

FACTORS INFLUENCING HOW STUDENTS VALUE ASYNCHRONOUS
WEB BASED COURSES

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This dissertation discovered the factors influencing how students value asynchronous Web-based courses through the use of qualitative methods. Data was collected through surveys, observations, interviews, email correspondence, chat room and bulletin board transcripts. Instruments were tested in pilot studies of previous semesters.

Factors were identified for two class formats. The asynchronous CD/Internet class format and the synchronous online Web based class format. Also, factors were uncovered for two of the instructional tools used in the course: the WebCT forum and WebCT testing. Factors were grouped accordingly as advantages or disadvantages under major categories. For the asynchronous CD/Internet class format the advantages were Convenience, Flexibility, Learning Enhancement, and Psychology. The disadvantages included Isolation, Learning Environment, and Technology. For the synchronous online Web based class format the advantages were Convenience, Flexibility, Human Interaction, Learning Enhancement and Psychology, whereas the disadvantages included Isolation, Learning Environment and Technology. Concurrently, the study revealed the following factors as advantages of the WebCT Forum: Help Each Other, Interaction, Socialization, Classroom News, and Time Independent. The disadvantages uncovered were Complaints, Technical Problems and Isolation. Finally, advantages specified for the WebCT testing tool were Convenience, Flexibility and Innovations, and its disadvantages were Surroundings Not Conducive to Learning, and Technical Problems.

Results indicate that not only classroom preference, learning style and personality type influence how students value a Web based course, but, most importantly, a student's lifestyle (number of personal commitments, how far they live, and life's priorities). The WebCT forum or bulletin board, and the WebCT testing or computerized testing were seen mostly by students, as good tools for encouraging classroom communication and testing because of the convenience and flexibility offered. Still, further research is needed both quantitatively and qualitatively to ascertain the true weight of the factors discovered in this study.

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CHAPTER 1

This dissertation will discover the factors influencing how students value asynchronous Web-based courses through the use of qualitative methods.

INTRODUCTION

Those involved in distance learning have recruited the Internet for the delivery of classroom material in the last few years. Several schools across the USA and in other parts of the world have different degrees of involvement with the Internet. In some schools professors post their syllabi and class Web pages on the Internet and use E-mail as their main teacher-student and student-student communication tool (Barnard, 1997; Terrell, 1996; Dickinson, 1997). In the more advanced settings, the use of the Internet also involves the posting of digitized pictures and video. Class-lecture videos on the Internet could be classified as the latest innovation in the field of distance learning.

The literature review that follows explores how diverse, extensive and effective the use of class-lecture videos on the Internet has been. The findings of this literature review will then justify the direction of a narrower and more formal research project to uncover the factors that influence students' acceptance or rejection of a course with a format consisting of asynchronous video lectures on the Web.

PROBLEM STATEMENT

The Internet and associated technologies are making it increasingly easy for educators to offer classes that do not require the physical presence of the student in the classroom. Many variations in the use of these technologies have a direct effect on the

number of hours spent watching the classroom lectures from a distance. Since teaching with video on the Web is reasonably new, a preliminary informal literature review has confirmed that no similar settings of asynchronous video lectures have been reported, nor has formal research been conducted on any aspect of this setting.

The more one does research on this topic, the more the lack of research regarding courses with a format of asynchronous video lectures on the Web becomes obvious. Today scant statistical data are available to show the effectiveness or ineffectiveness of teaching classes through the Internet with class-lecture-videos. More specifically, data are needed to determine the effectiveness of attending a class based solely on the materials available through the Internet: class notes, reading assignments, E-mail, and finally, asynchronous class-lecture videos.

Many courses offered in the combined setting of distance learning and the Internet share some commonalties. Most of these courses, which are offered by over 762 institutions in the USA alone (Gubernick et al., 1997), either rely on synchronous class-lecture videos and written material (class syllabi, class notes, and E-mail) accessible through the Internet or simply rely on the Internet for the exchange of written subject material between the teacher and the students (Hirumi et al., 1996). Using the Internet as the vehicle for distance learning, where a class is taught using asynchronous class-lecture video, is almost non-existent. Therefore, supporting formal statistical data are also non-existent.

As a consequence of these findings in the literature review, a need for more research in this field exists before continuing to spend time, money and other resources in

this innovative and rapidly exploding use of technology. This research project will generate data that will help us understand the student-teacher-technology interaction.

STATEMENT OF NEED

Because of the demographic shift and the increasingly nomadic nature of our society, educational institutions must commit to implementing Internet classroom technologies in order to adapt to the changing characteristics of the society they serve. However, before more money, time and resources are committed to this innovative and fast-exploding instructional method, research, with well documented student feedback and unbiased observation, must be conducted to generate data to provide a better understanding of the current practices. Such an investigation will shed light onto what leads students to accept or reject this technology in their learning.

Although studies have been conducted to measure classroom performance with and without the use of technologies, the literature review indicates no studies have been conducted on the use of the Internet for asynchronously teaching a class. Studies that included the use of technology in classrooms which are using the old pedagogy have traditionally been confined to using the quantitative approach, a lab-like setting where dependent and independent variables are defined, and extraneous variables controlled by selecting comparable settings. The major drawback of such a setting is that the researcher controls the known expected behavior, as dictated by decades of research in the traditional classroom environment.

This research proposed to observe a class in which the instructor used new technologies that dictated changes in the pedagogy, technologies that allowed for flexibility in the traditional constraints, such as scheduling and location. The researcher, through non-participant observation in the classroom setting and through a questionnaire and semi-structured, in-depth interviews with students, sought to identify the factors that enhanced and inhibited student acceptance of an asynchronous video course. Without the rigid format of the quantitative approach, the true factors, interacting and heavily influencing the students' acceptance or rejection of the class format under study, were allowed to surface and thus be described. Therefore, the qualitative research methods employed in this research enabled the researcher to uncover the instructor's actual practice as well as the student's reactions, thoughts, and attitudes.

A case study employing qualitative research methodology, including a grounded theory approach to data analysis developed by Barney Glaser and Anselm Strauss, was the most appropriate approach for this investigation. Through qualitative methods of data collection such as interviews, observations and surveys, categories were discovered, relationships were established, and new theories were developed, as opposed to conducting research with a set of already defined variables where any possibility of discovery is eliminated (Strauss & Corbin, 1990). Further, the use of three qualitative methods of data collection also ensured the validity of any findings through a process of triangulation - meaning that similar data collected through different techniques substantiates the findings of a study. These findings can then justifiably be used to

determine the *factors influencing how students value a course with a format consisting of asynchronous video lectures on the Web.*

The classroom setting for this study fit the criteria for using the qualitative approach. As explained by Strauss and Corbin:

- "Qualitative methods can be used to uncover and understand what lies behind any phenomenon about which little is known" (1990, p.19). This study sought to uncover and understand what specific factors influence how students value a course with a format consisting of asynchronous video lectures on the Web.
- "It can be used to gain novel and fresh slants on things about which quite a bit is already known" (1990, p.19). Although teaching and learning have been extensively and quantitatively researched using the classic pedagogical standards for measuring success in the traditional classroom setting, no qualitative research has been done to study this new setting.
- "Qualitative methods can give the intricate details of phenomena that are difficult to convey with quantitative methods" (1990, p. 19). Observation of the student-teacher interactions, the student-student interactions, the teaching process, the learning process and interviews to determine the participants' insights, thoughts and class experiences were conducted in order to uncover the intricate details of this phenomenon.

Further, the grounded theory approach allowed this researcher "to explain the phenomena in light of the theoretical framework that evolves during the research itself

... [and not be] constrained by having to adhere to a previously developed theory" (Strauss & Corbin, 1990, p.49).

DATA ANALYSIS STRATEGY

As part of the qualitative research methodology, the researcher used the grounded theory approach to data analysis. This approach involves a simultaneous analysis process along with data collection that continuously shapes and refocuses the researcher's investigation. Strauss and Corbin (1990, p.62) stated that during the process of data analysis, "two analytic procedures are basic to the coding process: ... making of comparisons and asking of questions. ... These two procedures, explain why grounded theory is often referred to as the 'constant comparative method of analysis' (Glaser & Strauss, 1967, p. 101-116)."

According to Strauss & Corbin, making comparisons and asking questions helps the researcher conceptualize and categorize data. Conceptualizing data implies that every observation and collected piece of information is dissected and weighted alone in order to determine how it can be labeled and how it relates to other collected data. Through this process, the collected data becomes manageable pieces of data items. As the research progresses and phenomena are identified in the data, categories are labeled and identified concepts are grouped. Categorizing is then a process by which similar concepts are put together under an emerging label or theme (1990).

Conceptualizing and categorizing data, conducted concurrently with data collection, made data analysis and coding manageable tasks that helped focus the

research by eliminating non-relevant collected data and by refining new research questions.

Finally, once the data collection and the data analysis phases were completed, the compilation of the research findings occurred. In using the grounded theory approach as part of this writing phase, the researcher interpreted and related the uncovered phenomena, thus developing theory.

RESEARCH QUESTION

For the researcher's purpose in this study, a graduate course offered at the University of North Texas, Cognitive Processing, that physically met a number of times and viewed the remaining lectures, via the Web was selected to find answers to:

“Factors influencing how students value asynchronous Web based courses.”

OUTLINE OF OTHER CHAPTERS

In the literature reviewed in chapter two of this dissertation, the researcher explored current technology trends and variations as they are being used in the classroom today. The literature review has helped the researcher establish what cognitive theories relate technology with learning and the elements of that relationship in the studied setting. The data collected in this study have been examined and subsequently interpreted in the context of all the generalizations about cognitive and learning theories gleaned from the literature review.

The methodology, which is the last section of this dissertation, addresses the question of what tools this researcher used to collect the data for this study. Because of the newness of this alternative classroom setting, the most appropriate methodological approach for uncovering what is going on in this unexplored setting is the qualitative approach, based, in this case, on observation, survey and semi-structured interviews with the instructor and students. By using these three strategies, this researcher has been able to examine ample aspects of the student-teacher-technology interaction, thus obtaining information to answer the grand tour question of this research.

CHAPTER 2

LITERATURE REVIEW

Distance learning originally followed a format as identical as possible to the real life, traditional classroom setting. Distance learning in the beginning involved at least two classrooms: one classroom where the teacher was physically imparting instruction, sometimes alone and sometimes with a live group of students; and a second receiving classroom where, with the help of a TV monitor, students away from the first classroom could receive instruction. Later, additional receiving classrooms in other parts of the city, state, country and even the world were added to the equation.

As computer technology evolved, new hardware was developed to digitize and compress analog video, thus making it ready for computer viewing (Barron, 1995). New software was developed for streaming audio and video with a PC without the need for first downloading files (Fleischman, 1996). These capabilities allowed for multi-media materials to be used for computer presentations (hypermedia) and to travel on the Internet. More importantly, these advances in computer technology made possible the transition in distance learning from a satellite transmission, or one-way communication, to a one-way video and two-way audio transmission, to finally a more advanced interactive compressed video format. The interactive compressed video format uses T-1 data lines to carry the signal and to connect networks and the Internet (Sagan et al., 1995). The interactive compressed video format allows for the two-way communication

in a synchronous transmission; thus, audio and video can flow freely both ways. This format was first transmitted in local networks of colleges, universities, and industry. Today, use of the Internet has enabled this format to travel much farther and faster.

With the introduction of the Internet to distance learning, other classroom materials (class notes and syllabi) were made available to students, and the concept of the virtual classroom became a reality. Partly based in theory and partly in reality, it is safe to say that class-lecture videos on the Internet may be delivered in two different ways: synchronous or live, and asynchronous. Today, in synchronous transmission, students and teachers are simultaneously connected through the Internet, while being miles away. Usually for this setup, students and teachers are meeting in classrooms located in different parts of a state, country, or even the world. For example, the doctoral program at Colorado State University for community college teachers and administrators connects across the state and uses for instructional tools cohort grouping of students at two distant sites, two-way compressed video on a weekly basis for lectures, and three classes during the semester when all students meet at the main university campus (Davies, 1997). An example of a connection across the country is the case of Phoenix University's on-line BS and MBA programs, a university solely dedicated to distance learning and the pioneer in this field (Feller, 1995), or California State University's on-line nursing BS program (Gubernick et al., 1997).

Finally, a world-wide connection is the case of the partnership between MIT and some Asian universities to supply the content resources and finances needed to offer “the largest ever MBA granting experiment based solely on distance learning” (Feller, 1995).

MIT will be the supplier of the academic content in this endeavor, but its partners – in Singapore, Nanyang Technological University Business School NTU, Epoch Foundation of Taiwan (a consortium of corporate interests) and some undecided but possible universities from the People's Republic of China – will be the financiers of this endeavor. The program will use satellite transmission for full-motion videoconferencing to classrooms and asynchronous communication tools (Web pages, E-mail, bulletin boards and on-line conferencing) (Feller, 1995). Another example is Duke University's Fuqua School Business MBA program, which is also accessible worldwide (Gubernick et al., 1997). Further examples are the South Africa University and Paisley University of Scotland with a Hong Kong branch, also world wide accessible (Sherrit et al., 1997). In synchronous transmissions, the class is being taught in one classroom and viewed live in another classroom; both classrooms are specially equipped to send and receive either satellite transmission or Internet connections. A major advantage of this form of delivery is the savings noted in traveling distances and time otherwise spent in reaching the teacher for class instruction (Graves, 1996; Davies, 1997). As a consequence, the learning infrastructure and the contact-hour model, which determined the number of lectures students and teachers were required to meet, are now being redefined. Our educational system is shifting from a teacher-centered, institution-based system to a more flexible, student-centered, distance-based system. Tuition, in most cases, is a bit higher per credit, anywhere from five dollars per credit more than regular tuition (University of Maine) to more than double the price per credit (Duke University), although students do save money on building fees and room-and-board (Gubernick et al., 1997).

The second method of Internet delivery is sometimes called asynchronous or delayed transmission. For this delivery, class-lecture videos are stored in the school's server, and students through the Internet have unrestricted access to them. Even though this form of delivery has been discussed in higher-education literature, actual classroom examples of its use are not available. The most innovative use of asynchronous digitized videos in the field, although not as extensive as a full class-lecture, was found as illustrations of concepts in the presentation of written course materials through the Internet. At the University of Houston - Clear Lake, one unit of a graduate course on "Social and Cultural Diversity in Education" was carefully analyzed and designed, using the Dick and Carey (1990) systematic design model, to present on the Internet for remote student access. This model, in general terms, consists of the following phases: analysis, design, development, implementation and evaluation. As part of the chosen unit, text, audio, and video were included in the lesson materials. More specifically small video clips were added to illustrate lesson concepts. Students were then able to access this material at their leisure. Although no data are available as to the effectiveness of this alternative course presentation of short video clips inserted in lessons presented on the Internet, the comments submitted were very encouraging (Hirumi et al., 1996). However, Hirumi's literature review indicated research data exist that support the idea that students in the overall distance learning programs can perform as well as students in the traditional classroom setting. Hirumi further agrees with Clark, "Instructional design is more directly related to program effectiveness than the medium used to deliver the instruction" (1996, p. 5; Owston, 1997, p. 29). But, on the assumption of effective human learning

through the Internet, Hirumi emphasizes the need for further testing and research. Other authors in this field, like Dickinson, Sherrit and Muffoletto among many others, also share Hirumi's concerns.

Ken Dickinson (1997) describes in detail the specifics of distance learning on the Internet. Among the delivery tools for classroom instruction Dickinson mentions the use of E-mail, class-lecture notes and Web pages that would include an occasional digitized picture and video. Dickinson's article does not refer to any on going research or past collected data to support the effectiveness of this method of delivery.

Sherritt (1997) in her paper "Using the Internet in Higher Education" points out the enormous possibilities made available by the onset of the Internet. She reports on the already wide use of this new resource by a staggering number of higher-education institutions. She also cautions that the new methodologies in use through the Internet are not the result of proven research on their efficacy. On the contrary, she warns "solid research on any aspect of Internet education is practically non-existent" (Sherritt et al., 1997, p. 4). Sherritt argues that, in pre-Internet times, educational methodologies were widely practiced only after formal research and volumes of statistical data were obtained favoring their implementation. Today, partly due to forces outside academe, namely industry, partly due to our lifestyle needs, and partly because of the novelty of a constantly evolving technology, no one has setup a format for testing the efficacy and productivity of Internet-based learning (Sherritt et al., 1997).

Muffoletto (1997) has also designed and developed his "Technology and Education" course to be delivered on the Internet. Some of the tools he has used are E-

mail, mailserve, Web pages with hyperlinks to other relevant resources on the Internet, and, as did Hirumi, small QuickTime video clips in different sections of his Internet pages. As he explained, with every new semester where he offered this same course, he further fine tunes his delivery package, a result of long thinking, careful planning and of listening to his students. Delivering a class on the Internet was challenging, time consuming and demanding, but nevertheless Muffoletto seemed to have positive feelings about it. Muffoletto only related his own experiences, no research literature on this topic was mentioned, nor any statistical data were produced as a result of the implementation of this Internet-based course.

