THE EFFECTIVENESS OF MULTIMEDIA LEARNING IN HOSPITALITY HIGHER EDUCATION

By

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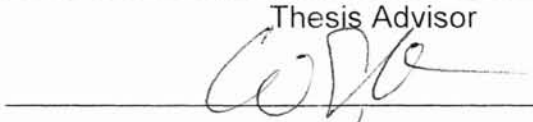

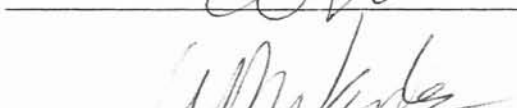

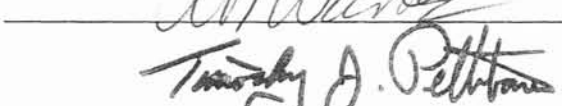

Dean of the Graduate College

PREFACE

I would like to thank Dr. Hailin Qu., committee chair, for his assistance with this thesis. I wish also to thank Dr. Woody Kim and Dr. Bill Warde for their help and time with this thesis. Without your help and patience with this thesis I would not have been able to complete this task in my life.

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I would also like to thank my entire family for their love and support over the last few years. And lastly, I would like to dedicate this thesis to my mother and father whose love and support have molded me into who I am today.

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Chapter 1

INTRODUCTION

Background

The popularity of multimedia applications has been growing in the world of industry over the past 15-20 years. While the term "multimedia" is often the subject of contention, there is no disputing its novelty and the rapid escalation of its evolution (Cranitch, Gonzalez, & Jo, 2000). Multimedia applications have grown out of the technological age of the late 1980's and the 1990's, and are common topics today among many leading industrial leaders around the world. In recent years, the uses of multimedia technologies have seen an expansion in popularity, partly due to their large varieties. Among these applications are programs that help with both teaching and training, video conferencing, and other areas. Today, these types of applications have started to work their way into many industries including the hospitality industry. Among the current multimedia applications that seem to have one of the greatest potentials for greatness in industry—especially areas like hospitality—is the use of multimedia in the teaching of students in the form of multimedia tutorials.

Benefits of Multimedia Learning

The benefits of these packages include instruction designed by experts; the ability to repeat or review content; the capacity to be interactive; a

context presented by text, graphics, and illustration; a nonlinear format that provides feedback to the student (Thurston & Verschelden, 1996). Furthermore, other media, such as illustrations, video diagrams, animation, and computer graphics with text can be integrated into multimedia programs (Cauble & Thurston, 2000). Other benefits include reduced training cost, reduced printing and distribution costs over traditional printed materials, and improved training (Grunberg, 1999). According to Hoch (1994), in the case of multimedia education the essential advantages of this kind of learning derive from circumstances that the pupils can themselves largely choose what they want to learn from the subject assigned, and when they want to learn it.

Multimedia Learning Challenges

With the growth of multimedia learning there is a need for differentiation. The use of multimedia products for learning within the enterprise may not necessarily be a good idea if the products are not based on sound educational knowledge according to RRC Business Training. According to Heinz Holz of BIBB, The Federal Institute for Vocational Training, "All methods of multimedia learning tend toward individualization" (Hoch, 1994). This trend toward individualization may make it even harder to measure multimedia standards. With vast amount of multimedia applications coming on-line since the mid-80's, industry has been hard-pressed to thoroughly test many of these multimedia applications. The cost of many multimedia programs can be high, and while the return on investment (ROI) for companies can be great, ROI could

also be bad if the application does not live up to its hype. In the case of the hospitality industry, which has historically been slow to adapt to new technologies, this is especially true and this lack of understanding further slows assimilation of new technologies.

Problem Statement

Due to the limited amount of research on the effectiveness of multimedia learning within hospitality education, this study evaluated the effectiveness of a few simple multimedia designs within a hospitality-learning program. The specific objectives of this study are to:

1. explore differences in students' post–test scores between the different multimedia treatment groups.
2. find differences in students' post-test scores between the control group and the multimedia treatment groups
3. determine relationships between students' post-test scores and their demographic profiles within each of the multimedia treatment groups.

This study was conducted on a random sample of hospitality students enrolled in Introduction to Hotels, Restaurants, and Tourism around the World, Management in Hospitality and Food Service Systems, and Mechanical Equipment and Building courses at the School of Hotel and Restaurant Administration at Oklahoma State University for the fall semester of 2002.

Chapter 2

REVIEW OF THE LITERATURE

Introduction

The use of multimedia-based learning has experienced exponential growth over the last decade. An almost unknown educational tool just ten years ago, multimedia learning is now a billion dollar a year business. According to Framingham, Mass.-based International Data Corp. (IDC), the market is expected to grow to $11.4 billion by 2003 (Sambataro, 2000). In addition, millions of dollars are being saved by the use of this new medium. Rick Horton, general manager of International Business Machines (IBM) Global Services' Learning Services group, stated that IBM saved two hundred million dollars in internal training cost in one year alone thanks to multimedia based training/learning. It makes sense therefore that the hospitality educators would want to make use of this new medium. However, the lack of research into the methodology associated with multimedia education and its effectiveness has been a large concern for many educators. The research that has been done in areas like the cognitive constraints on multimedia learning, for example, has shown that careful planning must go into multimedia programs used for teaching in order to be effective (Heiser, Lonn & Mayer, 2001). However, while there is still a lack of research many educators are pressing ahead with multimedia learning programs due to the overwhelming benefits. It is therefore imperative

that research be done to ensure this new medium is used effectively in the classroom.

The Makeup of Multimedia learning Programs

The use of multimedia as a learning aid is still undergoing changes but can be better understood by taking a look at what the word multimedia most generally means. The first definitions of multimedia in the late 80's and early 90's referred to a device, program etc. that used more than one medium (Collins & Malik, 1992). Others have referred to multimedia as the combination of text, graphics, sound, data, an animation, and perhaps video in a message, a document, or at a Website (McNurlin & Sprague, 1998). In recent years this definition of multimedia has come to mean even more. One significant characteristic of multimedia is that it is a vehicle for the convergence of the traditionally separate technologies of computing, entertainment, and telecommunications (Cranitch, Gonzalez & Jo, 2000).

The makeup of multimedia learning programs, while constantly evolving can be broken down into five components parts, (1) Animation, (2) Graphics & Colors, (3) Sounds, (4) Text, and (5) Video. A closer look at these elements, their interactions, and the current multimedia principles related to them must be taken if multimedia learning is to be effective in the hospitality industry.

Animation in Multimedia Education

The use of animation within a multimedia program refers to a simulated object or person similar in nature to a cartoon only used for educational purposes. In a study conducted by Mayer and Moreno on the use of animation in multimedia learning seven principles were outlined. These multimedia principles are, spatial contiguity principle, temporal contiguity principle, coherence principle, modality principle, redundancy principle, and the personalization principle. The first of these principles, the multimedia principle, is that students learn more deeply from animation and narration than from narration only. The second principle, spatial contiguity, simply states that students learn more deeply when text is presented next to the portion of the animation that it describes than when on-screen text is presented far from the corresponding action in animation. The next principle, temporal contiguity, says that students learn more deeply when animation and narration are presented at the same time than when they are separated in time. The coherence principle states that students learn more deeply from animation and narration when extraneous words, sounds (including music), and video are excluded rather than included. The fifth principle, modality, shows that students learn more deeply when animation and narration are used than from on-screen text. The redundancy principle states that student learn more from animation and narration than from animation, narration, and on-screen text. The final principle of Mayer and Moreno's work is the Personality Principle, which states that students will learn more deeply from animation and narration

when the narration is in conversational rather than formal style (Mayer & Moreno, 2002).

The use of animation has been shown to have a positive impact on students' perceptions of multimedia education. In a survey involving a group of introductory geography students by Proctor and Richardson (1997), students showed a liking for animation and found animation valuable as a learning tool.

Graphics & Colors in Multimedia Education

The use of Graphics and color can play an important role in the overall effectiveness of a multimedia program. While research has been limited, it has been suggested that no more than two colors per screen for everything other than graphics be used, and that the use of color for text contrast with the background color. It has also been suggested that solid colors be used for background and that textured or designed backgrounds be avoided. The best approach, however, due to the lack of research may be to just be consistent with colors and let the colors direct the user. Research on graphics like that of color has been very limited to this point. Most agree however that the use of graphics be limited and be used only in relation to content on the screen of the user. Downs and Clark suggested four main considerations should be used when selecting graphics, (1) choose graphics that are related to the content of text on the screen, (2) consider the developmental level of the viewer when selecting the complexity of the graphics, (3) use realistic graphics when content is dependent

on visual detail, and limit the number of graphics per screen to one unless showing a contrast or comparison (Clark & Downs, 1997).

Sounds in Multimedia Education

In a study conducted by Mayer, Moreno, Boire, and Vagge (1999) at the University of California, multimedia was studied for it constructivist learning. The study looks at the aspects of visual and verbal multimedia on the working memory of students. The study looked at three combinations successive small bites, successive large bites, and concurrent bites of verbal segments. The finding of this study showed that visual and verbal representations can be held in working memory at the same time and that multimedia designers should be leery of situations in which large amounts of visual information are presented without corresponding verbal information or when large amounts of verbal information are presented without corresponding visual information.

Text in Multimedia Education

Downs and Clark outlined a simplistic approach to multimedia. Their research showed that color, text, graphics and special effects should be kept simple in order to be most effective. Text, including text color, font size, placement, justification, etc., should fit the context of the work, should easily be seen, and limited to only a few lines per screen. Lastly, they stated that special effects should be limited (Clark & Downs, 1997).

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Video in Multimedia Education

O'Neill (1987) suggest that images in video may need to be chosen for dramatic effect, novelty or even shock. Childs, & Ellis (1999), after doing research on different methods of video in multimedia training called the Broadnet Project, suggested the following; Use video stories to put the subject into its context of use; Use clips followed by questions to encourage active participation from trainees and build on existing knowledge; Ensure these clips have the information required to answer the questions; Limit the length of talking head video clips and use them to elaborate on specific points.

