferencing, Internet, and correspondence courses. (Primary Research Group, Inc., 1997). Today, the Internet has become the fastest-growing medium for use in American educational distance learning endeavors (McVay, 2000). Internet technology has the most potential as a distance learning medium in the future, due to both low cost and convenience factors (Primary Research Group, Inc., 1997). Thus, the evolution of distance learning and associated technology has brought us to the concept of "online" or "Web-based" learning. Online learning is harder to define, as it can include anything from Web searches for information to college courses and degree programs offered entirely online (McVay, 2000). Thus, online learning does not always occur in the same way. For the purpose of this study, online learning includes classes that are mostly to entirely conducted via a computer and the Internet.

Reactions

In the midst of this evolution of distance learning, it is important to stop and consider the results of this evolution, and the effectiveness of these new methods. There has been much debate in academic circles about the effectiveness of online learning experiences as compared to the traditional classroom settings. Everyone involved, including administrators, faculty, staff, and students, has discussed numerous advantages, disadvantages, and opinions.

One general advantage of distance courses, including online courses, is flexibility for both instructor and student. Students have the ability to take courses they might otherwise miss due to the inability to be on the campus where the course is offered for whatever reason (McVay, 2000). A particular advantage with online courses comes

from using computers as an instructional tool. They provide the opportunity for self-paced learning and multimedia usage. As computer technology advances, access increases as more and more people are linked together (Willis, 1993). Access to a variety of cutting edge technology is another mark in favor of distance education (McVay, 2000).

One of the largest advantages to using the Internet as a learning tool is temporally unlimited access to course materials. Not only can students access the material at any time of day, but they also have access to the course materials at any time during the course, rather than enduring "fixed delivery" of the lessons (Nguyen & Kira, 2000). Another advantage students report is that the online environment allows them to feel anonymous, and therefore freer to ask questions (Vonderwell, 2003).

However, this freedom can turn out to be a disadvantage for students in distance learning situations. Poor time management and neglect of course work can result when students are unprepared for the self-direction and self-motivation inherently required in distance courses (McVay, 2000). When asked to report types of problems encountered in online courses, both students and faculty reported the same two problems as being encountered most frequently. The biggest problem relating to student characteristics was lack of self-discipline (Cheurprakobkit et al., 2002). Students often view online courses as merely more convenient and easier. They do not understand that an online course demands more from them because it is less structured, and that the instructor is not as visible as in a traditional class (Palloff and Pratt, 2002).

In her qualitative study of online courses, Mahoney (2002) noted one student who took the online version of a course only because he did not want to have to get up early in the morning to attend the traditional course. This student later reported self-discipline issues during the course, and emerged with a negative opinion about the course. Students may encounter problems like these in online learning situations because they choose them for these types of reasons rather than because they feel the format will result in success with their learning style (Allen et al., 2002).

Both their perceptions of the technologies and factors unique to the student, such as personalities and attitudes, influence how students react to distance learning technologies. Some students may be opposed to technology because they feel it cannot replace the atmosphere of a live classroom (Allen et al., 2002). Others may note a lack of individual relationships with the instructor, resulting in the students not getting to know the instructor personally (Vonderwell, 2003).

In order to experience success in online courses, students must possess certain characteristics. These students must be independent learners, keep up with course lessons, and have some previous experience with the technology used (Schrum, 2000).

Institutional Support

A successful online course requires more than just motivated, conscientious, technically savvy students. There are also institutional factors that need to be considered when determining whether an online course will be successful. If distance learning is to be effective, it must have support from a wide network of individuals, including faculty, students, staff, and administrators (Willis, 1993). In particular, faculty must have

support from their institution. This includes recognition of work done on these courses when considering promotion or tenure, allowing time for course development, and offering assistance as needed (Schrum, 2000).

A good technical support staff is also essential. This may include anyone from instructional and graphic designers to hardware and software support staff. In addition to offering support to faculty, technicians can offer unique perspectives on ways to prepare students for online courses. In a survey of technical support staff in the University of Texas system, 68% agreed with the statement "Most undergraduate courses in any discipline can be developed and offered Web-based with successful learning outcomes." However, they qualified that statement by agreeing (65.4%) that students without a basic level of computer knowledge should not be allowed in these courses. The technicians suggestions for success included making sure students have a basic level of computer knowledge by doing a skills assessment, and making sure students have thorough orientations before beginning online courses (Cheurprakobkit et al., 2002).

Case Studies

As online learning has exploded onto the academic scene, so have statistics to back up the effectiveness of these new methods. At Concord University of Law, an online law school, the pass rate on the California bar exam is touted as 60%, compared to the overall 37% average pass rate for the bar (Cable News Network, 2003). A company called The Career Education Corporation offers online as well as traditional courses in a variety of subjects, and report a 98% job placement rate for online students

as compared to 94% of their traditional students (Cable News Network, 2003). Though useful, these numbers alone cannot definitively determine the value of online learning.

The academic community has been quick to respond to the demand for evidence to back up claims of student success (or lack of it) in online courses. Of course, there are many different definitions of success. Weldon's study (1999) of an online statistics course found that the students in the traditional and online sections performed in a comparable manner on the course exams. However, he also determined that when given a choice only 20% of the students would choose the online course. Nonetheless, he felt that the online course did fill an important need for students who lived farther away or had schedule conflicts (Weldon, 1999).

Success is often measured in terms of student grades and satisfaction. In a recent study, Hong (2002) looked at several factors that could influence student success within this construct. He found that students' gender, age, and learning style did not affect either their grades or satisfaction in the course. Students with higher scholastic perfprmance (GPA) were not more or less satisfied with the online course, but did receive better grades. Students whose computer skills were more advanced did not receive better or worse grades, but did report higher levels of course satisfaction (Hong, 2002).

Researchers have begun to look at this body of literature collectively. A meta-analysis by Allen et al. (2002) found no difference in student satisfaction of distance and traditional courses. A large number of previous studies have shown no statistically significant differences between student success in traditional and technology-based

distance courses (Russell, 2002a). The “No Significant Differences” Web site cites these findings in studies done in a variety of courses, including biology, Spanish, accounting, construction, philosophy, microbiology, nursing, and pathomechanics (Russell, 2002a).

A study of computer science majors enrolled in a computer science course found that the online students and traditional students performed equally well in the course (Buerck et al., 2003). Aragon et al. (2002) also found that students in online and traditional versions of a graduate instructional design course performed equally well, despite differences in learning styles. Carey’s (2001) study of an undergraduate management information systems course showed no statistically significant differences in student grades. These studies seem to indicate that as long as an online course is designed well, students should be able to experience success at least equivalent to what they would in a traditional course.

However, there is also a growing body of literature claiming there are indeed significant differences between the two types of courses, and a group of “Significant Difference” studies has been complied in rebuttal of Russell’s “No Significant Difference” theory (Russell, 2002b). Studies cited by Russell as having significant differences favor both methods as superior. Web students were found to perform worse than traditional students in studies involving microeconomics and English classes. However, most studies cited reported Web students performing better than their traditional counterparts. Subjects tested in these studies included physics, psychology, English, and economics (Russell, 2002b). It is interesting to note that even in the same subject, in this case English, outcomes are not always similar.

Other studies also tout the superiority of Web-based methods. Brandao (2002) noted that in her experience, her high school students got higher grades in her online course than the students in the traditional version. In one of the first studies to quantify online learning results, Schutte (1996) found that students in the online version of his applied statistics course scored 20% better on exams than students in the traditional class.

Taken as a whole, these cases do not seem to point definitively at one method being better or worse than the other. How, then, can instructors decide whether their particular course will succeed as a Web-based course? Looking at studies involving courses similar to theirs is a start, as is looking to see which online methods have been shown to be successful with similar courses.

Course Development

Whatever their opinions on the subject, many academics would likely agree that online education is here to stay. Therefore, effective methods of constructing an online learning experience must be employed in order for the course to achieve maximum success toward the goal of educating students.

To develop an online course, four steps must come into play. The first includes identifying a problem, assessing a need, determining who the audience will be, and establishing goals based on these findings (Willis, 1993). At Texas A&M University, the course Horticulture (HORT) 203, Floral Design, is extremely popular with students of all majors and is extremely difficult to enroll in due to the fact that it fulfills a humanities and visual/performing arts core curriculum requirement needed to complete

an undergraduate degree (TAMU, 2003). The number of graduate teaching assistants available for lab sections limits expansion of the course. The problem, therefore, is not having adequate resources to expand the course as taught currently. However, the need for expansion is obvious due to the number of calls and e-mails received from students trying to enroll in the course (Duray, 2002). One solution to expanding enrollment in HORT 203 may be distance learning.

The second step in adapting a course to online distance learning, according to Willis (1993), is course development. This is achieved through organizing the content, developing course materials, and deciding on delivery approaches. In the case of HORT 203, the course materials had already been organized for the traditional class for many years. The lecture outlines already existed in Power Point© presentations. These presentations were given more detail, as well as voice-over sound bites, for use in the online class. The traditional labs relied on quizzes, design demonstrations, and brief lectures about design history, tools, and flower identification. The lectures were converted to text for the Web site, and a database was constructed for flower identification. Online quizzes were developed as HTML Web pages, with answers being processed via Flexmail (4D, 2003).

The design demonstrations for the lab portion of HORT 203 were recorded for a previous study (MacAlpine, 2002) as QuickTime™ videos, with accompanying text, as well as broken down into step-by-step still images, also with text. MacAlpine's study (2002) comparing traditional, QuickTime™ video, and still image lab instruction found that though there was no significant difference between design scores using

QuickTime™ or still image instruction, there were significant differences between both distance learning methods and the traditional method, resulting in higher design scores with the traditional method (MacAlpine, 2002).

The third step is an evaluation of the course. This is the impetus behind this study, to evaluate and compare effectiveness of the online course to the traditional course. As mentioned earlier, there are differing opinions and research results regarding the effectiveness of online courses. According to Willis (1993), it is only logical that no significant difference between technology-based and traditional teaching approaches is often found. He argues that both are merely different sides of a same coin, that is, a delivery medium for instruction. As long as the design is effective in presenting the content, the method of delivery itself should have no effect on student performance. After all, at the most basic level, teaching is communication. Technology is just another mode of communication (Lever-Duffy et al., 2003).

HORT 203, Floral Design, is somewhat different compared to online courses that have been evaluated in the past which were “lecture only” or “concrete concept” distance learning courses. HORT 203 attempts to teach students a visual art form. Few, if any, studies have tried to evaluate the effectiveness of teaching an art form via computers. People have a hard time seeing how art and technology fit together on many levels (Narey, 2003). It is logical, then, to assume skepticism will exist toward the concept of using computers to actually teach an art form.

CHAPTER III

METHODOLOGY

This chapter begins with an overview of study objectives and hypotheses, and discusses methodology used in the study. The population is defined, and procedures and instrumentation used are explained. Data collection is addressed, and design of the study and statistics are included. Reliability and validity are also addressed. The Institutional Review Board approved this study prior to its start in the spring of 2003.

Statement of Objectives and Hypotheses

The goal of this study was to compare student performance and satisfaction in traditional and Web-based versions of HORT 203, Floral Design. In order to further this goal, several objectives and hypotheses were developed. These included:

1. To determine whether there are differences in grades between students in the traditional and Web-based classes, with the null hypothesis that there is no difference between student academic performance in the traditional and Web-based classes.
2. To determine whether there are differences in course satisfaction between students in the traditional and Web-based classes, with the null hypothesis that there is no difference between student course satisfaction in the traditional and Web-based classes.
3. To determine whether there are differences in design skills between students in the traditional and Web-based classes, with the null hypothesis that there is

no difference between student floral design skills in the traditional and Web-based classes.

4. To determine whether students registered for the Web-based class have the technical and personal skills necessary to successfully complete the class, and whether the skill levels have any correlation to performance and satisfaction.
5. To determine whether demographic variables influence student performance and satisfaction in the course.