The advantages listed previously in this paper for the synchronous transmission also apply to asynchronous transmission of digitized video. In addition, with asynchronous transmission, the student may choose a convenient time to review the class lecture. This format accommodates the older or returning student population who needs to hold a full-time job and go to school. Of the total student population, the percentage of older students in school has slowly been increasing. As of 1994, the older students made up 41% of the total student population (Gubernick et al., 1997).

But no educational program is ever perfect and flawless. For all the advantages previously mentioned, some very real disadvantages also exist. Although most of the course material can be delivered through the Internet, the question of how to assess student knowledge is still unanswered. No solution to this problem has been found (Braun, 1997). Posting tests on the Web poses several problems including plagiarism and

cheating; therefore, most teachers delivering courses on the Internet adopt other forms of evaluation.

The lack of interaction has been pointed out by many students as a major disadvantage. The interaction of students and teacher meeting in a classroom, asking questions, exchanging non-verbal cues is missing when “attending” classes on the Internet. A Harvard Business School spokesman further elaborated that not being together goes against the established learning process at Harvard (Gubernick et al., 1997). Chris Dede exhorts that for distributed learning to be successful, there needs to be an equilibrium between the electronic and the face-to-face encounters to maintain the classroom bonding (Talley, 1997). Further, Brown and Duguid argue that universities that rely solely on the distance learning model “risk making inaccessible all the valuable insights into communities that students previously gathered by default” (Talley, 1997, p. 70).

ECONOMIC FACTORS

Several arguments in support of using technology seem to coincide with the general consensus that technology is the more cost-effective answer for higher education institutions. On the one hand, the market shows technology costs are lowering in comparison to the always rising costs of faculty salary, building fees, administrative fees and other fees associated with maintaining a university campus (Curran, 1997; Sherrit et al., 1997). On the other hand, the demographic composition of the student population is changing. Whereas years ago the students adapted to the class schedule, university facilities and teachers’ teaching styles, students today represent more of a nomad

population with more business and family ties (Sherrit et al., 1997) and voiced learning-style needs. Higher education institutions, in order to maintain and raise enrollment while keeping costs down, need to adapt to their new clientele. Technology seems to be the answer. Technology can adapt the classroom experience to fit the lifestyle of today's student. And, because technology can bring instruction textually (lecture notes, E-mail), visually (lecture videos) and interactively (chat rooms), the student can also receive instruction that best meets his or her learning style. The unanswered question is, will teachers redesign their course material to deliver a pedagogically sound program through the Internet? Although the jury is still out on the "productivity gain of using technology" (Curran, 1997, p. 345), students from the virtual classroom are satisfied with their distance learning experience, continue to obtain cyber-degrees, are able to juggle their family and job commitments while pursuing a degree, and have just as much motivation to learn, if not more, than their on-campus counterparts (Gubernick et al., 1997).

In comparing costs between the two educational settings, using technology to reach more students with fewer faculty and staff members seems to be a cost-effective argument (Curran, 1997). Also, because students and teacher do not need to meet physically, future construction of more university facilities and their subsequent maintenance costs can be avoided or at least drastically minimized.

The more we reflect on this topic, the more it seems that technology is the more cost-effective answer. Although all the evidence surely confirms this assumption, we should keep in mind Green's and Gilbert's (1995) admonition, "We have yet to hear of an instance where the total costs associated with teaching some unit to some group of

students actually decline while maintaining the quality of learning” (Curran, 1997, p. 345).

All literature reviewed in this chapter encourages the use of technology in the classroom, but it is still the classroom teacher who will determine its effectiveness. Technology is only providing the tools that help the teacher facilitate learning.

CHAPTER 3

METHODOLOGY

BACKGROUND AND SETTING

At the University of North Texas in Denton, new technologies are being used and tested to deliver class instruction across the Internet. In the Department of Technology and Cognition, faculty have been posting their class syllabi on the department's Web site to give prospective students a chance to read about the classes in which they are interested before they actually register, a sort of "class sampling." Innovations in the faster delivery of video on the Internet are now allowing teachers to take "class sampling" one step further. By storing portions of videotaped class lectures on the department's server, faculty are giving students a chance not only to read about a class but also to listen to a class. Through this "class sampling," unknowingly students are being exposed to the setting of attending classes through the Internet.

Once the semester is under way, each professor updates their class' Web site with information such as the class reading list and test and project deadlines. E-mail, as a form of communication among students and between students and teachers, has also been available for years, not only for personal communication but also for submitting class assignments and receiving feedback.

In implementing the next logical step, the department has developed a pilot program for the delivery of asynchronous class-lecture videos with the use of the Internet. For this project, the course CECS5300, Cognitive Processing was recorded in its entirety

during the spring semester of 1998. The video was split into manageable segments. Each clip was then labeled by class sequence and by the book chapter to which the segment related. All video clips were then encoded using Real Video technology, stored on the department's server and the URL (Web site address) published in subsequent semesters in the class syllabi.

Also in subsequent semesters, this course is being presented in a modified classroom setting. Of the five scheduled weekend class meetings, Friday-Saturday combination, two are conducted in a classroom with all registered students physically present. The remaining class lectures are presented through the pre-recorded video clips stored on the department's server. Each registered student is thus responsible to Web-view the clips in their own time.

During the Spring of 1999, the class setting was also supported with the use of other Internet technologies including:

- **E-mail** for student-teacher communication. Students submitted questions and comments related to the technology, scheduling and/or class material through email to the teacher. The teacher used the email not only to respond but also as a medium to keep the class abreast of changes in schedule, use of technology, and any other class related news.
- **WebCT testing** for taking the mid-term and final exams. WebCT provided flexibility of schedule by allowing students to take the test at any time, within a window of several days. The test could then be taken at any computer, anywhere an Internet browser was available. Other WebCT test taking features included a side

chart with the questions answered automatically highlighted in red as opposed to the green yet unanswered questions. A timer within the test heading kept the student informed of the remaining test time. Students could answer the multiple-choice questions by clicking on the right answer and immediately submitting the individual answer. Answers to questions could be reviewed, changed and resubmitted. Once all the questions had been answered and individually submitted, the student had to submit the test. The next screen shown allowed the student to read his or her test grade. Changes to the final exam structure included the addition of comment boxes under each question so students could explain their reasoning to application-oriented, multiple-choice questions and the extra time added for taking the test.

- **WebCT** also provided a **Forum**, a bulletin board, used for student-student communication about the mid-term exam. The bulletin board, although temporarily used, provided a medium for students experiencing technological problems to communicate with other students in the class.
- **Audio-conferencing** for question-answer sessions on the topics covered in the asynchronous Web video lectures. Audio-conferencing using Microsoft NetMeeting software, a live Internet-conferencing client, was used to provide a medium for students and teacher to communicate one hour a week at previously arranged meeting times. A White Pine meeting point server provided the connection point. During these set times announced during the first class meeting, all class participants were to be involved in question-answer sessions on the topics covered in the asynchronous lectures. Simultaneously, a chat room on the computer screen was to support the

session with the textual display of questions and comment entries from the participants. During the first audio conferencing meeting, students experienced different technology problems, echoes, and third party interruptions. During the second scheduled night meeting, as students logged in for the meeting, similar problems were reported, and after 11 participants had logged in, the server software was unable to accommodate the load and the audio connection was simply lost. After the experience of these two sessions, it became clear the software could not support more than 10 participants at a time, contrary to the 50 participants-session announced by the manufacturer, thus making the software useless for whole class discussions. The manufacturer could not remedy the situation, except to refund the purchase price of the software, so audio-conferencing was not used again.

- **Live-video Web-based lectures** were broadcast on the last scheduled weekend for the class to meet before the final, as a substitute to the audio-conferencing and to allow for long distance participation of those students unable to come to class. The live Web lectures were available to any student, anywhere with a computer, an Internet browser and the Real Video client software. During these sessions, the students were able to see and hear the teacher lecturing, type in their questions or comments to the teacher using a chat room, see the textual entries of other students in the class, and hear the teacher's verbal response to their text entries.

CECS 5300, while using a variety of tools for the delivery of instruction, relies heavily on technology. It is this use of Internet related technologies in this class and the students' experiences with this particular classroom setting that this researcher studied in

order to name the *factors influencing how students value asynchronous Web based courses.*

RESEARCH APPROACH AND INSTRUMENTS

PILOT STUDIES

"The tentativeness of a proposal may be greatly reduced, ... if written after preliminary pilot fieldwork has been completed that sufficiently informs the researcher about the promise of the field situation. If the opportunity exists, this is the preferred procedure" (Glesne & Peshkin, 1992, p. 14).

Two pilot studies were conducted on the newly formatted course CECS5300-Cognitive Processing, which used asynchronous video lectures on the Web. The studies involved the collection of data by a thirty-question survey, distributed toward the end of the academic semesters, spring '98 and summer '98. Of the questions, seven were demographic questions, sixteen were closed questions related to students' viewing the videos, and six were open-ended questions regarding students' perceptions of the advantages and disadvantages of this modality. Answers to the open-ended, survey questions uncovered possible factors that may have influenced how students value a course with the format under study. The studies yielded promising results, thus justifying further formal research.

The results from the pilot studies included:

- ❑ The class modality is time semi-independent, which is accommodating to students' traveling demands and other inflexible schedules.

- ❑ The class modality is not site based, thus allowing for independent long distance connections.
- ❑ In these pilot studies, some international students indicated that, because of their lack of English fluency, participating in class through the Internet helped in the following ways:
 - ❑ Increased their ability to go over missed words and/or to pause to write down notes and assimilate concepts.
 - ❑ Removed the peer pressure and inadequacy felt when they were trying to formulate questions. Typing in the questions also gave them the needed, non-pressured, quiet moments to formulate them properly for the teacher.

These results, while promising, were limited and suggested that an understanding of this student-teacher-technology interaction may be gained by further research that would combine the survey with in-class observations and semi-structured interviews of all participants.

POPULATION

For the purpose of this research, the instructor and the students enrolled in CECS 5300 during the spring semester of 1999 at UNT comprised the population under study. Of a total of 44 students enrolled, who stayed in the course at least until after the first class meeting, three students directly or indirectly declined participation in this research, four students dropped before the twelfth day of classes and two students received an incomplete at the end of the course. All of these students were unable to complete all the surveys and interview requested; therefore no complete data sets were available. One

additional student who had completed all requested surveys and the interview, was dropped out of the participants pool because he had not viewed any of the lecture videos, which made his judgements about the class format highly unreliable. With the elimination of the ten students from the study, the total active population of this study remained at 34 students.

Students who agreed to participate in this research signed a “Web Consent Form” (Appendix A). In an effort to ensure the anonymity of all participants, as explained in the consent form, all students were given a pseudonym by the researcher. Pseudonyms and identities were only known by the researcher; its use allowed the researcher to discuss the data and progress of this study with colleagues and professors.

As explained in previous chapters, no published work was found describing the classroom setting under study. At the University of North Texas in the Technology and Cognition Department, this course was the first class to be completely taught utilizing the format of asynchronous class lecture videos on the Web. Therefore, the setting of this research is that of a case study.

PROCEDURE

During the first class meeting of the spring 1999 semester, the researcher made a brief introductory presentation to the students enrolled in the class to explain the purpose of the research project and its potential meaningfulness. Other topics discussed during this presentation were the confidentiality of the subjects’ identity, other procedures that

directly required student involvement, and consent forms, which were explained, distributed and signed.

"The experience of learning as participant observer precedes recourse to interviewing and is the basis for forming questions. The things we have seen and heard about the people and circumstances of interest to us therefore become 'irritants' around which we construct our questions" (Glesne & Peshkin, 1992, p.65).

Interviewing was the tool used in this study for creating a deeper understanding of the data collected during observations and through the surveys, and for collecting new data that could not otherwise have been collected through observations, such as participants' insights, "opinions, perceptions and attitudes" (p.65) about the class setting. Interviews also played a role in "serendipitous learning" (p.65). Questions during the interview process triggered the discovery of unexpected relevant data (Glesne & Peshkin, 1990). Other categories and relevant relationships between students' personal knowledge, demographics, learning styles, personality traits, preferences and lifestyle were uncovered during the interview process.

Periodically throughout the semester, this researcher made non-participant in-class observations, distributed several surveys, and finally, in the last month of the research, conducted an in-person or over-the-phone, semi-structured interview with each of the students and instructor. Because the interview data for this study emerged from the participants' experiences in their interactions with the technology, the initial phase of the investigation involved only distributing a "Participant Demographic" survey (Appendix

B) and non-participant class observations to give ample time for students to utilize and feel comfortable with the technology in this class.

During the second phase of the investigation, other surveys (Appendices C and D) and the interview with students were conducted after the course mid-term exam. Questions for the interview were developed from the class observations and survey responses. All participants were interviewed at least once using an interview protocol with follow-up questions tailored to each participant's voiced experience. These follow-up questions were E-mailed to participants to allow for privacy and to give all parties a chance to elaborate on their answers.

The three different data collection strategies stated previously, together with observation field notes, interview notes and transcripts, computer printouts of E-mail communications, chat room transcripts, and E-mail responses to follow-up questions, enabled this researcher to validate the findings by triangulation. These findings were then justifiably used to determine the *factors influencing how students value a course with a format consisting of asynchronous video lectures on the Web.*

CHAPTER 4

INTRODUCTION

The purpose of this study was to determine the *factors influencing how students value asynchronous Web based courses*. In the CECS5300 class, three main delivery formats were implemented - 1) the prerecorded lectures video setting, 2) the live online Web lectures setting, and 3) the traditional classroom setting - and four instructional tools were made available – 1) Forum, 2) WebCT testing, 3) Email, 4) chat room. Subsequently both the delivery formats and the instructional tools were compared and evaluated by the students in the course.

Of these three class formats, the first two can be considered Web based, due to their use of the computer and Internet connection tools. The instructional tools, also referred to as Internet connection tools, were used as support resources in all class formats and for the textual interaction in the course. Of the four listed tools, this researcher was able to collect a significant amount of data from the students' use and evaluation of the WebCT testing and Forum. The following is a compendium of the students' evaluation of the class formats and instructional tools, from which the *factors influencing how students value an asynchronous Web based course* will be named.

The findings are organized for presentation by class format; then under each class format categories and sub-categories of advantages and disadvantages are presented. Student comments are used to illustrate the subcategory and as a tallying mechanism to

determine level of consensus on the importance of the subcategory. In some cases the same student comment maybe found in more than one subcategory.

DELIVERY FORMATS

CD/INTERNET FORMAT

The prerecorded lectures video, which for practical purposes will be referred to in this paper as the CD/Internet format, involved either the use of a CD-ROM with the pre-recorded videos or the use of the Internet for direct access to the same pre-recorded videos stored in the department's server. Students had either option for viewing lectures, but in both formats an Internet connection was still needed to access other class resources such as films, E-mails, bulletin board or Forum, and testing. This CD/Internet format was evaluated by the students, on the basis of their personal learning preferences and current lifestyle, as providing several advantages and disadvantages. These advantages and disadvantages consequently were grouped in several categories, which represented the defining factors of this research. All statements made by the students in their surveys, interview, and email communications were carefully read multiple times to determine the category of "best-fit." Following the advantage and disadvantage sections, students' preferences and suggestions for this CD/Internet class format have also been compiled and listed as separate sections.

• ADVANTAGE FACTORS

Statements collected from the students' interviews and surveys implied that they perceived a tangible gain or intangible benefit while "attending" class through the

CD/Internet delivery format, a benefit which otherwise would not have occurred while attending the same course in the traditional class format. The statements were further grouped under the four broad categories below.

I.- CONVENIENCE

Convenience is defined as “saves work.” Student responses related to convenience of format were organized into five sub-categories: Family, Focus, Comfort of Familiar Environment, Economy. Statements indicating convenience were placed in the five subcategories as they embodied the characteristics in the descriptions.

Family – responses related to the student’s direct relationship with other members of his or her family. **Focus** – responses related to improved concentration and focus on the class material. **Comfort of Familiar Environment** – responses related to the convenience of viewing the lectures in one’s own comfortable surroundings. **Economy** – responses related to a savings of resources, either of **Time**; or **Travel** (no driving to and from school-work-home); or **Money**; or **Intellectual-Energy** (not spending any mental resources in listening to other students’ participation in class. Avoiding class nuances and distractions); or **Eco-System** (contributing to saving the environment).