The Functional Design of Multimedia Programs

The second main concern within multimedia programs is that of functional design. Functional design refers to any interaction which is taken by the user of a multimedia program. Two main types of interaction will be examined in this literature review, Interactive Multimedia (IM), and Navigational Interaction.

Interactive multimedia

In the article Multimedia: An Alternative Context for Studying Working of Art, Cason (1998) studied the effectiveness of Interactive multimedia (IM) as an instructional resource. This study which used forty-eight undergraduate volunteers were randomly assigned to one of two treatment groups composed of similar gender, ethnic background, age group, and college major showed that interactive multimedia can be a valuable instructional resource. In particular, this

study shows a contribution to higher-order understanding and choice of appropriate search strategies in thinking and writing about art. The applications, however, of this study are limited and the author, Nancy F. Cason, recommends that larger studies on the subject of IM are needed.

Lewis (1977) states that interactive multimedia can bring new possibilities to adult education. Lewis's article shows that interactive multimedia is especially useful with learning skills that involve drill and repetition, such as math or foreign languages. The article also states "With the computer, students can also skip through material they have already mastered; faster learners don't have to wait for others to catch up".

Navigational Interaction

Navigational patterns in multimedia have also been studied. A paper written by Fenley (1998) looked at the five main routes in navigation Linear, Circular, Star, hierarchical, and complex. The study, which used 20 students, who were given the navigations task within a multimedia package, showed that most of the students used a combination of linear and hierarchical patterns in the task. It is suggested in the article that the cause of this strong linear and hierarchical approach was that students had been taught in the same manner throughout their lives.

Trumbo (1997) discusses the process and problems of navigation and orientation in multimedia by looking at four of its aspects; behavioral, physical, conceptual, and perceptual. The designer challenge, according to Trumbo is to

use directional and non-directional space to create multiple paths through a coherent, navigable garden of content rather than a labyrinth of dark, empty passageways and blind alleys. As described in his work, a well-developed approach to navigation design minimizes travel by creating simple paths between points, minimizes complexity by creating a hierarchy with a minimum of levels, and minimizes redundancy to avoid creating multiple paths to the same place. The user must create a sense of continuity and a clear sense of direction within the document. In addition, the designer has the task of designing multimedia programs in conceptual space. This gives the user the ability to move around but requires a reliance on memory. Because of this, as Trumbo states, the designer needs to use a variety of tools to help the user remember where they are in the design space i.e. program.

Historical Multimedia Principles

In the early 1990's Cates helped define fifteen main principles for designing effective instructional multimedia products in his article Fifteen Principles for Designing More Effective Instructional Hypermedia / Multimedia Products. The fifteen principles Cates listed are; Match current curricular emphases, Match current teaching practice, Match current instructional time restraints, Provide the capability of tailoring the product to meet specific teachers needs, Make the database easily accessible for use as a research tool, Make the database expandable, Design the product so that it helps learners develop their inquiry skills, Encourage learners to think about what they know and what they

are learning, Design a "user-friendly" learning environment, Think of a videodisc as more than just a full motion repository, Include video segments that make effective use of the medium, Be careful to use good writing and correct spelling and punctuation, Make the product interactive in meaningful ways, Emphasize context, Not just isolated facts, and Provide print materials that are at least as valuable as the multimedia database. In closing, his article he states, "Content instruction is the engine of education, Concentrate on the content; make it solid; provide powerful tools to teach it well. Then instructional hypermedia / multimedia products can realize their promise" (Cates, 1992).

Current Multimedia Applications in Hospitality

Hospitality education is changing faster today than perhaps ever before due to one key word in today's world, technology. "One look around a typical restaurant, and it becomes immediately clear that the foodservice industry is slowly but surely becoming a world of POS, MIS, ERP, CRM and other three-letter acronyms representing technologies designed to enhance restaurant operations, improve the bottom line and increase customer satisfaction. A recent National Restaurant Association report cited technological changes as 6 of the top 10 trends affecting the restaurant industry by the year 2011. Only 10 years ago technology did not even figure on that list. Given the increasing importance of technology in foodservice operations, future managers, concept developers and chief executives not only must know what those acronyms mean but also must understand the capabilities and limitations of the technology they

represent. "These changes [in technology] make it incumbent upon hospitality education to provide students with the basic knowledge, skill and attitude necessary to be effective in this environment," said Mark Hamilton, director of the Technology Research and Education Center at the University of Houston's Conrad N. Hilton College. "Additionally, students must be taught to think strategically about technology and its uses, both now and in the future." To ensure that their students are prepared to succeed in a foodservice industry increasingly dependent upon complex technologies, many hospitality programs are developing special technology-focused curriculums and encouraging their students to master computers"(Klassen, 2001).

In order to meet / keep up with some of these demands, multimedia applications in Hospitality education are becoming more and more wide spread as a means to both introduce students to computer systems and to help quell the need for more faculty. The largest source of these applications is in the form of multimedia CD-ROM (Compact Disk, Read only Media) and online multimedia, which have seen a surge in both educational applications and training applications.

Current CD-ROM Applications in Hospitality

An unknown media only a few years ago the word CD-ROM (Compact disk, Read only Media) is today synonymous with today's tech world. One of the first hospitality companies to use this media, Jarvis Hotels, won a national tourism award for their staff training CD-ROM. The company created an

innovative multimedia system that improves introductory training for staff and is unique in the industry. Custom built by VEGA Skill change, part of VEGA Group Plc, a series of interactive CD-ROMs enables staff to learn in a fun and realistic manner. The user-friendly package sets out a series of realistic room settings within a hotel and the operator is guided through a number of learning subjects such as corporate policy and standards, fire-training, food hygiene and customer care. At the end of the program, a quiz-type assessment test assesses the knowledge gained (Morrison, 2000).

Another example of this shift to a new training technique was seen in 1997 when Club Corporation International released its first CD-ROM training disk. Like many hospitality organizations, Club Corporation International (ClubCorp) has heretofore built its training strategy on traditional techniques and tools. Those tools included on-the-job training combined with classroom instruction using texts, manuals, flip charts, overheads, and videotapes. The company changed its approach in 1997, when ClubCorp made a $47-million commitment to technology that included the installation of computers in all of its clubs. Managers believed that a better way must exist to facilitate training, and the technology installation opened the door to computer-based learning for employee partners, as the company's workers are called (Clemenz, Gore & Pamela, 2000).

Through an investigatory process that included the benchmarking of such companies as BMW and American Airlines, ClubCorp's managers became interested in interactive multimedia training, which uses text, graphics, animation, pictures, video, and sound to present information. The CD had the following

favorable aspects. It (1) offered storage space sufficient to hold all of the multimedia components, including compressed video, (2) allowed for a custom graphic environment along with fast operation and immediate playback of video segments, and (3) was supported by all of ClubCorp's computers, which were equipped with CD drives and offered multimedia capabilities.

The major drawback of the CD-ROM is the difficulty of updating the material, since a new CD has to be burned for every change. That drawback was not a concern for this particular topic, however, since the basics of board relations do not change that rapidly. Moreover, CD burners are now commonplace and affordable (Clemenz, Pamela & Gore, 2000). After all of their research, ClubCorp released it first CD-ROM training disk title "Board of Governors: The Cornerstone of a Private Club".

In addition to the educational programming and the pure training that CD-ROMs offer they are now being used to help facilitate certification among hospitality professionals. An example of this is a food safety training and certification program released by Nugget Brand Distributors in the fall of 1999. Food Safety Training and Certification was the latest in a series of interactive multimedia training programs designed for the foodservice industry. The series is being developed by Nugget Brand Distributors (members of Premier Foodservice Distributors of America, Inc.) and Chimera Multimedia, which produces award-winning interactive training tools for the foodservice industry. The Foodservice Operators' Training Achievement Program (TAP) Series covers topics important to foodservice operators including Food Safety. This training

program leads managers and staff through the steps necessary to successfully complete a food safety certification exam.

Current Internet Applications in Hospitality

Next to CD-ROM programs the greatest use of multimedia within hospitality education and training is that of online or web based training and classes. Thanks to a new on-line hospitality-training program, the phrase "You've got mail" soon might be synonymous with "You've got homework" (Duluth, 2000). The Educational Institute of the American Hotel & Motel Association officially rolled out its CourseLine on-line learning program, and in just a few short months, several hotel companies and hospitality schools have signed on to use the system. In development and beta testing for about 2 years, CourseLine soon will be made available to hotel employees at all Cendant Corp. and MeriStar Hotels and Resorts properties. The program already is offered to hospitality students at Purdue University; Sullivan College in Louisville, Kentucky; and Champlain College in Burlington, Va. (Duluth, 2000).

In addition, for the first time, entire educational programs are even offered on line. According to William Cole, director of hospitality programs at central Texas College, hoteliers and restaurateurs find it hard to work a college schedule around the demands of the business (Cleveland, 2001). Thanks to a recent alliance between Central Texas College and the American Hotel and Motel Association, the college now offers two accredited associate degrees, Hotel Management and Food and Beverage Management (Cleveland, 2001).

Other Multimedia Applications in Hospitality

While CD-ROM and Internet applications are currently the most widespread form of media being used throughout the hospitality industry and hospitality education, other applications exist in the form of video conferencing, video tapes, projections, etc. The use of video conferencing, which has seen a rise in popularity over the last few years, may become one of hospitality's greatest tools in teaching and training. At present, video conferencing is gaining popularity in hotels as a form of conference revenue enhancement. Its applications, however, can and probably will, in the near future, be used in the educational forum. It is already being used throughout universities as a whole to help spread the expanse of distance learning. However, video conferencing, as is true with the other media currently being used in the hospitality industry, has not been thoroughly studied, and with so many media applications now available, it is imperative that a greater understanding of these medias be gained in order to be of the greatest and most efficient use to hospitality education and the hospitality industry as a whole.