Population

The target population for this study was students who enrolled in the HORT 203 Floral Design course at Texas A&M University. The accessible population consisted of students enrolled in the open sections of HORT 203 for the spring 2003 semester. This included sections 501 – 505 of the traditional course, and sections 508 – 511 of the Web-based course. Ninety-three students were enrolled in the traditional course, and 73 students were enrolled in the Web-based course. Most students were "traditional" undergraduates; that is, students who physically attend the majority of their classes on campus and are enrolled in a regular, non-distance four to five year degree program. The students in the Web-based course were mostly students who simply could not get in to the traditional sections or could not fit the traditional sections into their schedules, as opposed to students who were actually physically unable to come to campus to attend the traditional section. In fact, due to the way the course was listed in the University course schedule, it is believed that some of these students did not realize when they

registered for the course that it was an entirely Web-based course rather than a traditional or even a part traditional/part Web-based course.

Procedure and Instrumentation

Beginning of Semester

During the first class meetings on January 13, 2003, the study was explained to students, and students were given the opportunity to participate by filling out the informed consent form (Appendix A). Students who agreed to participate were asked to fill out the demographic form and initial surveys.

Demographic information was collected from participants in all sections (both traditional and Web-based sections) using a form designed by the principal investigator to collect background information deemed necessary for this study (Appendix B). This included information about age, gender, ethnicity, major, student classification, GPA, SAT, previous experiences with floral design and Web-based courses, modes of Internet access and connection speeds, and initial opinion about the course.

Two initial surveys were also given at this time. The first was the Student Self-Evaluation Checklist (McVay, 2000), which was designed to help determine whether students were suited to the distance learning environment (Appendix C). This survey was given only to the students in the Web-based sections. The second was the Survey of Student Technology Experience (McVay, 2000), which was designed to determine students' level of technology experience (Appendix D). This survey was given to students in all sections.

After the surveys were completed by the participating students, all materials were collected and immediately placed in a secure storage area on the 5th floor of the building, in care of a professor not involved with the course, for the remainder of the semester. This was done so that neither the principal investigator nor any of the other HORT 203 instructors knew who was or was not participating in the study.

In the lab portion of the course, student-created designs were evaluated during the first lab session using a modified version of MacAlpine's (2002) criteria (Appendix E), based on the nationally accepted Pi Alpha Xi design judging standards. Designs were evaluated in three traditional sections that were scheduled at times the evaluators were able to attend them, and in all four web-based sections. The design taught in the first lab session was a small round design. The designs were evaluated in order to get an initial assessment of design skill. Designs were rated as good, fair, or poor in each of the following categories: Suitability/Conformity, Balance/Proportion, Focal Area, Line/Rhythm, and Mechanics. Later, values were assigned as follows, with an average being calculated to give the total design score: good=3, fair=2, poor=1.

Since it was not known who was participating in the study, all students in these sections were evaluated. Once again, these evaluations were placed in the same 5th floor secure storage for the remainder of the semester. Students were not shown their design evaluations.

All students in both treatment groups (traditional sections and Web-based sections) then went on to participate in the class as they normally would in any given semester. For the traditional class lecture portion, this meant attending a one-hour

lecture given by Dr. Jayne Zajicek twice a week. For the Web-based class, lectures were online at the course Web site (http://aggie-horticulture.tamu.edu/203w) so that students could access them anytime and learn the material at their own pace. For the lab portion of the course, traditional students met once a week for two hours in the lab section they had registered for. These five sections were taught by four different graduate-level teaching assistants (TAs). The Web-based class' lab area was open from 9 a.m. – 2 p.m. on Tuesdays and Wednesdays, and 1 – 5 p.m. on Thursdays. Students in the Web-based class were able to come in whenever they chose during those time periods to complete their lab for the week. The Web-based lab was monitored by three graduate-level TAs, who each monitored the lab for 2 or 3 hours at a time.

End of Semester

During the last regular week of classes, April 14-18, 2003, students in both treatment groups were asked to evaluate the course during their lab time. The course evaluation survey instrument used in this study (Appendix F) was a modified version of the Course Evaluation Instrument (CEI) developed for use by the University of South Australia (University of South Australia, 2002). The CEI was designed to gauge students' reactions to and opinions about various facets of a course, such as curriculum design, assessment, and support. The principal investigator modified the survey to fit the needs of this study by keeping the general format the same, but using only those sections (and questions within the sections) deemed relevant for this course. The survey statements were answered by students on a Likert-type scale, with the following choices offered: 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, and 5=Strongly Agree.

Also during lab time, all student floral designs were again evaluated in the same seven sections using the same criteria from the first evaluation. The design of the week was a horizontal design, which was felt by the instructors to be fairly comparable to the small round design. In addition, since this was the last regular week of lab, students would have a whole semester's worth of acquired design skill to display. Again, both the surveys and design evaluations were immediately taken to be stored in the previously mentioned 5th floor storage area. This insured that neither the researcher nor the other instructors would know who had or had not completed the surveys, or what they had said.

Data Collection

Data collection for this study was conducted by several different methods. In addition to the demographics, initial surveys, and design and course evaluations previously listed, student grades were also recorded for the course.

Students in both treatment groups took three lecture examinations during the semester, each worth 100 points. At the beginning of the semester, both classes had been informed of the dates and times of these exams, and the Web-based class was instructed to come to a designated room on campus to take the exams at the given time. The tests were administered on the same days for both classes. The same tests were given in both classes. Three "take-home" quizzes, worth 10 points each, were also assigned throughout the semester to both treatment groups. In the traditional class, the quizzes were announced in lecture. In the Web-based class, the quizzes were posted online.

In the lab portion of the course, weekly quizzes were given to both treatment groups, each worth 15 points. Quizzes were over flower identification, design information, and tools and mechanics. To maintain uniformity in quizzes, instructors took questions from a question bank for each quiz for both treatment groups. Halfway through the semester a midterm quiz worth 35 points was given, and at the end of the semester a final quiz worth 50 points was given in each treatment group. These followed the same format as the weekly quizzes, except that they consisted entirely of flower identification.

During each lab session, students in both treatment groups completed an assigned floral design. In both treatment groups, the instructor (or lab monitor, for the Web-based lab) evaluated students' designs for a weekly 5-point completion grade. During the last week of the course, students in both treatment groups were required to use the principles they had learned in the class to complete a randomly assigned design style they had never made before. These designs were graded on merit rather than as completion grades, and were worth 25 points.

After students completed the lecture and lab portions of the course, initial grades were calculated based on 630 possible points (330 from lecture, 300 from lab). Students in the traditional course who had an 'A' average and five or fewer lecture absences were excused from taking the final exam. In the Web-based course, students having an 'A' average alone were excused from the final, since the lecture attendance requirement did not apply. After the final exam was administered, final grades were assigned in the course.

Design of Statistical Analysis

Data were entered into a Microsoft Excel© spreadsheet, and analyzed using the Statistical Package for the Social Sciences (SPSS®) for Windows™ 10.1 (SPSS, 2000). A majority of the data did not meet one or more of the four assumptions needed to use parametric tests, including normality, homogeneity of variance, interval scale, and independence (Field, 2000). For this reason, non-parametric tests were used. The Mann-Whitney test was used to compare means when only two groups existed, and the Kruskal-Wallis test was used when there were more than two groups being compared. The Wilcoxon Signed-Rank test was used when the scores to be compared came from the same subjects, and correlations were done using Spearman's rho. The critical p-value for all tests was set a priori at 0.05.

In order to enter the data in the spreadsheet for analysis, it first had to be coded. Each student was assigned a unique identifier. Demographic questions with non-numeric answers were coded with integers starting with 1 and continuing with as many numbers as the questions had responses.

The Survey of Student Technology Experience was a series of 40 statements with "yes" or "no" responses. "Yes" responses were coded as 1, and "no" responses were coded as 2. These numbers were averaged to provide each student with a technology experience (TE) score ranging from 1 (completely familiar with the technology) to 2 (completely unfamiliar with the technology).

The Student Self-Evaluation Checklist consisted of 13 statements with a Likert-type response scale, which was coded 1=rarely, 2=sometimes, 3=most of the time, and

4=all of the time. The coded responses were averaged to produce a distance preparedness (DP) score ranging from 1 (completely unprepared) to 4 (well prepared) for each student in the Web-based course.

The course evaluation survey included 45 statements with a Likert-type response scale, which was coded 1=Strongly Disagree, 2=Disagree, 3=Neutral, and 4=Agree, and 5=Strongly Agree. The coded responses were averaged to produce a course evaluation (CE) score ranging from 1 (very unsatisfied) to 5 (very satisfied) for each student.

Reliability and Validity

In a study such as this, potential problems can arise due to circumstance. Several attempts were made to control for possible problems. The nine sections involved six different instructors. For the lecture portion of the course, the same person, Dr. Jayne Zajicek, taught the traditional course and created the online lectures for the Web-based course, in order to ensure that both courses were receiving the same information. For the lab portion of the course, there were five teaching assistants (TAs) to cover the various labs. In order to ensure that the TAs would give comparable quizzes, a quiz bank was prepared each week for them to draw quiz questions from. Quiz questions were objective, and set criteria were defined for grading purposes. For the two design evaluations in the study, the three most experienced TAs were chosen to do the evaluations both times. However, there was no way to ensure that the same TA evaluated the same students each time, due to the flexible nature of the Web-based lab.

In the Web-based class, all students in the four sections received the same instruction and quizzes, so it was possible to group them as a single class. However, the

five lab sections of the traditional course were not all taught by the same lab instructors, so it was necessary to determine whether they could be grouped together for lab points. Kruskal-Wallis tests were performed in order to determine whether statistically significant lab point differences existed between the sections (Table 1). No differences were found in lab points. Thus, it was decided that the sections could indeed be grouped together as a single class for this measure.

Table 1. A comparison of traditional class students' lab points in HORT 203, Floral Design, when separated by lab sections.

Measure	Lab Section	Number of Cases	Mean	SD	Mean Rank[z]	df	Chi-Square	Sig.
Lab Points	501	15	284.90	17.716	36.70	4	2.019	.732
	502	17	286.35	14.610	39.76			
	503	14	275.79	31.130	31.71			
	504	15	290.07	8.672	42.63			
	505	14	280.86	24.307	38.57			

[z]Mean of ranks of data; in a Kruskal-Wallis test, data are analyzed by ranking them

Also, as mentioned previously, all survey data, including consent forms, were stored in a secure area for the duration of the semester. Thus, none of the six instructors had any idea who was or was not participating in the study. This was done in compliance with the Institutional Review Board, to ensure that no instructor could intentionally or unintentionally treat or grade the students in a biased manner based on whether they were participating in the study.

Two instruments were tested for reliability using SPSS®. A reliability analysis was performed on the Student Self-Evaluation Checklist (Appendix C), with a resulting reliability coefficient of alpha=0.8305. Despite the fact that removing questions 1 and 5

would slightly increase the alpha, it was decided to keep these questions because the researcher felt they were still important predictors of student readiness. Reliability analyses were also run on the course evaluation survey (Appendix F). These analyses were run on the seven categories of questions, as well as the whole survey overall. Based on these analyses, questions 30, 31, and 42 were deleted, and question 29 was moved to a different section, resulting in six remaining categories. Reliability analyses were then run on the new groupings as well as the overall survey, resulting in seven course evaluation reliability measures – one overall measure and six submeasures, all with alphas of 0.8445 or higher (Table 2).

Table 2. Reliability tests for both the individual sections of the course evaluation survey and the overall course evaluation survey taken by HORT 203, Floral Design, students.

Section	Questions	Items	Alpha
Core Questions	1-7	7	.8899
Curriculum Design	8-16	9	.9125
Assessment	17-28	12	.9206
Lectures	32-35	4	.8822
Online Materials	29, 36-41	7	.9251
Teacher Contact	43-45	3	.8445
Overall Survey	1-29, 32-41, 43-45	42	.9701

Coded responses for each student were averaged in order to give a score for each subsection, including core questions, curriculum design, assessment, lectures, online materials, and teacher contact, as well as for the overall survey. These subsection scores and the overall scores were found to be highly correlated, further establishing the reliability of the instrument (Table 3).

Table 3. Spearman's rho correlations between the sections of the course evaluation survey and the overall course evaluation survey taken by HORT 203, Floral Design, students.