A. Family

- Allows me time with my family. (Alexander)
- Can spend more time with my family. (Charles)
- Having a family at home, it just made the time convenience more appropriate. (Henry)
- I do not have to get a sitter for my child. I save money and time. (Jo)

- Able to handle family matters. In other words can have some semblance of a life beyond school. (Joe)
- You can stop the tape, get up and go do whatever you have to, if you need to get a drink, or if you have to have a caffeine fix, or you have to go play with the kids. (Joe)
- Having a family at home, it just made the time convenience more appropriate (important). (Henry)
- Taking a Web course as opposed to attending on campus, a large part of it is family. Because, I can get home at 8:30 pm as opposed to 9:30 pm or 10 o'clock many times is what it would take when I was going driving to Denton to take a class. (Marcelino)
- It's really primarily, the distance. And other commitments that I have. I have three children and a job. Those all add up, to a lot of time committed already. But, the distance is the primary thing. I would not be taking any classes, if they were not offered conveniently. I would either not be in this doctoral program, or I'll be trying to find the money to go to Baylor. That is the biggest deal, in this market in the Waco area. (Mary)
- Viewing was tricky with a kid running around. For my life situation (divorced, full-time job, a child, 45 min away) this class is my best bet. (Teresa)

B. Focus

- Watch and listen. Focused. (Alexander)
- More concentration. (Anastasia)
- Constant focus on what's being taught in class. (Consuelo)
- I would try to find things in the book so that I could have a better idea of what he was talking. (Consuelo)
- (The video portion of the tapes) It's not necessary, but it does help. (Henry)
- With the CD I can make myself not connect to the Internet and pay more attention. (Jo)
- The image gives me something to focus on. And not just a still image, ... if not doing anything, it's not keeping your attention. I also took notes. (Joe)
- I had the headphones on like if my husband was home and he was watching TV, or there was something going on outside the room, and that way I wouldn't get as distracted. (Leslie)
- Another way to clear up question is you know, I don't mind self settings, I would go back and look up things in the textbook to follow up on the lectures. (Mary)
- Because of the media, I think you are more apt to retaining. I am, because it's a different way of bringing it in. I guess it's because it's an innovative way to teach, and you are more involved in it than maybe going to the traditional classroom. (Rebecca)
- I was listening, watching, listening to what other people were arguing. I would even have the children work through things and apply what I had read about. Now I understood. "Direct experiencing" what I was learning. (Veronica)

C. Comfort of Familiar Environment

- I have a desk in our bedroom, and I sit there. Drink ice tea, eat pretzels, take notes. Printout his printouts on things, and follow along. Allows me to be in the comfort of my own home. (Alexander)
- More comfortable to be at home. Privacy, quiet. (Anastasia)
- Watched videos at work and at home. At home had to use headphones, because if my son were to hear he would come and want to know what I was doing. (Charles)
- It would have been much easier on me, if all my classes had been, where I could stay home, at my convenience, watch the online, watch the videos. ... Allows me to be involved in class and still be able to do things around the house. ... I did pause it a lot to go to the restroom, and get up, and take care of the things around the house. (Consuelo)
- Frees up a night to be at home. (Erica)
- I can watch it in a T-shirt and sweat pants. (Hellen)
- (While listening) I would sit in my chair with my feet propped up, I really liked that. I would get up and walk around when I got tired of sitting. I would get up and walk outside the door. Walk, leave the door open, stand outside and smoke a cigarette. Still listening through the speakers. That was really handy, I love to smoke. (Henry)
- At home where I can close the door, I can clear off everything and really focus on the book and the notes, I focused better than at work. It was almost like being in class. I might not always be staring straight at the professor, but I'd be paying more attention to my notes and to my book. (Leslie)
- Whenever I'm really studying or write a paper, I always have to have something to munch on. That's part of my learning style, I guess. (Leslie)
- More comfort. (Marcelino)
- I just spread out. I can have material spread out on the desk in front of me. I can be studying and looking. From home I was doing, cleaning things, re-arranging stuff on my desk and listening. It was truly listening, I really wasn't watching it. (Marcelino)
- Convenience. (Mary)
- I would drink a soda. My cat would come sit in my lap. (Rebecca)
- Don't have to leave home. (Rita)
- Being at home I can be in my own space and be comfortable. (Veronica)
- Pleasure of sitting at home, by not hurrying up to school for the class. Attending the lecture from home. Very Convenient. (Virginia)

D. Economy

1.- Time

- Saving time. (Arthur)

- I feel I'm making the most of my time. I'm not wasting my time driving (to Denton) when I don't have to. (Cristina)
- No drive, saves gas/time. (Erica)
- Saving time. I can view videos (CD) when I'm gone, on a trip. (Erica)
- Time available. (Isaac)
- It saves time. (Jessica)
- With the CD there were no connection problems, no Net Congestion. It was much faster. (Jo)
- I do not have to get a sitter for my child. I save money and time. (Jo)
- Instead of going to class, listening to the lecture. Then going home, add another time to have it processed, because since I have to drive from McKinney, which is 45 minutes. And then stay in the class for 3 hours, and drive. I don't even want to touch it again, for maybe another week or so. So, that I think I found that I'm using my time a lot more efficiently, because I've built it in, as I do stuff. (Leslie)
- I did notice the CD helped a tremendous amount for me, over the Internet. I could easily stick my disk in (and watch the videos). As opposed to, pulling it up on the Internet, logging in, getting different messages. My biggest thing was getting messages and not knowing. Like, I didn't know Net Congestion, "what do I do now?" Buffering, "what do I do now?" I learned but, eventually it's like it totally freaked me out. "Oh, gosh, I'm doing something wrong! What can I do?" And I was pressing (all keys). So, the CD eliminated all of that for me and saved a big amount of time. (Nancy)
- Once I got the CD and didn't have the Net Congestion it was fine. The CD-ROM was better (than online) because there was no buffering or Net Congestion to slow you down. (Rita)
- Prefer CD over traditional if refined, because it capitalizes all my time. (Samantha)
- Getting the CD helped a great deal over the Internet. (Teresa)
- CD improved viewing over the Internet. (Velma)
- Not having to be on campus. For me it's a 3 hr drive. We did not plan to move, but the fact that we did and I was already half way through and have to start some where over was not good. So the ability to have this was a God sent. (Veronica)
- With the videos we don't have to waste time listening to other students get the class off track with their questions and detailed description of their own anecdotes. (Nancy)

2. Travel

- User-friendly, don't have to drive to school. (Alexander)
- I don't have to drive. (Amanda)
- Saves me the commute down here (school) and coming back and getting off in enough time to get up here. (Amy)

- Don't have to travel. (Bernardo)
- No travel. (Catalina)
- Saves wear and tear on my car. (Consuelo)
- I feel I'm making the most of my time. I'm not wasting my time driving (to Denton) when I don't have to. (Cristina)
- No need to come to class. (Diego)
- No drive. (Elizabeth)
- No drive, saves gas/time. (Erica)
- If I didn't live close to campus, I think that I would have no qualms at all taking a class this way. My experience has not been so detrimental that I wouldn't do it again. I would do it again if I had issues that made it convenient. (Hellen)
- No driving to class. (Isaac)
- I do not have to drive! (Jo)
- No travel time to return home after class. (Joe)
- Instead of going to class, listening to the lecture. Then going home, add another time to have it processed, because since I have to drive from McKinney, which is 45 minutes. And then stay in the class for 3 hours, and drive. I don't even want to touch it again, for maybe another week or so. So, that I think I found that I'm using my time a lot more efficiently, because I've built it in, as I do stuff. (Leslie)
- I just find that without that much windshield time I'm learning more, because I'm not tired from the trip. (Marcelino)
- I'm 120 miles from Denton and so it saves me the travel time. (Mary)
- I am very happy that we have this kind of a chance to learn in the outside of campus. For those students that live far away of campus it's convenient for them. (Nicholas)
- Convenience. I don't need to drive to class to attend it. (Nicholas)
- Don't have to drive 200 miles to class. (Olivia)
- I don't have to travel to Denton, 3 hours one way. This was a big PLUS. (Rebecca)
- There is a lot of flexibility there. I did not have to travel. (Rebecca)
- I was able to take the course, otherwise I would not have been able to. (Rebecca)
- It virtually eliminated the need to attend class. (Rita)
- It has saved travel time, time in the media library, and made the format possible. (Samantha)
- No drive. (Teresa)
- Convenience time wise. It could cut down an hour and a half driving time, each time to class. (Velma)
- Not having to be on campus. For me it's a 3 hr drive. We did not plan to move, but the fact that we did and I was already half way through and have to start some where over was not good. So the ability to have this was a God send. (Veronica)
- No fuss to commute till the classroom. (Virginia)

3. **Money**

- Saves wear and tear on my car. (Consuelo)
- No drive, saves gas/time. (Erica)
- No parking problems. I've got free parking at home. (Henry)
- I do not have to get a sitter for my child. I save money and time. (Jo)
- Saves money, gas, hotels, etc. (Olivia)
- Not having to be on campus. For me it's a 3 hr drive. We did not plan to move, but the fact that we did and I was already half way through and have to start some where over was not good. So the ability to have this was a God sent. (Veronica)

4.- **Intellectual-Energy**

- Often I find the traditional class setting gets the class off of the subject and on to irrelevant topics. The class gets lost in the details rather than listening to the whole topic. Class moving at a slow pace. (Amanda)
- There is too many distractions for me (in traditional). (Amy)
- I stopped, rewind, and fast forwarded the tape, through the parts that I didn't think were that great. (Anastasia)
- There is one in every class, who is just really annoying. And at least on the video I didn't have to hear it, I could edit out annoying people. (Cristina)
- Question-answer sessions, that's the part of the class I can do without. I'm not real concerned with other people's questions. (Edward)
- (Not in touch with other students) In fact I kind of enjoy it. (Henry)

5.- **Eco-System**

- Environmentally friendly. If not driving ... you are not polluting the atmosphere. (Alexander)

II.- **FLEXIBILITY**

Flexibility represents any advantage related to adjustability to conflicts.

Flexibility subcategories include: Class Backup, Comprehension/Understanding, Learning Self-Assessment, "More Alert" Time, Schedule Flexibility, Viewing Flexibility. Statements indicating flexibility, were placed under the subcategories as they embodied the characteristics in the description.

Class Backup – responses related to being able to access class content when unexpected circumstances make it impossible to be in the classroom.

Comprehension/Understanding – responses related to the ability to go over the class material more than once for improved comprehension or understanding of it.

At different levels this was accomplished through **Reviewing Lectures** (viewing the whole lecture more than once); and through **Content Accuracy** (re-

listening/reviewing the teacher’s sentence to understand, or because it was

missed). **Learning Self-Assessment** – responses related to satisfaction with the

amount of material covered in the class using this format. **“More Alert” Time** –

responses related to the flexibility of being able to choose one’s own best time of

the day for learning. **Schedule Flexibility** – responses related to being able to

view lectures around one’s work and family schedule. **Viewing Flexibility** –

responses related to being able to stop or pause, to take a break or handle other

types of interruptions, once viewing of the lecture has started.

A. Class Backup

- I prefer normal class (traditional), but if there are circumstances where I can’t come, I’m glad there is something there that I can (attend class). (Alicia)
- I can view them even if I’m sick and can’t attend. (Amy)
- Saving time. I can view videos (CD) when I’m gone, on a trip. (Erica)
- I rather have both, the videos as back up, and the in-person in the class. (Jessica)
- It’s great to watch the missed sections. Even if I miss the class, I can always attend the class. (Virginia)

B. Comprehension/Understanding

1.- Reviewing Lectures

- Can repeat recorded lectures if need be. Ability to view multiple times. (Alexander)
- I can review them—not a one shot deal. (Amy)

- Could rewind on the things I didn't catch the first time around. Could watch the film 20 times. (Anastasia)
- Repeating lectures. In traditional I can't repeat lectures. (Arthur)
- I reviewed them again. (Diego)
- Can repeat as needed. (Elizabeth)
- Can watch them more than once. (Erica)
- Can re-look at a lecture if I'm unsure about content or book. (Isaac)
- I can rewind it and listen to it again. (Jessica)
- Once I read the lesson I also can go back. (Jessica)
- I can review tapes. (Jo)
- You can review with the pre-recorded. (Marcelino)
- If we can't understand the content of lecture we can review again. (Nicholas)
- I feel that I'm learning the material. I play the videos three or four times. I feel like I've gotten the content, but I'm doing it differently. (Olivia)
- Can schedule so I have time available. (Veronica)
- I can repeat any topic I want to listen to. (Virginia)

2.- Content Accuracy

- If I don't understand something I can go back and turn and I can listen twice or even more times. But in a classroom if I skip something it's gone. (Alicia)
- If I had questions, I would rewind it to where I thought I'd heard the answer to the question. I just replay the segment. (Amy)
- In class if I missed something that's it. (With the CD) Could rewind on the things I didn't catch the first time around. Could watch the film 20 times. (Anastasia)
- I really liked the CD, if I missed something I can rewind, I can hear it again. (Consuelo)
- If I missed something, I could move the video back and would play that part of the video again. Instant replay. (Cristina)
- If I thought something was important, I would pause and rewind and play it again. I moved the marker back and forth. (Diego)
- Sometimes I would go back and review it, if I missed something. (Edward)
- Go back and look at things. Being in a lecture he'll mention something about what he talked about the other day. And I'll say "I don't remember that" and I'll go back try to find it. (Henry)
- The nice thing about the videos is that I could stop it if I needed to go and say wait a minute, I didn't get that part back it up, and play it again. That was a nice part. Go at my own rate. (Leslie)
- Whenever it was videotaped, I could back up and look at stuff. (Leslie)
- Being able to review, back up and review a particular thing on a pre-recorded lecture, stop and re-read a particular portion of the text. That was kind of interesting, to get my wife's reaction as well. (Marcelino)
- Being able to go back and forth if you missed anything, a word, or whatever. (Nancy)

- I don't think I had questions. What I would do several times, is he would make a statement and I would want to hear that again, I would just back it up (the video) just that tiny amount and listen to that several times until I heard exactly how he said it. (Olivia)
- In a pre-recorded lecture you have the advantage of going back and reviewing if you think you have missed it. I did not have that opportunity in the lecture. If you missed the notes when he is talking, it's gone. Unless you go back and ask him. (Rebecca)
- You know you can pause the Real Player if you missed it, need to, if you don't get it. Or you can rewind it back a little bit. (Rebecca)
- My favorite thing to do was to go back and listen to them again. So, if you missed a word which I tend to do, you can go back and get it. (Samantha)
- Whenever I had questions, I just stopped it, and moved back a little bit and replayed that segment of the CD, so I could get the idea down. (Teresa)
- Back it up, when either you didn't understand it, or you back it up to hear it again. The rewind feature is delightful. (Velma)
- When I got buffering, I would stop it. Bring it back to that point, and start over, to the point where I was having a problem, and then go from there. So, it didn't really affect me, it just was an interruption. (Veronica)
- It's great to watch the missed sections. (Virginia)

C. Learning Self-Assessment

- I learned as much (as in traditional) (Cristina)
- I felt I had a good grasp on the material. (Edward)
- I don't feel I have learned any less. (Leslie)
- I feel like I've learned as much from a prerecorded class as I do when I'm in a traditional setting. (Mary)
- I don't feel that I have missed out on anything. I wouldn't take another class like that if I had. (Mary)
- As far as learning, I don't think there is a lot of difference between CD and traditional. I think this is a good way to learn the course. (Nicholas)
- The technical problems were minimal compared to the FACT that the instruction is available and we are learning. We can work around the technical problems and this is a new field. You have to expect problems at first. (Rebecca)
- I think I can do well because I'm auditory, and I don't need all that visual stuff in class. The content was not influenced by the presentation type for me. (Rita)
- I think if I did a few more and got more comfortable with it. It would be ok. Because I think academically, I can get all the content I need (from the CD). (Rita)
- I have learned as much in this setting (the CD) as if I were in the traditional, but it's taking more work to get there. (Rita)
- Didn't watch, just listened. I've learned the same as in traditional. (Samantha)
- I felt like I learned the material. That was the thing that I finally realized that was the most important, was being able to hear him, and hear his inflections when he was talking. I would do it again. (Teresa)

- I have learned through the textbook and the videos that I am able to watch. I felt comfortable with the content. (Veronica)

D. “More Alert” Time

- I could watch them whenever I wanted to. (Anastasia)
- I could get to it anytime without a problem. (Arthur)
- By shifting the burden of managing the time to the student, I make better use of time, because I go to the material when I’m ready for it, not tired. (Edward)
- I can actually come to class fresher, because I haven’t had to drive (for) an hour. At least I’m more alert and more open to learning by not having traveled that far that helps to compensate (viewing CD over not going to class). It takes anywhere from 45 minutes to an hour depending on traffic. (Marcelino)
- I’m a morning person and I really like to do it around seven in the morning. I can pick the time that works best for me. (Olivia)
- I could do it at 2 o’clock in the morning if I feel like it, that’s definitely a convenience. (Velma)