Current Media Comparisons

While limited there has been some progress over the last few years toward understand the effectiveness of different media types within the classroom. An example of this is a study titled "Learning a Procedural Task: Effectiveness of Multimedia Presentations. In this study three experiments where undertaken the first comparing the effectiveness of text, line drawings, text

and line drawing, video, and video stills for learning a first aid task. The second and three experiments studied the interaction and effectiveness of text and text and pictures. All three of these experiments used 268 undergraduate students between the ages of 18 and 45 without any student being involved in more than one experiment. The findings of this these experiments showed that text and line drawings and video presentations had advantages over the video stills, text only treatment, and the line drawing only treatment. In addition beneficial effects from the combination of text and pictures were seen (Michas & Berry, 2000).

An additional study, "Principles of Educational Multimedia User Interface design", also showed some of the differences with media. For example it was shown that for the communicating verbal information, text is better than auditory narration. For recalling and recognizing items, pictures are better than text and pictures are also better than text for communicating spatial information. In addition it appears that elaborative media (e.g., pictures vs. text, text vs. audio narration) may improve learning performance more than media that may not be as elaborate (Najjar, 1998).

Hypothesis

H_o 01 There is no significant difference in students' post-test scores among different multimedia treatment groups.

H_o 02 There is no significant difference in students' post-test scores between the experimental groups and the control group.

H_o 03 There is no significant relationship between students' post-test scores and their demographic profiles within the multimedia treatment groups.

Chapter 3

METHODOLOGY

Introduction

This chapter will give an account of the general methodology to be used within this study. The major topics which will be discussed are (a) The Research Design, (b) Instrumentation, (c) Sample, (d) Reliability and Validity, and, (e) Data Analysis.

Research Design

The design of this study is in the form of an experimental design. For this experiment students from the target population were randomly placed into five groups, group A (Control Group) which acted as the control group, and groups B (Text only Media), C (Text and Graphics Media), D (Text and Interaction Media), and E (Text and Video Media) which acted as the experimental groups. After subjects for group (A) had been randomly selected the remaining students were randomly assigned to groups (B), (C), (D), and (E). Groups (B), (C), (D), and (E) then took a multimedia tutorial on the cruise line industry corresponding to their media types, while control group (A) received a traditional lecture on the cruise line industry. In addition age range, gender, and classification were gathered from all subjects (See Appendix C & D).

Instrumentation

The instrumentation of the research consisted of four multimedia CD-ROM (Compact Disk Read only Media), tutorials created by using Macromedia Authorware 6.0. All tutorials consisted of four parts, general information, multimedia tutorial, post-test, and demographics. All data collected from the CD-ROMs was automatically written to a text file for analysis.

Part one of all four CD-ROM programs consisted of general information questions (See Appendix C). The CD programs asked all students their Classification, department and college, and major.

Part two of all four CD-ROM programs consisted of a tutorial about the cruise line industry that was divided into three sections (Cruise Line History, Cruise Line Departments, and A Look at Cruise Line Service). CD-ROM one was administered to Group (B) and used text only throughout the entire multimedia program. CD-ROM two, which was given to Group (C), used text and graphics throughout the entire multimedia program. CD-ROM three, which was given to Group (D), used text and video throughout the entire multimedia program. Group (E) used text and interactivity throughout the entire multimedia program. All text used throughout all of the multimedia programs is exactly the same (See Appendix A).

Part three of all four CD-ROM multimedia programs consisted of a post-test (See Appendix B). The post-test was the same on all Four CD-ROMs. There were 20 multiple-choice questions corresponding to the multimedia tutorial

text. All of the post-test questions were worth 5 points a piece for a maximum score of 100 points.

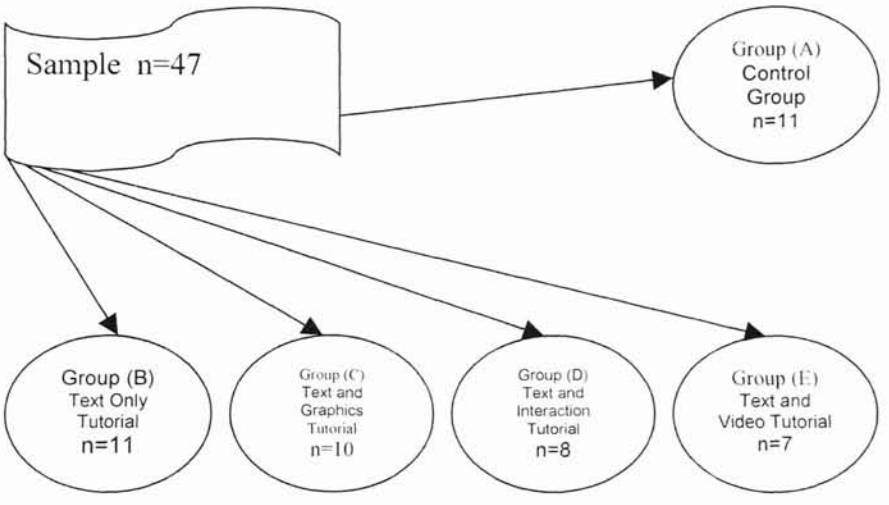
Part four of all four CD-ROM multimedia programs consisted of demographic information (See Appendix D). The CD program asked all students two demographic questions, age and gender.

The classroom lecture of this study acted as the control group, Group (A). Students in this group were given a lecture on the cruise line industry. At the end of this lecture all students in this group were given a post-test identical to the one given to the other groups taking the multimedia tutorials (See Appendix B).

Sampling

The target population used in this research consisted of all persons who would undertake multimedia training. A convenience sample of 199 undergraduate students enrolled in Introduction to Hotels, Restaurants, and Tourism around the World; Management in Hospitality and Food Service Systems, and Mechanical Equipment and Building courses in the School of Hotel and Restaurant Administration at Oklahoma State University for the fall semester of 2002 was used. Of this sample,77 students participated. However due to computer problems, data from 30 of these students was lost leaving a total of 47 viable responses; 11 in Group A, 11 in group B, 10 in group C, 8 in group D, and 7 in group E (See Figure 1).

Figure 1: Sampling



Data Analysis

Data analysis for this experiment was done with Statistical Package for the Social Sciences (SPSS vs. 11.0). One-way Analysis of Variance (ANOVA) was used to assess the relationships post-test scores among students' different demographics both in the control group and in the multimedia groups. The least significant difference test (LSD) was used to see the individual differences within these groups. In addition, ANOVA along with the LSD test were used to assess differences in post-test score among the different multimedia programs.

Chapter 4

FINDINGS

A total of 47 students of the 199 students participated in this multimedia research. This represents 24% of the total target population.

Demographic Profile

Forty-seven percent of the students surveyed were male, while 53% of the students in this sample were female (See Table 1).

Those students aged 22-25 represented the largest percentage of students in this study (66%) followed by those students aged 18-21 (21%) those aged 26-29 (8.5%) and lastly those students aged 30 years or older (4.5%).

Most of the students in this study were juniors (47%) followed by sophomores (25.5%), seniors (21%), and lastly those students who were freshmen made up the smallest percentage (6.5%).

By far most of the students in this study (79%) were Hotel and Restaurant Administration Majors and the remaining students were enrolled in Nutrition & Dietetics (9%), Business (4%), Journalism (2%), Construction (2%), Management Information Systems (2%), and one student was undeclared (2%). Most of the students in the study were from the College of Human Environmental Sciences (92%). The only other colleges represented were the Business College (6%) and College of Engineering, Architecture, and Technology (2%).

Table 1: Age and Classification Distribution

Gender	Frequency	Percent
Male	22	47%
Female	25	53%
Age Range	**Frequency**	**Percent**
18-21	10	21%
22-25	31	66%
26-29	4	9%
>29	2	4%
Classification	**Frequency**	**Percent**
Freshman	3	7%
Sophomore	12	25%
Junior	22	47%
Senior	10	21%
Major	**Frequency**	**Percent**
Hotel and Restaurant Administration	37	79%
Nutrition and Dietetics	4	9%
Business	2	4%
Journalism	1	2%
Management Information Systems	1	2%
Construction	1	2%
Undeclared	1	2%
College	**Frequency**	**Percent**
Human Environmental Sciences	43	92%
Business	3	6%
College of Engineering, Architecture, and Technology	1	2%

Comparisons of Multimedia Tutorials

The students who took the text only treatment had a post-test mean score of 45.91, and (SD=11.58), while students who took the text and graphics treatment had a mean post-test score of 46.50, and (SD=8.83). Those students who took the text and video treatment had a mean post-test score of 44.29, and a (SD=12.05) and those students who took the text and interaction treatment had

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Female	25	53%
Age Range	**Frequency**	**Percent**
18-21	10	21%
22-25	31	66%
26-29	4	9%
>29	2	4%
Classification	**Frequency**	**Percent**
Freshman	3	7%
Sophomore	12	25%
Junior	22	47%
Senior	10	21%
Major	**Frequency**	**Percent**
Hotel and Restaurant Administration	37	79%
Nutrition and Dietetics	4	9%
Business	2	4%
Journalism	1	2%
Management Information Systems	1	2%
Construction	1	2%
Undeclared	1	2%
College	**Frequency**	**Percent**
Human Environmental Sciences	43	92%
Business	3	6%
College of Engineering, Architecture, and Technology	1	2%

Comparisons of Multimedia Tutorials

The students who took the text only treatment had a post-test mean score of 45.91, and (SD=11.58), while students who took the text and graphics treatment had a mean post-test score of 46.50, and (SD=8.83). Those students who took the text and video treatment had a mean post-test score of 44.29, and a (SD=12.05) and those students who took the text and interaction treatment had

a mean post-test score of 48.13, and a (SD=19.07). Finally students in the control group had a mean post-test score of 40.00, and a (SD=12.65) (See Table 2).