Measure	Measure						
	CQ**	CD**	A**	L**	OM**	TC**	OS**
Core Questions (CQ)		.807*	.794*	.628*	.537*	.563*	.860*
Curriculum Design (CD)			.797*	.701*	.607*	.641*	.911*
Assessment (A)				.612*	.597*	.550*	.890*
Lectures (L)					.428*	.493*	.763*
Online Materials (OM)						.566*	.777*
Teacher Contact (TC)							.724*
Overall Survey (OS)							

*Correlation is statistically significant

**CQ=core questions section, CD=curriculum design section, A=assessment section, L=lectures section, OM=online materials section, TC=teacher contact section, OS=overall survey

CHAPTER IV

RESULTS AND DISCUSSION

This chapter will present, analyze, and interpret the data collected, in order to fulfill the study's goal of comparing student performance and satisfaction in traditional and Web-based versions of HORT 203, Floral Design. Information and conclusions regarding the study objectives beyond the testing of the hypotheses will also be discussed. These objectives were to determine whether students registered for the Web-based course had the technical and personal skills necessary to successfully complete the course, and if the skill levels had any correlation to performance and satisfaction, as well as to determine if demographic variables influenced student performance and satisfaction in the course.

Hypotheses

In accordance with the study goal and objectives, the following null hypotheses were tested:

H_{01}: There is no difference between student academic performance in the Web-based and traditional classes of HORT 203, Floral Design.

H_{02}: There is no difference between student course satisfaction in the Web-based and traditional classes of HORT 203, Floral Design.

H_{03}: There is no difference between student design skills in the Web-based and traditional classes of HORT 203, Floral Design.

Sample Description

The target population for this study was students who enrolled in the HORT 203, Floral Design, course at Texas A&M University. The accessible population consisted of students enrolled in the open sections of HORT 203 for the spring 2003 semester. The sample consisted of 140 students who volunteered to participate in the study. Seventy-five were enrolled in the traditional class, which had 93 students total, and 65 were enrolled in the Web-based class, which had 73 students total. Frequency tests were run in SPSS® to categorize students based on their demographic information. This information was broken down based on class (treatment group).

In terms of gender, both classes were predominantly female (Table 4).

Table 4. Gender demographic information broken down by number and percentage of each gender within each HORT 203, Floral Design, class.

Measure	Class	Category	Number of Cases	Percentage Within Class
Gender	Traditional	Male	14	18.7
		Female	61	81.3
	Web-based	Male	18	27.7
		Female	47	72.3

Student classification was also compared (Table 5). In both classes, almost 50% of the students were seniors. One explanation for this large number of upperclassmen is that it is hard to enroll for this course because it fills up during early registration and on the first day of pre-registration, which is open only to seniors.

Table 5. Student classification demographic information broken down by number and percentage of each classification within each HORT 203, Floral Design, class.

Measure	Class	Category	Number of Cases	Percentage Within Class
Classification	Traditional	Freshman	9	12.0
		Sophomore	13	17.3
		Junior	18	24.0
		Senior	35	46.7
	Web-based	Freshman	4	6.2
		Sophomore	12	18.5
		Junior	18	27.7
		Senior	31	47.7

In addition to classification, students were asked to report their age. Age is broken down in Table 6. The largest number of students in both classes were aged 21 and up, which corresponds to the number of students classified as seniors.

Table 6. Age demographic information broken down by number and percentage of each age within each HORT 203, Floral Design, class.

Measure	Class	Age	Number of Cases	Percentage Within Class
Age	Traditional	18	6	8.0
		19	11	14.7
		20	15	20.0
		21	27	36.0
		22	10	13.3
		23	3	4.0
		24	1	1.3
		25	1	1.3
		DNR*	1	1.3
	Web-based	18	4	6.2
		19	8	12.3
		20	12	18.5
		21	16	24.6
		22	17	26.2
		23	5	7.7
		27	1	1.5
		29	1	1.5
		33	1	1.5

* DNR=Did Not Respond

Students were also asked to report their ethnicity (Table 7). In both classes, students were predominantly Caucasian.

Table 7. Ethnicity demographic information broken down by number and percentage of each ethnicity within each HORT 203, Floral Design, class.

Measure	Class	Category	Number of Cases	Percentage Within Class
Ethnicity	Traditional	Caucasian	70	93.3
		African-American	1	1.3
		Hispanic	3	4.0
		Asian-American	0	0.0
		Other	1	1.3
	Web-based	Caucasian	57	87.7
		African-American	0	0.0
		Hispanic	5	7.7
		Asian-American	1	1.5
		Other	2	3.1

In addition to demographic information, students were asked to respond to several questions designed to gauge background experience in floral design and with Web-based courses. Students were also asked to provide information about how they would access the Internet for this course. This information was especially relevant to the Web-based class, but also helpful to know for the traditional class, since they needed to access various materials on the traditional class Web site throughout the semester.

Students were asked to report whether or not they had any previous experience in floral design (Table 8). In both classes, at least 88% reported no prior experience in floral design. Nine out of 75 students, or 12%, of the traditional students, and 7 out of 65, or 10.8%, of the Web-based students had previous experience with floral design. In both classes, this experience ranged from a brief, one-time encounter with making a few designs, to previous floral design courses. Visual comparison of reported experiences

revealed that those students who did have experience had roughly equivalent amounts of experience.

Table 8. Student self-report of whether or not they had any floral design experience prior to enrolling in HORT 203, Floral Design, separated by number and percentage within each class.

Measure	Class	Response	Number of Cases	Percentage Within Class
Floral design experience	Traditional	Yes	9	12.0
		No	66	88.0
	Web-based	Yes	7	10.8
		No	58	89.2

Students were also asked whether they had ever taken a Web-based course before (Table 9). Again, a majority of students in both classes reported no previous experience in a Web-based course.

Table 9. Student report of whether they had taken a Web-based class prior to enrolling in HORT 203, Floral Design, separated by number and percentage within each class.

Measure	Class	Response	Number of Cases	Percentage Within Class
Prior Web-based class	Traditional	Yes	13	17.3
		No	62	82.7
	Web-based	Yes	14	21.5
		No	51	78.5

Another question was where the students would be accessing the Internet for this course (Table 10). Most students in both classes planned to access the Internet through their home or dorm room computer.

Table 10. Self-report of location of computers students used to access the Internet for HORT 203, Floral Design, broken down by number and percentage within each class.

Measure	Class	Location	Number of Cases	Percentage Within Class
Internet access location	Traditional	Home/Dorm	56	74.7
		Work	6	8.0
		TAMU Lab	12	16.0
		DNR*	1	1.3
	Web-based	Home/Dorm	55	84.6
		Work	0	0.0
		TAMU Lab	8	13.2
		DNR*	2	3.1

*DNR=Did Not Respond

In addition to location of Internet access, students were also asked to report the type of connection the computer they would be using would have (Table 11). This was important due to the large size of some of the files, which would be easier to access with a high-speed connection. A majority of students in both classes indicated they would be using a computer with a high-speed connection.

Table 11. Type of connection students used to access the Internet for HORT 203, Floral Design, broken down by number and percentage within each class.

Measure	Class	Connection	Number of Cases	Percentage Within Class
Type of connection	Traditional	Dial-up Modem	17	22.7
		Cable Modem	16	21.3
		DSL	5	6.7
		Ethernet/Resnet	25	33.3
		Don't Know	11	14.7
		DNR*	1	1.3
	Web-based	Dial-up Modem	15	23.1
		Cable Modem	24	36.9
		DSL	5	7.7
		Ethernet/Resnet	16	24.6
		Don't Know	4	6.2
		DNR*	1	1.5

*DNR=Did Not Respond

In order to confirm that the students in the traditional and Web-based classes were equally distributed when starting the course, several demographic comparisons were made. Student GPAs, SAT scores, and ages were compared using a Mann-Whitney test, and no significant differences were found (Table 12).

Table 12. A comparison of traditional and Web-based students' GPAs, SAT scores, and ages for students enrolled in HORT 203, Floral Design.

Measure	Class	N	Mean	SD	Mean Rank[x]	Sum of Ranks[y]	MWU[z]	Sig.
GPA	Trad.	65	3.14	.472	66.24	4305.50	1739.50	.298
	Web	60	3.09	.510	59.49	3569.50		
SAT	Trad.	45	1168.67	131.10	44.74	2013.50	978.50	.925
	Web	44	1171.14	129.38	45.26	1991.50		
Age	Trad.	74	20.57	1.41	64.82	4796.50	2021.50	.097
	Web	65	21.20	2.36	75.90	4933.50		

[x]Mean of ranks of data; in a Mann Whitney test, data are analyzed by ranking them
[y]Sum of the ranked data (number of cases x mean rank)
[Z]Mann-Whitney U test statistic

Based on all of these factors, it was apparent that students in the traditional and Web-based classes were demographically, scholastically, and experientially equivalent going in to the course.

Findings Related to Hypothesis One

Analysis and Results

In order to evaluate the null hypothesis that there is no difference between student academic performance in the Web-based and traditional classes of HORT 203, Floral Design, class grades were compared between the two classes. Grades were divided into three categories – lecture points, lab points, and final grade average. Mann-Whitney U-Tests were run on all three measures (Table 13). There were statistically significant differences in each case, with students in the traditional class outperforming

students in the Web-based class in lecture, lab, and overall grade. Thus the null hypothesis was rejected.

Table 13. A comparison of HORT 203, Floral Design, students' overall grades in the traditional and Web-based classes.

Measure	Class	N	Mean	SD	Mean Rank[x]	Sum of Ranks[y]	MWU[z]	Sig.
Lecture	Trad.	75	289.65	19.85	79.15	5936.50	1788.50	.007*
	Web	65	276.78	27.05	60.52	3933.50		
Lab	Trad.	75	283.81	20.42	88.89	6667.00	1058.00	.000*
	Web	65	265.68	25.27	49.28	3203.00		
Course	Trad.	75	91.03	5.53	83.90	6292.50	1432.50	.000*
	Web	65	86.46	7.06	55.04	3577.50		

*Statistically significant at $p<.05$
[x]Mean of ranks of data; in a Mann Whitney test, data are analyzed by ranking them
[y]Sum of the ranked data (number of cases x mean rank)
[Z]Mann-Whitney U test statistic

The question also arises of whether the magnitude of difference between the classes is the same for both lecture and lab. A look at the data reveals that the difference is approximately equal; that is, Web-based students performed about the same in both the lecture and the lab, rather than scoring much lower on one or the other (Table 14).

Table 14. Relative difference of traditional and Web-based students' points earned in lecture and lab for students enrolled in HORT 203, Floral Design.

Measure	Course	Number of Cases	Mean	SD	Difference	% Difference
Lecture	Traditional	75	289.65	19.85	12.87	3.9
	Web-based	65	276.78	27.05		
Lab	Traditional	75	283.81	20.42	18.73	6.2
	Web-based	65	265.08	25.27		

Additional Findings

Tests were also run to determine whether various other factors had an effect on grades. There were no statistically significant differences noted on final grades based on previous experience in an online course, previous floral design experience, ethnicity, student classification, where they accessed the Internet, or their connection speed. However, three factors did appear to be related to grades – gender, initial pre-course statement, and post-course statement.

A Mann-Whitney U-Test comparing males and females across both classes indicated that females had statistically significantly higher grades (Table 15). Overall, females in the course scored an average of 45 points higher than males. The data were then broken down into gender comparisons within both classes (Tables 16 and 17). Again, the females outperformed the males academically in both classes.

Table 15. Lecture grade, lab grade, and overall course grade comparisons between genders for students enrolled in HORT 203, Floral Design, combining both Web-based and traditional classes.

Measure	Gender	N	Mean	SD	Mean Rank[x]	Sum of Ranks[y]	MWU[z]	Sig.
Lecture	Male	32	267.47	24.86	44.50	1424.00	896.00	.000*
	Female	108	288.48	21.98	78.20	8446.00		
Lab	Male	32	256.48	27.02	39.72	1271.00	743.00	.000*
	Female	108	280.63	20.94	79.62	8599.00		
Course	Male	32	83.95	6.78	40.61	1299.50	771.50	.000*
	Female	108	90.38	5.91	79.36	8570.50		

*Statistically significant at p<.05
[x]Mean of ranks of data; in a Mann Whitney test, data are analyzed by ranking them
[y]Sum of the ranked data (number of cases x mean rank)
[Z]Mann-Whitney U test statistic

Table 16. Lecture grade, lab grade, and overall course grade comparisons between genders, using only the traditional class students enrolled in HORT 203, Floral Design.

