A comparison of interactive televised courses, and traditional face-to-face courses at California State University, San Bernardino

Richard Murray

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A COMPARISON OF INTERACTIVE TELEVISIONED COURSES, AND
TRADITIONAL FACE-TO-FACE COURSES AT CALIFORNIA
STATE UNIVERSITY, SAN BERNARDINO

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Education:
Instructional Technology

by
Richard Murray
September 2003
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Approved by:

Dr. Eun-Ok Baek, First Reader

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Date 9/2/03
ABSTRACT

This study compared two groupings of students at California State University, San Bernardino (CSUSB). The first group was composed of on-campus students instructed in the traditional face-to-face format. The second group received the same instruction by way of closed circuit interactive television (ITV) on the satellite campuses of Palm Desert, Victor Valley, and Moreno Valley. The study provides comparisons of student satisfaction and student performance between the two mediums. The design of the study holds teaching methodology constant. The variable is the instructional delivery system. The delivery system consisted of two levels, the traditional classroom model, and interactive television. It was found that as a group, students who received instruction with interactive television reported significantly higher levels of satisfaction with the courses than their counterparts in the traditional classroom. However, when the satellite sites were examined individually, significant differences between the campuses were revealed.
ACKNOWLEDGMENTS

Special thanks need to be given to the many people who helped me on this project. The faculty: Pam Schram, David Reifer, and Dennis Kroeger were all very helpful in allowing me to use their classes in my survey, and providing me with their grade distributions. The staff: Cynthia Flores and Bill Gray both had a hand in providing helpful assistance at crucial points throughout the process. Bonnie Butterfield answered important questions. Chani Beeman provided the SPSS expertise. Special thanks goes to Tim Thelander for developing the master's thesis template, and for knowing all things involved in the process of producing a final product. Thanks to Dr. Eun-Ok Baek for advising me and sacrificing part of her summer vacation to review my thesis. Dr. Richard Ashcroft, my second reader, provided insightful edits and gave up part of his summer too. Thanks to all.

Above all, I'd like to acknowledge and thank Dr. Carl Pitts for his help, guidance and genuine interest in this project.
DEDICATION

This project is dedicated to my mother and my father who believe in me, support me, love me, and let’s face it, have put up with me all my born days. Without either one of them, I could never have pulled this off.
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CHAPTER ONE

BACKGROUND

Introduction

With today's advances in distance learning technology, correspondence courses via the US mail have, in effect, become obsolete. Technological advances in synchronous compressed video and asynchronous, web-based learning environments have vastly and rapidly revolutionized distance learning. A relatively new concept of a virtual classroom is a reality for many students in today's universities. The term virtual classroom generally refers to a classroom where the instructor is not physically present. The methodology of teaching in a virtual classroom is being redefined almost as rapidly as advances in new technology are introduced into the marketplace. The need to study these evolving forms of instructional environments and their effect upon student performance and student satisfaction provide an important and much needed opportunity for research.

Two-way closed circuit video courses, the most popular method for adapting lecture style courses for distance learning, are routinely offered as a means of providing access for students on satellite campuses to
classes taught from the main campus. At California State University, San Bernardino, students enrolled at Victor Valley, Moreno Valley, and Palm Desert frequently are faced with the two-way closed circuit video format as their only option for taking required courses.

Purpose of the Project

This is a survey study and is designed to compare the differences of student perceptions and performance between the traditional on-campus course, and its off-campus counterpart taught simultaneously at the satellite sites via a two-way closed circuit video format. The ultimate intent of this study is to provide results that shed light on areas of the CSUSB distance learning program that up until now have not been systematically studied.

Context of the Problem

Much like any business, universities are faced with a certain amount of pressure to grow and generate new business, or in this case, new students. The current state of technology has opened doors to new methods of course delivery that were previously unavailable. CSUSB offers partially online courses, fully online courses, and courses offered in the two-way, closed circuit video format. This two-way video format frequently is favored as
a means of delivery because it requires the least amount of change in instructional methodology from the participating professor. Two-way video courses (otherwise known as compressed video courses or interactive television) are intended to offer students the same lecture as students on the main campus, the same opportunity to ask questions via a desktop microphone, and the same access to course materials. There is even a facsimile of face-to-face contact by means of a compressed video image.

Are students at satellite sites as satisfied with the classes as students who have regular face-to-face contact with the professor? And are the students performing as well as students on the main campus? This study is an attempt to answer these research questions.

Significance of the Project

In this era of heightened competition for delivery of quality goods and services, clearly it is significant to produce a preferred product. Delivering distance education to students who do not travel to the main campus is a service. It is also a product with economic value to the university. It is of ethical concern that the university produces distance learning courses with a perceived
quality level similar to that of the main campus. And it is a matter academic reputation that the university maintains a uniform level of effectiveness when distributing the learning environment.

In light of today's California budget woes, the need for cost effective offerings that maintain the university’s demand for quality education is more pressing now than it has been for a number of years. At the same time, student satisfaction with these courses should be of great concern to the university. Future growth of distributed learning will depend greatly on how current students perceive the medium as a learning environment.

Assumptions

The following assumptions were made regarding the project:

1. Delivery of the learning environment is uniform to all satellite campuses.
2. The professor gave no special consideration to student grades vis-à-vis the campus they were on.

Limitations and Delimitations

During the development of the project, a number of limitations and delimitations were noted.
Limitations

The following limitations apply to the project:

1. The scope of this project is limited to four distance learning courses taught during one quarter, with a total of 214 participants in the survey. The population of all distance learning courses at CSUSB is much greater than this. A more comprehensive study could include web-based courses, hybrid courses (a combination of both face-to-face and online), and the balance of the closed circuit video courses that were not included in this study.

2. The anonymous nature this survey disallowed a statistical correlation between grades and satisfaction with the differing campuses involved in the survey.