Using the One-way analysis of variance (ANOVA) no significant differences between post-test scores were found; Text Only Treatment vs. Text and Graphic Treatment ($p \leq 0.917$), Text Only Treatment vs. Text and Interaction Treatment ($p \leq 0.715$), Text Only Treatment vs. Text and Video Treatment ($p \leq 0.797$), Text only Treatment vs. Control Group ($p \leq 0.291$), Text and Graphics Treatment vs. Text and Interaction Treatment ($p \leq 0.793$), Text and Graphics Treatment vs. Text and Video Treatment ($p \leq 0.731$), Text and Graphics Treatment vs. Control Group ($p \leq 0.258$), Text and Interaction Treatment vs. Text and Video Treatment ($p \leq 0.570$), Text and Interaction Treatment vs. Control Group ($p \leq 0.185$), and Text and Video Treatment vs. Control Group ($p \leq 0.498$). None of these values were significant at either the 90% or 95% confidence interval.

Table 2: Media Comparisons

Descriptives

	N	Mean	Std. Deviation	Std. Error
Control Group	11	40.000	12.649	3.814
Text Only	11	45.909	11.580	3.491
Text and Graphics	10	46.500	8.835	2.794
Text and Video	7	44.286	12.052	4.555
Text and Interactive	8	48.125	19.075	6.744
Total	47	44.787	12.724	1.856

ANOVA

	Sum of Squares	df	Mean Square	F	Sig
Between Groups	386.160	4	96.540	0.574	0.683
Within Groups	7061.713	42	168.136		
Total	7447.872	46			

Multiple Comparisons

Dependent Variable: Post-Test Score
LSD

(I) GROUP	(J) GROUP	Mean Difference (I-J)	Std. Error	Sig.
Control	Text Only	-5.909	5.529	0.291
	Text and Graphics	-6.500	5.666	0.258
	Text and Video	-4.286	6.269	0.498
	Text and Interaction	-8.125	6.025	0.185
Text Only	Text and Graphics	-0.591	5.666	0.917
	Text and Video	1.623	6.269	0.797
	Text and Interaction	-2.216	6.025	0.715
Text and Graphics	Text and Video	2.214	6.390	0.731
	Text and Interactive	-1.625	6.151	0.793
Text and Video	Text and Interactive	-3.839	6.711	0.570

There were, however, differences between post-test scores among the control group and the multimedia group. In fact, all of the multimedia treatment groups had higher post-test scores than the control group. The text and interaction group for example had a mean post-test score of 48.125 while the control group had a mean post-test score of only 40.00. This represents a difference of (20.31%) and shows that those students in the text and interaction group tended to learn more than those in the control group (See Table 3). Differences between post-test scores and the multimedia groups were also seen. The largest of these differences was between the text and interactive treatment group and the text and video treatment group. In this case, the mean post-test

score for the text and interactive group was (8.67%) higher than the text and video group. This again seems to show that students are learning more from the text and interaction program. Overall the highest post-test scores were from the text and interaction group (48.125) followed by the text and graphics group (46.50), the test only group (45.909) and lastly the text and video group (44.286) (See Table 3)

Table 3: Media Comparisons

(I) GROUP	(I) Group Mean	(J) GROUP	(J) Group Mean	Mean Difference (I-J)	% Difference	Sig.
Control	40.000	Text Only	45.909	-5.909	14.77%	0.291
		Text and Graphics	46.500	-6.500	16.25%	0.258
		Text and Video	44.286	-4.286	10.71%	0.498
		Text and Interaction	48.125	-8.125	20.31%	0.185
Test Only	45.909	Text and Graphics	46.500	-0.591	1.29%	0.917
		Text and Video	44.286	1.623	3.54%	0.797
		Text and Interaction	48.125	-2.216	4.83%	0.715
Test and Graphics	46.500	Text and Video	44.286	2.214	4.76%	0.731
		Text and Interactive	48.125	-1.625	3.50%	0.793
Text and Video	44.286	Text and Interactive	48.125	-3.839	8.67%	0.570

Demographic Relationships

Text Only Treatment and Demographics

A total of 11 students (23% of all groups) took the text only test, of which there were 4 sophomores (36.37% of text only group), 5 juniors (45.45%), and 2 seniors (18.18%) (See Table 3). The sophomores in the group had a mean post-test score of 53.00 and a standard deviation of 7.58. The juniors in this group had a mean post-test score of 35.00 and a standard deviation of 10.00. The seniors in this group had a mean score of 50.00 and a standard deviation of 7.07.

Using the One Way ANOVA statistical test between classification and post-test scores, a significant relationship of ($p \leq 0.035$) was found along with an F value of 5.248. Further analysis using the least significant test (LSD) shows that the specific relationships are between the sophomores and juniors and between the juniors and seniors. The juniors had a much lower post-test score than both the senior class (30%) and the sophomore class (34%). While the reason for this relationship is not clear it does show that students tend to get more from a text only tutorial at different stages in their academic life.

There where a total of 7 students aged 22-25 (63.64%) in this group, 2 students (18.18%) aged 18-21, and 2 students (18.18%) aged 26-29. Those students aged 18-21 had a mean post-test score of 57.50, a standard deviation of 10.61 and a standard error of 7.50, while those students aged 22-25 had a mean post-test score of 40.71, a standard deviation of 10.58, and a standard error of 3.99, and lastly those aged 26-29 had a mean post-test score of 52.50, a standard deviation of 3.54, and a standard error of 2.50. Using the One Way ANOVA statistical test between age groups and post-test scores no significant relationship ($p \leq 0.124$) was found along with an F value of 2.735. While not significant, large relationships did exist between the mean post-test scores and age group. The highest post-test scores came from the 18-21 age group and were (29%) higher than the 22-25 age group and (9%) higher than the 26-29 age group.

A total of 6 students in this study were male (54.55%) and 5 were female (45.45%). The males in this group had a mean post-test score of 40.83 while the

females in this group had a mean post-test score of 52.00. Using the One Way (ANOVA) statistical test between gender and post-test scores, no significant relationship ($p \leq 0.114$) was found along with an F value of 3.058. The mean post-test score for the females within this group was 21% higher than the male group. While not significant, this does seem to show that females are learning more for this type of tutorial.

Given a significant value of 95%, ($p \leq 0.05$), significant relationships where found in the group between the text only post-test scores and the students classification. Therefore, hypothesis 3, *there is no significant relationship between students' post-test scores and their demographic profiles within the multimedia treatment groups,* was rejected.

Table 4: Text Only Demographic Comparisons

Classification	N	%	Mean	Std. Deviation
Freshmen	0	0	N/A	N/A
Junior	5	45.45	35.000	7.583
Sophomore	4	36.37	53.000	10.000
Senior	2	18.18	50.000	7.071

F Value	Sig.
5.248	0.035*

Post Hoc

Comparison	Mean Difference	Std. Error	Sig.
Sophomore vs. Junior	18	5.71	0.014*
Sophomore vs. Senior	3	7.12	0.685
Junior vs. Senior	-15	7.37	0.076**

*(P≤0.05)
**(P≤0.10)

Age Group	N	%	Mean	Std Devation
18-21	2	18.18	57.500	10.607
22-25	7	63.64	40.714	10.579
26-29	2	18.18	52.500	3.536
< 29	0	0	N/A	N/A
F Value	Sig.			
2.735	0.124			

Gender	N	%	Mean	Std Devation
Male	6	54.55	40.833	12.416
Female	5	45.45	52.000	7.583
F Value	Sig.			

Text and Graphics Treatment and Demographics

A total of 10 students (21% Δ) took the text and graphics treatment, of which there were 3 sophomores (30.00%), 6 juniors (60.00%), and 1 senior (10.00%) (See Table 4). The sophomores in this group had a mean post-test score of 46.67, a standard deviation of 7.64, and a standard error of 4.41. The juniors in this group had a mean post-test score of 47.50, a standard deviation of 10.37, and a standard error of 4.23. The seniors in this group had a mean post-test score of 40.00. Using the One Way ANOVA statistical test between classification and post-test scores, no significant relationship ($p \leq 0.779$) was found along with an F value of .259. Relationships, while not significant, could be seen between the seniors and the juniors and between the seniors and the sophomores. The seniors in the group had lower scores than both the juniors (16%) and the sophomores (14%). This seems to show that the seniors learn less from a graphics and text tutorial than either the sophomores or the juniors.

All students in this group fell into the same age group. There is therefore no comparative data between age and post-test scores.

A total of 6 students in this study were male (60.00%), and 4 were female (40.00%). The males in this group had a mean post-test score of 45.00 and a stand deviation of 10.00, while the females in this group had a mean post-test score of 48.75 and a standard deviation of 7.50. Using the One Way ANOVA statistical test between gender and post-test scores, no significant relationship ($p \leq 0.543$) was found along with an F value of 0.404. The mean post-test score for the females within this group was 8% higher than the male group. While not significant this does seem to show that females are learning more for this type of tutorial.

Table 5: Text and Graphics Treatment and Demographic:

Classification	N	%	Mean	Std. Deviation
Freshmen	0	0	N/A	N/A
Sophomore	3	30	46.667	7.638
Junior	6	60	47.500	10.368
Senior	1	10	40.000	N/A

F Value	Sig.
0.259	0.779

Age Group	N	%	Mean	Std Devation
18-21	0	0	N/A	N/A
22-25	10	100	N/A	N/A
26-29	0	0	N/A	N/A
< 29	0	0	N/A	N/A

F Value	Sig.
2.735	0.124

Gender	N	%	Mean	Std Devation
Male	6	60	45.000	10.000
Female	4	40	48.750	7.500

F Value	Sig.
0.404	0.543

Text and Interaction Treatment and Demographics

A total of 8 students (17% Δ) took the text and interaction treatment, of which there was 1 sophomore (12.5%), 3 juniors (37.5%), and 4 seniors (50%) (See Table 5). The sophomores in the group had a mean post-test score of 50.00. The juniors in this group had a mean post-test score of 38.33, a standard deviation of 23.63, and a standard error of 13.64. The seniors in this group had a mean post-test score of 55.00, a standard deviation of 17.80, and a standard error of 8.90. Using the One Way (ANOVA) statistical test between classification and post-test scores, no significant relationship ($p \leq 0.593$) was found along with an F value of .581. While not significant, large relationships were found. The juniors had a much lower post-test score than both the senior class (30%) and the sophomore class (23%). This seem to correspond to the data in the text only program and again shows that students are learning more from tutorials such as this one at different times in the academic life.