Measure	Gender	N	Mean	SD	Mean Rank[x]	Sum of Ranks[y]	MWU[z]	Sig.
Lecture	Male	14	279.79	19.71	27.61	386.50	281.50	.048*
	Female	61	291.92	19.34	40.39	2463.50		
Lab	Male	14	268.54	23.64	19.50	273.00	168.00	.000*
	Female	61	287.31	18.07	42.25	2577.00		
Course	Male	14	88.03	5.17	23.89	334.50	229.50	.007*
	Female	61	91.72	5.42	41.24	2515.50		

*Statistically significant at p<.05
[x]Mean of ranks of data; in a Mann Whitney test, data are analyzed by ranking them
[y]Sum of the ranked data (number of cases x mean rank)
[Z]Mann-Whitney U test statistic

Table 17. Lecture grade, lab grade, and overall course grade comparisons between genders, using only the Web-based class students enrolled in HORT 203, Floral Design.

Measure	Gender	N	Mean	SD	Mean Rank[x]	Sum of Ranks[y]	MWU[z]	Sig.
Lecture	Male	18	257.89	24.64	19.94	359.00	188.00	.001*
	Female	47	284.02	24.51	38.00	1786.00		
Lab	Male	18	247.11	26.29	19.72	355.00	184.00	.000*
	Female	47	271.97	21.40	38.09	1790.00		
Course	Male	18	80.78	6.24	17.47	314.50	143.50	.000*
	Female	47	88.64	6.13	38.95	1830.50		

*Statistically significant at p<.05
[x]Mean of ranks of data; in a Mann Whitney test, data are analyzed by ranking them
[y]Sum of the ranked data (number of cases x mean rank)
[Z]Mann-Whitney U test statistic

Gender data were further broken down to compare each gender separately across the classes. Females in the traditional class scored statistically significantly higher on lab points and final grades compared to the Web-based class females, but not on lecture points (Table 18). Males in the traditional class scored statistically significantly higher on all three measures when compared to the Web-based class males (Table 19).

Table 18. Lecture grade, lab grade, and overall course grade comparisons between traditional and Web-based class females enrolled in HORT 203, Floral Design.

Measure	Class	N	Mean Rank	Sum of Ranks	MWU	Sig.
Lecture	Traditional	61	58.25	3553.50	1204.500	.156
	Web-based	47	49.63	2332.50		
Lab	Traditional	61	68.66	4188.50	569.500	.000*
	Web-based	47	36.12	1697.50		
Course	Traditional	61	62.41	3807.00	951.000	.003*
	Web-based	47	44.23	2079.00		

*Statistically significant at p<.05

Table 19. Lecture grade, lab grade, and overall course grade comparisons between traditional and Web-based class males enrolled in HORT 203, Floral Design.

Measure	Class	N	Mean Rank	Sum of Ranks	MWU	Sig.
Lecture	Traditional	14	21.11	295.50	61.500	.014*
	Web-based	18	12.92	232.50		
Lab	Traditional	14	20.68	289.50	67.500	.026*
	Web-based	18	13.25	238.50		
Course	Traditional	14	22.21	311.00	46.000	.002*
	Web-based	18	12.06	217.00		

*Statistically significant at p<.05

Due to differences found among gender on grades, GPA and SAT scores were compared based on gender (Table 20). Though males and females showed no statistically significant difference on SAT scores, females did have higher GPAs.

Table 20. Comparison of students' GPAs and SAT scores, based on gender, for students enrolled in HORT 203, Floral Design.

Measure	Gender	N	Mean Rank[x]	Sum of Ranks[y]	MWU[z]	Sig.
GPA	Male	29	50.12	1453.50	1018.50	.029*
	Female	96	66.89	6421.50		
SAT	Male	22	43.14	949.00	696.00	.696
	Female	67	45.61	3056.00		

*Statistically significant at p<.05
[x]Mean of ranks of data; in a Mann Whitney test, data are analyzed by ranking them
[y]Sum of the ranked data (number of cases x mean rank)
[Z]Mann-Whitney U test statistic

Grades were also compared based on students' feelings about whether the course they were enrolled in was the course they wanted. This was measured by their pre- and post-course statements (Table 21). These statements were coded as follows: for pre-course statements, 1=I got into the traditional course, which was what I wanted, 2=I got into the Web-based course, which was what I wanted, 3=It did not matter to me whether I got in the traditional or online course, 4=I got into the traditional course, but I wanted to be in the Web-based course, 5=I got into the Web-based course, but I wanted to be in the traditional course; for post-course statements, 1=I was in the traditional course, and I am glad I was (rather than the Web-based course), 2=I was in the Web-based course, and I am glad I was (rather than the traditional course), 3=The type of course (traditional or Web-based) I was in did not make a difference to me, 4=I was in the traditional course, but I really wish I had been in the Web-based course, 5=I was in the Web-based course, but I really wish I had been in the traditional course. There was a statistically significant difference in grades in both cases. Though the non-parametric Kruskal-Wallis test does not reveal exactly where the significant difference comes in, a look at the averages reveals that students who stated they got in to the course they wanted had higher average grades than those who were neutral or not in the course they wanted.

Table 21. Comparison of students' overall course grades, based on students' pre- and post-course statements, for students enrolled in HORT 203, Floral Design.

Measure	Statement*	N	Mean Grade	SD	Mean Rank[z]	df	Chi-Square	Sig.
Pre-course	1	67	90.91	5.69	82.04	3	11.95	.008**
	2	20	88.49	5.36	62.47			
	3	32	85.93	8.39	55.61			
	5	20	87.95	5.75	60.22			
Post-course	1	56	91.26	5.39	76.25	4	16.49	.002**
	2	35	88.30	6.14	56.94			
	3	12	87.24	6.40	51.21			
	4	3	88.22	11.99	69.63			
	5	19	83.81	8.55	41.55			

*Statements were coded as follows: Pre-course – 1=I got into the traditional course, which was what I wanted, 2=I got into the Web-based course, which was what I wanted, 3=It did not matter to me whether I got in the traditional or online course, 4=I got into the traditional course, but I wanted to be in the Web-based course, 5=I got into the Web-based course, but I wanted to be in the traditional course, Post-course – 1=I was in the traditional course, and I am glad I was (rather than the Web-based course), 2=I was in the Web-based course, and I am glad I was (rather than the traditional course), 3=The type of course (traditional or Web-based) I was in did not make a difference to me, 4=I was in the traditional course, but I really wish I had been in the Web-based course, 5=I was in the Web-based course, but I really wish I had been in the traditional course.
**Statistically significant at p<.05
[z]Mean of ranks of data; in a Kruskal-Wallis test, data are analyzed by ranking them

In addition to mean comparisons, correlations were also run on grade data (Table 22). Gender was correlated to final grades, with females having higher grades. In addition, students who scored higher on the distance preparedness survey and students who reported higher GPAs also had higher final grades in HORT 203.

Table 22. Spearman's rho correlations of various measures to student overall course grade for students enrolled in HORT 203, Floral Design.

Measure	Number of Cases	Correlation to Course Grade	Sig.
Gender	140	.403	.000*
Distance Preparedness Score**	65	.322	.009*
GPA	125	.520	.000*
Technology Experience Score**	140	.082	.333
Course Evaluation Score**	125	-.088	.346

*Statistically significant at p<.05
**Based on their respective surveys

Student study time data were also collected from both classes in order to determine the effect of study time on grades. Students were asked to report how much time per week they spent studying for both the lecture and lab part of the course. The Web-based class reported statistically significantly higher study times for both the lecture and lab portions of the course (Table 23), with Web-based students averaging 0.8 hours more study time per week than traditional students.

Table 23. Comparison of traditional and Web-based students' self-reported time (in hours) spent studying for both lecture and lab in HORT 203, Floral Design.

Measure	Class	N	Mean	SD	Mean Rank[x]	Sum of Ranks[y]	MWU[z]	Sig.
Lecture Study	Trad.	66	1.44	1.13	57.29	3781.00	1570.00	.019*
	Web	62	1.81	1.03	72.18	4475.00	3781.00	
Lab Study	Trad.	66	.76	.567	50.79	3352.00	1141.00	.000*
	Web	62	1.17	.627	79.10	4904.00	3352.00	

*Statistically significant at $p<.05$
[x]Mean of ranks of data; in a Mann Whitney test, data are analyzed by ranking them
[y]Sum of the ranked data (number of cases x mean rank)
[Z]Mann-Whitney U test statistic

Discussion

Overall, students who were taught floral design by traditional lecture and lab methods had higher grades compared to students taught by a Web-based structure. This was unexpected, as most studies cited (Weldon, 1999; Buerck et al., 2003; Aragon et al., 2002; Carey, 2001; Russell, 2002a, Russell, 2002b) found Web-based students' performance to be comparable or even superior to traditional students' performance. Only a few studies, in courses like microeconomics, by no means an 'artistic' course like floral design, reported superior performance by the traditional classes (Russell, 2002b). Even when Web-based students reported more study time than traditional students,

grades in the Web-based course were lower. However, it is possible that the Web-based students could have counted the time they spent on the Internet watching the lecture presentations and design tutorials as "study time," whereas the traditional students would count the live versions of these activities as "lecture time." This could explain the discrepancies in reported study time; if this is the case, it is likely the Web-based students spent equal or even lesser amounts of time actually "studying."

Another factor affecting grades was whether or not students were in the type of class they wanted (traditional or Web-based). Though traditional students grades' were higher overall, a pattern was found within each class: the students who wanted to be in their type of class scored better than those who wanted to be in the other class.

GPA and DP scores were also correlated with grades. Overall, students with higher GPAs did better in the course. This is consistent with Hong's (2002) finding that students with higher scholastic aptitude did better in class. Within the Web-based class, students who were better prepared for a distance course (higher DP score) did better.

Gender effects were also noted, with females outperforming males both overall (Table 15) and within the two classes (Tables 16 and 17), though both genders in the traditional class outperformed their counterparts in the Web-based class (Tables 18 and 19). This gender effect is in direct contrast to Hong's (2002) finding that gender has no effect on performance. However, in this case, females had higher GPAs and DP scores compared to males. It is uncertain, therefore, whether a gender effect exists, or whether the success of the females is due to the fact that they had higher GPAs and DP scores, or whether the differences are in some part to all three factors. The gender tests also help

support the finding of differences based on class. Even when you remove the effect of gender and look at each gender separately, the students in the traditional class still outperform the Web-based students.

The variables of previous experience in an online course, higher technology experience (TE) scores, more convenient computer locations, and higher Internet connection speeds did not result in higher grades. Course satisfaction did not correlate to higher grades either, indicating that students do not necessarily have to like a course to be successful academically.

In conclusion, structure of the course (Web-based or traditional) did make a difference in grades. However, several other factors also influenced grades, including gender, GPA, distance preparedness (DP) scores, and course preference. Again, women also had higher GPAs and DP scores, so it is hard to tell whether any one of these factors alone can predict success.

Findings Related to Hypothesis Two

Analysis and Results

In order to evaluate the hypothesis that there is no difference between student course satisfaction in the Web-based and traditional courses, a Mann-Whitney test was run comparing student course evaluation (CE) scores between the two courses (Table 24). No statistically significant difference was found between the CE scores, which resulted in a failure to reject the null hypotheses. Both courses reported average CE scores greater than 4.0, indicating that overall the students agreed with the positively worded evaluation statements in the CEI.

Table 24. Comparison of participating traditional and Web-based class students' course evaluation (CE) scores in HORT 203, Floral Design.

Class	Number of Cases	Mean*	Standard Deviation	Mean Rank[x]	Sum of Ranks[y]	MWU[z]	Sig.
Traditional	68	4.33	.436	66.25	4505.00	2125.00	.938
Web-based	63	4.26	.623	35.73	4141.00		

*Means can range from 1 (very unsatisfied) to 5 (very satisfied)
[x]Mean of ranks of data; in a Mann Whitney test, data are analyzed by ranking them
[y]Sum of the ranked data (number of cases x mean rank)
[z]Mann-Whitney U test statistic

Additional Findings

Because gender effects were found with grades, tests were also performed to determine whether course satisfaction would vary by gender. This was not found to be the case, as no statistically significant differences were reported. Nor were there differences due to previous experience in an online course, ethnicity, classification, where they accessed the Internet, or their connection speed. However, there were statistically significant differences based on their post-course statement of whether they had been in the course they wanted (Table 25). Though the non-parametric Kruskal-Wallis test does not pinpoint the differences, a look at the data reveals that in terms of their CE scores, students who were in the type of course they wanted (or who did not care which course they were in) reported higher evaluation scores for their class than those students who were not in the type of class they wanted.