Delimitations

The following delimitations apply to the project:

1. Grades collected reflect G.P.A s of students involved in this survey. Cumulative G.P.A s from the differing campus sites (both distance and non-distance courses) were not collected. This is to say that differing campus sites may have predominately higher or lower G.P.A s in
relation to each other, but there is no way to know if differing campus sites have unique G.P.As unless all campus site grades are collected and analyzed.

Definition of Terms

The following terms are defined as they apply to the project.

- **Virtual classroom** - A class conducted by a professor who is not physically present. Examples include; live chat sessions, web based learning environments, videotapes, video conferencing courses, interactive video conferencing or any combination of above mentioned tools or technologies used together to create a learning environment.

- **Distance learning** - Any one of several modes of virtual classrooms.

- **Remote and satellite** - Essentially these two terms mean the same thing—separated from the main campus by location.

- **Host** - This is the campus site where the instruction originates.

- **Compressed video** - The means by which a live image is broadcast to satellite locations.
• Interactive television (ITV) - A method of distance learning whereby the student can ask questions of a professor from a remote location during a live video feed.

• Outcome evaluation - A method used to determine effectiveness in a reliable way. The purpose of outcome evaluation is to demonstrate effectiveness, or lack of effectiveness, to others.

• Satisfaction - The student's perception of how well, and to what degree their needs are being met.

• Performance - Usually a two-stage process where goals are predetermined and efforts are then made to achieve those goals. Performance is how well the goals are achieved. In the case of this study, grades are used to measure performance.

Organization of the Thesis

The thesis portion of the project was divided into five chapters. Chapter One provides an introduction to the context of the problem, purpose of the project, significance of the project, limitations and delimitations and definitions of terms. Chapter Two consists of a review of relevant literature. Chapter Three documents the steps used in developing the project. Chapter Four presents the
results and discussion from the project. Chapter Five presents conclusions and recommendations drawn from the development of the project. Project references follow Chapter Five. The Appendices for the project consists of: Appendix A; Satisfaction Survey Template, Appendix B; Demographic Information, Appendix C; Student Comments, Appendix D; Informed Consent, Appendix E; Debriefing Statement. Finally, the Project references are presented.
CHAPTER TWO

REVIEW OF THE LITERATURE

Introduction

Comparing traditional face-to-face and distance learning instruction has concentrated primarily on outcome measures such as grades and learning. A problem of semantics arises, however, if one wants to review the literature concerning the distinction between face-to-face instruction and distance learning. Distance learning has become a catchall phrase that includes postal correspondence, asynchronous, synchronous, web-based, on-line, partially on-line, hybrid, video, televised, interactive televised (ITV), and two-way compressed video courses (which is another way of saying ITV). The definitions are numerous. This study is a comparison of ITV and face-to-face educational methods.

Though researchers have devoted many studies to testing student outcomes for ITV courses, few studies have focused on student satisfaction with fully interactive televised courses (Anderson, Banks, & Leary, 2002). This study is an attempt to answer an important and fundamental question that remains largely overlooked and understudied at CSUSB -- the importance of student satisfaction with
ITV. This literature review discusses how researchers have approached measuring outcomes of both satisfaction and performance in distance learning, with an emphasis on the ITV format.

Because of the expense associated with televised courses, researchers in the early years sought to prove that student performance outcomes justified the high cost of implementing and maintaining televised courses (Keegan, 1986). This is an attitude that prevails today. Russell (1999) identified 355 studies in which a comparison of distance learners and traditional students showed no significant differences in classroom outcome measures. As noted by Russell, it is generally accepted that ITV courses, when compared with on-campus courses, have demonstrated an equal level of student achievement. However, within those studies mentioned by Russell, there are undoubtedly a variety of methods researchers have used for analyzing outcomes. The following is a sampling of some of those methods.

**Meta-Analysis**

One of the methods some investigators have used to answer the face-to-face versus ITV question is the meta-analysis, an approach designed to provide an overview by reducing numerous studies to single variables. Allen,
Bourhis, Burrell, and Marbry (2002), reviewed the literature where distance learning and traditional face-to-face instruction have been compared. Their approach was to mass together results from all types of distance learning courses as one variable, and results from traditional face-to-face classes as another variable to find out if there was a difference in student satisfaction. A meta-analysis such as this, Allen maintained, can provide a sense of consistency whereby a more accurate picture of the relationship can emerge.

Allen's attempt at generating a "more accurate picture of the research" includes comparing all modes of distance learning, from postal correspondence courses to sophisticated interactive television courses. The stipulation for inclusion in the analysis was that the study had to compare student satisfaction with a distance education course to a course using traditional face-to-face methods of instruction. A problem immediately becomes apparent. Unless both face-to-face and ITV courses were taught in exactly the same way, with the same professor, saying the same thing and using the same level of enthusiasm, there is a high probability of spurious data. Due to this problem, Allen's conclusion that; "The objections to distance education should not be based on
the issues related to student satisfaction; students find distance learning as satisfactory as traditional classroom learning formats", is questionable at best.

**Standardized End-of-Semester Evaluation Forms**

A study that counters this finding analyzed 3,282 students on the difference between on-campus classes and interactive televised classes. Anderson et al. (2002) used information from a database of standardized end-of-semester student evaluation-of-teaching forms. These evaluation forms were not designed to evaluate distance learning, and therefore had no specific questions about the medium. However, the researchers in this case were looking for an objective overview of student satisfaction. They felt that specific questions pertaining to the medium could be leading and would skew the data. The data they then collected were organized into three campus categories: traditional, host, and remote classes. The host and remote classes were both taught by the same professor simultaneously utilizing an ITV format. The traditional class was instructed using a face-to-face modality with no ITV instruction. When all three categories were compared, the remote site classes had the highest mean score on all 23 questions asked. The higher scores reflected less satisfaction. The scores went down
with host site instruction, and then again with the face-to-face instruction. The authors feel this phenomenon is consistent with the "halo effect", the tendency for a respondent's perception of one facet of a situation to influence his or her perception of another unrelated aspect of the situation. Given the highly significant differences (p = .001) on each of the 23 items, the interpretation appears to be that the differences were caused by the ITV delivery system. This method presents compelling objective data for their results. They concluded that their data indicated remote-site students were less satisfied than the host-site students (Anderson et al., 2002).