There were 6 students aged 22-25 (75%), and 2 aged 26-29 (25.00%) in this group. Those students aged 22-25 had a mean post-test score of 44.17, a standard deviation of 20.60, and a standard error of 8.41, while those aged 26-29 had a mean post-test score of 60.00, a standard deviation of 7.07, and a standard error of 5.00. Using the One Way ANOVA statistical test between age group vs. post-test scores, no significant relationship ($p \leq 0.347$) was found along with an F value of 1.039. While not significant, a large relationship did exist between the mean post-test scores and the age groups. The highest post-test

scores came from the 26-29 age group and were (26%) higher than the 22-25 age group.

Two students in this study were male (25%), and 6 were female (75%). The males in this group had a mean post-test score of 47.50 while the females in this group had a mean post-test score of 48.33. Using the One Way (ANOVA) statistical test between gender and post-test scores, no significant relationship ($p \leq 0.962$) was found along with an F value of 0.002. The mean post-test score for the females within this group was 2% higher than the male group.

Table 6: Text and Interaction Treatment and Demographics:

Classification	N	%	Mean	Std. Deviation
Freshmen	0	0	N/A	N/A
Sophomore	1	12.5	50.000	N/A
Junior	3	37.5	38.333	23.629
Senior	4	50	55.000	17.795

F Value	Sig.
0.581	0.593

Age Group	N	%	Mean	Std Devation
18-21	0	0	N/A	N/A
22-25	6	75	44.167	20.595
26-29	2	25	60.000	7.071
< 29	0	0	N/A	N/A

F Value	Sig.
1.039	0.347

Gender	N	%	Mean	Std Devation
Male	2	25	47.500	24.749
Female	6	75	48.333	19.664

F Value	Sig.
0.002	0.962

Text and Video Treatment and Demographics

A total of 7 students (15% Δ) took the text and Video treatment, of which there were was 1 sophomore (14%), 4 juniors (57%), and 2 seniors (29%) (See Table 6). The sophomores in the group had a mean post-test score of 35.00. The juniors in this group had a mean post-test score of 47.50, a standard deviation of 15.55, and a standard error of 7.77. The seniors in this group had a mean post-test score of 42.50, a standard deviation of 3.54, and a standard error of 2.50. Using the One Way ANOVA statistical test between classification and post-test scores, no significant relationship ($p \leq 0.716$) was found along with an F value of 0.363. While not significant, large relationship were found. The sophomores had a much lower post-test score than both the senior class (18%) and the junior class (26%).

No students aged 18-21 were in this group, 5 were aged 22-25 (71%), and 2 aged 29 or greater (29%). Those students aged 22-25 had a mean post-test score of 40.00, a standard deviation of 5.00, and a standard error of 2.236, while those aged 29 or greater had a mean post test score of 55.00, a standard deviation of 21.21, and a standard error of 15.00. Using the One Way ANOVA statistical test between age group and post-test scores, no significant relationship ($p \leq 0.148$) was found along with an F value of 2.922. While not significant, a large relationship did exist between the mean post-test scores and the age groups. The highest post-test scores came from the 29 and older age group and were (27%) higher than the 22-25 age group.

Three students in this study were male (43%), and 4 were female (57%). The males in this group had a mean post-test score of 50.00 while the females in this group had a mean post-test score of 40. Using the One Way ANOVA statistical test between gender and post-test scores, no significant relationship ($p \leq 0.319$) was found along with an F value of 1.224. The mean post-test score for the males within this group was 20% higher than the female group. While not significant, this does seem to show that males are learning more for this type of tutorial.

Table 7: Text and Video Treatment and Demographics:

Classification	N	%	Mean	Std. Deviation
Freshmen	0	0	N/A	N/A
Sophomore	1	14	35.000	N/A
Junior	4	57	47.500	15.546
Senior	2	29	42.500	3.536

F Value	Sig.
0.363	0.716

Age Group	N	%	Mean	Std Devation
18-21	0	0	N/A	N/A
22-25	5	71	40.000	5.000
26-29	0	0	N/A	N/A
< 29	2	29	55.000	21.213

F Value	Sig.
2.922	0.148

Gender	N	%	Mean	Std Devation
Male	3	43	50.000	18.028
Female	4	57	40.000	4.082

F Value	Sig.
1.224	0.319

Control Group and Demographics

A total of 11 students (23% Δ) were in the control group, of which there were 3 freshmen (27% of control group), 2 sophomores (18%), 5 juniors (46%), and 1 senior (9%) (See Table 7). The freshmen in this group had a mean score of 48.33, a standard deviation of 11.55, and a standard error of 6.67. The sophomores in the group had a mean score of 35.00, a standard deviation of 14.14, and a standard error of 10.00. The juniors in this group had a mean score of 35.00, a standard deviation of 12.75, and a standard error of 5.70. The seniors in this group had a mean score of 50.00. Using the One Way ANOVA statistical test between classification post-test scores, no significant relationship ($p \leq 0.443$) was found along with an F value of 1.010. While not significant, large relationships were found. The sophomores and juniors had a much lower post-test score than either the freshmen or senior classes. Both the sophomore and junior classes had mean post-test scores of 35, which were (30%) lower than the Senior students and (28) the freshmen students.

There where a total of 8 students (73%) aged 18-21 and 11 students (27%) aged 22-25 in this group. No students were aged 26-29, or greater than 29 within this group. Those students aged 18-21 had a mean post-test score of 38.13, a standard deviation of 12.80 and a (SD=4.53), while those students aged 22-25 had a mean post-test score of 45.00, a standard deviation of 13.23, and a (SD=7.64). Using the One Way ANOVA statistical test between age group and post-test scores, no significant relationship ($p \leq 0.451$) was found along with an F value of .620. However, mean post-test scores for the 22-25 age group were

(15%) higher than those of the 18-21 age. While not significant, it does seem to show that older students are learning more from the control group.

Five students in this study were male (45%), 5 were female (45%) and one did not select. The males in this group had a mean post-test score of 37.00 while the females in this group had a mean post-test score of 46.00. Using the One Way ANOVA statistical test between gender and post-test scores, no significant relationship ($p \leq 0.269$) was found along with an F value of 1.409. The mean post-test score for the females within this group was 20% higher than the male group. While not significant, this does seem to show that females are learning more form the control group.

Table 8: Control Group Demographic Comparisons:

Classification	N	%	Mean	Std. Deviation
Freshmen	3	27	48.333	11.547
Sophomore	2	18	35.000	14.142
Junior	5	46	35.000	12.748
Senior	1	9	50.000	N/A

F Value	Sig.
1.01	0.443

Age Group	N	%	Mean	Std Devation
18-21	8	73	38.125	12.800
22-25	3	27	45.000	13.229
26-29	0	0	N/A	N/A
< 29	0	0	N/A	N/A

F Value	Sig.
0.62	0.451

Gender	N	%	Mean	Std Devation
Male	5	45	37.000	15.248
Female	5	45	46.000	7.416
Not Selected	1	10	N/A	N/A

F Value	Sig.
1.409	0.269

Overall Comparisons

A total of 36 students (77%) were in the experimental group, while 11 were in the control group (23%). The Experimental group, which was composed of all four multimedia groups, had a mean post-test score of 46.25 and a standard deviation of 12.56 and a standard error of 2.09. The control group had a mean score of 40.00, a standard deviation of 12.65, and a standard error of 3.81. Using the One Way ANOVA statistical test between the experimental post-test-scores and the control group post-test scores, no significant relationship ($p \leq 0.156$) was found along with an F value of 2.080. While not significant, there was a (14%) difference between the control group and the experimental group showing that overall students did learn more from the multimedia tutorials than from the control group.

Chapter 5

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The findings in this study showed that there were no significant differences among any of the multimedia treatments when compared to either the control group or between the multimedia treatments themselves. Therefore, hypothesis 1, *there is no difference between multimedia treatments*, was not rejected. However, this research does show that differences do exist in the mean post-test scores even if not significant. This may show that students tend to retain more information in the multimedia tutorials than in the classical classroom. In addition, the mean post-test score for the Text and Interactive treatment was well above the rest of the treatment groups, which might show student retain more when using tutorials that require active participation.

In addition, this research showed significant relationships between the students' classification and their post-test scores within the text only media treatment. These relationships, juniors vs. sophomores and juniors vs. seniors, caused, hypothesis 2, *there is no difference between students demographic profiles and their post-test scores*, to be rejected. This relationship, classification vs. students post-test scores, may show that students learn more from tutorials than from classroom lectures at different stages in their academic life.

Implications for Hospitality Higher Education

A total of three recommendations for hospitality higher education came out of this study. The first recommendation is that multimedia tutorials in hospitality higher education should be designed with high levels of interactivity. The reason for this recommendation comes from the high post-test scores within the text and interaction treatment, which while not significant, were well above all the other treatments. The second recommendation is that hospitality tutorials implement moderate levels of graphics into their program. The reason for this recommendation is derived from the fact that post-test scores for students taking the text and graphic treatment were higher than all but the interactive treatment group. The last recommendation is that hospitality tutorials use only limited amounts of video. This recommendation corresponds to the low post-test scores seen in the text and video treatment, which while not significant, were well below all but the control group.