Table 25. Comparison of course satisfaction, as determined by course evaluation score (mean), based on post-course statements, for students enrolled in HORT 203, Floral Design.

Post-Course Statement*	Number Of Cases	Mean**	Standard Deviation	Mean Rank	Chi-Square	Sig.
1	56	4.34	.436	65.19	13.256	.010***
2	35	4.38	.543	70.86		
3	12	4.46	.461	74.75		
4	3	3.96	.115	32.67		
5	19	3.96	.491	39.45		

* Statements were coded as follows: 1=I was in the traditional course, and I am glad I was (rather than the Web-based course), 2=I was in the Web-based course, and I am glad I was (rather than the traditional course), 3=The type of course (traditional or Web-based) I was in did not make a difference to me, 4=I was in the traditional course, but I really wish I had been in the Web-based course, 5=I was in the Web-based course, but I really wish I had been in the traditional course.
** Means can range from 1 (very unsatisfied) to 5 (very satisfied)
***Statistically significant at $p<.05$

In terms of correlations, technology experience (TE) scores, GPA, distance preparedness (DP) scores, and grades were not correlated with CE scores (Table 26).

Table 26. Spearman's rho correlations of various measures to course satisfaction, using study participants from both the traditional and Web-based classes of HORT 203 Floral Design.

Measure	Number of Cases	Correlation to Course Satisfaction	Sig.
Technology Experience Score	131	-.089	.313
GPA	118	-.088	.346
Distance Preparedness Score	63	.144	.261
Course Grade	131	-.031	.723

Discussion

Student satisfaction with the course did not vary based on course, gender, or other measures besides post-course statement, and no correlations were found. This would suggest that student satisfaction was based in most part on their actual experiences in the course. It makes sense that the post-course statements and CE scores appear to be related, since the post-course statement, by asking the students to look back

on the course and determine whether they were glad they were in their particular course type or not, is simply a more concise measure of course satisfaction. Allen et al. (2002) confirm this finding with the conclusion that there should be little difference between traditional and Web-based students' satisfaction with their courses, even if students don't learn as much in the Web-based course, which concurs with the findings in this HORT 203 study.

For the most part, student comments in both courses were positive.

Comments from traditional students included:

> "I really like this class; it provides a creative outlet that I can use with flowers from anywhere. Unlike other forms of art, home floral designs are fairly cheap and easy to do. I did not encounter any problems in this class and I would take another floral design/art class if my degree plan allows."

> "I very much enjoyed this course – I know that some of the lab techniques I learned will help in the future if I make my own floral designs."

> "I think I learned a lot because I'm a science major and this is WAY outside my normal realm of class work. I also was motivated to try designs on my own and was able to have lots of fun in this class. I always look forward to this class and lab."

Comments from the Web-based class included:

> "I like that the web based class was very laid back. I don't feel like I would have learned any more or any less had I been in the traditional course. Sometimes I wished the TAs were a little more helpful during lab, but if I specifically asked them a question they were happy to help me. Not going to class 2x/wk freed up a lot of time in my schedule, and I liked that."

> "Loved lab – Loved web based course and ability to set my own schedule. TA's (sic) and teacher were fabulous – good instruction and easily accessible. By far the best course I've taken at TAMU the last 4 years. Really perceived no problems – balance of lecture and lab were great."

"Overall I really enjoyed this course especially since it is well organized. Everything is assessible (sic) through the web which made it really easy to study for quizzes. I have not encountered any problems."

"I would recommend this course (web based) to others."

"This course was a great break from my typical school schedule. It was interesting to learn about floral design. I like the way the course is set up and believe it should stay that way."

Many students were able to articulate specific things they did not like about the course, and some gave suggestions on ways to improve the course.

Comments from the traditional students included:

"Lectures didn't follow a logical sequence. Mandatory attendance doesn't seem necessary in this class. Lab was awesome – no changes."

"I really enjoyed all parts of this class. The professor was well educated on the subject, although I would have liked to have seen her do more designs in lecture. My lab TA was also well educated and was very helpful with any difficulties making the design. She explained the designs very well."

"When Dr. Z missed a lecture and we had to look at the info on the web I was unclear as to the info I needed to know and so I did worse on the test than I expected."

Comments from the Web-based students included:

"The web based material is frustrating and very hard to access. Most computers on campus do not have sound equipment and other computers are too slow to download power points and sound. Everything spoken in the power point presentations should also be written somewhere for those who cannot easily access it. I liked the class and lab a lot but was frustrated with the information online and did not feel like I knew what was always going on."

" – the test did not completely reflect the material we were given for lectures
– it was difficult to determine what was going to be on the exams
– everything else I like and thought was well organized"

It is interesting to note the comments from the Web-based students regarding whether or not the Web-based class was a good fit for them:

> "I was in web course but I would have rather been in traditional because I always procrastinated, but that was my fault anyway."
>
> "Lab was great and I had fun and learned alot (sic). I attended lab on Tuesday's (sic) and normally there were no more than 5 people there. This made it easy to do projects w/o other inteferring (sic) and the T.A. could help more than if the class was full. Now lecture is a different story. The only lecture I watched or went through was the first one. I have not watched a lecture since. I would have been better off taking the lecture because I would have went to class. For the test I study old exams and practice quizzes and the rest was up to total guess. Another problem I have is I am enrolled in 10 hours and I am graduating in 5 weeks. I am burned out on school and really tired of studying. If I would have taken this class earlier than my last semester I may have done better."
>
> "I would have rather had a normal class where I could have a teacher verbally explain all the material and for the fact being in class is "promised" time of learning the material. I am just not self disciplined enough to study the material enough on my own."
>
> "The course as a whole was good, however I have learned that my learning style is not the same as the online teaching style. I am sure the course will work for others, I just feel as though I missed out on the personal side of the class."

Findings Related to Hypothesis Three

Analysis and Results

The other measure of student performance in the course was based on student floral design skill, with the null hypothesis that there is no difference between student design skills in the Web-based and traditional classes. Web-based students were taught design skills in their lab with the use of QuickTime™ videos and still image slides, and traditional students were taught design skills by an instructor in a live lab. Student designs were evaluated twice during the semester to give a first and second design score. These scores were compared between classes with a Mann-Whitney test (Table 27). In

both the first and second design scores, statistically significant differences between the two classes were noted, with the traditional class students scoring higher on both designs. Therefore the null hypothesis that there is no difference between traditional and Web-based course design scores was rejected.

Table 27. Comparison of participating traditional and Web-based students' first and second design scores in HORT 203, Floral Design.

Measure	Clas	N	Mean*	SD	Mean Rank[x]	Sum of Ranks[y]	MWU[z]	Sig.
First design	Trad	44	13.36	1.2	67.57	2973.00	877.00	.000**
	Web	65	12.09	1.9	46.49	3022.00		
Second design	Trad	46	13.15	1.7	69.24	3185.00	886.00	.000**
	Web	65	11.82	2.0	46.63	3031.00		

*Mean scores range from 5 (poor) to 15 (excellent)
**Statistically significant at p<.05
[x]Mean of ranks of data; in a Mann Whitney test, data are analyzed by ranking them
[y]Sum of the ranked data (number of cases x mean rank)
[Z]Mann-Whitney U test statistic

However, it should be noted that a test performed at the onset indicated statistically significant design score differences between the lab sections of the traditional course (Table 28), indicating that students were at varying design skill levels within the traditional labs. Thus, it may not be valid to combine the sections of the traditional course into one single class for purposes of comparison, since students may have received distinctly different levels of instruction, or else unintentional bias toward certain sections may have occurred during the scoring of designs.

Table 28. A comparison of traditional class students' design scores when separated by class sections in HORT 203, Floral Design.

Measure	Section	N	Mean*	SD	Mean Rank[z]	df	Chi-Square	Sig.
First design	501	14	13.71	.994	25.79	2	6.186	.045**
	502	16	12.81	1.04	16.38			
	505	14	13.64	1.39	26.21			
Second design	501	15	14.27	1.03	33.30	2	12.560	.002**
	502	17	12.71	1.72	19.32			
	505	14	12.50	1.91	18.07			

[z]Mean of ranks of data; in a Kruskal-Wallis test, data are analyzed by ranking them
*Mean scores range from 5 (poor) to 15 (excellent)
**Statistically significant at p<.05

Additional Findings

Once again, gender tests were run, finding females outperformed males on both design scores (Table 29). Comparisons based on previous floral design experience, ethnicity, classification, where they accessed the Internet, or their connection speed showed no statistically significant differences.

Table 29. Comparison of first and second design scores by gender of students enrolled in HORT 203, Floral Design.

Measure	Gender	N	Mean*	SD	Mean Rank[x]	Sum of Ranks[y]	MWU[z]	Sig.
First design	Male	28	11.93	1.86	43.29	1212.00	806.00	.020**
	Female	81	12.84	1.71	59.05	4783.00		
Second design	Male	28	11.64	2.07	43.66	1222.50	816.50	.017**
	Female	83	12.61	1.97	60.16	4993.50		

*Mean scores range from 5 (poor) to 15 (excellent)
**Statistically significant at p<.05
[x]Mean of ranks of data; in a Mann Whitney test, data are analyzed by ranking them
[y]Sum of the ranked data (number of cases x mean rank)
[Z]Mann-Whitney U test statistic

In addition, first design scores were found to be positively correlated with second design scores (p=.001), indicating that students who started out with better design skills maintained those skills throughout the semester.

Discussion

From the floral design score results, it would appear that the traditional class of HORT 203, Floral Design, did better on both the first and second design scores. This is consistent with MacAlpine's (2002) study, where students did better when taught floral designs in a traditional setting. Other studies in classes such as microeconomics and English have also found traditional methods to be superior (Russell 2002b).

The gender effect was again evident for design scores, indicating once again that females may have more success than males in performance in a floral design course, independent of the delivery method.

Additional Findings Related to Objectives

Distance/Technology Preparedness

Tests were also run to determine how the students' self-assessments of technology experience (TE) and distance learning preparedness (DP) could relate to success and satisfaction. It was found that students in the both classes reported similar high levels of technological readiness on the technology survey, with no significant difference between the classes (Table 30). The average TE scores were 1.29 for the traditional course and 1.26 for the Web-based course, on a scale where 1.0 is completely familiar with the technology and 2.0 is completely unfamiliar with the technology. This

seems to indicate that students in both courses had the necessary skills for the computer work they were required to do.

Table 30. Comparison of participating traditional and Web-based class students' technology experience (TE) scores in HORT 203, Floral Design.

Class	Number of Cases	Mean*	Standard Deviation	Mean Rank[x]	Sum of Ranks[y]	MWU[z]	Sig.
Traditional	75	1.29	.138	75.11	5633.00	2092.00	.148
Web-based	65	1.26	.147	65.18	4237.00		

*Means can range from 1 (completely familiar with the technology) to 5 (completely unfamiliar with the technology)
[x]Mean of ranks of data; in a Mann Whitney test, data are analyzed by ranking them
[y]Sum of the ranked data (number of cases x mean rank)
[Z]Mann-Whitney U test statistic

The distance learning preparedness tests and resulting DP scores were applicable to the Web-based class only, since the test was meant to assess whether students would be successful in a distance course. It was found that previous experience in an online course, ethnicity, classification, where they accessed the Internet, or their connection speed did not result in statistically significant differences in DP scores. However, there was a difference based on gender, with females having higher DP scores compared to males (Table 31). This would indicate that the females in this class were more prepared for, and therefore more likely to succeed in, a distance learning course. It should also be noted that a positive correlation was found between DP scores and grades (Table 20).

Table 31. Distance preparedness score comparisons of participating students within the Web-based class, separated by gender, in HORT 203, Floral Design.