Controlling for Differences

Dalton (2001) used his own students in a study that afforded him the opportunity to administer a pretest, a mid-semester posttest before the midterm, and a follow-up test on the last class meeting before the final. Two of Dalton's classes were traditional on-campus courses, and the third was an ITV course. The distance component of this course was taught simultaneously via interactive television, which eliminated the problem of comparing different teaching methodologies. His study emphasized evaluating students acquiring course knowledge. But Dalton
also administered a course evaluation at the end of the semester and compared grades.

While initially the educational method (traditional vs. ITV) seemed to impact the changes on the scores from pretest, posttest and follow up, controlling statistically for the student's ethnicity and other extraneous demographic variables, effectively explained any differences between groups (Dalton, 2001). Basically, Dalton found that demographically his groups were not the same, and when he eliminated the effect of those differences statistically, the educational method showed no significant difference in acquiring course information between his groups.

His observations also included no significant difference between groups in grades and evaluations which led him to conclude that his research added to the body of research that suggests there is no significant difference between on-site and distance courses.

**System Design Factors and Communication Style**

Hackman and Walker (1995) wanted to know if system design factors and communication style had an affect on perceptions of televised instruction. Their questionnaire contained six measures assessing perceived student learning, perceived student satisfaction, social presence,
information transfer, verbal teacher immediacy, and nonverbal teacher immediacy. They found that when instructors engaged in immediate behaviors, that they should not be adversely affected by teaching via television. The immediate behaviors that Hackman and Walker identified having significant results were in five areas: addressing students by name, instructor’s use of student’s first name, conversations before and after class, probing student feelings about an assignment or discussion topic, and the instructor’s use of humor. Their conclusion was that when the system of conveyance allows interactivity and control, and when instructors are immediate and present, students learn more and are more satisfied with the experience regardless of the modality (Hackman and Walker).

In a similar study, Egan, Welch, Page, and Sebastian (1992) found that the lack of instructional “intimacy” associated with face-to-face conventional delivery systems in traditional classrooms affected student satisfaction in ITV courses. Specifically, factors such as limited interaction with the instructor, delays in receiving feedback, and the instructor’s inability to monitor student cues (both verbal and nonverbal) were seen as negative influences on attitudes of ITV students.
Summary

Undoubtedly there are many ways of measuring outcome. Controlling variables, presenting data clearly, and choosing a particular method of analysis are all of utmost importance in a study. The choices a researcher makes in this regard can influence the credibility of the findings and results.

Allen's meta-analysis produced an overview of numerous studies, but weakened the results by introducing too many variables. Then, Anderson's method of analyzing responses from standardized end-of-the semester evaluation forms presented objective data that show students are generally less satisfied in ITV courses than their counterparts. The strength of their study - the objectivity of the results, becomes a shortcoming if there is to be any enhancement or changes made to the medium. When Dalton eliminated for demographic differences from his study, any variance his groups experienced in acquiring course information could be effectively explained using statistical analysis. And finally, Hackman and Walker found that students learn more and are more satisfied when instructors use specific communication techniques regardless of the modality.
Based on the outcome of this literature review, a variety of conclusions on the consensus of the findings may be reached. However, one thing is certain, when comparing student satisfaction with the ITV format versus traditional educational methods, the differences that emerge are, either a lower level of satisfaction with ITV, or there is no difference between the two mediums. It is rarely found that students are more satisfied with ITV than with traditional educational methods.
CHAPTER THREE

METHODOLOGY

Introduction

The first step when one considers methodology is measurement. Grades can be measured. Overall satisfaction can be measured. But what are the components that make up an overall feeling of satisfaction? Do scales and measurement tell the whole story? What do the participants have to say in their own words? This study is an attempt to answer these questions using both quantitative and qualitative methods. This multi-method approach is used to get a clearer picture of what students feel about the current state of ITV in comparison to traditional classroom education.

Development

Measuring satisfaction has long been used in the service industry to determine the consumer’s perception of a particular service or product, and to determine what improvements can be made to meet the consumer’s needs. A well-designed service template should provide a means whereby consumers can rate what they look for from a service and what they, in fact, receive (Long, Tricker, Rangecroft, & Gilroy, 1999). When there were differences
in this comparison level, it was referred to in this study as a service gap.

The service template design was selected to measure the gap between importance to the student, and satisfaction with the outcome. Students answered each question in two ways. First, importance was determined by asking students to rate on a 7-point Likert scale their perception of how strongly a particular question related to their distance learning experience. Second, they were asked to rate it according to their level of satisfaction. The analysis of the survey used a combination of the Likert scale results, and a means analysis to identify differences. The differences are considered to the service gap.

Grades were calculated at the end of the quarter for each of the classes surveyed. For the purpose of this study the main campus results were chosen to be the baseline for comparing both grades and satisfaction.

Resources and Content Validation

The type of data collected in this survey can be defined as nominal (e.g., 1 = on-campus, 2 = off-campus) and ordinal data (e.g., agree, disagree, strongly disagree). The Chi square test can be used to evaluate a relationship between two nominal or ordinal variables. Chi
Square is used to determine if the differences in the relationship of the variables is a function of chance, or if they are significantly different. Statistical significance measures the likelihood of obtaining a given result by chance. The lower the result, the higher the degree of confidence the result is correct. Statistical significance is generally considered to be $p = .05$ or less (Voelker, Orton, & Adams, 2001).