Limitation

This study was limited by three main factors, sample size, content design, and the lack of follow up testing. The sample size for this project was not large enough to get good feedback on the statistical analyses that were run. It is possible that with a larger sample size some of the multimedia comparisons would have different results. The second limitation deals with the context within the tutorials. It is possible that different types of content would have different impacts on the effectiveness of a multimedia tutorial. The last issue was the lack

of follow up testing. In order to get a full understanding of the effectiveness and retention rates of different multimedia tutorials, follow up testing really needs to be done.

Recommendations

It is the recommendation of this researcher that a more in depth study be done on a large population size, if possible across numerous hospitality schools. Secondly, it is the recommendation that additional research be done on the different types of content in order to determine the effectiveness of content type within multimedia tutorials. Third, more tutorials using the same types of media need to be designed to help understand the subtle differences within any particular media, i.e. video design 1 vs. video design 2. Lastly, it is the recommendation of this researcher that a more long-term study be done with follow-up testing to help determine any long term advantages of different media types on students.

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APPENDIXES

APPENDIX A

Text for Multimedia Programs

Multimedia Text

The following is a copy of the text used in all of the multimedia programs for this study. In addition, noted within the text are the specific areas from which the questions for the post-test were taken. Please refer to appendix B for actual post-test questions.

Part One: The History of Cruise Lines

Question #1 Appendix (B) The cruise line industry has been an increasingly important part of the overall hospitality industry since it beginnings in the mid 19th century. The first of these early cruise line companies was known as the P&O, Pennsylvania and Oriental Steam Navigation Company, and had among its guests the noted English Novelist William Makepeace Thackeray. **Question #2 Appendix (B)** Thackeray was also the first to give a published account of his journey in his book *Notes of a Journey from Cornhill to Grand Cairo.* His accounts of cruise life in those early days of cruise line history portray cruises very different from those of today. Noted in his book were accounts of seasickness, complaints about bugs, beggars and the high prices.

The second account of early cruise line history was given by the American humorist Mark Twain in 1867 on America's first cruise ship, the paddle wheel steamer Quaker City. Twain exploits chronicled in *The Innocent Aboard* show cruising life far different from that of today. He described how every evening after dinner guests would promenade the deck, sing hymns, say prayers, listen to

organ music in the grand saloon, read, and write in their journals and sometimes go to dances held on the upper deck.

Unlike the Quaker City most of the worlds early cruises were out of necessity. During the late 19th century and early twentieth century great masses of emigrants took early cruises to America in ships like the Titanic. This immigration rush speared the cruise line industry until the United States curtailed its immigration policy in the early 1920's. The 1920's also saw the end of World War II and the start of prohibition both of which helped the cruise industry rebound from the slowing in immigration. **Question #3 Appendix (B)** The war speared interest among teachers and students who started taking cruises to places like London, Paris, and Rome. Prohibition saw the start of day cruises which would pick up passenger in places like New York and travel outside United State costal water where alcohol could legally be served.

Question #4 Appendix (B) During the early 1930's the great depression caused a downturn in the number of vacationers who could afford to go on extended trips to Europe. In order to adapt to this the cruise line industry for the first time started to offer short inexpensive vacation / party cruises to Nova Scotia, Nassau, and Bermuda. The ships used for these voyages were made for transatlantic trips and therefore were ill suited for these types of cruises especially those in warmer climates. This time period also marks the first great image change for the cruise line industry. For the first time posters showed

passengers dressed in leisure clothes around outdoor pools instead of dressed up in business clothes. In addition, the new ships that were produced during this period were light colored, more open, and more resort-like.

The Second World War marked the next change in the industry. Most of the cruise ships, which where mainly owned by European interests, where turned into troop ships or stayed in port. This continued until 1945 when the rebuilding of Europe once again spurred a growing demand for ocean liners. This also marked the point when the United States started subsidizing the building of new vessels. One of the first of these new ships, the United States, launched in 1951 set a new world speed record on its first transatlantic crossing. **Question #5 Appendix (B)** All of this, however, came apart with the Pan America World Airways transatlantic flight of a Boeing 707 jet in 1958.

Question #6 Appendix (B) The birth of modern cruising started in the 1960's when Miami entrepreneur Leslie Frazer charter two ships, the Bilu and the Nili, and marked them exclusively for cruising. The growth continued in 1966 when Ted Arison, a young Israeli from Tel Aviv, joined with a Norwegian, Knut Kloster, to start Norwegian Caribbean Lines, NCL. By 1971 this partnership had transformed South Florida's contemporary cruising from a regionally marked collection of old transatlantic liners into a nationally marketed cruise line featuring brand-new vessels designed for Caribbean cruising.

At the same time Ed Stephan, a former hotelier from Miami, started Royal Caribbean Cruise Lines, RCCL. RCCL soon launched its own modern fleet of ships with a sleek, yacht-like profile. Ed Stephan helped to speed not only the growth of the Caribbean cruise market, but also that of the Norwegian cruise market which to this day RCCL—"Now known as Royal Caribbean International"—maintains a control over.

The birth of Princess cruise lines in the late 1960's moved the cruise line industry into the Mexican Riviera. Started by Stanley McDonald, by 1972 Princess Cruise Line had four ships. At the same time a former bush pilot, Chuck West, founded West's cruise line and began offering cruises along Alaska's inside passage. The next big boast for the cruise line industry, especial Princess cruise lines, was the 1977 premier of the TV show Love Boat. **Question #7 Appendix (B)** Love Boat used two of Princesses ships to show audiences life aboard cruise ships. Love Boat ran for ten years and became one of America's favorite TV shows.

In 1971 Ted Arisen left Norwegian cruise lines and started Carnival cruise lines. Arisen bought a laid-up ocean liner, the Empress of Canada, and renamed it the Mardi Gras. The Mardi Gras ran aground soon after leaving port but was soon put back into service. Arison had to make changes in order to compete and decided that people wanted fun more than new ships. Carnival soon started offering more activities and entertainment than its competitor. By 1975 Ted

Arisen's vision paid off and Carnival became profitable and was soon able to add new ships. Today it is the world's largest cruise line.

The cruise line industry today consists of 35 cruise lines in North America alone. As of 1996, 57 million passengers took cruises from North American ports making up about 65% of all cruise travel.

Cruise lines are now divided into various market segments. **Question #8 Appendix (B)** The largest of these segments, according to Cruise Lines International, CLIA, is the contemporary / value segment, which are the popular-priced mass-market lines. Cruise lines such as Carnival, Norwegian, and Royal Caribbean are all part of this popular segment. The next segment, premium cruise lines, charge more and carry fewer passengers per ton of space in addition to a few more amenities. Examples of this segment include Celebrity, Holland America, and Princess. **Question #9 Appendix (B)** The next main segment is the luxury segment, which charges an average of $800 per night. Examples of this segment include Crystal, Cunard, Silversea, and Windstar. The final cruise line segment is that of specialized cruises. These vessels specialize in a single destination and include American Hawaii Cruises and Delta Queen Steamboat.

Question #10 Appendix (B) Today there are three main players in the cruise line industry, Carnival the largest, Royal Caribbean International, and the smallest of the three P&O. Below is a list of cruise lines owned by the big three.

Carnival:

Carnival Cruise Lines

Holland America Line-Westour

Windstar

Seabourn and Costas

Royal Caribbean:

Celebrity Cruise Lines

P&O:

Princess Cruises

Princess Tours

P&O UK

Question #11 Appendix (B) Today the average cruise passenger is 51, has a household income of $64,000, and pays $200 a day for an all-inclusive vacation that includes a cabin, four to five meals a day, and entertainment.

Part Two: Cruise Line Departments

Today's cruise ships are divided into three main departments: ship operations, engineering and hotel operations. The first of these departments, ships operations, handle the actual running of the ship itself. The head of this

department, as well as all the other ship departments, is the ship captain. Ship operations are handle by professionals specializing in seamanship and adhere to their own set of laws called maritime law. All of these personal wear uniforms showing their specific rank and duties that they perform. The two main function of this department are ship navigation and ship safety.

The next department, engineering is responsible for the mechanical operation and upkeep of the ship. This includes the power supply, ship engines, plumbing, electrical systems and general repairs. This department consists of a wide range of specialist such as plumbers and electricians as well as general engineers. All of these personal are under the control of the Chief Engineer, who reports to the Chief officer.

The last of the cruise ship departments is the hotel department. **Question #12 Appendix (B)** This department is the department that makes a cruise ship a cruise ship and is by far the largest of the three main departments. The head of this department is the Hotel Manager or General Manger, GM. The crew within the hotel department is primarily responsible for creating the vacation experience of the passengers on board. While there are similarities to a land-based hotel, the hotel department on a cruise ship is uniquely different. One of the major differences is that there is no onboard sales and marketing department. Another is that hotel staffs on cruise ships do not have to check in any of the guest, a function done on land. The last major difference is the large number of sub-

departments or divisions that the hotel department must oversee. A few of these divisions include, food and beverage, room service, medical care, entertainment, shore excursions, beauty salons, health spas, gift shops, photography, and casino operations. With so many sub-department functions to oversee, some of the smaller cruise ships will outsource certain departments like food and beverage.

One of the most important hotel department divisions is the Purser's office. The head of this division is the chief purser who over sees a division responsible for the ship banking, human resources, and complaint handling. **Question #13 Appendix (B)** The largest of these duties is the banking side of the division but complaints like room problems, lost luggage etc. fall to the pursers division, which has the authority to fix any problem as they see fit. In addition, the purser's office runs the front office and clears the ship at foreign ports.

In most cruise ships cash is not used for everyday transactions. A credit system is used to handle guest transaction. Once onboard guest are asked to register a credit card or to put cash down at the purser's office as a deposit. All transactions made once onboard are then charged to that account. Today most guests receive, from the Purser's office, an all-purpose, magnetic-coded card that serves as identification, room key, and charge card. In addition this card may have room number, dinning time, and table assignments printed on it.