Gender	N	Mean*	SD	Mean Rank[x]	Sum of Ranks[y]	MWU[z]	Sig.
Male	18	2.97	.353	23.47	422.50	251.50	.012**
Female	47	3.24	.421	36.65	1722.50		

*Mean scores rangle from 1 (completely unprepared) to 4 (very prepared)
**Statistically significant at p<.05
[x]Mean of ranks of data; in a Mann Whitney test, data are analyzed by ranking them
[y]Sum of the ranked data (number of cases x mean rank)
[Z]Mann-Whitney U test statistic

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Purpose of Study

The purpose of this study was to determine whether there was any difference between student performance and satisfaction in traditional and Web-based versions of a floral design course. The specific objectives and hypotheses were:

1. To determine whether there are differences in grades between students in the traditional and Web-based classes, with the null hypothesis that there is no difference between student academic performance in the traditional and Web-based classes.
2. To determine whether there are differences in course satisfaction between students in the traditional and Web-based classes, with the null hypothesis that there is no difference between student course satisfaction in the traditional and Web-based classes.
3. To determine whether there are differences in design skills between students in the traditional and Web-based classes, with the null hypothesis that there is no difference between student floral design skills in the traditional and Web-based classes.
4. To determine whether students registered for the Web-based class have the technical and personal skills necessary to successfully complete the class, and whether the skill levels have any correlation to performance and satisfaction.

5. To determine whether demographic variables influence student performance and satisfaction in the course.

Review of Literature

Distance learning has been around for over 130 years. During that time, the methods of distance learning have evolved and changed (McVay, 2000). Today many entities are exploring online or Web-based education and training (Schrum, 2000). As distance learning has evolved, its practitioners have evolved too. It has also gained wider acceptance in the academic community (Primary Research Group, Inc., 1997).

Despite more widespread acceptance, the jury is still out on online learning. Russell (2002a) illustrates this point with his collection of over 350 studies, which report no statistically significant differences between traditional and technology-based distance education. However, many studies do report statistically significant differences between the two methods, some of which contend that online learning is not as effective (Russell, 2002b).

In predicting whether or not to make a course an online course, it is important to consider not only available research, but also inherent advantages and disadvantages of online learning. Advantages include greater course availability, the chance for students to be self-paced, and the use of advanced technology (Willis, 1993; McVay, 2000). Some disadvantages are that students need to possess a high degree of initiative and self-discipline to be successful in an online course (McVay, 2000; Cheurprakobkit et al., 2002).

Instructors must follow sound steps and guidelines when creating an online course. These include initial assessments, course development, and course evaluation (Willis, 1993). This study fulfills this third step for the HORT 203, Floral Design, course at Texas A&M University.

Methodology

Students participated in the HORT 203 course as they normally would any other semester. Those who volunteered to participate in the study filled out a demographic form and the Survey of Student Technology Experience (McVay, 2000) at the beginning of the semester. Students in the Web-based class also filled out the Student Self-Evaluation Checklist (McVay, 2000) at this time. At the end of the semester, all participants filled out a course evaluation survey based on the University of South Australia's Course Evaluation Instrument (University of South Australia, 2002). The surveys were collected and immediately placed in a secure storage area, so that no one involved with the study knew which students were or were not participating. Student designs were evaluated at the beginning and end of the semester using criteria based on MacAlpine's (2002) Pi Alpha Xi-based judging standards. These scores were stored along with the surveys until the semester was over. Student grades in the course were also collected for use in this study.

Population and Sample

This study was conducted using volunteer participants from the open sections of Texas A&M University's HORT 203, Floral Design, course in the spring semester of 2003. All participants, who ranged in age from 18 to 33, were undergraduates enrolled

in a degree program. The control group consisted of 75 students in the traditional class, and the treatment group was 65 students in the Web-based class.

Instrumentation

Demographic information was collected using a form designed by the principal investigator (Appendix B). All students filled out the Survey of Student Technology Experience (Appendix D), designed to measure familiarity with technology (McVay, 2000). Web-based students also filled out the Student Self-Evaluation Checklist (Appendix C), to determine whether they had the personal skills necessary to succeed in a Web-based course (McVay, 2000). Designs were scored using criteria based on MacAlpine's (2002) modification of national Pi Alpha Xi judging standards (Appendix E). The course evaluation survey (Appendix F) was a modified version of the Course Evaluation Instrument used by the University of South Australia (University of South Australia, 2002).

Conclusions

Hypothesis/Objective One

There were statistically significant differences between traditional and Web-based students in their lecture points, lab points, and final grades. Traditional students outscored the Web-based students on all three measures. These results are similar to a minority of literature cited by Russell (2002b) showing statistically significant differences in favor of traditional students. In addition, statistically significant grade differences were found based on several groupings. Females outscored males on all three grade measures, both within each course and across both courses. When

interpreting these findings, it should be noted that females had higher GPAs at the start of the semester compared to males, which Hong (2002) cites as an indicator of more success, as well as more preparedness for a distance course. Also, students who indicated on their pre- and post-course statements that they got into the type of course (traditional or Web-based) that they wanted did better in the course than students who did not. Thus, course selection appears to play a logical role, in that a student will do better if they are in the type of course they prefer.

Hypothesis/Objective Two

No statistically significant differences were found between traditional and Web-based students' level of course satisfaction at the end of the course, consistent with the meta-analysis done by Allen at al. (2002) showing no differences in course satisfaction between traditional and online courses. Various other tests were performed comparing student satisfaction based on demographic differences. Again, no statistically significant differences were reported. The only case of statistically significant differences in course satisfaction occurred when students were grouped based on their post-course statement. Students who were in the type of course the wanted at the end of the semester were more satisfied with the course. As with any course, whether traditional or Web-based, some students always like the course more than others do. These results indicate that overall, students had favorable evaluations for both the traditional and Web-based courses.

Hypothesis/Objective Three

Results indicated that traditional students also performed better on their floral designs than Web-based students. Gender division was evident here too, as females had

higher design scores than males. These results differ from many (Weldon, 1999; Buerck et al., 2003; Aragon et al., 2002; Carey, 2001; Russell, 2002a, Russell, 2002b) that report equal or better student performance in Web-based courses compared to traditional courses. Results from both this study and MacAlpine's (2002) indicate that the physical art of floral design may be taught more effectively by the traditional methods versus the Web-based techniques.

Objective Four

Most Web-based students did indeed have the technical skills needed to participate in the Web-based course. Results of the evaluation of personal skills were more varied. Though the technical skills did not appear to have any correlation with performance or satisfaction, personal skills (distance preparedness) did. Overall, females were more prepared for distance courses. A higher level of distance course preparedness correlated with a higher grade in the course. These findings indicate that students can determine ahead of time whether they have the personal skills necessary to succeed in a Web-based course. This can save students from enrolling in a course where they do not have the traits needed to get a high grade.

Objective Five

Though most demographic factors did not seem to have any effect on performance or satisfaction, gender effects were a recurring trend. Females seemed to perform better on designs and grades in both traditional and Web-based classes. It cannot be said with certainty that these effects were strictly based on gender, since

females also had higher GPAs and, in the Web-based course, higher distance preparedness levels.

Recommendations

Recommendations for Practice

One recommendation to improve the Web-based class is to screen students by giving them a questionnaire at the onset of the course. This is in accordance with the Cheurprakobkit et al. (2002) study, where respondents agreed that students should be pre-screened to determine whether the have they skills needed for a Web-based class. This survey should include the distance learning preparedness survey, the applicable pre-course statement choices, a place to report GPA, and a question about the reason they enrolled in the Web-based class rather than the traditional class. This information should be analyzed immediately, and students deemed "at-risk" for doing poorly in the Web-based class should be given the option to drop the class, or switch with a traditional student who would likely succeed in the Web-based class. "At-risk" could be defined as having some combination of the following factors: low GPA, low DP score, male, Web-based class was not the class they wanted, taking the class for the wrong reasons (i.e., thinking it is less work, or avoiding getting up early to go to the traditional course).

Also, a much more in-depth orientation should be offered at or before the first lab session. This suggestion is supported by both Hong (2002) and Cheurprakobkit et al. (2002). This orientation should include an explanation of class procedures, a demonstration of the lab computer equipment, a walk-through of the class Web site, and instructions about the names and uses of the necessary tools and materials used

throughout the lab. Printed materials with the information should be distributed, as well as posting the same instructions on the Web site.

Other suggestions are to consider making text of the audio contained in any online lectures, for the students who cannot access the audio, and to be sure to compare the exams with the online lectures, to make sure the questions are all covered in the material. Also, something like an online bulletin board may help give students a sense of community and interaction. Interaction among students in Web-based courses, such as through an online community, may influence success in Web-based courses (Hong, 2002). Boards would have to be monitored in order to prevent cheating.

Recommendations for Research

Suggestions for further research include more tests of gender effects across and within the courses. Males and females with similar GPAs and DP scores should be compared to see it there are still differences in grades and designs. Also, more tests should be done dealing with only the designs and design scores, to better determine whether a computer can effectively instruct students in the art of floral design. Lastly, another look should be taken at the variable of study time, separating out “class” and “study” time to determine if discrepancies in class performance has a basis is disparate study time.

LITERATURE CITED

4D. 2003. 4D WebSTAR V. 7 August 2003. <http://www.4d.com/products/4dwsv.html>.

Allen, M., J. Bourhis, N. Burrell, and E. Mabry. 2002. Comparing student satisfaction with distance education to traditional classrooms in higher education: A meta-analysis. The American Journal of Distance Education. 16(2):83-87.

Aragon, S. R., S.D. Johnson, and N. Shaik. 2002. The influence of learning style preferences on student success in online versus face-to-face environments. The American Journal of Distance Education. 16(4): 227-244.

Belanger, F., and D.H. Jordan. 2000. Evaluation and implementation of distance learning: Technologies, tools, and techniques. Idea Group Publishing, Hershey, PA.

Beyth-Marom, R., E. Chajut, S. Roccas, and L. Sagiv. 2003. Internet-assisted versus traditional distance learning environments: Factors affecting students' preferences. Computers & Education. 41:65-76.

Brandao, C. 2002. Teaching online: Harnessing technology's power at Florida virtual school. 7 August 2003. <http://www.thejournal.com/magazine/vault/A4036A.cfm>.

Buerck, J.P, T. Malmstrom, and E. Peppers. 2003. Learning environments and learning styles: Non-traditional student enrollment and success in an Internet-based versus a lecture-based computer science course. Learning Environments Research. 6:137-155.

Cable News Network. 2003. Online education attracts students, profits. 11 June 2003. <http://www.cnn.com/2003/EDUCATION/06/07/tech.education.reut/index.html>.

Carey, J.M. 2001. Effective student outcomes: A comparison of online and face-to-face delivery modes. 7 August 2003. <http://teleeducation.nb.ca/content/pdf/english/DEOSNEWS_11.9_effective-student-outcomes.pdf>.

Cheurprakobkit, S., D.F. Hale, and J.N. Olson. 2002. Technicians' perceptions about Web-based courses: The University of Texas system experience. The American Journal of Distance Education. 16(4):245-258.

Connick, G., and J. Russo. 1995. Technology and the inevitability of educational transformation, p. 14-20. In: E. Boschmann (ed.). The electronic classroom: A handbook for education in the electronic environment. Learned Information, Inc., Medford, NJ.

Duray, S. 2002. Personal communication. Department of Horticultural Sciences, Texas A&M University. College Station, TX.

Field, A. 2000. Discovering statistics using SPSS for Windows. Sage Publications, Inc., Thousand Oaks, CA.

Hong, K. 2002. Relationships between students' and instructional variables with satisfaction and learning from a Web-based course. Internet and Higher Education. 5:267-281.

Lever-Duffy, J., J.B. McDonald, and A.P. Mizell. 2003. Teaching and learning with technology. Allyn and Bacon, Boston.

MacAlpine, C.L. 2002. Comparison of digital images and compressed video as supplements in the teaching of floral design. M.S. Thesis, Texas A&M University.

Mahoney, S.E. 2002. Mindset change: Influences on student buy-in to online classes. Ph.D. Dissertation, Texas A&M University.

Meyer-Peyton, L. 2000. Elements of a successful distributed learning program, p. 82-90. In: L. Lau (ed.). Distance learning technologies: Issues, trends, and opportunities. Idea Group Publishing, Hershey, PA.

McVay, M. 2000. How to be a successful distance learning student. Pearson Custom Publishing, Needham Heights, MA.