Grades were calculated by taking the sum of all grades for each class, based on a standard 4-point scale, and dividing that sum by the number of students in the class. Grades were collected for each student in the participating classes of the survey.

**Design**

In this study, teaching style is held constant by using the same instructor in each modality. It is the researcher's intent to correct what he perceives as a design flaw in studies reviewed here in. Namely, that teaching style was an uncontrolled variable in many studies reviewed, and as such, confounds those results. The design of this study theoretically eliminates this design flaw because the students are simultaneously receiving instruction from the same professor in both face-to-face and ITV environments.
The survey was administered to four distance-learning classes during the winter quarter of 2003 (CJUS 580, HUM 335, PSYC 311, and PSYC 360) taught by professors who lectured primarily from the main campus, but who also visited the satellite locations. Thus, students at the main campus had experience with the compressed video environment during the same quarter whenever the professor visited other locations. The fact that the students on the main campus experienced several class periods of distance learning explains the reason for administering the same survey to all students. These participants were not randomly selected from the general population. All participants were enrolled in distance learning classes at CSUSB.

The format of the survey was based on a Noel-Levitz Student Satisfaction Inventory. The questions were changed
to address the specific issues involved in face-to-face and ITV instruction at CSUSB. This service template design was selected to measure the gap between perceived importance to the student, and satisfaction with the outcome. First, the participant is asked to rate each question on a 7 point Likert scale according to the student’s perception of importance, then the student is asked to rate their level of satisfaction on the same scale (Appendix A). The gap between the two responses to the same question is the measurement being studied. Schreiner and Juillerat (2003) demonstrated this instrument to be both valid and reliable in their study of student satisfaction.

Although the study was primarily designed to measure levels of perception, biographical and situational data were also gathered from the survey. In addition to this, the participants were given space to make comments or suggestions. If a participant felt anything was missed in the survey, they then had an opportunity to express themselves in their own words.

Population Served

California State University, San Bernardino

undergraduate students involved in classes originating
from the main campus and broadcast to the satellite campuses of Palm Desert, Moreno Valley, and Victor Valley.

Data Analysis Procedures

S.P.S.S. statistical software was used to analyze the data. The service gap was measured using the mean result of the student's perception of "importance", and comparing that to the mean result of the student's perception of "satisfaction" for each question.

Summary

This study began with a question about the relationship between traditional face-to-face instruction, and distance learning instruction. There was no hypothesis. It was, and is exploratory research. Data was gathered using a multi-method approach; it measured overall satisfaction, it broke down overall satisfaction into 11 components and measured the difference between importance and satisfaction with these components, it compared grades, and it gave the participants an opportunity to express themselves in their own words. Comparisons were made using the main campus as the baseline. Students from the main campus had experience with distance learning when the professor visited the satellite campuses.
Measuring intangibles such as perceptions present problems that are not found in other fields. Social scientists have developed their own means of measuring such concepts as attitudes, behaviors, emotions, and personalities (Rymarchyk, 2003). Surveys are one form of measurement these social scientists use. In this study the survey is the primary means of gathering data, but it also relies on the participant to express themselves in their own words. Many times answers can be found there.
CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The survey was administered at the end of the Winter quarter of 2003 and was completed by 122 students from the main campus, 64 from the Palm Desert campus, 24 from the Victor Valley campus, and 4 from the Moreno Valley for a total of 214 participants. A total of 324 grades were collected from all students in these classes. Of the surveyed students, 70 are third year and 131 are fourth year students.

Presentation of the Findings

Initially results from the study were analyzed in the most general terms - main vs. remote (all satellite campuses combined), overall satisfaction, and grade point averages. Results were then broken down by campus.

The results of analyzing overall satisfaction between the main and remote campuses show the remote campuses as having a higher level of overall satisfaction than the main campus [p = .001] (Table 1).
However, when the results were broken down by campus, Palm Desert students were noticeably less satisfied than the other satellite campuses and slightly less satisfied than the main campus \( p < .05 \) (Table 2).
Grades fell into much the same pattern as overall satisfaction. The end-of-the-quarter grade point averages were calculated for each of the classes involved in the study. Mean overall grades were higher on the remote campuses when compared to the main campus showing no statistical significance \( [p > .05] \) (Table 3). And when mean overall grades were broken down by campus, Palm Desert campus grades were lower than the main campus \( [p > .05] \) (Table 4). When Victor Valley and Moreno Valley grades were added together and compared to the Palm Desert
campus grades \((p < .05)\)\(^1\), and the main campus grades \((p < .05)\)\(^2\), initially there did seem to be some statistical significance. But because of the size of the cross tabulations there were more cells with an expected count of less than 5 than the Chi square allows. This violates an assumption of the test and makes the tests suspect. A visual examination of the data however is sufficient to show the differences (Tables 3&4).

1. 4 cells (40.0%) have expected count less than 5. The minimum expected count is 2.08.

2. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 1.64.
Table 3. Grades-- Main Versus Remote

![Bar graph showing mean grades for Main and Remote campuses.](image)

CAMPUS
Table 4. Grades-- by Campus

Means were calculated from the responses the students gave ranking their perceived level of importance, and satisfaction assigned to 11 questions concerning their distance learning experience (Appendix A). The results from the difference (the service gap) of the two of two categories (importance and satisfaction) were then posted to a table. The service gap was broken down by campus. The closer the gap approaches "0" suggests the least amount of difference between what the student perceived to be important, and their level of satisfaction with it. The higher numbers reflect less satisfaction relative to
importance. Negative numbers indicate the student assigned a low level of importance compared to a higher level of satisfaction.

The positive service gaps reflect certain areas of concern (Table 5). Moreno Valley, for instance, shows that they rate the faculty providing timely feedback about student progress as more important relative to their level of satisfaction. Considering that their average service gap is in fact a negative number, this gap of a positive 1.50 would be a red flag area of concern. Palm Desert’s service gap is generally twice that of the main campus, which is being used as the baseline for measurement.