E. Schedule Flexibility

- Fits better in my schedule ‘work-edu-family’ (Alexander)
- I don’t have to rush to school at a certain time. ... I can watch it whenever I like, the time is more flexible (especially) if I have a job and can’t come to school. (Alicia)
- With my work schedule, this offers me the flexibility regular classes don’t. (Amy)
- I can control my time to study. I can study whenever I want to. (Arthur)
- Flexibility of when to watch, depending on your schedule. Can watch at midnight if I want to. (Arthur)
- If it weren’t for the tech problems I prefer the pre-recorded setting because of my schedule. It made my schedule more flexible. (Charles)
- You can do it self-paced, so it works with your time, your schedule. (Consuelo)
- I was able to view it at my own pace. (Diego)
- Gives you time freedom. (Edward)
- I stayed late at work, to watch videos. (Edward)
- I just covered the material differently. It can happen on my desktop at will, whenever I want it. I do a little bit more between the normal class meetings than I would just coming the 5 weekends and cramming the material those weekends. Efficient use of my time. (Edward)
- Can do at any time. (Elizabeth)
- Saving time. I can view videos (CD) when I’m gone, on a trip. (Erica)
- I can watch them at wee hours of the morning and create more “day” time for myself. Nice to have control over my schedule. (Erica)
- Being able to choose the time that I wanted to spend doing that (viewing videos). (Hellen)

- Time convenience. Any time. I can look at it at 4:30 am for 30 or 40 minutes in the morning. (Henry)
- I can listen to the lesson at my convenience. Any time. (Jessica)
- I can view tapes when I have time. (Jo)
- I can pick my time (to view them). (Joe)
- You can review at leisure. (Marcelino)
- I can do it in my, its an asynchronous opportunity to take a class where you don't have to be there at a certain time. I missed part of the lecture this weekend, but it's available over the Internet, and I can just go back and watch it when it's convenient for me. So it really makes it easy to work it around your schedule. (Mary)
- I like both (DL and CD), but it (CD)'s preferable in some ways because it's more flexible in scheduling. (Mary)
- It's really primarily, the distance. And other commitments that I have. I have three children and a job. Those all add up, to a lot of time committed already. But, the distance is the primary thing. I would not be taking any classes, if they were not offered conveniently. I would either not be in this doctoral program, or I'll be trying to find the money to go to Baylor. That is the biggest deal, in this market in the Waco area. (Mary)
- I watched sometimes several segments at one time, just because I would plan my time around that. I would say my kids had to be gone for 3 hours and I would just watch the segments., or late at night after they had gone to bed. (Nancy)
- I can view the videos when I'm free. (Nicholas)
- It's also convenient to work at your own pace and set up your own time schedule. (Olivia)
- I prefer the CD over traditional, convenience. Time and place convenient to me. A lot of flexibility, convenience so you can watch it when you want to. (Rebecca)
- Flexibility of schedule. Can view at a time convenient for me. (Rita)
- The schedule. View when it fits you, I thought that was neat. Whether it was late night, morning, or the middle of the day. (Samantha)
- It allows me more flexibility. (Teresa)
- I can watch the lectures as my schedule allows. I watched the videos typically after my son went to bed, and could focus my attention. It's a God send for those of us that have outside commitments. (Teresa)
- Convenience of scheduling. (Velma)
- Can schedule so I have time available. (Veronica)
- I prefer this kind of class than the traditional because I'm able to review, recall what was said, in my own time. If I can't make it to class, no problem. (Virginia)
- Like an independent study. Study at own pace, when you want. (Virginia)

F. Viewing Flexibility

- I can interrupt any time and come back. Ability to stop and return at will. If I really got tired, I stopped it, took a break, came back and continued from where I left off. (Alexander)

- I can stop it as soon as I have to do something else, and then pick it up easily. (Alicia)
- I would also pause the video every so often and go do whatever I needed to do. I can do it any time I want at my leisure. (Amy)
- I did pause it a lot and go to the restroom, and get up, and take care of the things around the house. (Consuelo)
- Allows me to view the sessions in smaller increments. (Consuelo)
- I can do it at my own time and pace. Watch at my leisure. (Cristina)
- I rather have the prerecorded (than traditional) I have more control to it, convenience of time, rewind, pause, review. In lectures I don't. (Diego)
- A couple of longer segments, I would break up into shorter ones. I would find a break, jot down the time, and come back to it. At my own pace. (Edward)
- Could start and stop. (Elizabeth)
- Would pause, re-start in my case, to catch what I missed or to take a break. (Hellen)
- I can look at it, stop, get up, go do something I need to do, come back and start again. Breaks at my convenience. (Henry)
- You can stop if the phone rings or whatever, then you come back the next day, you just slide the bar over, and it starts immediately. (Jo)
- I can eat, go to bathroom, etc. when I want to. (Jo)
- You can stop the tape, get up and go do whatever you have to, if you need to get a drink, or if you have to have a caffeine fix, or you have to go play with the kids. (Joe)
- I could take my time viewing them. Interruptions were not a problem. (Joe)
- If I needed a break I could just take a break for 30 minutes and come back to it. So, that was another good part. (Leslie)
- I took my lap top. It's portable, you can take it with you. If I had a computer, I would watch some of it (videos) between events (daughter's games). Took it to the meets. I was sitting in the car. It was private because I was in my car. I just sat in the car and listen to it. You really don't need the video part, as long as you have the audio. I wasn't even watching the screen, there's really no point. The video is really sufficient. (Mary)
- I prefer CD-ROM over Online. I think the CD-ROM, it still gives you more flexibility. I could not sit on the TV the whole time, or on the computer the whole day Saturday, because I had to leave and go some where. (Mary)
- I would put my book in front of me in my desk, and also I would put on my notes if he said something important for me. Write the notes and check on the book, in the chapter. (Nicholas)
- I tried to maintain the same focus I would in a classroom. If I had to get up and walk I always stopped it, or paused it. (Rebecca)
- I can participate in the class or the material at my convenience. The availability of the CD made the class easier. (Teresa)
- Another person in the class and I got together a number of times, to watch them together, and that made it a lot more fun. (Velma)

III.- LEARNING ENHANCEMENT

Learning enhancements include all those advantages that represent new approaches to a classroom routine and that turned out to be beneficial to the student. The subcategories of Better Note Taking, Discipline, Multi-Tasking, Technological Factors (learning, liking) all include learning enhancements. Statements indicating learning enhancements were placed under the subcategories as they embodied the characteristics in the description.

Better Note Taking – responses related to improvement in the amount and quality of the notes taken over the class lectures. **Discipline** – responses related to developing a level of discipline to cover the class material. **Multi-Tasking** – responses related to the ability to perform, concurrently or simultaneously, other tasks while viewing the lectures. **Technological Factors** – responses related to gaining, intentionally or unintentionally, an understanding of the technology used in the class. Also, learning and/or liking the technology occurred as a consequence of being exposed to it in this class format.

A. Better Note Taking

- I can go at my own pace. Can take breaks and not miss anything. Could push pause while catching up on notes. (Amy)
- Took notes in Word while listened to lecture. (Anatasia)
- Just listened and typed notes in Word, helped me focus. (Catalina)
- I took notes with ... index cards ... context map ... (Cristina)
- Easier to take notes because you can pause it, and write down. And if I needed to, hear him again.
- There was Net Congestion, but it helped me to take down notes during that time. (Jessica)
- I would stop the video and take notes. (Jo)

- What I found myself doing is that I was listening more, and taking more notes, and going through the book, and occasionally I'd glance up at the screen. (Leslie)
- I don't feel as though I've had to spend a lot more extra time studying, outside of class. And the reason why, is because I'm doing it as I'm watching a lecture. I can stop it, and I can take my notes, and I can process this stuff from the book at the same time. (Leslie)
- I would put my book in front of me in my desk, and also I would put on my notes if he said something important for me. Write the notes and check on the book, in the chapter. (Nicholas)
- Because of how long I've been out of school I couldn't listen to Dr. Young and take notes at the same time. I could only do one or the other. With the videos it was easier because I could listen, stop the video and write the notes. And that's something I really liked about the CD. I could stop. (Teresa)

B. Discipline

- Harder to schedule the time in. It's more self-disciplining. (Anastasia)
- I had a schedule (to view the videos) that I followed, otherwise you get behind. (Jo)
- I don't feel as though I've had to spend a lot more extra time studying, outside of class. And the reason why, is because I'm doing it as I'm watching a lecture. I can stop it, and I can take my notes, and I can process this stuff from the book at the same time. (Leslie)
- I make my own schedule. What I try to do is block out some time in the morning and do a little bit. (Leslie)
- Motivation. You really have to establish some personal rules and adhere to them. (Rebecca)
- Being self-disciplined enough to work through during the semester and not wait until the end. (Veronica)
- Like an independent study. Study at own pace, when you want. (Virginia)

C. Multi-Tasking

- I surfed the Internet, worked on my Web page. (Amy)
- Re-arranged the room, cleaned up the room, ate dinner. (Anastasia)
- While listening I was programming, or looking around the Web to related material surfing the Web. (Charles)
- Allows me to be involved in class and still be able to do things around the house. (Consuelo)
- I could do more than one thing at a time. If (lecture) went off on a tangent I could ignore it and do something else, play free cell, do paper work. Multi-task without feeling like I'm being rude to professor. (Cristina)
- I was mostly listening to the lectures, fixing my table, doing things in my room, organizing books, taking notes. (Diego)

- I felt like I could divide my attention and still learn. I wouldn't watch the videos, just listen, and surf the Web, play little games. I don't need to see him, in order for him to engage me. (Edward)
- While just listening I would, take notes, smock dresses, clean up my desk. I didn't want to watch it. (Jo)
- I'd eat, go grab a coke real quick, folded some cloth, things like that. Which if I was in class I obviously wouldn't be doing. It was really hard to do anything that was too involved. (Leslie)
- From home I was doing, cleaning things, re-arranging stuff on my desk and listening. It was truly listening, I really wasn't watching it. (Marcelino)
- I watched it at work when I was doing busy work. And, it is something you can do and you don't have to give it 100% attention or you can break it up into smaller pieces if you are doing something else. (Mary)
- I'll listen to it and if it pauses then I can jump around in my desk until I hear it come back on again. I guess it's a little distracting. I just simply listened to it. I'm doing something else on the computer. (Olivia)
- While watching the videos, actually I ironed. I ironed the whole time, and then if I thought I'd missed something then I would just back it up. (Samantha)

D. Technological Factors

- Prefer online and recorded over traditional. (Arthur)
- CD improved viewing (over the Net). (Catalina)
- Learn new technology! (Catalina)
- Watched videos at work and at home. At home had to use headphones, because if my son were to hear he would come and want to know what I was doing. (Charles)
- I can't say the quality was bad. I viewed it and I thought "This is pretty good considering it's the first time I've seen something like that on video, or on the computer." (Consuelo)
- Once I got the CD, I was able to load it to my hard drive and then I got a really good playing time. It ran much smoother. (Cristina)
- I can't say the quality was bad. I viewed it and I thought "This is pretty good considering it's the first time I've seen something like that on video, or on the computer." (Consuelo)
- No difficulties with the CD. (Erica)
- Just listened and took notes. Didn't bother me. (Hellen)
- With the CD there were no connection problems, no Net Congestion. It was much faster. (Jo)
- And there are no marks on the videos. I've learned now, which I didn't know then, as I go through I need to mark the time setting on certain topics. (Joe)
- I think with this class with the video and the audio that's added a lot (over an all textual Web classes). (Leslie)
- I really like experimenting with new things, with technology, because as an educator I believe that's where it's going to end up going. I like to try stay on the latest things out there. I almost like the fact whenever it doesn't work, because

that tells me, ok, don't try this piece try it this way, maybe it will work better. I learn a lot more, when everything doesn't work. And we have to work through the problem to try and resolve it, than when everything works perfectly. (Leslie)

- If I paused the videos, I could just start again. But, if I stopped it, it would take it back to the very beginning. (Leslie)
- (In case of Net Congestion) "I always kept an eye on where the video was, because it had the minutes down at the bottom. And then whenever I go and re-launch it, I would fast forward the video to about the same time, and there be no problem. I seem to have a little more patience than other people, because I work with technology a lot with my job at school. (Leslie)
- Viewing videos over the Internet after 5 o'clock was slow. So, I tried to do it in the morning on the weekend because for some reason, I don't know if everybody was watching Saturday morning cartoons or sleeping in, or what, but it was great. That was a matter of figuring it out at first. (Leslie)
- That maybe one reason why I prefer to do something on the Web, rather than just go to class. Because, the challenge in of itself, just to get on line, and make sure that everything works. That to me, it's really cool! (Leslie)
- The CD really improved the viewing of the videos (over using the Internet). (Marcelino)
- I did notice the CD helped a tremendous amount for me, over the Internet. I could easily stick my disk in (and watch the videos). As opposed to, pulling it up on the Internet, logging in, getting different messages. My biggest thing was getting messages and not knowing. Like, I didn't know Net Congestion, "what do I do now?" Buffering, "what do I do now?" I learned but, eventually it's like it totally freaked me out. "Oh, gosh, I'm doing something wrong! What can I do?" And I was pressing (all keys). So, the CD eliminated all of that for me and saved a big amount of time. (Nancy)
- The technical problems were minimal compared to the FACT that the instruction is available and we are learning. We can work around the technical problems and this is a new field. You have to expect problems at first. (Rebecca)
- I think if I did a few more and got more comfortable with it. It would be ok. Because I think academically, I can get all the content I need (from the CD). (Rita)
- Once I got the CD and didn't have the Net Congestion it was fine. The CD-ROM was better (than online) because there was no buffering or Net Congestion to slow you down. (Rita)
- The CD with the videos I think they did help me. I don't think I had any more Net Congestion. (Samantha)
- When I saw that the class was going to be online, that was the main motivating factor. Because it would fit into my schedule, and I figured it would be a great excuse to learn my computer better. I have learned a great deal, actually. (Teresa)
- Getting the CD helped a great deal over the Internet. (Teresa)
- CD improved viewing over the Internet. (Velma)
- The classes that were produced on the current version of the real-player were not all that difficult (to view) as compared with the earlier classes. (Veronica)

- Most films (1-10) do not play on the Real Player G2 version. That's why they took 2 to 3 times longer to view, if I was able to view them at all. When I got to the G2 videos it was much better. (Veronica)
- The videos on the CD were very good and much easier to get through than trying online. (Veronica)
- Not discouraged at all from the glitches experienced this semester. Glitches are normal until technology becomes the usual. (Virginia)

IV.- PSYCHOLOGY

Psychological factors include those advantages of the CD/Internet format that have, from the student's perspective, beneficially affected the personality or psyche of the participant. The subcategories of Posing Questions, Teacher Support, Participation, Self-esteem all contain psychological advantages. Statements were placed under the subcategories as they embodied the characteristics in the description.

Posing Questions – responses related to being able to interact textually with the teacher or other students in one's own time and space. **Teacher Support** – responses related to availability, accessibility, and planning on the teacher's part that helped make the experience with the setting a better one. Some 99% of the students agreed that teacher availability and accessibility was very much true of their semester experience. Statements that were made beyond answering the question "Was the teacher accessible?" with a "Yes" or "No," have been compiled and placed in this section. **Participation** – responses related to not having to orally participate in the class. **Self-esteem** – responses related to the improvement of one's level of confidence.