Narey, M.J. 2003. Technology in the fine arts classroom, p. 211-239. In: L.A. Tomei (ed.). Challenges of teaching with technology across the curriculum: Issues and solutions. Information Science Publishing, Hershey, PA.

Nguyen, D., and D. Kira. 2000. Summative and formative evaluations of internet-based teaching, p. 22-38. In: L. Lau (ed.). Distance learning technologies: Issues, trends, and opportunities. Idea Group Publishing, Hershey, PA.

Palloff, R.M., and K. Pratt. 2002. Beyond the looking glass: What faculty and students need to be successful online, p. 171-184. In: K.E. Rudestam and J. Schoenholtz-Read (eds.). Handbook of online learning: Innovations in higher education and corporate training. Sage Publications, Inc., Thousand Oaks, CA.

Primary Research Group, Inc. 1997. The survey of distance learning programs in higher education. Primary Research Group, Inc., New York.

Russell, T.L. 2002a. The “no significant difference phenomenon.” 11 June 2003. <http://teleeducation.nb.ca/nosignificantdifference/>.

Russell, T.L. 2002b. The “significant difference phenomenon.” 11 June 2003. <http://teleeducation.nb.ca/significantdifference/>.

Schrum, L. 2000. Online teaching and learning: Essential conditions for success!, p. 91-106. In: L. Lau (ed.). Distance learning technologies: Issues, trends, and opportunities. Idea Group Publishing, Hershey, PA.

Schutte, J.G. 1996. Virtual teaching in higher education: The new intellectual superhighway or just another traffic jam? 7 August 2003. <http://www.csun.edu/sociology/virexp.htm>.

Simpson, O. 2002. Supporting students in online, open, and distance learning, second edition. Kogan Page, Ltd., London.

Statistical Package for the Social Sciences (SPSS®). 2000. SPSS 10.1.0 for Windows™. Prentice Hall, Upper Saddle River, NJ.

Texas A&M University (TAMU). 2003. Undergraduate catalog. Texas A&M University, College Station, TX.

University of South Australia. 2002. Introducing the Course Evaluation Instrument (CEI)/Student Evaluation of Teaching (SET). 22 October 2002. <http://www.unisanet.unisa.edu.au/sei/evaluation/cei-intro.doc>.

Van der Perre, G. 1999. Educational innovation and information and communication technologies (ICT): Revolution or evolution?, p. 107-125. In: C.M. Feyten and J.W. Nutta (eds.). Virtual instruction: Issues and insights from an international perspective. Libraries Unlimited, Inc., Englewood, CO.

Vonderwell, S. 2003. An examination of asynchronous communication experiences and perspectives of students in an online course: A case study. Internet and Higher Education. 6:77-90.

Weldon, K.L. 1999. Seven trimesters of an online introductory statistics course. 2 June 2003. <http://cade.icaap.org/vol14.2/weldon.html>.

Willis, B. 1993. Distance education: A practical guide. Educational Technology Publications, Englewood Cliffs, NJ.

APPENDIX A

INFORMED CONSENT FORM

INFORMED CONSENT FORM: A Comparison of Traditional and Web-Based Floral Design Courses

I understand that I am agreeing to participate in a research study to compare performance and satisfaction of students in traditional and web-based versions of floral design (HORT 203). All students enrolled in HORT 203 sections 501-505 and 508-511 are eligible to participate. This study will be conducted during this current semester, the spring semester of 2003.

As a participant, I agree that I will fill out the preliminary surveys given to me today and return them before leaving class. This should take no more than a few minutes of my time. I also agree that I will fill out a course evaluation and any other given surveys at the end of the semester, and return them at that time, before leaving class. Again, this should take no more than a few minutes of my time. I also agree to allow my floral designs that I make in the lab portion of the course to be evaluated for this study. I also agree that my course grades may be used in this study for comparison purposes. I understand that course grades include my final grade in the course, as well as grades received on exams and assignments in both lecture and lab throughout the semester.

I understand that this study is confidential, which means that my name will not be associated with my grades, designs, or survey responses. I understand that no data will be assimilated or processed until after the final grade for the course has been assigned.

It is expected that up to approximately 160 students will participate in this study. I understand that I will not receive any benefits or compensation for participating in this study. I understand that I may refuse to answer any questions on any of the surveys that make me uncomfortable, and that it will not affect my ability to participate in this study. **I understand that my participation in this study is voluntary, and that choosing not to participate will have no effect whatsoever on my grades in this course.** I understand that I may voluntarily withdraw from this study at any time, with no consequences. To do so I should contact Dr. Dan Lineberger in HFSB 506.

I understand that no risks, whether physical, psychological, or emotional, are expected to be incurred by participating in this study.

Initials:_____ Date:_____

More on reverse->

I understand that this research study has been reviewed and approved by the Institutional Review Board - Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, I can contact the Institutional Review Board through Dr. Michael W. Buckley, Director of Support Services, Office of Vice President for Research at (979) 458-4067. I understand that my signature on this consent form indicates my willingness to participate in this study.

I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study.

I have been given a copy of this consent form.

Signature of Participant and Date: _____

Printed Name of Participant: _____

Signature of Principal Investigator and Date: _____

For information about this study, I may contact:

Sharon Henss

Mail Stop 2133

Department of Horticultural Sciences

Texas A&M University

College Station, TX 77843-2133

979-845-4255

Dr. Jayne Zajicek

Mail Stop 2133

Department of Horticultural Sciences

Texas A&M University

979-845-4482

APPENDIX B

DEMOGRAPHIC QUESTIONNAIRE

Demographic Questionnaire

Name:_____
Age:_____ Sex(circle one): M or F

What is your classification at TAMU(circle one):

Freshman Sophomore Junior Senior Graduate

What is your major:_____

Do you consider yourself(circle one):

Caucasian African-American Hispanic Asian-American

Other:_____

What is your overall GPA:_____

What was your SAT score:_____

Do you have any previous experience in Floral Design(circle one):

Yes or No

If yes, please describe *type* and *duration* of experience(for example, "semester-long class in high school", or "worked two summers as a florist's assistant"):_____
_____
_____

Where do you access the web from most often (where you plan to access the web site for this class)(circle one):
Home/Dorm Room Computer Work Computer TAMU Computer Lab
Other:_____

What type of connection does this computer have(circle one):
Dial-up Modem Cable Modem DSL Ethernet/Resnet
Don't Know Other:_____

Have you ever participated in an online/Web-based course before(circle one):
Yes No

Circle the statement which **best** describes how you feel:
I got in to the traditional course, which was what I wanted.
I got in to the web-based course, which was what I wanted.
It did not matter to me whether I got in the traditional or online course.
I got into the traditional course, but I wanted to be in the web-based course.
I got into the web-based course, but I wanted to be in the traditional course.

APPENDIX C

STUDENT SELF-EVALUATION CHECKLIST

Student Self-Evaluation Checklist ▶

This survey is designed to assist you in rating your current readiness to pursue distance education courses. Answer honestly by rating your agreement with each statement. Darken the bubble that best matches your feelings.

Statement	Response
I am able to easily access the Internet as needed for my studies.	❑ rarely ❑ sometimes ❑ most of the time ❑ all of the time
I am comfortable communicating electronically.	❑ rarely ❑ sometimes ❑ most of the time ❑ all of the time
I am willing to actively communicate with my classmates and instructors electronically.	❑ rarely ❑ sometimes ❑ most of the time ❑ all of the time
I am willing to dedicate 8 to 10 hours per week for my studies.	❑ rarely ❑ sometimes ❑ most of the time ❑ all of the time
I feel that online learning is of at least equal quality to traditional classroom learning.	❑ rarely ❑ sometimes ❑ most of the time ❑ all of the time
I feel that my background and experience will be beneficial to my studies.	❑ rarely ❑ sometimes ❑ most of the time ❑ all of the time
I am comfortable with written communication.	❑ rarely ❑ sometimes ❑ most of the time ❑ all of the time
When it comes to learning and studying, I am a self-directed person.	❑ rarely ❑ sometimes ❑ most of the time ❑ all of the time
I believe that looking back on what I've learned in a course will help me to remember it better.	❑ rarely ❑ sometimes ❑ most of the time ❑ all of the time
In my studies, I am self-disciplined and find it easy to set aside reading and homework time.	❑ rarely ❑ sometimes ❑ most of the time ❑ all of the time
I am able to manage my study time effectively and easily complete assignments on time.	❑ rarely ❑ sometimes ❑ most of the time ❑ all of the time
As a student, I enjoy working independently.	❑ rarely ❑ sometimes ❑ most of the time ❑ all of the time
In my studies, I set goals and have a high degree of initiative.	❑ rarely ❑ sometimes ❑ most of the time ❑ all of the time

* This survey reproduced with permission of the publisher from How to be a successful distance learning student by M. McVay.

.

APPENDIX D

SURVEY OF STUDENT TECHNOLOGY EXPERIENCE

Survey of Student Technology Experience ▶

Place an X in the Yes or No box as it relates to each of the statements.

Statement	Yes	No
I have used a computer for more than one year.		
I use a computer every day.		
When I have a problem with my computer I can usually fix it.		
When I have a problem with my computer I have someone I can call to fix it within 24 hours.		
I use a word processing program daily.		
I know how to print a document from my word processing program.		
I have created several documents that exceed ten pages in my word processing program.		
I know how to set margins in my word processing program.		
I know how to paginate (set page numbering) and set headers and footers in my word processing program.		
I know how to save my word processing file as an RTF file.		
I know how to save my word processing file as an HTML file.		
I use an Internet e-mail program every day.		
I know how to set up and use an address list or address book in my e-mail program.		
I correspond, via e-mail, with more than 5 people on a regular basis.		
I have sent an attached document with e-mail.		
I have sent an attached picture or graphic with e-mail.		
I know how to access web pages via their web page address (URL).		
I know how to use a search engine (e.g.,Yahoo or AltaVista) to find information on the Internet.		
On several occasions I have used the Internet to research important information.		
I am familiar with electronic library databases.		
I have used electronic library resources (e.g., FirstSearch, InfoTrac, ProQuest, NTDB, etc.) to research a paper.		

(continued on next page)

Survey of Student Technology Experience ▶

(continued from previous page)

Statement	Yes	No
I easily follow "hot links" from one web page to another.		
I am able to navigate backward and forward among many web pages.		
I know how to print web pages from the Internet.		
I know how to navigate and print within web page frames.		
I have taken surveys or answered questionnaires on the Internet.		
I have created more than three presentations using a graphical presentation program.		
I use Microsoft PowerPoint (or an equivalent program) on a regular basis.		
I have saved a presentation in HTML format.		
I have created web pages using an HTML editor (e.g., Netscape Composer, Microsoft FrontPage, Dreamweaver, etc.).		
I have posted pages on the World Wide Web and made them accessible to others.		
I know how to subscribe to a list-serve or newsgroup.		
I participate in two or more list-serves or newsgroups.		
I know how to access a bulletin board.		
I frequently post comments to two or more bulletin boards.		
I know how to access different chat rooms on the web.		
I know how to speak privately to an individual while in a community chat.		
I have actively participated in one or more chat rooms.		
I have shared data in "real-time" through the use of a whiteboard or other shared resource across the Internet.		
I have used a desktop videoconferencing product to contact another person (e.g., NetMeeting, CU-SeeMe, etc.).		

*This survey reproduced with permission of the publisher from How to be a successful distance learning student by M. McVay.