Table 5. Service Gap Analysis

<table>
<thead>
<tr>
<th>Survey Questions</th>
<th>Main</th>
<th>WC</th>
<th>MV</th>
<th>PDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am able to experience intellectual growth in this environment?</td>
<td>0.62</td>
<td>-0.02</td>
<td>0.25</td>
<td>1.43</td>
</tr>
<tr>
<td>Faculty provides timely feedback about student progress in a course?</td>
<td>0.62</td>
<td>0.78</td>
<td>1.50</td>
<td>1.47</td>
</tr>
<tr>
<td>Faculty interacts with all sites equally?</td>
<td>0.41</td>
<td>-0.08</td>
<td>-0.50</td>
<td>1.12</td>
</tr>
<tr>
<td>The personnel involved are helpful?</td>
<td>0.31</td>
<td>0.44</td>
<td>0.00</td>
<td>1.55</td>
</tr>
<tr>
<td>The quality of technology is adequate?</td>
<td>0.90</td>
<td>0.71</td>
<td>-0.25</td>
<td>1.45</td>
</tr>
<tr>
<td>The frequency of student and instructor interactions is adequate?</td>
<td>0.68</td>
<td>0.22</td>
<td>-0.25</td>
<td>1.29</td>
</tr>
<tr>
<td>The frequency of student-to-student interactions is adequate?</td>
<td>0.34</td>
<td>-0.66</td>
<td>0.75</td>
<td>0.76</td>
</tr>
<tr>
<td>Email provided?</td>
<td>0.61</td>
<td>0.34</td>
<td>0.25</td>
<td>0.71</td>
</tr>
<tr>
<td>Web site provided?</td>
<td>0.55</td>
<td>0.21</td>
<td>-1.75</td>
<td>1.19</td>
</tr>
<tr>
<td>Virtual office hours provided?</td>
<td>0.72</td>
<td>0.74</td>
<td>-1.42</td>
<td>1.48</td>
</tr>
<tr>
<td>Online course documents provided?</td>
<td>0.93</td>
<td>0.31</td>
<td>-1.42</td>
<td>1.49</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>0.63</td>
<td>0.27</td>
<td>-0.26</td>
<td>1.27</td>
</tr>
</tbody>
</table>
Discussion of the Findings

Results from the survey indicate some demographic differences. Students attending the remote campuses are a bit older with 60% over the age of 24 compared to 34% at the main campus. And the remote sites have a higher percentage of Hispanic students (41%) than the main (27%). There is no significant difference in part time and full time students by campus ($p > .05$). On first glance, it would seem that other than these noted differences the foremost influence determining the outcomes would be the educational medium. But upon closer observation, other variables must also be present.

Initially the results point to the remote campuses as having a significantly higher level of overall satisfaction than the main campus ($p = .001$). This, in and of itself, is interesting when compared to studies that show there is no significant difference in student satisfaction between ITV students and traditional class-room based students (Silvernail and Johnson, 1990). And it runs contrary to studies that show students were less satisfied than their on-campus counterparts (Egan et al., 1992; Gunawardena, 1992; Kochman, 1998; Wheeler & Batchelder, 1996). But to confound the issue even more, after the results are broken down by campus, Palm Desert
was actually weighing down the satisfaction levels of Victor Valley and Moreno Valley campuses. Palm Desert’s overall satisfaction is actually below that of the main campus (p < .05). And the other remote campus’s overall satisfaction levels are higher (p < .05) when Palm Desert is taken out of the mix.

This finding is consistent with the service gap result that shows Palm Desert as having less satisfaction in relation to the importance of the 11 specific questions regarding their ITV experience. On average, Palm Desert’s service gap is twice that of the main campus.

Some studies suggest reasons for the dramatic difference in levels of satisfaction between Palm Desert and the other remote campuses. First, it is important to realize that Moreno Valley and Victor Valley are community college campuses. The distance learning courses are generally comprised of the same population of community college students. The Palm Desert campus is a freestanding building and is no longer located on the local community college campus. Classes in Palm Desert are offered in both traditional and ITV format. California State courses

3. 7 cells (50.0%) have expected count less than 5. The minimum expected count is .77.
offered in Victor Valley and Moreno Valley are only offered in the ITV format.

Clow (1999) postulated that remote-site students may tend to inflate their responses in an attempt to keep distance education efforts alive. Remarks from the comment sheet of the survey tend to support this theory (Please refer to Appendix C for all comments). Below is a sampling of the comments:

Remote Sites Other than the Palm Desert Campus

Humanities 355, Moreno Valley.

#1

"I think there should be more distant learning classes in the future & online classes as well."

#2

"My only suggestions is for more distance learning programs. For as big as CSUSB is we have a poor learning program for off campus. Please look at more. I enjoyed this class and thanks to all involved. Good job."

Humanities 355, Victor Valley Community College.

#11

"I am very concerned about the lack of classes offered at VVC next Quarter. I don't understand why video classes are offered at other off-site
campuses and not here. Isn't it easy enough to get a video feed out to VVC for the same classes? The reason I am enrolled at Cal State is because I knew there was an extension here at VVC. If there are going to be so few classes here, I will need to enroll somewhere else. I am very upset that I have to travel to San Bernardino next Quarter when these classes should be offered here."

"I was very disappointed that the Victor Valley Campus was left without an adequate distance learning curriculum for the Spring Quarter. After one semester of distance learning I am now forced to drive to the main campus to continue my education. It seems that the classes provided to Palm Desert could just as easily be provided to Victor Valley. In the event that this continues, I will be changing from Cal State to one of the private universities." that provide a Bachelor's Degree for those living in the High Desert."
Palm Desert Campus

Comments from the Palm Desert campus were generally unfavorable:

Humanities 355, Palm Desert Campus.

#6

"I didn’t like distance learning for this class at all."