A. Posing Questions

- I just rather have the pre-recorded and that's it. What I like to do is to hear the lecture, take my notes, and if I don't understand something then ask the questions later. My question is actually more relevant this way. (Amy)
- If I had time to think about it, type it out, then it would come out better (using email for asking questions). (Amy)
- The fact that if I did have a question, or I didn't understand something I could stop things and I could write things down, and think it through and process it. Instead of just having it skipped over and try to catch on to the next thing, and possibly miss something. That maybe why I don't feel like I have to study quiet as much as I typically would, because I can really get it the first time instead of having to go back and figure out where my guesses are later. (Leslie)
- Questions, I would email, you could email the instructor. You can do a lot of the foundation work with the CD-ROM. Then just give the students an opportunity, like he is doing, a couple times during the semester and meet together and ask questions. (Mary)
- More chance to let the International students that willing to express their ideas on the Web (email, Forum, chat). (Nicholas)
- Shyness. Fear of asking a question others will think stupid. My ability or lack of ability to communicate, prefer email or the chat. I'm very quiet. I generally do not ask questions. If there had been something I did not understand I think I would have e-mailed him and asked him. I would've taken that initiative.(Rebecca)
- Teacher is always available to answer questions in-person, or by Email, or chats. (Virginia)

B. Teacher Support

- The willingness of Dr. Young to return email and be available was really helpful, makes a difference. (Erica)
- I like very, very structured teaching. I liked him putting out the outlines, that were coming up. (Joe)
- Some classes lend themselves to that, especially if the instructor is more organized, more structured, then to me he ought to be online. (Joe)
- I think that his personality has helped at times, because he is approachable. And I think, that's a big thing in getting this to work. (Nancy)
- I love the accessibility of the course, department and professor via the Web. (Teresa)
- Teacher is always available to answer questions in-person, or by Email, or chats. (Virginia)

C. Participation

- I have enjoyed not having to go to and verbally participate in class. (Amy)
- Don't miss interaction with other students. (Charles)
- I feel I can learn from somebody else's interaction too. I like to see the interaction between people that goes on in the class. But I don't have to be the one who's always got the questions being asked. (Cristina)
- The contact with other people has been sufficient. (Leslie)
- As far as the classroom setting, I don't really miss it. I've attended enough classes. It's not for me, it's not a social event. I have other goals. (Mary)

D. Self-esteem

- Apprehensions of old classroom experiences are now gone. In India teachers use corporal punishment with a stick, not very friendly. A classroom of 60 students. Still today is like that back home. (Virginia)

• DISADVANTAGE FACTORS

The statements collected from the students' interviews and surveys implied that they perceived they have lost a tangible or intangible built-in benefit while "attending" class through this CD/Internet delivery format or that a potential disadvantage or loss could occur if this situation was ever present, a loss which otherwise would not have occurred while attending the same course in the traditional class format. The statements were further grouped under the three broad categories below.

I.- ISOLATION

Isolation, as described by the students, consists of a feeling of being alone and disconnected from the teacher and other students due to a perceived lack of interaction and/or communication. Statements about the feelings were grouped into four subcategories: **Absence of Body Language Cues** - responses related to the lack of body language in communication among members of the class; **Absence of Hearing Classroom Discussions** – responses related to difficulty

hearing the videos; **Absence of Immediate Questioning** - responses related to inability to raise questions in a timely fashion; **Lack of Interaction** - responses related to absence of shared communication among all class participants. Lack of Interaction includes absence of socialization opportunities and of feedback from the teacher. These sub-categories, although valid to the students who experienced them or thought of them as potential disadvantages, do not imply a general consensus among all participants, but rather they imply that these are factors that need to be taken into account as possible disadvantages of the CD/Internet format.

A. Absence of Body Language Cues

- (Can't see other students). (Alicia)
- You don't pick up visual cues. You've got a little itty bitty screen. I usually look for cues from the instructor on what's important. (Bernardo)
- I would have liked to see the nuances of the expressions on their faces. Hearing how their body language speaks about something. (Hellen)
- I like traditional better, to concentrate better, and also to ask questions face-to-face, directly and get the answer from him. (Jessica)
- Although the turn around time on the emails from the teacher was fast, the reply in the class is a really long answer compared to the email answers. In class, he watches your face when you are talking, and he can tell by the look on your face that you are not getting it. So, he keeps talking. (Velma)

B. Absence of Hearing Classroom Discussions

- You can't hear what's going on in the classroom. (Bernardo)
- Questions came up, and that's where I felt really lost. I felt if I asked him, it wouldn't be fresh in his mind (the taped material). I don't have anywhere to go, I felt very isolated. In the traditional you could go ask someone in the class, not with the CD. (Catalina)
- Couldn't hear student's questions. Felt disjointed. (Edward)
- Can't hear students comments, so you are an outsider. You can't see them. A feeling of being a second class student, looking at left over material. (Elizabeth)
- Not able to hear all the comments. (Joe)
- One thing that was frustrating was, when watching the pre-recorded, was the fact that I couldn't hear people's questions or comments that were going on in

the class. So, it sounded like they were having a wonderful discussion, I hear people laughing, but I had no idea what was going on. (Leslie)

- I could not hear people's questions when they were being asked on the videos. (Teresa)

C. Absence of Immediate Questioning

- Inability to ask specific questions. (Alexander)
- Can't ask questions. Felt like an outsider, not like a student but a viewer. (Alicia)
- Prefer traditional classroom, in case I have a question. (Amanda)
- Don't get the spontaneous discussion and questions to clarify in person. (Anastasia)
- I like traditional better, questions come up. But suddenly you forgot (them in this setting). (Arthur)
- I'm forced to be passive. I feel I get more out of it as an active participant. On Web I can't ask my questions to clarify my understanding, also miss the discussion with other students. (Catalina)
- Very rarely had a chance to ask questions. (Consuelo)
- Not able to ask any questions right away. (Diego)
- It's like a correspondence course. (Elizabeth)
- Can't ask questions. Just the simple thing of being able to ask a question and clarify. The way you learn something initially is the way it sticks with you. In a lecture, if I have a question, he clarifies it and it's already in my mind. And as he goes on, I can add to that. For me, it leaves a real big gap when I have a question and I don't get that clarified, right then. I had to put more study time in. (Erica)
- Not being able to ask questions. Direct interaction is always optimal. I have to do more independent study. (Hellen)
- Can't ask questions, not a big disadvantage though. If I just review, I'll usually get the answer. (Henry)
- (Can't ask questions). If I didn't understand something or didn't quite get what he was referencing, it made it hard for the rest of it to make any sense to me. I just got disinterested. I never liked a self-paced course. (Isaac)
- I was a spectator, not a participant. It was unnerving for me that there were people asking questions and I couldn't. CD would work if we could get online with the professor and did some questions and answers. Not trying to type them in. (Isaac)
- I like traditional better, to concentrate better, and also to ask questions face-to-face, directly and get the answer from him. (Jessica)
- Asking questions is not an option. (Jo)
- It seemed to me that we had an awful lot of videos to get through all at once. (Joe)
- I crave the interaction between the teacher and us. By the time you send an e-mail asking a particular question about a particular topic, by the time you get a response to that there been two lags in time from that process gone, he gathers

his thoughts as to what the circumstances were for the making of the question. Then when I get the responses, what was I thinking at the time that I had trouble that I needed to ask questions about? There really just needs to be a continuity of flow of ideas when those things are happening (when the lecture is going on). You lose the continuity. I'm a very time immediate person. (Marcelino)

- I don't feel I've learned nearly as well as I could have in a traditional (classroom setting). I just feel much more comfortable in the classroom setting, with person-to-person, asking a question (than typing it in). When you are watching a video you can't ask questions. (Nancy)
- Asking questions through the email was too much trouble. (Nancy)
- The content I feel comfortable with, it's just how much work I've had to do to get to the content that's annoying. (Rita)
- Asking questions in a timely manner. (Teresa)
- Not having questions answered, I felt isolated. (Veronica)

D. Lack of Interaction (no feedback, no socializing)

- I would like something with more immediate interaction. I would prefer to come to class. Offered both ways (CD or traditional) I would drive for the sake of interaction. (Alexander)
- From my perspective as an educator, education demands interaction. When you take the interaction away, you are decreasing the amount of teaching and learning that can take place. ... (if something) is not clear at that time or needs to be explored deeper, that's a teachable moment that's lost. (Alexander)
- Couldn't participate the discussion. Felt distant. (Alicia)
- I feel myself almost cannot remember what I have learned in that class, probably because of the class setting: without much interactivity. (Alicia)
- I don't participate. (Amanda)
- I just like the human interaction better. (Amanda)
- I like going to class (traditional). I like getting in the car and going. I like the drive there, the drive home is not fun. (Amanda)
- I feel it's a shame I kind of missed out on him as a teacher. I don't feel he would know me from anybody. (Anastasia)
- Less interaction with teacher. Less idea of how test would be. (Anastasia)
- We don't have much of the interaction with students and teacher. (Arthur)
- You can't interact with the instructor. I need to interact with people. (CD setting) Not optimal, but with more effective interaction it would have been better. (Bernardo)
- No interaction. I feel I learn better when can interact with other students and prof. If lecture purely informational, then I think Web is fine. (Catalina)
- Never got complete understanding of what is expected. (Catalina)
- Didn't know anybody in the class. Felt disconnected, isolated. (Catalina)
- I'm forced to be passive. I feel I get more out of it as an active participant. On Web I can't ask my questions to clarify my understanding, also miss the discussion with other students. (Catalina)

- I would take again a class with this technology, only if I had to. Lived far away, and that was my only choice.(Catalina)
- I would like more interaction among the class, using the message board, and thing like that. (Charles)
- No interaction. (Consuelo)
- You don't get to know the other people in the class. I do enjoy getting together with other students. So, that's the one downside for me. But, that's ok. (Cristina)
- You don't get to know other students and discuss. (no interaction) (Diego)
- No feedback on how I'm doing and of how the class is doing. (Edward)
- Isolation, lack of interaction. (Edward)
- I miss the classroom interaction. Feedback. (Elizabeth)
- We never talked about the readings. The test was more book related than lecture related. (Elizabeth)
- I miss the interaction with class and professor. (Erica)
- Need socialization. Felt isolated. I like the camaraderie of the traditional class, having an opportunity to meet with people. Find out how other people are dealing with their learning. (Hellen)
- Didn't have the interaction that I needed. It was hard for me to go on. It just didn't seem like I was in a class. I like the interaction of the students and the professor, to get the camaraderie. (Isaac)
- I would rather be able to interact with the instructor, I would rather come up (to traditional). (Joe)
- I missed out on the interaction, which can help in understanding. I feel I would gain more understanding if I participate, even if in a small way. (Leslie)
- I learn more in a class than I would off of a pre-recorded lecture because of the non-interactive nature of the pre-recorded. You can't ask for amplification or clarification, which you can in a lecture. Pre-recorded content is not as substantive as interactive. (Marcelino)
- I like coming to class, I like planning around it. I like making myself do it. To me the Internet is a constant reminder of what I'm not doing. What I need to get done (because you are on your own). (Nancy)
- I miss the interaction. (Rita)
- Unsure of expectations of test. (Rita)
- I feel like I'm in an island, (no students to talk to) I am out here all by myself, me and my little computer. It's just scary that we are not always good friends. (Samantha)
- Miss the spontaneity. (Samantha)
- If my life and my schedule would allow it, I much rather be in the classroom. I miss the interaction very much. (Teresa)
- It feels more like road memorization, learning something and then just giving it back on the test. I think that's disappointing from a graduate point of view. (Teresa)
- I do miss the classroom dynamics. I wonder if I'm learning all that I need, what the prof wants me to know, all that's necessary. (Teresa)

- The connection with the other students, that shared experience is real critical. (Velma)
- Communication with other students and teacher was not sufficient. I would feel isolated. (Veronica)
- I'm not one among the participants. (Virginia)

II.- LEARNING ENVIRONMENT

Problems with the learning environment were grouped into four subcategories.

Interruptions/Distractions – responses related to problems in the student's personal environment; **Lack of Focus** – responses related to inability to concentrate on the content of the videos being viewed; **Missed Material** – responses related to technical problems or student perceptions; **Procrastination** – responses related to the student's own lack of motivation.

A. Interruptions/Distractions

- I don't like studying at home because of many distractions, TV, radio. (Lack of) self-control. (Arthur)
- Distractions from home life. (Catalina)
- You get interrupted often. People come in and interrupts you. You have family that interrupts you. The telephone can ring. (Consuelo)
- Too many interruptions at home. If the computer is on, my baby has to be on my lap. (Edward)
- Distractions. (Henry)
- Sometimes there are distractions at home: crying baby, chores, etc. (Jo)
- When at work viewing the videos, I found myself getting distracted, going through my mail at the same time. (Leslie)
- Finding quiet time at work. (Olivia)
- Distractions from home and family. That's the biggest disadvantage, I have kids. So, tried to do this at home with kids running in and out of the office. It's really hard, unless I did it after bedtime. (Rita)
- Interruptions, distractions connected with being around my family. (Samantha)
- Distractions. (Teresa)
- Some interruptions like guests/visitors, phone call, etc. (Viginia)

B. Lack of Focus

- Not concentrate as well. Bored watching CD. (Alicia)
- I'm more focused, better concentrated (in traditional). At home I think of the bazillion things I have to do. (Amanda)
- Do not pay attention as did in traditional class because of lack of watching. (Arthur)
- Often became distracted. (Consuelo)
- I work on the computer 8 hrs a day. So for me, to go home at night and try to sit and watch a computer, it's hard because it really makes for a long day. (Isaac)
- I rather have both, the videos as back up, and the in-person in the class. (Jessica)
- I like traditional better, to concentrate better, and also to ask questions face-to-face, directly and get the answer from him. (Jessica)
- My interest level is so much lower just watching the videos. I never stand and watch TV, I put the put the movie in and walk around the house and I do stuff. When a scene comes along in the movie I love, I run in, rewind, I watch it. (Velma)

C. Missed Material

- Probably missed more of the material than if I had been in the classroom. (Amanda)
- Because of the difficulties I didn't learn as much as I could have. (Bernardo)
- Lots of technical problems have gotten on the way, I don't feel like I've gotten as much content as I wanted to. I feel like I didn't learn the material adequately. (Catalina)
- I have not learned as much from this course, as I would have traditionally. (Elizabeth)
- I learn more in a traditional class. (Erica)
- It was real choppy, because whenever there was a Net Congestion break it would loose portions of the data, and I couldn't figure out whether it was 30 sec or 3 minutes of content. So, developed some coping strategies. (Marcelino)
- I'd probably would have been better prepared for the mid-term had I actually gone to class and been able to pin him down on specifics. (Marcelino)
- I don't feel I've learned nearly as well as I could have in a traditional (classroom setting). I just feel much more comfortable in the classroom setting, with person-to-person, asking a question (than typing it in). When you are watching a video you can't ask questions. (Nancy)

D. Procrastination

- Time management. Becoming lazy. Procrastinate. (Arthur)
- Not as motivated to do it. Procrastination. (Catalina)
- Allowed me to procrastinate more. (Charles)

- You are not in the routine and you've got to be very self-disciplined. (Procrastination) (Consuelo)
- Easy to put it off until last minute. Procrastinate. (Cristina)
- Be lazy and not watch it on time. Procrastination. (Diego)
- Difficult to be disciplined enough to make time. (Procrastination) (Edward)
- I don't have the self-discipline that I should have to take full advantage of the online setting. (Procrastination) (Henry)
- Procrastination. You've got to have discipline. It was difficult setting and keeping an agenda for getting the videos viewed. (Joe)
- That's the hard part, managing the time. Because without having a schedule where somebody is taking attendance and expecting you there, and checking you off, you are just completely on your own to make sure that you take care of it. (Leslie)
- I think I would be more focused if I watched it and took notes, but I just haven't happened to have done that. (Olivia)
- Finding the time to schedule. (Veronica)

III.- TECHNOLOGY

Technology problems that were either perceived as a potential disadvantage or actually experienced as a disadvantage by the students. Technology problems were experienced in the following circumstances: **Language** – responses related to difficulty understanding lectures over the Internet. While viewing the videos directly from the school's server and over the Internet **Net Congestion/Buffering** – responses related to difficulty accessing the videos directly from the department's server over the Internet. **Not in-Synch Video and Audio** – responses related to the video and audio not playing simultaneously on the same portion of the video. **Poor Video Quality** - responses related to the small size, low resolution and jerkiness of the video image. Other **Video Segments Issues** responses related to confusing labeling, gaps, outdated material, irrelevant discussion. **Other Hardware/Software Problems** – responses related to not being comfortable with the technology and having to do upgrades.