APPENDIX E

DESIGN SCORE SHEET

Design Evaluation Criteria
Based on the Pi Alpha Xi National Judging Standards

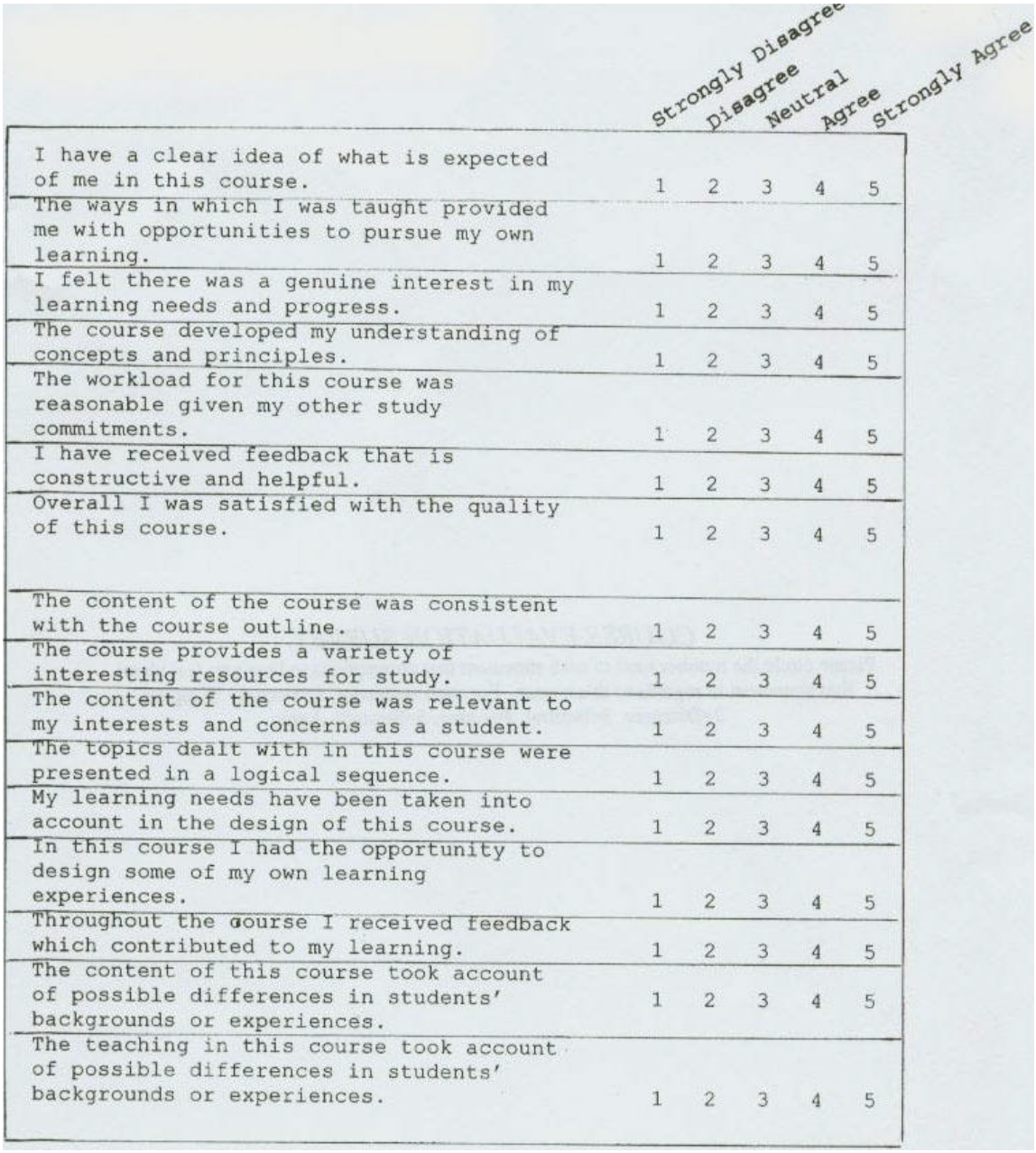
	Good (3 pt)	**Fair (2 pt)**	**Poor (1 pt)**
Suitability	_____	_____	_____
Proportion/Balance	_____	_____	_____
Line/Rhythm	_____	_____	_____
Focal Area	_____	_____	_____
Workmanship/Mechanics	_____	_____	_____

APPENDIX F

COURSE EVALUATION SURVEY

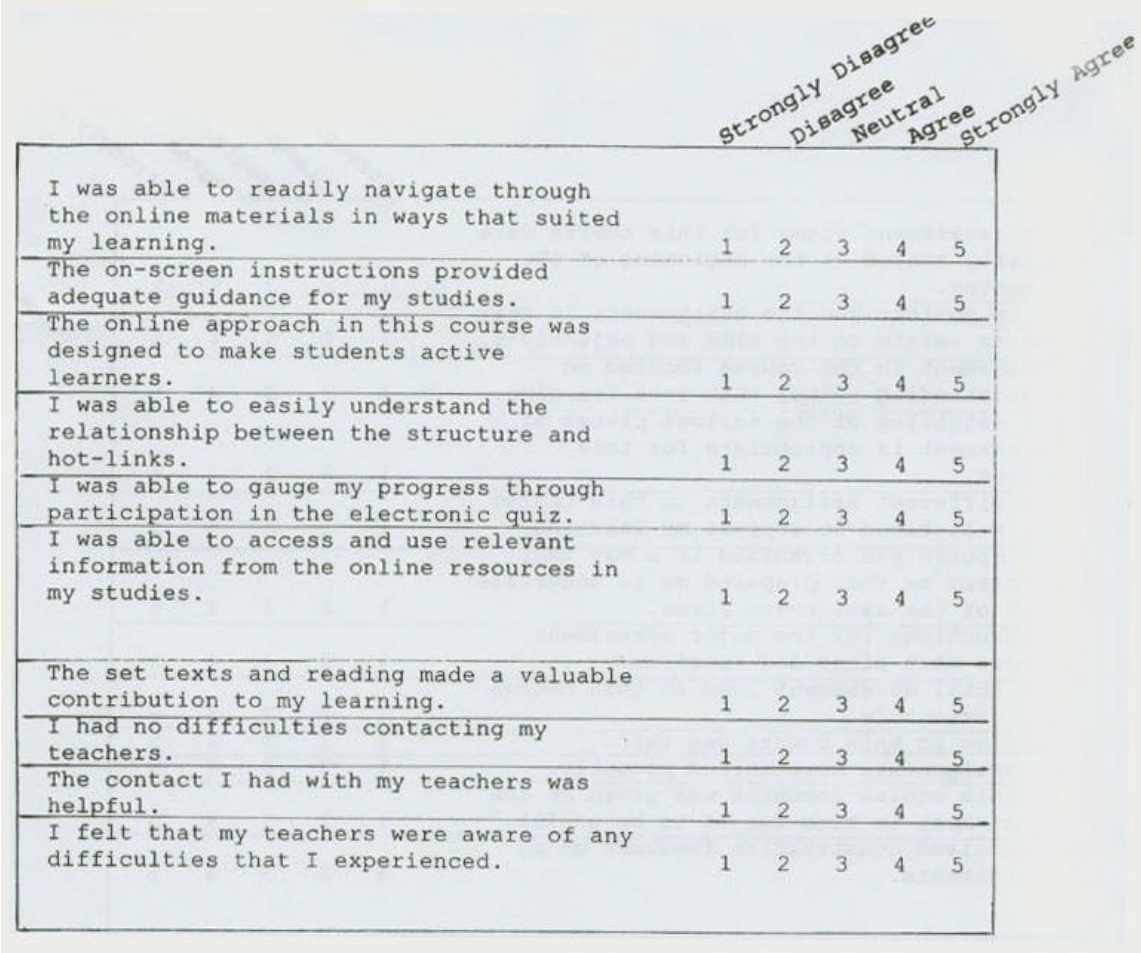
COURSE EVALUATION SURVEY

Please circle the number next to each statement that corresponds to how you feel about that statement in regards to this course. For each statement, 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.



	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I have a clear idea of what is expected of me in this course.	1	2	3	4	5
The ways in which I was taught provided me with opportunities to pursue my own learning.	1	2	3	4	5
I felt there was a genuine interest in my learning needs and progress.	1	2	3	4	5
The course developed my understanding of concepts and principles.	1	2	3	4	5
The workload for this course was reasonable given my other study commitments.	1	2	3	4	5
I have received feedback that is constructive and helpful.	1	2	3	4	5
Overall I was satisfied with the quality of this course.	1	2	3	4	5
The content of the course was consistent with the course outline.	1	2	3	4	5
The course provides a variety of interesting resources for study.	1	2	3	4	5
The content of the course was relevant to my interests and concerns as a student.	1	2	3	4	5
The topics dealt with in this course were presented in a logical sequence.	1	2	3	4	5
My learning needs have been taken into account in the design of this course.	1	2	3	4	5
In this course I had the opportunity to design some of my own learning experiences.	1	2	3	4	5
Throughout the course I received feedback which contributed to my learning.	1	2	3	4	5
The content of this course took account of possible differences in students' backgrounds or experiences.	1	2	3	4	5
The teaching in this course took account of possible differences in students' backgrounds or experiences.	1	2	3	4	5

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The assessment items for this course were clearly stated at the beginning of the semester.	1	2	3	4	5
It is obvious how the assignments in this course relate to the aims and objectives.	1	2	3	4	5
Assessment in the course focused on understanding rather than rote learning.	1	2	3	4	5
The weighting of the various pieces of assessment is appropriate for this course.	1	2	3	4	5
The different assignments in this course are well-timed to support my learning.	1	2	3	4	5
The course was organized in a way that prepared me that prepared me to undertake each of the assignment items.	1	2	3	4	5
Instructions for the major assessment pieces were clear and specific.	1	2	3	4	5
The total assessment load in this course was reasonable.	1	2	3	4	5
Marking in this course was fair.	1	2	3	4	5
My assignments were marked promptly.	1	2	3	4	5
In this course feedback was given on the assessment in time for it to be useful.	1	2	3	4	5
I received constructive feedback on my assignments.	1	2	3	4	5
Computer resources in this course were adequate to support my learning.	1	2	3	4	5
The laboratory sessions were well organized.	1	2	3	4	5
The textbook was a valuable resource for my learning.	1	2	3	4	5
In this course the lectures assisted my learning.	1	2	3	4	5
In this course lectures were well structured.	1	2	3	4	5
I was able to maintain interest throughout the lectures.	1	2	3	4	5
The lectures motivated me to do additional work.	1	2	3	4	5



	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I was able to readily navigate through the online materials in ways that suited my learning.	1	2	3	4	5
The on-screen instructions provided adequate guidance for my studies.	1	2	3	4	5
The online approach in this course was designed to make students active learners.	1	2	3	4	5
I was able to easily understand the relationship between the structure and hot-links.	1	2	3	4	5
I was able to gauge my progress through participation in the electronic quiz.	1	2	3	4	5
I was able to access and use relevant information from the online resources in my studies.	1	2	3	4	5
The set texts and reading made a valuable contribution to my learning.	1	2	3	4	5
I had no difficulties contacting my teachers.	1	2	3	4	5
The contact I had with my teachers was helpful.	1	2	3	4	5
I felt that my teachers were aware of any difficulties that I experienced.	1	2	3	4	5

Looking back on this course, please circle the one statement that BEST describes how you feel:

I was in the traditional course, and I am glad I was (rather than the web-based course).
I was in the web-based course, and I am glad I was(rather than the traditional course).
The type of course (traditional or web-based) I was in did not make a difference to me.
I was in the traditional course, but I really wish I had been in the web-based course.
I was in the web-based course, but I really wish I had been in the traditional course.

How many hours per week would you say you spent studying the lecture part of the class? _____

How many hours per week would you say you spent studying the lab part of the class?

_____

FREE RESPONSE SECTION:

This is your opportunity to tell us your opinions about this course. We are interested in how you feel about any and all aspects of the course, in both the lecture and lab portions of the course. What did you like or dislike about the course? What problems did you encounter? What would you keep the way it is, and what would like to see done differently in this course? You may use as much space (front and back) as you need. Your input is valuable and will be used to help improve this course.

*Survey questions taken from the Univeristy of South Australia's Course Evaluation Instrument and reproduced by permission.

VITA

Candidate: Sharon R. Henss

Address: 123 S.E. Harris St.
Burleson, TX 76028

Education: M.S., Horticulture, Texas A&M University, 2003
B.A., Botany, The University of Texas, 2000

Professional Experience: Texas A&M University
Teaching Assistant for HORT 203 (Flowers and Plants Used in Interiors), 2001-2003

Lady Bird Johnson Wildflower Center
Intern, 2000

Useful Wild Plants, Inc.
Research Intern, 1999

Affiliations: Aggie Master Gardeners
President, 2002-2003
Member, 2001-2003

Horticulture Graduate Council
Secretary, 2002-2003
Member, 2001-2003

Student American Institute of Floral Design
Member, 2002-2003

Credentials: Texas Master Gardener
Certified, 2002

Benz School of Floral Design
Completed Program, 2003