#5

"The teacher @ the transmission site was not available for questions/discussions. The audio was horrible. Students at the transmission site didn’t use their microphones so we couldn’t hear their questions."

Psychology 360, Palm Desert Campus.

#10

"It feels that the Palm Desert campus students are not treated equally as main campus students, although we pay tuition that is equal to them. The resources + attitudes we receive are often neglect + secondary to those available to main campus - and if I have to hear that I have to make the drive (to the main campus) one more time I’m going to vomit."
It is interesting to note that the grades for the semester on the satellite campuses of Victor Valley and Moreno Valley were higher than those of the main and Palm Desert campuses. One possibility is that their satisfaction levels could have been affected by their grades, or their grades could have been affected by satisfaction level. There was insufficient data from this study to make statistical comparisons with grades and satisfaction. And as it turns out, grades are not the best measure of outcome. Grades are confounded by a number of extraneous variables including student attendance, oral and written communication skills, attitudes, work habits and preparation (Hackman, Walker, 1995). Further research on grades would have to control for these many variables for it to be of statistical value. However, grades do seem to convey a certain amount of face value. And here, it is left up to the reader to make their own speculations from the results.

Summary

The satisfaction level at the Palm Desert Campus being lower than that of the main campus is consistent with findings from other studies that show students are significantly less satisfied with an ITV format when
compared to traditional classes. Anecdotal data clearly seems to indicate that higher satisfaction levels at the other satellite campuses is indicative of their appreciation of the service offered to their geographically isolated campuses, and their desire not to drive to the main campus. Necessity and convenience play a large part in the satisfaction level of students taking ITV courses. Students at the Palm Desert campus may not appreciate the convenience of ITV courses because the vast majority of classes taught on the campus are taught in the traditional format. The two mediums are in direct competition with each other. Students on the community college campuses do not have a choice of medium. If they want to take a California State course, it will necessarily be offered in the ITV format.

Using ITV as a teaching method, which is at the heart of this research, is multi-dimensional. It includes such issues as faculty education in the use of the technology, faculty resistance to its use, course modifications, development of materials best suited for ITV, and student preparation for the courses. Student satisfaction with the ITV environment is the tip of the proverbial iceberg. However, student satisfaction is important for many reasons. The failure of studies to keep up with student
satisfaction and ITV could have consequences ranging from decreased student retention to ultimately seeing certain academic programs being terminated (Anderson et al.).

Currently CSUSB does not perform outcome evaluations of the ITV courses. Evaluating student satisfaction is a start. Implications for further research could include how to influence student satisfaction. But unless there is a measurement, or a baseline, changing teaching methodology to accommodate the student needs is a fruitless endeavor. What is needed is a systematic evaluation of these courses, and a clear understanding of the research that is already done in order to improve satisfaction and provide students with the best possible educational service.
CHAPTER FIVE
CONCLUSIONS AND RECOMMENDATIONS

Introduction

As a result of completing this project, certain conclusions concerning the surveyed ITV courses delivered to the campuses of Palm Desert, Victor Valley, and Moreno Valley during the '03 Winter quarter can be derived from the results. Further, recommendations extracted from the project based on the literature review, student comments and the author's own experience with working in ITV are presented. Lastly, the Chapter concludes with a summary.

Conclusions

The conclusions extracted from the project are as follows.

1. There is a significant difference in student satisfaction between traditional classroom lecture courses and distance learning courses at CSUSB.

2. The Palm Desert campus is significantly less satisfied with the ITV learning environment than the other satellite campuses and the main campus.
3. Palm Desert Campus has a wider service gap than the other satellite campuses and the main campus.

4. Grades and satisfaction were shown to be highest at the campuses of Victor Valley and Moreno Valley.

5. Studies have shown, and anecdotal information gathered in this study point to the higher student satisfaction levels on the Yucca Valley, and Moreno Valley campuses as being a result of remote-site students tending to inflate their responses in an attempt to keep distance education efforts alive (Clow, 1999).

Recommendations

The recommendations resulting from this project are as follows.

1. Further studies of this nature that focus on student satisfaction with ITV at CSUSB should be done on a regular basis.

2. Methods of monitoring effectiveness of educational methodology using ITV should be instituted.
3. Seminars on how best to use the medium should be required of all faculty involved in ITV.

4. Student assistants who support the classes at the remote locations should have specific training for their job.

5. Audio problems regarding student/teacher and student/student interaction between campuses need to be addressed in a more effective way.

Summary

The considerable investment in ITV and the trend of its increasing usage point to the need for a systematic evaluation of its outcome. Institutes of higher education are in a unique position when it comes to analyzing return on investment. They not only have to be concerned with increased student enrollment, but they also need to be concerned with whether the student is getting an education or not. Student satisfaction plays an important role in both these areas.

A valuable lesson can be learned from the service industry -- perception means everything. Not studying the outcome of distance learning (more specifically ITV) courses does two things: it means there is no effective measure for developing educational methodology in distance
learning, and it gives the impression to the student that no one really cares.

The pressure on higher education to pursue a cost-effective means of growing, and take advantage of new technology requires informed and careful study. Understanding where student needs exist is the first step in providing an effective and successful learning environment. Matching educational methodology and technology to meet student needs satisfactorily should be the goal.
APPENDIX A:

SATISFACTION SURVEY TEMPLATE
<table>
<thead>
<tr>
<th>Importance to me...</th>
<th>My level of satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not very important at all</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Not very important</td>
<td>Very satisfied</td>
</tr>
<tr>
<td>Somewhat unimportant</td>
<td>Satisfied</td>
</tr>
<tr>
<td>Neutral</td>
<td>Somewhat satisfied</td>
</tr>
<tr>
<td>Somewhat important</td>
<td>neutral</td>
</tr>
<tr>
<td>Important</td>
<td>Not very satisfied</td>
</tr>
<tr>
<td>Very important</td>
<td>Not satisfied</td>
</tr>
<tr>
<td>Not applicable</td>
<td></td>
</tr>
</tbody>
</table>

1. I am able to experience intellectual growth in this learning environment.
2. Faculty provide timely feedback about student progress in a course.
3. Faculty interacts with all sites equally.
4. The personnel involved are helpful.
5. The quality of the technology being used.
6. The frequency of student and instructor interactions is adequate.
7. The frequency of student-to-student interactions is adequate.