A. Language

- (Was harder to understand spoken English over the Web). (Alicia)
- It was harder to understand English, but I try to listen several times, again and again. (Arthur)
- English over the Web, it takes more time to understand him. (Nicholas)
- Even the quality of the sound isn't the same, you have to work a little harder to listen to it, until you get used to it. (Velma)

B. Net Congestion/Buffering

(only applicable to the Internet portion of this class format, not the CD)

- We had Net Congestion. Had the CD and connected to the Internet. We were all confused. The image would stop, then the sound ... (Amanda)
- Kept running into Net Congestion watching the video this slowed the entire process down. (Amy)
- Net Congestion without the CD. (Anastasia)
- If I had an hour's worth of clip, it would take me two hours to watch it. It would stop, net congestion, ... (Catalina)
- It would take forever if I wanted to move it forward. (Consuelo)
- Using Internet, too many interruptions. Net Congestion. So the convenience factor was taken away. (Erica)
- Net Congestion. Videos over the Internet, if you stop then next time you have to wait almost the whole time (you viewed before) for the Net Congestion to get it caught up. (Jo)
- Net Congestion, buffering. (Joe)
- Sometimes it would freeze up with Net Congestion. (Leslie)
- It was kind of slow, and I really think it was Internet traffic. (Leslie)
- I was having Net Congestion, from home it was horrible. (Marcelino)
- Internet, a lot of Net Congestion. The streaming video is too slow coming through – too many interruptions. The use of CD eliminated this problem. (Mary)
- One problem was the Net Working traffic. Sometimes, it stopped. (Nicholas)
- Net Congestion. (Olivia)
- Net Congestion. Was just a little frustrating, but I was able to watch all the films. (Rebecca)
- Net Congestion only with the Internet. (Rita)
- The network buffering made viewing the videos much longer than was necessary. Disruptive. (Samantha)
- Net Congestion, buffering. Then when it picked up back again, it didn't pick up where it left off. That was frustrating. (Velma)
- Net Congestion, buffering over the Internet. Some videos had no audio. (Veronica)
- Net Congestion. (Virginia)

C. Not in-Synch Video and Audio

- The video and the audio were not in-synch. I had to just listen to the audio. (Amy)
- Technology on that doesn't work properly either. There is a disjoint between what your eyes are picking up as far as him, and what you are hearing. Cognitive dissonance. (Bernardo)
- He (Dr. Young) wasn't really synched (with the audio). (Catalina)
- I quit watching them, because it messed up the synchronization of what I was hearing and what I was watching. Most of the time I just listened to them, it was annoying to watch them. (Consuelo)
- Picture never matched the audio. (Erica)
- Computer image out of synch. Distracting. (Hellen)

D. Poor Video Quality

- I didn't really watch him, because the picture wasn't so great, just listened. (Anastasia)
- The videos, I hated them. I could never get the picture up. I never did get the videos to work in my computer. I had to go to somebody else's house to view them. I never did see all of them. (Amanda)
- The picture was so small. I can't see the picture. Horrible experience. (Amanda)
- The size of the image is pretty small. (Arthur)
- Couldn't see blackboard. (Arthur)
- (Using the Internet, problems) the bandwidth was inconsistent. (Bernardo)
- The movement on the videos was a little choppy. (Charles)
- The audio was good, so I ended up just listening, because the watching was a real distraction. I don't really like just listening to something. I would have liked to see him. (Charles)
- Bad Internet connection made video jerky. (Cristina)
- Just listened, because Dr. Young was making jerky, robot like movements. (Elizabeth)
- Didn't have the visual cues. I had to shut off the video because it was so jerky and so out of proportion, that it was distractive. Just listened to the audio. And drove me crazy, because I really need to see the cues, and how the professor is putting out the information to me. (Isaac)
- Maybe because I was over a slow modem (28.8) at home, it's almost like I was getting screen shots of what was going on rather than a full motion video. With a T1 connection at work, it was basically like running the videos off of the CD. (Leslie)
- The jerkiness really bothered me. (Nancy)
- I wasn't watching them, the jerkiness really bothered me. (Rita)

- The jerkiness really bothered me. (Samantha)
- Internet, problems with getting a good visual stream. The video got distorted, even though you could hear it. I would start distracting myself. (Teresa)
- The videos were horribly boring. It's hard enough to sit in class, and listen to somebody just talk and talk. But when you can only see him in a 3X3 square, it's even worse. A VHS tape would be better. (Velma)

E. Video Segments Issues (confusing labeling, gaps, outdated material, irrelevant discussion)

- There were too many video segments. Should be one class one video. (Amy)
- Too difficult to access. The material is not indexed in any form or fashion. (Bernardo)
- There were gaps here and there (between video segments). I wouldn't be able to follow where he was starting of. (Catalina)
- Filenames were a little too ambiguous ... I had trouble keeping track of which video to view next. (Cristina)
- This recording was recorded a long time ago. Maybe something happen since then, some improvement. Within 6 months maybe he did something which he could tell us in class. (Diego)
- Too much video for not enough content. Hearing other people's experiences not important. Cut off the fat by editing videos. (Edward)
- The lectures are stale, since they are for somebody else, they are not for me. (Elizabeth)
- I wouldn't want to take the whole class totally by CD. Unless if the recorded was thorough enough I wouldn't mind. Relating the lecture back to the book. (Joe)
- When viewing, you can't speed it up with the videos. The video just goes at its pace. And you can't skim through it. (Joe)
- It seemed to me that we had an awful lot of videos to get through all at once. (Joe)
- On the CD I did think it was difficult the index on it, to find out which video was which. (Rita)
- Not being able to relate current events to the lecture, it makes it less meaningful. (Velma)
- The ones that I did see, they did not have much content. (Veronica)

F. Other Hardware/Software Problems (not comfortable w/technology, upgrades)

- Connection doesn't allow to view at home (Internet). (Arthur)
- (Using the Internet, problems) the bandwidth was inconsistent. Poor technology use. (Bernardo)

- I don't really feel like I'm in a class ... because there is no communication among the students and the lack of structure, partially due to problems with software being used. (Charles)
- Slow modem speed, viewed at work. (Charles)
- I can not confidently depend on it (technology) 100% (Diego)
- [Had major technical problems due to her computer's sound card, because of this] Have spent 3 times more time on this class than I would have, had it been traditional. Had to upgrade hardware and software. Couldn't pause videos which meant, couldn't take breaks, couldn't take notes well. Not pausing was my biggest disadvantage. (Hellen)
- Worry about server being down. (Jo)
- I will never take another Internet class. It's on the technical that I've had problems. (Nancy)
- I don't like having to email him. I don't like having to do everything through the computer. (Nancy)
- I don't understand or know about the technology, and I don't feel comfortable enough. And it's a big "time consumption" for me trying to access the information, no tech expertise. (Nancy)
- I need more technical preparation to Web view classes at home. (Nancy)
- But being so uncomfortable with the technology, it bother me. Because I'm not comfortable dialing in. It's awkward. (Rita)
- The technical thing, time consuming trying to figure that out. I rather not deal with the technical, that's not a comfort area for me. (Rita)

• PREFERENCES

Statements made by students expressing their class format choice are included below.

1. Positive

- Prefer online and recorded (Arthur)
- The quality was fine with the CD (better than Internet) (Elizabeth)
- If one's intent is to learn, one will be successful in either environment. (Henry)
- This is actually not just a viable substitute (of traditional) but a preference. I would like to take all my classes like this. (Henry)
- I would choose the pre-recorded over the traditional and the live. (Jo)
- No disadvantages with CD. None, to me. (Mary)
- Because there are (also) some compensating things that I can do with the technology. It's not as good, but it's acceptable. And, when you add to it the time, there is actually less time driving. The fatigue factor, and those kinds of things, I'm more inclined to continue taking Web courses because it works out ok. (Marcelino)
- I prefer the CD-ROM over the Internet or traditional. (Nicholas)

- No disadvantages with the CD. (Nicholas)
- Just straight over the Internet, watching the videos (pre-recorded), I would take it again yeah. (Olivia)
- I would take another class using this technology. (Rita)

2. Negative

- Prerecorded videos didn't have any advantages for me. (Amanda)
- A recorded lecture is not an acceptable delivery mechanism. (Bernardo)
- (CD) the delivery wasn't much more reliable than the Net. (Bernardo)
- (I wouldn't take another class with this technology) Because, I feel it compromises teaching quality. (Elizabeth)
- Damaging teaching practices for the sake of convenience. We don't establish relationships with our professors, which is the basis historically, of what a doctoral program is. Looking ahead, how convenient does it need to be? Do we owe everyone, no matter where they live, a doctoral education or a master education? How far are we willing to take it for convenience sake? (Elizabeth)
- I would rather have a class taught traditional. (Hellen)
- Coming to class is a break for me. Because of my computer job and no distractions from the wife. (Isaac)
- I would pick the online over the CD. (Nicholas)
- Overall, I would prefer the traditional. (Olivia)
- I prefer traditional. (Velma)
- If I lived in town I don't know that I would choose to do that. I would probably come in person. (Veronica)

• SUGGESTIONS

Statements made by students, recommending a variation on the implementation of the class format are included below.

- I don't see (the Web classes) as a substitute (for traditional) (Bernardo)
- I wouldn't mind taking another class using this technology if the bugs were worked out, more well thought out, more communication among the students. (Charles)
- Maybe every week, for just an hour, no longer than an hour, just do the online chat. Be at home and have that interaction. (Consuelo)
- CD would work if we could get online with the professor and did some questions and answers. Not trying to type them in. (Isaac)
- Some classes lend themselves to that, especially if the instructor is more organized, more structured, then to me he ought to be online. (Joe)
- (She is explaining the Virtual High School, a project she is involved in "... across the United States, ... time zones are a big factor in that, and so that's why it's all asynchronous.") (Leslie)
- CD is ok for straight lectures not for discussions. (Leslie)

- You can do a lot of the foundation work with the CD-ROM. Then just give the students an opportunity, like he is doing, a couple times during the semester and meet together and ask questions. (Mary)

ONLINE WEB FORMAT

The live online Web lectures format, which will be referred to in this paper as the Online Web format, involved the live broadcast over the Internet of the class lecture. Students had the option of either coming to the classroom or viewing the class over the Internet from home or anywhere a computer, Internet connection and Web browser were available. In the classroom, the setting was traditional. From a distance, students sitting in front of a computer were able to see and hear the teacher conducting the lecture, and through WebCT, students accessed the class' chat room where all class participants could enter their textual comments and questions. Any statements made appeared on the screen preceded by the participants' name. Students could post as well as read other students' statements. Students in the classroom had access to a computer at each of their desks on which they could view the live broadcast video of the teacher and could access the chat room box. Many chose to participate while in the classroom, but all were aware of the comments and questions posted by all class participants. While lecturing, the teacher would routinely look at the computer monitor in front of him, skimming through the lines of text looking for questions students might have posted in order to address them.

Students experienced the Online Web format on Friday, April 9, from 6pm to 9pm, and Saturday, April 10, from 9am to 3pm. After experiencing the Online Web format, students were asked to complete the Online Class Survey, "What do you think?"

(Appendix D). Questions about the setting were also addressed during the individual interviews. In both instances, students were asked to evaluate their experience generally expressed as advantageous and disadvantageous with the class format. Their statements were carefully read multiple times to determine the category of “best-fit,” whether advantageous or disadvantageous.

- ADVANTAGE FACTORS:

Statements collected from the students’ interviews and surveys implied that they perceived they have gained a tangible or intangible benefit while “attending” class through the Online Web format, a benefit which otherwise would not have occurred while attending the same course in the traditional class format. The statements have been grouped under the four broad categories used with the CD/Internet format.

I.- CONVENIENCE

Convenience is defined as “saves work.” Student responses related to convenience of format were organized into five sub-categories: Family, Focus, Familiar Environment, Economy, Same as Being in the Classroom. Statements indicating convenience were placed in the five subcategories as they embodied the characteristics in the descriptions.

Family – responses related to the student’s direct relationship with other members of his or her family. **Focus** – responses related to improved concentration and focus on the class material. **Comfort of Familiar Environment** – responses related to the convenience of viewing the lectures in one’s own comfortable

surroundings. **Economy** – responses related to a savings of resources, either of **Money/Time**; or **Travel** (no driving to and from school-work-home); or **Eco-System** (contributing to saving the environment). **Similarity to Traditional Classroom** – responses related to feeling as comfortable with the setting as when being in the classroom or feeling that one is not missing out on any of the interaction or visual cues.

A. **Family**

- For those who live close, it would make those “difficult” Friday eve and Saturday classes more accessible, especially for those who need to take care of young children or otherwise be at home. (Alexander)
- Allows more time w/one’s family. (Consuelo)
- I can stay home and don’t have to get a sitter. (Jo)
- I could sit there listening while I was nursing my baby. (Jo)
- I’d like being able to stay at home and take care of house/family business and still take part in the class. (Joe)
- When I need to be home (I can), my wife could go out. I have my family considerations. More convenient. (Joe)
- I do have a baby on the way. And that’s another thing I thought it would be nice, if there is more distance learning kind of things whenever I have a new born, it will be impossible for me to drive and get babysitters and all that kind of stuff. (Leslie)
- You are able to share somewhat of what you are learning with others in your household. My husband comes in every so often and listens to the professor. (Rebecca)

B. **Focus**

- For those who live close, it would make those “difficult” Friday eve and Saturday classes more accessible, especially for those who need to take care of young children or otherwise be at home. (Alexander)
- Allows more time w/one’s family. (Consuelo)
- I can stay home and don’t have to get a sitter. (Jo)
- I could sit there listening while I was nursing my baby. (Jo)
- I’d like being able to stay at home and take care of house/family business and still take part in the class. (Joe)
- When I need to be home (I can), my wife could go out. I have my family considerations. More convenient. (Joe)

- I do have a baby on the way. And that's another thing I thought it would be nice, if there is more distance learning kind of things whenever I have a new born, it will be impossible for me to drive and get babysitters and all that kind of stuff. (Leslie)
- I liked the convenience of it coming to me, but the closer you get to the live experience the more it grabs your attention. (Olivia)
- You are able to share somewhat of what you are learning with others in your household. My husband comes in every so often and listens to the professor. (Rebecca)

C. Comfort of Familiar Environment

- Allows me to be in the comfort of my own home. (Can interact with family while watching videos). (Alexander)
- I liked the convenience of being at home and listening to the class. (Amy)
- I felt more comfortable in my home than in class. (Amy)
- More comfortable being at home. Privacy, quiet. (Anastasia)
- Convenience, can work at home. (Catalina)
- View the class at home. Convenient to home base. (Consuelo)
- Nobody is watching me!! I can be barefooted, sloppy. I don't have to put on my makeup. I'm all by myself. I really liked it. (Cristina)
- Be able to stay at home, no drive. Watch it from wherever I am. (Diego)
- I don't have to worry about coming up here. He doesn't take breaks and that was driving me nuts. I have to go to the bathroom and I was hungry. (Jo)
- I can be in my own little corner in my comfortable chair. I could be at home in my own "comfort zone." (Leslie)
- It is more comfortable because I don't have to go and get dressed up and go to class. Also, the fact that I can be in my comfy chair with my feet propped up and munching on a coke and a pizza. Where in class you have to wait for a formal break, and you can't bring food in the class (Leslie)
- I just spread out. I can have material spread out on the desk in front of me. I can be studying and looking.. (Marcelino)
- I liked being able to view the lecture at home and at the same time have the instructor there for questions, comments. (Mary)
- I really like this kind of method to learn the online over the traditional, because it is easier to learn the knowledge without leaving the house. (Nicholas)
- I liked the convenience of it coming to me, but the closer you get to the live experience the more it grabs your attention. (Olivia)
- Being at home I can be in my own space and be comfortable. (Veronica)

D. Economy

1.- Money/Time

- Convenience for off campus students in access and times. (Anastasia)

- It's convenient for the long-distant commuters. The more people can have chances to learn higher education. Saving time. (Arthur)
- No traveling on the road as often, and paying wear and tear on my car. (Consuelo)
- I feel I'm making the most of my time. I'm not wasting my time driving (to Denton) when I don't have to. (Cristina)
- I hate looking for parking lots at UNT. (Cristina)
- No drive, saves gas/time. (Erica)
- Better than traditional because no hassle of coming to class. (Virginia)

2.- Travel

- User friendly, don't have to drive to school. (Alexander)
- Allows interaction and participation without the drive. Opens the class to those who live great distances from campus. (Alexander)
- Convenience for off campus students in access and times. (Anastasia)
- Commuting will not be the burden it now is. (Anastasia)
- It's convenient for the long-distant commuters. The more people can have chances to learn higher education. Saving time. (Arthur)
- Reduced travel. (Bernardo)
- Convenience for those students who commute. (Charles)
- No traveling on the road as often, and paying wear and tear on my car. (Consuelo)
- I feel I'm making the most of my time. I'm not wasting my time driving (to Denton) when I don't have to. (Cristina)
- Be able to stay at home, no drive. Watch it from wherever I am. (Diego)
- No drive, saves gas/time. (Erica)
- I would not have to travel to class. (Hellen)
- No drive. (Jo)
- I don't have to worry about coming up here. He doesn't take breaks and that was driving me nuts. I have to go to the bathroom and I was hungry. (Jo)
- I could be at home, in my clutch, and just not have to do a big commute, because it is pretty far for me (Leslie)
- It's really primarily, the distance. And other commitments that I have. I have three children and a job. Those all add up, to a lot of time committed already. But, the distance is the primary thing. I would not be taking any classes, if they were not offered conveniently. I would either not be in this doctoral program, or I'll be trying to find the money to go to Baylor. That is the biggest deal, in this market in the Waco area. (Mary)
- Don't have to drive to Denton. (Olivia)
- Students anywhere could take the class. (Olivia)
- No need to travel back and forth as often. (Samantha)
- No drive. (Teresa)
- Less travel. (Velma)
- Don't have to come to campus. (Veronica)

3.- Eco-System

- Environmentally friendly. If not driving, ... you are not polluting the atmosphere. (Alexander)

E. Similarity to Traditional the Classroom

- Just one step removed from being live in the classroom. (Alexander)
- SAME as traditional classroom setting. (Alexander)
- The disadvantages do not weigh heavier than the advantages. (Alexander)
- No real disadvantages to my way of thinking. (Alexander)
- Better than CD, I can use the chat room simultaneously and feel myself IN class. (Alicia)
- If done this way – I can't see any disadvantages. (Erica)
- I like the Internet setup. Lecture and chat is all that is needed. (Henry)
- Better than CD, I have a sense of "in the classroom" during the live online. (Henry)
- Online Web setting and traditional – "virtually" the same. (Henry)
- Almost the same as traditional class settings. (Isaac)
- For the most part I feel part of the class and it's just getting used to it. (Joe)
- I felt like I could be a part of it, and also I was interacting with what was going on. (Leslie)
- In the chat and the comments that students are making, it juts other lines of thought in your own mind. That kind of synthesis, those are the things that really trigger learning, in my opinion. You've got to have your mind knocked along see if you start thinking in other tracks. Some of that was occurring by watching the questions and the comments on the chat. It was almost as good as being there sitting and listening to them talk. (Marcelino)
- Different, but just as effective for learning, for me. (Mary)
- There was not a thing I disliked. There are no disadvantages for me. (Rebecca)
- The content was not influenced by the presentation type for me. (Rita)
- Online Web at home refined is just as good and comparable as the traditional. Not much different than being in class. (Veronica)

II.- FLEXIBILITY

Flexibility represents any advantage related to adjustability to conflicts.