Another important hotel division is the Food and Beverage department, F&B. Research has shown that food is one of the most important aspects of a cruise from the passenger's point of view. **Question #14 Appendix (B)** Food is included in the price of most cruises, however beverages are not and represent the largest single source of onboard revenue for all of the major cruise lines. In addition to feeding the passengers the F&B department is responsible for feeding the crew who may be aboard for months at a time and come from diverse cultures with different likes and dislikes. **Question #15 Appendix (B)** The head of the F&B department is the F&B manager. Some of the other positions within the F&B department are assistance F&B manager, executive chef, the maitred', bar manager and provision master.

There are several points that the F&B department has to be concerned with. The most important of these are safety, sanitation, and health. Because of this everything in the F&B department is highly structured according to regulations, which must be followed with no expectations. The F&B department on cruise ships is different from that of a land based hotel in several ways. First, food cost issues are handled on land before the ship cruises. This means that the F&B department doesn't have to worry about food cost. The next difference is that of people skills, including communication. This is do to the diverse cultures and customs on all cruise ship. Another large issue is serving time. Since passenger have no were else to go to eat the F&B department must find ways to serve all

passenger in a fast but courteous way in order in insure all get food and to allow for the changing of meals.

The housekeeping department on a cruise ship has many similarities to that of any land-based hotel. It is the responsibility of housekeeping to clean and do general maintenance for all of the cruise ship cabins. In addition housekeeping is responsible for passenger laundry and dry cleaning as well as all crew uniforms, linen, sheets and towels.

Question #16 Appendix (B) There are a few differences between a shore based housekeeper and a cruise ship housekeeper, called cabin steward's. Some of the differences are guest interaction, cabins are serviced twice a day, and many cabin stewards have other jobs or responsibility on board such as lifeboat drills or helping with the wait staff. While on a shore-based hotel most housekeepers have little interaction with the guest the opposite is true on a cruise ship. In fact most cabin stewards count on the gratuity of guest for part of their income and therefore must interact with the guest. One of the other differences of the housekeeping staff on a cruise ship is the number of hours that are worked per week. A cabin steward may work up to 70 hours a week while a land-based housekeeper will rarely work more than 50 hour per week.

The Cruise Director and staff are one of the most visible of all divisions working for the hotel department. **Question #17 Appendix (B)** The members of

this division are entertainers, musicians, and children's counselors and they are responsible for directing the daily activities onboard and onshore cruise ships. One of the most important functions for the cruise director is to sell and coordinate shore excursions while at destination ports. Shore excursions represent a large part of the onboard revenue for any cruise line. Some examples of shore excursions are white-water rafting, snorkeling expeditions, tours of ancient ruins, rain forest and volcano expeditions, golf, nightclubs, shopping and much more. Typically tours are contracted out of locals on shore and sold by the cruise director and staff in advance of arrival.

Another important part of the cruise director's job is to make sure there are plenty of daily activities onboard the ship for guest. In most cases activities are put on a daily activities calendar, which is given to all guest when they board. Some examples here include aerobic classes, bingo, tennis tournaments, dancing lessons, movies, cooking demonstrations, lectures, and more. Finally it is the responsibility of the Cruise director to monitor all of the activities both onboard and ashore to insure that the highest level of quality is maintained.

The medical department is another important division of the hotel department. While land based hotels can call for medical care if a guest gets sick, a cruise ship may be hundreds of miles from medical help. Therefore cruise ships maintain a medical division with a full staff of medical doctors and nurses. In addition, most modern ships have all the state of the art medical equipment to

take care of almost all medical needs. **Question #18 Appendix (B)** Statistics however show that only about three percent of passengers on cruise lines need medical care. In fact, most of the medical care preformed on a cruise ship is preformed on crewmembers not guest.

Part Two: A Look at Cruise Line Service

Quality management on a cruise ship is the bonding block that links all the various departments and divisions together and ensures good customer service. Atle Brynestad, founder of Seabourn cruises stated that there were two keys to insuring good customer service. **Question #19 Appendix (B)** The first is that you have to take care of your internal guests, the crew, before you can expect them to take care of your external guests. The second is that the guest is Seabourn's most important asset. Therefore, it is the staff's job to find out what the guest needs and meet those needs and more. In addition, all Seabourn staff are given a copy of a document called Twelve Points of Seabourn Hospitality. There points include:

- Any crewmember who receives a guest complaint "owns" that complaint. He or she is responsible for ensuring guest satisfaction.
- Always remember the importance of teamwork and service to co-workers.
- Communicate guest problems to fellow employees and management.
- Take responsibility for you own behavior.

- Do not be afraid to make a mistake as long as your efforts are sincerely intended to do your job in a better way.

Another important part of Quality management is to have a good set of procedures. Operation procedures insure uniform solutions to problems or tasks. One example of this is Seabourn's procedures for proper management style. Its seven part are:

1. I will support front line employees, not try to control them.
2. I believe every employee wants to do the best job he or she can.
3. I fully realize that my employee's attitudes and feelings affect their performance, and that my supervision can affect those attitudes and feelings.
4. I will give positive feedback to my colleagues as often as possible.
5. When I need to give negative feedback, I will refer only to facts—not to people. I will say, "This ashtray needs cleaning." I will not say, "You don't take proper care of ashtrays," or, even worse, "You are a sloppy person."
6. I will listen to the ideas of my employees and give them full credit when they contribute to success.
7. I will give each of my colleagues all the respect that is their right as a human being. This means treating them, as they want to be treated.

Question #20 Appendix (B) The next step in insuring quality service is to take passenger comments serious. This is one of the best ways cruise lines

have to see if the customer is receiving great service and to know what they want in the future. This type of data can be obtained either verbally by the guest or in the form of a comment card given to the guest. In the case of comment cards, raking can be used to help determine overall customer service.

These are just a few examples of how cruise lines are starting to ensure quality service and just like all the other hospitality industries service quality is a must.

APPENDIX B

Post-Test Questions and Answers

Post-Test Questions

The following is a copy of the post-test questions used in all of the multimedia programs and in the classroom control group for this study. Correct answers are marked with an (X). Please refer to appendix A for location of question origin.

Post-Text:

1. When was the birth of the cruise line industry?

   [ ] a. 1790's [ ] b. 1820's [X] e. 1840's

   [ ] c. 1890's [ ] d. 1910's

2. Who was the first person to give a written account of cruise line life?

   [ ] a. Mark Twain [ ] b. Ted Arisen [ ] e. Neither a, b, c, or d

   [ ] c. Chuck West [X] d. William Thackeray

3. Which of the following speared interest in cruising among teachers and students in the 1920's?

   [ ] a. Prohibition [ ] b. The Start of the Olympics [ ] e. Neither a, b, c, or d

   [X] c. The end of World War I [ ] d. Lower Prices

4. When were the first vacation / party cruises offered?

[ ] a. 1890's [ ] b. 1910's [ ] e. 1920's

[ ] c. 1900's [X] d. 1930's

5. In what year was the first Pan American World Airways first transatlantic flight of a Boeing 707 made?

[ ] a. 1948 [ ] b. 1953 [ ] e. Neither a, b, c, or d

[X] c. 1958 [ ] d. 1962

6. Which cruise line started by Miami entrepreneur Lesle Frager ushered in the birth of modern cruise lines?

[X] a. Norwegian Caribbean Lines [ ] b. Royal Caribbean Cruise Lines [ ] c. Carnival Cruise Lines[ ] d. Princess Cruise Lines

[ ] e. Royal Caribbean Cruise Lines International

7. What cruise line was the TV show The Love Boat based on?

[X] a. Princess Cruise Lines [ ] b. Carnival [ ] e. Neither a, b, c, or d

[ ] c. West's Cruise Lines [ ] d. Royal Caribbean Cruise Lines

8. Which of the following is not a contemporary / value cruise line?

[ ] a. Carnival [ ] b. Royal Caribbean [ ] e. Neither a, b, c, or d [ ] c. Norwegian [X] d. Princess

9. What is the average daily cost per person on a luxury cruise line? ***

[ ] a. $500 [ ] b. $600 [ ] e. Neither a, b, c, or d

[X] c. $800 [ ] d. $1000

10. Which of the following is today's largest cruise line?

[ ] a. Norwegian Caribbean Lines [ ] b. Royal Caribbean Cruise Lines [X] c. Carnival Cruise Lines [ ] d. Princess Cruise Lines

[ ] e. Royal Caribbean Cruise Lines International

11. How old is the average cruise line passenger?

[ ] a. 33 years [ ] b. 37 years [ ] e. 41 years

[ ] c. 46 years [X] d. 51 years

12. What is the largest department on most of today's cruise ships?

[ ] a. Ships operations [ ] b. Engineering [ ] e. Neither a, b, c, or d

[ ] c. Food and Beverage [X] d. Hotel

13. What is the biggest function of the Purser's office?

[X] a. Banking [ ] b. Problem Handling [ ] e. Neither a, b, c, or d

[ ] c. Human Resources[ ] d. Rooms directing

14. What is the largest source of onboard revenue for most cruise ships?

[ ] a. Food [ ] b. Shows [ ] e. Neither a, b, c, or d

[X] c. Beverages [ ] d. Excursion packages

15. Which of the following is not a food and beverage position?

[ ] a. Executive Chef [ ] b. maitred' [ ] e. Neither a, b, c, or d

[X] c. Bar Steward [ ] d . Provision Master

16. What is not a difference between shore based hotel house keeping and ship based hotel housekeeping?

[ ] a. Guest interaction [ ] b. Number of hours worked per week

[X] c. Cleaning standards [ ] d. Daily cleaning routine

[ ]e. Neither a, b, c, or d

17. Which of the following would not be classified as a part of the Cruise directors' staff?

[ ] a. Entertainer [ ] b. Musician [ ] e. Neither a, b, c, or d

[ ] c. Children's counselor [X] d. maitred'

18. About what percentage of guest need medical care when on a cruise?

[ ] a. 1% [X] b. 3% [ ]e. Neither a, b, c, or d

[ ] c. 5% [ ] d. 9%

19. What is one of the two main keys to insuring good customer service?

[X] a. Taking care of the internal guest first [ ] b. Interacting with guest

[ ] c. Owning a guest complaint [ ] Taking responsibility for your own actions

[ ] e. Neither a, b, c, or d

20. Which of the following would give a hotel GM on a cruise ship the best idea of general service quality?

[X] a. Comment Card [ ] b. Room inspection report [ ] e. Neither a, b, c, or d

[ ] c. Ask a few guest about there service [ ] d. Average number of complaints

APPENDIX C

General Information Questions

General Questions

The following is a copy of the demographic questions used in part one of the multimedia programs and at the beginning of the post-test in the classroom control group for this study.