Adequate online resources are provided:
8. Email
9. Web presence (Web site)
10. Virtual Office hours
11. Online course docs
APPENDIX B:

DEMOGRAPHIC INFORMATION
<table>
<thead>
<tr>
<th>Gender:</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Age:</th>
<th>18 and under</th>
<th>19 to 24</th>
<th>25 to 34</th>
<th>35 to 44</th>
<th>45 to 54</th>
<th>65 to 64</th>
<th>65 and over</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Enrollment Status:</th>
<th>Primarily on-campus</th>
<th>Primarily off-campus</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Class Load:</th>
<th>Full-time</th>
<th>Part-time</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Class Level:</th>
<th>First year</th>
<th>Second year</th>
<th>Third year</th>
<th>Fourth year</th>
<th>Special student</th>
<th>Graduate/professional</th>
<th>Other class level</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Employment:</th>
<th>Full-time</th>
<th>Part-time</th>
<th>Not employed</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Ethnicity/Race:</th>
<th>African-American</th>
<th>American Indian</th>
<th>Alaskan Native</th>
<th>Asian or Pacific Islander</th>
<th>Caucasian/White</th>
<th>Hispanic</th>
<th>Other Race</th>
<th>Prefer not to respond</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Educational Goal:</th>
<th>Associate degree</th>
<th>Bachelor's degree</th>
<th>Master's degree</th>
<th>Doctorate</th>
<th>Professional</th>
<th>Self-improvement</th>
<th>Job-related training</th>
<th>Certification/initial or renewal</th>
<th>Other</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Current Distance Learning Enrollment:</th>
<th>1-3 credits</th>
<th>4-6 credits</th>
<th>7-9 credits</th>
<th>10-12 credits</th>
<th>13-15 credits</th>
<th>More than 15 credits</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Previous Distance Learning Enrollment:</th>
<th>1-3 credits</th>
<th>4-6 credits</th>
<th>7-9 credits</th>
<th>10-12 credits</th>
<th>13-15 credits</th>
<th>More than 15 credits</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Rate your overall satisfaction with the distance learning environment thus far:</th>
<th>Not satisfied at all</th>
<th>Not very satisfied</th>
<th>Somewhat satisfied</th>
<th>Neutral</th>
<th>Somewhat dissatisfied</th>
<th>Satisfied</th>
<th>Very satisfied</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>So far, how has your distance learning experience met your expectations?</th>
<th>Much worse than I expected</th>
<th>Quite a bit worse than expected</th>
<th>Worse than I expected</th>
<th>About what I expected</th>
<th>Better than I had expected</th>
<th>Quite a bit better than expected</th>
<th>Much better than I had expected</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>If you had to do it over, would you enroll in a distance learning class again?</th>
<th>Definitely not</th>
<th>Probably not</th>
<th>Maybe not</th>
<th>I don't know</th>
<th>Maybe yes</th>
<th>Probably yes</th>
<th>Definitely yes</th>
</tr>
</thead>
</table>
APPENDIX C:

STUDENT COMMENTS
PSYC 360 PDC

#10 PDC

"It feels that the Palm Desert campus students are not treated equally as main campus students, although we pay tuition that is equal to them. The resources + attitudes we receive are often neglect + secondary to those available to main campus - and if I have to hear that I have to make the drive (to the main campus) one more time I'm going to vomit."

#5 PDC

"Well our experience has been unsatisfactory because the technology doesn't work. We cannot interface with the professor."

#1 PDC

"Better technology."

CJUS 580 PDC

#13 PDC

"Sometimes the voice delay is a bit annoying. The lights inside always need to be dimmed in order to clearly read the overhead. A couple of days the voice microphones didn't even work. Other than that, it was what I expected it to be."

#11 PDC

"I feel that a bit more needs to be done to improve the quality of the equipment + teacher aids in the class to help during a malfunction."

#10 PDC

"I didn't like the style of the class. No televised."

#9 PDC

"Make it more interesting & make students feel on both sides that there both there."
"I am concerned with the lack of interaction between Palm Desert and the main campus."

"Would be nice if more online classes were provided for CJ majors."

"Interactions between other sites wasn't done well. It was hard to hear them most of the time. The teacher had a low voice so it was hard to hear unless we turned the volume up which gave feedback. Overall the course went well."

"My only suggestions is for more distance learning programs. For as big as CSUSB is we have a poor learning program for off campus. Please look at more. I enjoyed this class and thanks to all involved. Good job."

"I think there should be more distance learning classes in the future & online classes as well."

"I was very disappointed that the Victor Valley Campus was left without an adequate distance learning curriculum for the Spring Quarter. After one semester of distance learning I am now forced to drive to the main campus to continue my education. It seems that the classes provided to Palm Desert could just as easily be provided to Victor Valley. In the event that this continues, I will be changing from Cal State to one of the private universities that provide a Bachelor's Degree for those living in the High Desert."
#13 PDC

“\textquote{I was hoping to be able to fulfill all of my upper division capstones here at the Victor Valley campus. I was disappointed to find that none are available for the upcoming quarter.}”

#11 PDC

“I am very concerned about the lack of classes offered at VVC next Quarter. I don't understand why video classes are offered at other off-site campuses and not here. Isn’t it easy enough to get a video feed out to VVC for the same classes? The reason I am enrolled at Cal State is because I knew there was an extension here at VVC. If there are going to be so few classes here, I will need to enroll somewhere else. I am very upset that I have to travel to San Bernardino next Quarter when these classes should be offered here.”