Flexibility subcategories include: Class Backup, Community Maker,

Communication, Learning Self-Assessment, Schedule Flexibility, Viewing

Flexibility. Statements indicating flexibility, were placed under the subcategories as they embodied the characteristics in the description.

Class Backup – responses related to being able to access class content when unexpected circumstances make it impossible to be in the classroom.

Community Maker – responses related to interacting with others in the classroom for reasons other than questions on the material, resulting in a sense of connection and camaraderie, another form of interaction, a feeling that one knows the classmates. **Communication** – responses related to the exchange of information among class participants through: **Interaction** – being able to have immediate connectivity/interaction with teacher and students; **Socializing** – interacting with professor or students for reasons other than course related material; **Immediate Questioning** – ability to ask the professor or other students questions about the class material as soon as need arises; **Body Language Cues** – body gestures generated by the speaker that supports oral communication; **Class Discussions** – being able to hear or see, oral, or textual communication of other class participants. **Learning Self-Assessment** – responses related to satisfaction with the amount of material covered in the class using this format. **Schedule Flexibility** – responses related to being able to view lectures around one's work and family schedule. **Viewing Flexibility** – responses related to being able to stop or pause, to take a break or handle other types of interruptions, once viewing of the lecture has started.

A. Class Backup

- If there were technical difficulties the class would have to be recorded for later review. (Amy)
- If I have to miss the online class I'll have the prerecorded. (Henry)
- There is greater flexibility, since the information can be accessed from anywhere in the world. (Jo)
- I missed part of the lecture this weekend, but it's available over the Internet, and I can just go back and watch it when it's convenient for me. So it really makes it easy to work it around your schedule. (Mary)
- If I did miss something, I could go back onto Internet to retrieve info. at a later date. (Nancy)
- The fact that I had to leave a little early on Sat. I didn't get to listen to the last section of the lecture. And it was grand that I knew on my head, that I could come back on Tuesday and pick up the tail end of that lecture. I can see that more so than simply the CD with the videos on them. (Teresa)

B. Learning Self-Assessment

- Good for content heavy, lecture style. (Catalina)
- Structural wise, I feel I learned something. (Isaac)

C. Schedule Flexibility

- I like the flexibility of being able to choose to attend class in person or online. (Alicia)
- People like me could take these classes even with a hectic schedule. (Amy)
- I come from Dallas to work. This way I can either 1) stay at work if I'm running late 2) I can come. (Anastasia)
- Ability or chances to either come to class or listen to lectures at home. (Arthur)
- Time flexibility when viewing the recorded lecture. (Catalina)
- If I have to do something more important I can, and watch it (recorded) tomorrow. Watch any time. (Diego)
- Students could view the recorded at their convenience. (Nancy)
- Schedule flexibility. (Rita)

D. Viewing Flexibility

- I feel almost compelled to listen to the lecture when it's online, because it's live. With pre-recorded is easier to sort of fade out, continue my notes, continue surfing the Internet and come back on the next topic. (Amy)

- (Recorded) videos can be rewound to review information, that was missed due to inattentiveness, restroom break, etc. (Consuelo)
- It was spontaneous, but I could be informal at my office. I can get a snack, go to the bathroom. (Edward)
- I don't have to worry about coming up here. He doesn't take breaks and that was driving me nuts. I have to go to the bathroom and I was hungry. (Jo)
- When I needed to use the restroom I'll put on the speaker phone here (Points to the phone on his desk) and use the cordless phone, and continue to listen to the lecture as I walk down the hall, away from my office. (Marcelino)

III.- HUMAN INTERACTION

Human Interaction includes all those advantages related to the exchange of information among class participants that benefits all involved. The subcategories for Human Interaction are Community Maker and Communication. Statements indicating Human Interaction in this class format were placed under the subcategories as they embodied the characteristics in the description.

Community Maker – responses related to interacting with others in the classroom for reasons other than questions on the material, resulting in a sense of connection and camaraderie, another form of interaction, a feeling that one knows the classmates. **Communication** – responses related to the exchange of information among class participants through: a) ***Interaction*** – being able to have immediate connectivity/interaction with teacher and students; b) ***Socializing*** – interacting with professor or students for reasons other than course related material; c) ***Immediate Questioning*** – ability to ask the professor or other students questions about the class material as soon as need arises; d) ***Body Language Cues*** – body gestures generated by the speaker that supports oral

communication; e) ***Class Discussions*** – being able to hear or see, oral, or textual communication of other class participants.

A. Community Maker

- More of a feeling of camaraderie among students. Would feel comfortable asking questions outside of class. You are given some kind of community. (Catalina)
- Ability to interact via chat to build community among students. (Edward)

B. Communication

1.- Interaction

- More interactive, spontaneous. (Anastasia)
- Better interaction between students and teacher. (Arthur)
- Liked chatting about the lectures. I really enjoyed the chat portion, interactivity with other students. Interactive. Fun. (Consuelo)
- Interactive. (Diego)
- Ability to interact via chat to build community among students. (Edward)
- I rather ask questions in the chat. Where he can look at them and either respond briefly, and or even not respond. (Edward)
- The live online sessions of course are best. I like the live environment of being there and knowing that it's going on right now. (Henry)
- Being able to get class interaction and immediate questions answered from Dr. Young. (Isaac)
- Able to interact with other students. (Isaac)
- I liked the chat to ask him questions. (Jo)
- Sometimes there just be tons of comments on the chat line. I think people tend to be more free doing that (in chat than in traditional), but then again the instructor can ignore that also. (Joe)
- The online Web setting is better than the CD because I can interact with the instructor. (Joe)
- With the class as a synchronous piece, where we were able to comment (chat). I thought that was really neat, because there was that interactive thing. (Leslie)
- I felt like I could be a part of it, and also I was interacting with what was going on. (Leslie)
- I felt I was more involved in what was been discussed because of the chat room. (Leslie)
- And I did really like (better) the chat room as opposed to the Forum used in Dr. Schlieve's class. Because it's more immediate and you don't have to re-build your screen. (Marcelino)

- More connectivity with other students and instructor. (Mary)
- We had a chance to communicate with the whole classroom. (Nicholas)
- More chance to let the International students that willing to express their ideas on the Web (email, Forum, chat). (Nicholas)
- I liked the live student/professor interaction. I enjoyed listening to the professor and you could always ask a question if needed. (Rebecca)
- You interact with other students through the chat room. (Rebecca)
- It was our class, we were there. It just seemed a little more personable. (Rebecca)
- I think you actually have more interaction with this type of class than a traditional class. There is more communication. We are always getting email from the professor. You can talk to other students using the threaded Bulletin Board (Forum) and chat. It seems we all stay in touch with each other more. It is fun, except for those dreaded tests! (Rebecca)
- I liked it better simply because it was a live feed. A better sense of being in a real class. (Teresa)

2.- *Socializing*

- I can chat with my classmates without interrupting the instructor. (Alicia)
- I can talk to multiple students on-line and it's fun. I could see other people's comments, I could talk to them, I could feel that other people were sharing with me with my ideas or talking about things. (Alicia)
- Liked chatting about the lectures. I really enjoyed the chat portion, interactivity with other students. Interactive. Fun. (Consuelo)
- The informal chatting with the prof on breaks was nice. (Jo)
- We had it where could write back and forth. It was like, we could still be a part of the class and communicate. I did wish that we could have had that (setting) a little more frequently, so that you kind of know people in the class a little better. (Leslie)
- I still got to interact with other people online. And so, I saw that as more valuable, because I got to see a lot more of what was going on in their heads through the writing, than I would in class. I think I almost got more out of the discussion that were online (than traditional). (Leslie)

3.- *Immediate Questioning*

- The ability to type in a question and have an answer from him – that was the next best thing to being in class. Ability to interact with professor. (Alexander)
- Being able to see the instructor and hear the people asking questions. (Amanda)
- Ability to ask questions through the chat room during lectures. (Arthur)

- Online better than CD. We can clarify questions immediately. I feel I have better understanding, and feel more part of the process. Not isolated. (Catalina)
- Can ask questions both to instructor and students. (Catalina)
- It's nice to be able to ask questions, and have confusion eliminated during lecture. (Erica)
- Being able to get class interaction and immediate questions answered from Dr. Young. (Isaac)
- I liked being able to view the lecture at home and at the same time have the instructor there for questions, comments. (Mary)
- I just prefer the online over the CD, because we can ask questions at the same time. If we have a problem or question, we can write the question in the chat room right away. (Nicholas)
- I liked the live student/professor interaction. I enjoyed listening to the professor and you could always ask a question if needed. (Rebecca)

4.- Body Language Cues

- It gives me the option to watch my teacher to see what they emphasize. (Anastasia)

5.- Class Discussions

- Can hear and see student's discussions more clearly. (Arthur)
- Chat room meant I got to see other people's questions and comments. (Catalina)
- Seeing other people asking questions and him answering. (Diego)
- I found myself paying more attention to the conversation that was going on in the chat room. But the thing is, it actually helped me, because I was able to see what other people's questions were. (Leslie)
- On the online, as long as he was repeating the questions into the microphone, we were able to hear what was going on. (Leslie)

IV.- LEARNING ENHANCEMENT

Learning enhancements include all those advantages that represent new approaches to a classroom routine and that turned out to be beneficial to the student. The subcategories of Better Note Taking, Comprehension/Understanding, Discipline, Multi-Tasking, Technological Factors (learning, liking) all include learning enhancements. Statements indicating

learning enhancements were placed under the subcategories as they embodied the characteristics in the description.

Better Note Taking – responses related to improvement in the amount and quality of the notes taken over the class lectures.

Comprehension/Understanding – responses related to the ability to go over the class material more than once for improved comprehension or understanding of it.

At different levels this was accomplished through **Reviewing Lectures** (viewing the whole lecture more than once); and through **Content Accuracy** (re-

listening/reviewing the teacher's sentence to understand, or because it was

missed). **Discipline** – responses related to developing a level of discipline to cover the class material. **Multi-Tasking** - responses related to the ability to perform, concurrently or simultaneously, other tasks while viewing the lectures.

Technological Factors – responses related to gaining intentionally or unintentionally an understanding of the technology used in the class. Also, learning and/or liking the technology occurred as a consequence of being exposed to it in this class format.

A. Better Note Taking

- It helped, getting the power point ahead of time, then (during class) I could just jot down little side notes. (Cristina)
- I liked that you really could get the exact content from attending class over the Web. (Rita)

B. Comprehension/Understanding

1.- Reviewing Lectures

- It helped to have the recorded videos to go back to for review. (Amy)

- Can replay lecture later if I miss something. (Cristina)
- Lecture available at late time for review. (Hellen)
- Rather have the online and prerecorded than the traditional. Online during the semester, and then also have the pre-recorded as the backup. That would be ideal. (Henry)
- I prefer the live setting with a TA attending the chat for immediate questions. I also like the videos to be available for review. (Jo)
- With the live class, it's also videotaped so we can now go back as we need to. (Leslie)
- I also think it is advantageous to have the lectures on video tape for viewing later – this helps with review. (Leslie)
- I would very much like to see live content for the original lecture, with the back up recording so that you can go back and review that way you can get the best of both worlds. (Marcelino)

2.- Content Accuracy

- I can watch it again if I skip something. I can go back and replay. (Alicia)
- While in the classroom, if I missed something he said, I could pick up the headphones and hear it again. (Consuelo)
- Being recorded, I'll be able to access tomorrow whatever I missed, so the lack of technology reliability goes away. (Diego)
- (While in the classroom) There were a couple of times, I missed what he said, and it had such a delay, that I picked up the headphones, and listened to it again, and took the notes. (Erica)
- (Online and recorded) If I miss some points you know I can catch back. (Jessica)
- You get two opportunities. If you missed something in the live video feed, you can always go back and review the lecture. (Rebecca)

3.- Updated Lectures

- With the on-line contemporary issues that are going on that impact the lecture topic of discussion. It's nice to have those things folded in and it makes it more immediately pertinent to what's going on and the student can more directly relate those things to current events. (Marcelino)

C. Discipline

- Mostly listened and took notes. (Catalina)
- Online better for people who are not self-motivated. You have to watch it and you don't get behind. (Jo)

- It is a CD disadvantage if you are not good at managing your time. I really liked it, whenever we were able to listen to the lecture live and interact live, a lot better. (Leslie)

D. Multi-tasking

- I could do other things while listening to lecture. (Cristina)
- Convenience of being at home. I'm able to walk around, wiggle, squirm, smoke. (Henry)
- I would do other things, smocking dresses, surf the Net, etc. (Jo)
- From home I was doing, cleaning things, re-arranging stuff on my desk and listening. It was truly listening, I really wasn't watching it. From home I was doing, cleaning things, re-arranging stuff on my desk and listening. It was truly listening, I really wasn't watching it. (Marcelino)

E. Technological Factors (learning, liking)

- I would consider Web classes an extraordinary opportunity I might not otherwise have. (Anastasia)
- I am very comfortable with technology and enjoy learning new things that have to do with it. (Anastasia)
- This is just the right direction. (Diego)
- No net congestion. (Erica)
- Rather have the online and prerecorded than the traditional. Online during the semester, and then also have the pre-recorded as the backup. That would be ideal. (Henry)
- I thought it was great. I had a question that didn't get answered, but that is all part of a learning curve for me and Dr. Young. I could take all my classes this way. (Henry)
- This learning environment is great for me. We are kinda pioneering, so some problems will occur, but I think the ones we have seen have been addressed well. Go, Technologists!!! (Henry)
- I feel it was better (than prerecorded) because of not having to deal with the Internet loading effects. (Isaac)
- More conducive than CD. (Isaac)
- This does not scare me at all. The online has been very acceptable, and I think it's worked very well. (Joe)
- Liked being able to pull up the outline (powerpoint) on computer. (Joe)
- That maybe one reason why I prefer to do something on the Web, rather than just go to class. Because, the challenge in of itself, just to get on line, and make sure that everything works. That to me, it's really cool! (Probably because you are a direct experience, hands-on kind of learner.) (Leslie)
- It fits a variety of people's learning styles since both the traditional and online formats were available. (Leslie)

- It was very instrumental to have a couple of computers running at one time so that I could be getting his lecture content and all those other things (forum, power point slides, streaming video) and then I had another one that would be totally free so that I could go off and surf places and verify and do some more research based on what he was saying at the time, and it gave me some more resources that I could draw from than if I had been in class because it would have been distracting for students around me (Marcelino)
- It depends on whatever is handy at the time. The only way you can survive with technology is that you've got to adapt and utilize what's at hand. And live with it. (Marcelino)
- And I did really like (better) the chat room as opposed to the Forum used in Dr. Schlieve's class. Because it's more immediate and you don't have to re-build your screen. (Marcelino)
- I like this class format! (Mary)
- The software design was perfect and we can watch the lecture at different location in the same time. (Nicholas)
- Network traffic is not an issue with this method. (Nicholas)
- I think the concept of teaching classes in this manner reaches out to the different needs of the students. Some students can view the class long-distance and others can opt for going to the campus. What a deal! (Rebecca)
- It has the potential to reach out to a larger student population. (Rebecca)
- I had a hard copy of the power point slides. That was great! (Teresa)
- I think there are a lot of questions a lot of bugs to be worked out in the program. But, I think it's certainly worth pursuing. I think that's where the future of education is going to be, sooner or later. (Teresa)
- Although I couldn't attend the class, listening to it was fine for me, it was somehow easier than the ones I tried to view on the CD (better technology). (Velma)
- Online Web viewing 100% better than videos due to the technical difficulties of view the videos on the Internet. (Veronica)
- I liked both the video and audio setting. (Virginia)
- Transmission was good and clear.(Virginia)
- This virtual class got carried away cool! (Virginia)

V.- PSYCHOLOGY

Psychological factors include those advantages of the Online Web format that have, from the student's perspective, beneficially affected the personality or psyche of the participant. The subcategories of Posing Questions, Teacher Support, Participation, Self-esteem all contain psychological advantages.