1. Classification:

   [ ] Freshman (0 – 30hrs) [ ] Sophomore (31 – 60 hrs)

   [ ] Juniors (61 – 90hrs) [ ] Senior (>90 hrs)

2. Please list your department and college.

   _____

3. Please list your major. If undeclared please state undeclared

   _____

APPENDIX D

Demographic Questions

Demographic Questions

The following is a copy of the demographic questions used in part four of the multimedia programs and at the end of the post-test in the classroom control group for this study.

1. Age:

   [ ] 16 – 19 years [ ] 20 – 23 years

   [ ] 24 – 29 years [ ] > 29 years

2. Gender:

   [ ] Male [ ] Female

APPENDIX E

Students Greeting Form

Greetings:

The purpose of this study is to determine whether differences in multimedia types (Graphics, Video, and Interaction) have an affect on students' retention rates when using multimedia tutorials. You will be given the opportunity to take part in this study during your regularly scheduled class period on September 25th in the Class Room Building rooms 406 and 407. The tutorial will take about 35 minutes. Your participation is extremely important to the outcome of this study.

The tutorial will consist of four parts, general information, cruise line tutorial, a post-test, and demographics. Please try to answer all answers to the best of your ability.

Robert T. Miles, a Master's candidate in the School of Hotel and Restaurant Administration, is conducting this study along with Dr. Hailin Qu, Professor and Graduate Coordinator of the School of Hotel and Restaurant Administration at Oklahoma State University. Your participation is voluntary and if you do participate your responses to any of the questions in this study are completely **voluntary**, **anonymous**, and will be kept strictly **confidential**. The responses will be reported in aggregate form.

If you would like to receive the results of this study, please send an email to tmiles@ptsi.net with your name and email address. Thank you for your participating in this study. If you have any questions or need further assistance, please call me at (405) 7332-2402, or contact Sharon Bacher, Institutional Review Board Secretary, 204 Whitehurst, Oklahoma State University, Stillwater, OK 74078; (405) 744-5700. I look forward to you participation, and again, thank you.

Sincerely,

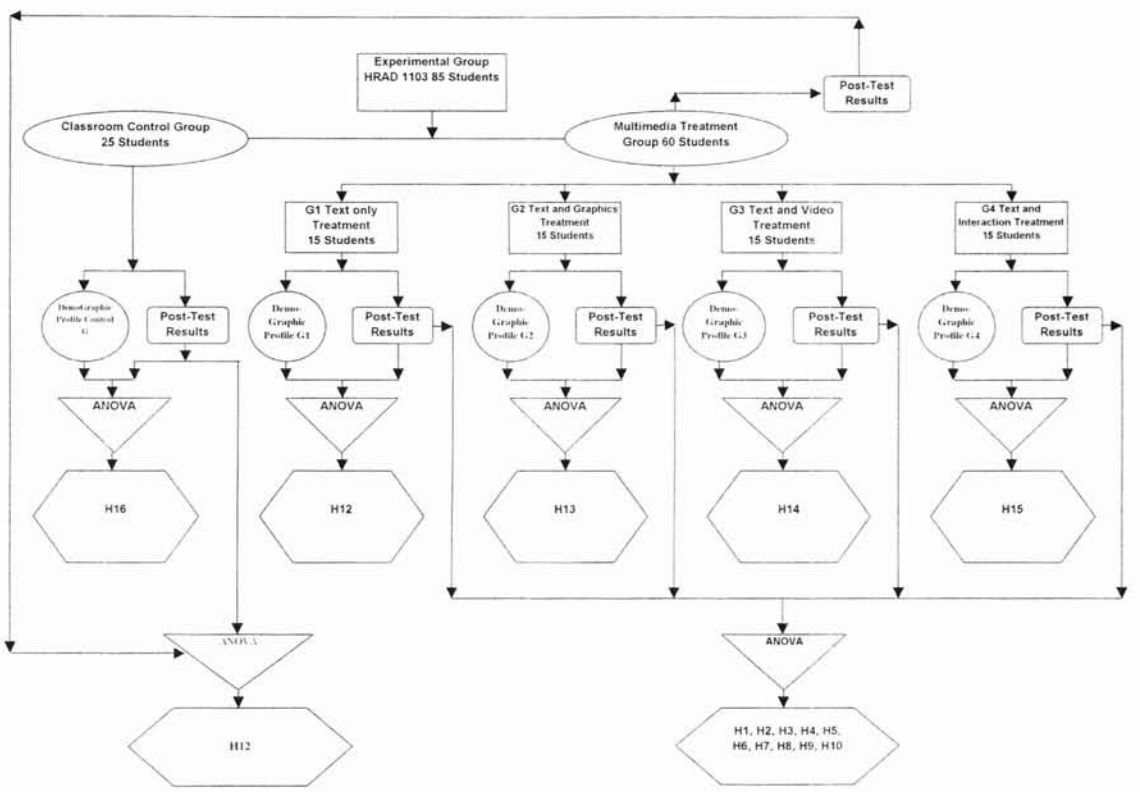
Robert T. Miles
Master's Candidate
Coordinator
School of Hotel and Restaurant Administration
Oklahoma State University
E-mail: tmiles@ptsi.net

Hailin Qu, Ph.D.
Professor and Graduate

School of Hotel and Restaurant Administration
Oklahoma State University
E-mail: qhailin@okstate.edu

APPENDIX F

Methodology Flow Chart



Note: Statistical techniques are represented by an inverted triangle, targeted result by a rounded rectangle, main groups by an oval, and subgroups by a rectangles.
Abbreviations: G=group, and H=Hypothesis

APPENDIX G

Internal Review Board Form

Oklahoma State University
Institutional Review Board

Protocol Expires: 9/18/2003

Date: Thursday, September 19, 2002 IRB Application No HE0315

Proposal Title: THE EFFECTIVENESS OF MULTIMEDIA LEARNING IN HOSPITALITY HIGHER EDUCATION

Principal Investigator(s):

Robert Miles
426 IBA Hall
Stillwater, OK 74078

Hailin Qu
201 HEWS
Stillwater, OK 74075

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Dear PI :

Your IRB application referenced above has been approved for one calendar year. Please make note of the expiration date indicated above. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved projects are subject to monitoring by the IRB. If you have questions about the IRB procedures or need any assistance from the Board, please contact Sharon Bacher, the Executive Secretary to the IRB, in 415 Whitehurst (phone: 405-744-5700, sbacher@okstate.edu).

Sincerely,

Carol Olson, Chair
Institutional Review Board

Oklahoma State University
Institutional Review Board

Protocol Expires: 9/18/2003

Date : Wednesday, October 09, 2002 IRB Application No HE0315

Proposal Title: THE EFFECTIVENESS OF MULTIMEDIA LEARNING IN HOSPITALITY HIGHER EDUCATION

Principal Investigator(s) :

Robert Miles
426 IBA Hall
Stillwater, OK 74078

Hailin Qu
201 HEWS
Stillwater, OK 74075

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s) : Approved **Modification**

Please note that the protocol expires on the following date which is one year from the date of the approval of the original protocol:

Protocol Expires: 9/18/2003

Signature

Carol Olson, Director of University Research Compliance

Wednesday, October 09, 2002
Date

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modifications to the research project approved by the IRB must be submitted for approval with the advisor's signature. The IRB office MUST be notified in writing when a project is complete. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

VITAE

Robert T. Miles

Candidate for the Degree of

Master of Science

Thesis: THE EFFECTIVENESS OF MULTIMEDIA LEARNING IN HOSPITALITY HIGHER EDUCATION

Major Field: Hospitality

Biographical:

Personal Data: Born in Guymon, Oklahoma, On October 22, 1977, the son of Robert and Joyce Miles.

Education: Graduated from Guymon High School, Guymon Oklahoma in May 1997; received Bachelors of Science degree in Mathematics from Oklahoma Panhandle State University, Goodwell, Oklahoma in July 2000. Completed the requirements for the Master of Science degree with a major in Hospitality Administration at Oklahoma State University in (December, 2002)

Experience: Employed by Bob Miles Insurance as office manager, 2000-2001; employed by The Atherton Hotel @ OSU as a guest service representative, 2001 to present.

Professional Memberships: Graduate Student Association

EFFICACY OF MOIST-SOIL MANAGEMENT TECHNIQUES ON HACKBERRY FLAT WILDLIFE MANAGEMENT AREA: RESPONSE OF VEGETATION, EXISTING SOIL SEED BANK, AND WATERFOWL

By

OWEN DEWAYNE MILLER

Bachelor of Science

Oklahoma State University

Stillwater, Oklahoma

1998

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
In partial fulfillment of
the requirements for
the Degree of
MASTER OF SCIENCE
August, 2002

EFFICACY OF MOIST-SOIL MANAGEMENT TECHNIQUES ON HACKBERRY FLAT WILDLIFE MANAGEMENT AREA: RESPONSE OF VEGETATION, EXISTING SOIL SEED BANK, AND WATERFOWL

Thesis Approved:

Thesis Advisor

Dean of the Graduate College