#9 PDC

“I wish they offered more classes that I could take at the Victor Valley Campus.”

#5 PDC

“Problems: Sometimes when we lose contact with the instructor. Some connections in audible connections with other sites. But I appreciate the opportunity to attend Cal State San Bernardino with (not) having to leave the High Desert.”

#2 PDC

“An interactive website with frequent updates would be helpful.”

\textbf{PSYC 311 VVC}

#5 PDC

“They are not all equal. Need to more than just lecture classes at distant sites.”

#10 PDC

“Good teacher helped a lot, prefer real teacher in class though.”
#2 PDC

"I feel there should be more of them offered each quarter."

HUM 355 PDC

#13 PDC

"I'm glad that distance learning is available. I wish that more courses can be offered i.e. management courses. The only problem I have is sometimes our system goes down, where we can't see what the instructor is showing. Overall I'm pleased. More distance learning classes will be beneficial."

#6 PDC

"I didn't like distance learning for this class at all."

#5 PDC

"The teacher @ the transmission site was not available for questions/discussions. The audio was horrible. Students at the transmission site didn't use their microphones so we couldn't hear their questions."

#2 PDC

"I went to the website for maps and couldn't even get into whatever part they were on. I had to find them myself elsewhere. Sometimes the connection is lost and I miss parts of the lecture. It is often hard to get a question in—mics don't always work. This should be looked into—fewer tech problems and websites that are usable would greatly help."

#18 PDC

I would appreciate if the person who is our instructor's assistant would stay in the class many times we had technical difficulties and we had no one to help us. I was very disappointed (with) the service here at CSUSB."

CJUS 580 MAIN

#7 Main

"It is sometimes hard to hear and follow along when the teacher is at the other campus. This is my 2nd class I have had like this. I don not
like learning this way and feel somewhat cheated when the teacher is not face to face.”

#6 Main

“I didn’t realize we’d be in a distance learning class. It was okay for the most part.”

#1 Main

“Better lighting in the classroom.”

PSYC 360 MAIN

#17 Main

“Seemed like everything worked out just fine.”

#21 Main

“Better equipment for audio. I like though the big screen for night. All classes should have it.”

#32 Main

“I am a commuter student to the main campus & disappointed w/the hour drive, but satisfied w/ the experience and instruction.”

PSYC 311 Main

#4 Main

“Really great experience.”

#18 Main

“Main site-distracting. Wouldn’t like to be on the other side!”

#22 Main

“It was a good experience that the main campus shared with Palm Desert. This needs to be considered for Victor Valley.”
"The notes presented on the overhead are extremely important & helpful."

"I thought the class worked well. However, I do not think I would like want to be at the distance site full time. I like a live, in person instructor."

"This class is really good except when the teacher is not on campus. It is hard to display interest."

"I thought the other sites were a little disruptive when the computer wouldn't work."

"You should be able to rent the video from the class."

"Distance learning is not a regular classroom and should not be seen as such. In a distance learning class, the professor is there merely to help the understanding of the course--everything else is left up to the student.

Personally I like the regular classroom more because of the interaction, sincerity and the extent of knowledge/experience obtained."

"Static in transmission lines."

"Quality of microphone + sound is somewhat distracting. It is difficult to be in a discussion and not be able to argue a point because the mic is
not working or you have to repeat yourself because you forgot to hold your "on" button down."
APPENDIX D:

INFORMED CONSENT
INFORMED CONSENT

You are being asked to participate in a research study involving CSUSB students enrolled and participating in distance learning courses that use compressed video as a means of holding class. The following questionnaire is an anonymous survey. Please do not write your name on any part of this questionnaire. Participants of this study are asked to check a box at the bottom of this form that indicates that they understand and agree to willingly participate in this study. After completion of this survey, return it to the proctor, and they will place it survey in a large envelope and return it to the research student.

Richard Murray, an Instructional Technology Masters candidate at CSUSB is conducting this study under the supervision of Dr. Eun-Ok Baek Assistant Professor of Instructional Technology, with the guidance of Dr. Amy Leh, Associate Professor and Program Coordinator of Instructional Technology.

The following questionnaire consists of 30 questions that will explore the importance and your level of satisfaction pertaining to the current status of the distance learning program at CSUSB. The questionnaire should take only 10 to 15 minutes to complete.

Your responses will be held in the strictest of confidence by the researcher of this study. Your participation in this study is strictly voluntary in nature. Participants are free to stop at any time and are not obligated to answer questions that are deemed uncomfortable.

The results of this study will be available in the fall of 2003 at CSUSB Pfau Library. If you have any questions and/or concerns regarding this study please feel free to contact Richard Murray at rchmurray@hotmail.com

I acknowledge that I am over 18 years old and have been informed of, and understand the nature and purpose of this study and freely consent to participate.

Participant's Mark (No Signature): ____________ Date ______
Campus ______________
Your participation is greatly appreciated.
Researcher's Signature: ______________________
Date ______
APPENDIX E:

DEBRIEFING STATEMENT
DEBRIEFING STATEMENT

You have participated in a study examining the current status of distance learning at CSUSB. The purpose of this study is to gain a better understanding of the demographics of the students, how satisfied they are, and how well they are doing in the compressed video classes currently being offered at CSUSB and remote campuses. Thank you for your participation in the study.

If you have any questions or comments concerning the study, contact of Dr. Eun-Ok Baek Associate Professor of Instructional Technology at California State University, San Bernardino (909) 880-5454. Richard Murray, an Instructional Technology M.A. student at California State University San Bernardino, conducted this study under the supervision of Dr. Eun-Ok Baek, with the guidance of Dr. Amy Leh, Associate Professor and Program Coordinator of Instructional Technology, California State University, San Bernardino.

The results of this study will be available at the Pfau Library at California State University, San Bernardino in the fall of 2003.
REFERENCES