Statements were placed under the subcategories as they embodied the characteristics in the description.

Posing Questions – responses related to being able to interact textually with the teacher or other students in one's own time and space. **Teacher Support** – responses related to availability, accessibility, and planning on the teacher's part that helped make the experience with the setting a better one. Some 99% of the students agreed that teacher availability and accessibility was very much true of their semester experience. Statements that were made beyond answering the question "Was the teacher accessible?" with a "Yes" or "No" have been compiled and placed in this section. **Participation** – responses related to not having to orally participate in the class. **Self-esteem** – responses related to the improvement of one's level of confidence.

A. Posing Questions

- Easier to talk and to ask questions over the Net. (Anastasia)
- In class I'm not that pushy ... to get a question. (With the chat room) at home I would (type my question) put it in the chat and see if it got answered, I got the equal chance with everybody else. (Anastasia)
- Can participate more than in a regular class. More bravery in asking questions. (Anastasia)
- Online better than CD. We can clarify questions immediately. I feel I have better understanding, and feel more part of the process. Not isolated. (Catalina)
- Better (than CD) if students have questions that they need to discuss. (Charles)
- I would probably type in (chat) my questions to the teacher. [didn't attend class] (Charles)
- He answered questions. Several of us could ask him questions at one time, and no one really knows what your name is and so they don't really put a name to your face. No one would say "that was dumb!" I like typing my questions. (Consuelo)
- Dr. Young answered the questions right there, like within a minute! (Cristina)
- Being able to ask questions. (Diego)
- Could ask questions/make comments right now. (Edward)
- People who may not speak up in a class (especially due to language problems) may speak more online in a chat room. (Jo)

- If I had a question as I was watching something, I would write it down. Even though I may not be able to get it to him right then, but I got it out. I felt like it was out there. Where in class I probably would not say a word. (Leslie)
- It's like every single person online liked opera. It was just interesting that all the online people had so many similarities, as we were discussing, and the questions that were being asked were very similar in thinking. (Leslie)
- I also enjoyed typing my questions in – I could input them right away when I had them – rather than wait and raise my hand to be called on. (Leslie)
- When we are having trouble we first have to wait to ask a question in the traditional classroom. But on the chat room we don't need to. (Nicholas)
- Here we have more courage, to write something and to wait for an answer from Dr. Young. (Nicholas)
- Can ask more questions through the Web than would in class. (Nicholas)
- The chat provides possibilities to ask questions. (Olivia)
- If I had to ask a question, I'd much prefer the online. Because for non-verbal when with the people (in the classroom), the text chat works much better. (Rebecca)
- The chat rooms were of great help to know each others questions. (Virginia)

B. Teacher Support

- I think it was a good class. Dr. Young was flexible and willing to change the class structure to go with the technology that worked. (Mary)
- I liked Dr. Young providing the power point slides, that was a big advantage! (Olivia)
- This was better than the CD, mainly because we had the slides, so the video could be the same, but this did "feel" slightly more engaging. (Olivia)
- I liked this better than the Video Conferencing courses – even with the Video Conferencing, you still have to be in a classroom, even if the professor is in another location. I really appreciate the ATTD department and the university going this extra mile for us. Teaching distance learning is a lot more work for the professors and requires a lot of resources. It is difficult enough just to try to talk, write on the whiteboard, and think all at the same time. And then to add having to worry about the camera, the microphone, the other technical stuff; e-mails/getting messages to the students; converting and posting the syllabus, class notes, power point slides, and other activities to HTML makes for a lot more work on the part of the professors! (Rebecca)

C. Participation

- I don't really talk to people even when I'm in class. But when I'm online I feel more comfortable because I don't see their faces. (Alicia)
- Pulled up the power point slides and just listened to him (Consuelo)

D. Self-esteem

- Easier to ask a question in the chat room. Your name is there but it's not with your face. No embarrassment factor. (Erica)
- The fact that I could say more, because I usually don't. I'd be curious to see if most people that decided to stay home were introverted or extroverted. (Leslie)
- Shyness. Fear of asking a question others will think stupid. My ability or lack of ability to communicate, prefer email or the chat. (Rebecca)

• DISADVANTAGE FACTORS

The statements collected from the students' interviews and surveys implied that they perceived they have lost a tangible or intangible built-in benefit while "attending" class through this Online Web delivery format or that a potential disadvantage or loss could occur if this situation was ever present, a loss which otherwise would not have occurred while attending the same course in the traditional class format. The statements were further grouped under the three broad categories below.

I. ISOLATION

Isolation, as described by the students, consists of a feeling of being alone and disconnected from the teacher and other students due to a perceived lack of interaction and/or communication. Statements about the feelings were grouped into four subcategories: **Absence of Body Language Cues** - responses related to the lack of body language in communication among members of the class; **Absence of Hearing Classroom Discussions** – responses related to difficulty hearing the videos; **Absence of Immediate Questioning** - responses related to inability to raise questions in a timely fashion; **Lack of Interaction** - responses

related to absence of shared communication among all class participants. Lack of Interaction includes absence of socialization opportunities and of feedback from the teacher. These sub-categories, although valid to the students who experienced them or thought of them as potential disadvantages, do not imply a general consensus among all participants, but rather they imply that these are factors that need to be taken into account as possible disadvantages of the Online Web format.

A. Absence of Body Language Cues

- I have the same problem with email, you don't hear a person's inflection of their voice. There is a lot to communication that comes from seen and hearing somebody. My main complaint is the lack of body language, the voice inflection. (Amanda)
- Couldn't ask questions face-to-face. (Jessica)
- In live, Dr. Young would look at you and you'd feel like he is really talking to you. (Joe)

B. Absence of Hearing Classroom Discussions

- Could not hear questions from classroom audience, and occasionally prof would not repeat the question. (Alexander)
- Difficult to hear those in the classroom asking questions. (Consuelo)
- The prof needs to be more attentive to Web (chat) queries and comments. (Marcelino)
- On the live setting it was hard to hear the other students in the classroom ask questions. On the Friday class Dr. Young did repeat the questions from the people in the classroom. But he did not do that on the Saturday class. He maybe just forgot to do the questions. (Nicholas)

C. Absence of Immediate Questioning

- I can't ask a question by simply raising hand. (Alicia)
- When someone asked a question, couldn't get the instructors attention immediately. (Alicia)
- With the live feed I could not do that instant replay when I was missing something. (Cristina)
- Questions not answered right away. (Erica)

- Moved so fast, it was hard to interject questions or comments in a timely fashion. (Hellen)
- It is easier for me, to ask questions and slow the instructor down, in a traditional class setting. (Hellen)
- A little bit of a delay on him being able to stop and getting to the question. (Isaac)
- The answer to the questions were not instant as they would have been in class. (Jo)
- The immediacy. Because when you are actually speaking to a person you have eye contact with him, you have their attention and you get immediate feedback. Where as on the chat you submit your question or your comment and its dati, dati da (sort of singing) and eventually it gets there, but the moment is passed. (Marcelino)
- Lag time delayed my questions. Not being able to get timely responses from Dr. Young, to questions. Not as immediate as when sitting in the classroom. (Teresa)

D. Lack of Interaction (no feedback, no socializing)

- You can not completely duplicate the live traditional classroom setting. More user friendly at home but you loose a little bit in the interaction. (Alexander)
- You couldn't face-to-face with another student. (Alexander)
- You don't have the human interaction. (Amanda)
- We could not see their faces. (Arthur)
- More comfortable in person. (Arthur)
- I think I'm missing something. (Arthur)
- Never get to meet classmates face-to-face. (Catalina)
- Less interaction w/instructor which makes it difficult to analyze/perceive what kind of person he/she is (which can tell student how much to study for tests) (Consuelo)
- Couldn't see students as they were asking questions. Felt isolated. (Hellen)
- I feel less likely to make contact w/instructor in this manner. (Hellen)
- Coming to class is a break for me. Because of my computer job and no distractions from the wife. (Isaac)
- Sometimes feel detached from class/instructor when sending questions. (Joe)
- In class I can look around and see if anybody else has this look of puzzlement on their face or not (Likes to compare himself with others). (Joe)
- I really enjoy "traditional" class setting for feedback, interaction, etc. (Nancy)
- The people that were at home, he still didn't address every comment that was made in class. (Samantha)

II. LEARNING ENVIRONMENT

Problems with the learning environment were grouped into four subcategories.

Interruptions/Distractions – responses related to problems in the student's

personal environment; **Lack of Focus** – responses related to inability to concentrate on the content of the videos being viewed; **Missed Material** – responses related to technical problems or student perceptions; **Lack of Time Flexibility** – responses related to having to adjust to the online class schedule in order to view the live broadcast; **Physical Problems** – responses related to health related problems that seem to worsen with the prolonged use of the computer.

A. Interruptions/Distractions

- Sometimes chatting distracts me from listening to the instructor. (traditional forces me to concentrate) (Alicia)
- Many distractions at home, we could miss lectures. (Arthur)
- Videos cause you to fatigue over time easily and you need frequent breaks. (Consuelo)
- No call waiting and loose the connection. (Diego)
- Not being able to attend the whole time. (Diego)
- Coming to class is a break for me. Because of my computer job and no distractions from the wife. (Isaac)
- I wasn't concentrating, I had other things in my mind. Professor is not watching us. (Not as engaging) (Jessica)
- Using the chat took the processing time from trying to listen to what he was saying. (Teresa)
- It's hard to keep a ten year old quiet and not bothering me, for large blocks of time, to view the lectures. (Teresa)

B. Lack of Focus

- I had a difficult time focusing. Need to be more disciplined. (Consuelo)
- Less personal interaction. As a result, the viewer loses focus on class lecture. (Consuelo)
- It was easy to be tempted to do other distracting things instead of pay attention to the lecture. (Edward)
- I wasn't concentrating; I had other things in my mind. Professor is not watching us. (Not as engaging) (Jessica)
- I rather like to listen to the professor in the class than listen to it online, as I can concentrate better and to ask questions face-to-face. (Jessica)
- I'm a morning person, ... for the online I had to be up here at work (don't have a computer at home) till 9 o'clock and I really did not care for that. (Olivia)

C. Missed Material

- Could not review portions that I felt I had missed. (Amy)
- If the technical difficulties were on the recording as well, the class would be lost, it would be like missing a class. (Amy)
- The set in-stone class times can cause problems i.e. when you are sick, that can be avoided w/pre-recorded lecture. (Anastasia)
- Can not hear all the comments/questions from class. (Joe)

D. Lack of Time Flexibility

- I have to do it at a specific time rather than any time, like in the case of the CD. (Diego)
- This setting is time and possibly space dependent. (Edward)
- Less convenient than the CD, because you have to “attend” at a predetermined time that may not always be possible. (Mary)
- I’m a morning person. With this format I’m stuck having to watch it at night. I prefer to be able to set my own schedule. After working all day, I had to stay ... and watch the class. I was really, really exhausted. (Olivia)
- I still like the traditional over CD or Online, because I can focus on the content without the hassle. (Samantha)
- I have to be home in front of my computer uninterrupted (HA!) for long periods of time. (Teresa)
- Like if I’m stopping to think of a question, and I type it, and he is still talking, I’m worried about what I’m missing while I’m trying to focus on typing. Where as in the class if you raise your hand, he stops to ask you what your question is. So there is only one thing going on at a time. (Velma)

E. Physical Problems

- Being in front of a computer monitor is harder on my eyes than being in the classroom. (Hellen)
- Got cramps from writing so fast, with CD at least could pause to catch what I missed or to take a break. (Hellen)

III.- TECHNOLOGY

Technology problems that were either perceived as a potential disadvantage or actually experienced as a disadvantage by the students. Technology problems were experienced in the following circumstances: **Language** – responses related

to difficulty understanding lectures over the Internet, while viewing the videos directly from the school's server. **Net Congestion/Buffering** – responses related to difficulty accessing the videos directly from the department's server over the Internet. **Poor Video Quality** - responses related to the small size, low resolution and jerkiness of the video image. **Other Hardware/Software Problems** – responses related to not being comfortable with the technology and having to do upgrades. **Typing** – responses related to those with little keyboarding skill. **Delay** – responses related to a 20 second delay between actual lecture broadcast and the time the computer would output the image and sound, becoming a nuance when students would ask a question and it became apparent the teacher had passed the topic.

A. Language

(statements from the CD/Internet class format, also apply here)

- English over the Web, it takes more time to understand him. (Nicholas)

B. Net Congestion/Buffering

- The only disadvantage would be if my connection from home was not adequate. (Anastasia)
- Computer problems (computer lock up, crash, connectivity), which obviously will go away as time passes by. (Diego)
- As far as reviewing recorded lectures, the CDs were functionally better – no Net Congestion. (Henry)
- People who are on a slow connection may get frustrated. (Jo)
- Net Congestion. (Joe)
- It could be a disadvantage if the server crashed, but we could always re-schedule the class. (Leslie)
- The CD-ROM was better because there was no buffering or Net Congestion to slow you down. (Rita)

C. Poor Video Quality

- The picture is still kind of fuzzy. (Amanda)
- Technical problems with the video feed. Audio was spotty. (Amy)
- Live video lacks quality, consistency, and resolution. (Bernardo)
- Same poor video quality. (Samantha)

D. Other Hardware/Software Problems (not comfortable w/technology, upgrades)

- If there were technical difficulties the class would have to be recorded for later review. (Amy)
- The instructor was distracted, trying to perform unfamiliar tasks. (Bernardo)
- Lower quality of learning. (Bernardo)
- This technology wouldn't work for lots of discussion. (Catalina)
- Potential technical problems. (Catalina)
- Possibility of technical problems. (Charles)
- If there are problems with technology, it gets frustrating. (Cristina)
- Technical problems. Didn't lose audio, screen froze. I was not able to use the chat. (Hellen)
- People who are resistant to change may have a hard time adjusting. (Jo)
- My question would be, can I trust the technology? (Joe)
- I can't tie up my computer, 4, 5 hours in the middle of the day. Because that's everyone's phone line. (Joe)
- During the middle of the day, it's financially not a good idea. I can't pay to have a second phone line, so I'm keeping my primary phone line open. (Joe)
- I disliked having to access the technology. I don't feel comfortable with the technology. (Rita)
- In the chat room I don't know the procedures. (Samantha)
- I could not hear people's questions when they were being asked on the videos and even on the online. (Teresa)
- What I get to see would be determined by the camera operator. (Velma)
- I didn't want to try the online because I was having much trouble with the other videos. And so I came. (Veronica)

E. Typing

- I can't answer the instructor's questions quickly because I have to type. (Alicia)
- I feel more apprehensive on the Web than in the class, I think that when we are doing the online stuff and people are asking questions. Ok, not only do you want to get your question across, you need to have it correctly grammatically. (Rita)

F. Delay

- The time/sound delay between live and the feed is distracting. Questions from remote students were out of synch with the lecture before they were addressed. (Bernardo)
- Mixed live and broadcast lectures are probably not a good idea unless remote observers have high-speed connections. (Bernardo)
- Delay between real time and online. Meant questions on chat group answered by the professor were way behind, after he had moved to another subject. (Catalina)
- Slight delays in lectures. (Consuelo)
- Delay. (Erica)
- Lag time or delay, hard to get used to. (Isaac)
- A comment made by students, there is a little bit of a timing problem I think, because by the time Dr. Young reached them on the screen, he's already moved on to another topic really. So, I don't know how useful they are unless it can be improved so that he can see those comments right away. Improve the synchronization of the comments from the distance students. (Mary)
- Like when they (students) were asking the questions (on the online), it may not be appropriate at that point, because we already went past it (there was a delay of few seconds on the online transmission). (Rita)
- Conversations are not sequential which is disconcerting. (Samantha)
- The 10 sec delay is little bit confusing. (Virginia)

• PREFERENCES

Statements made by students expressing their class format choice are included below.

- No real disadvantages to my way of thinking. (Alexander)
- The disadvantages do not weigh heavier than the advantages. (Alexander)
- I prefer to be in the classroom (traditional) just because it works best for me. (Amanda)
- I didn't like either one of the settings (CD or online). (Amanda)
- I just rather have the pre-recorded and that's it, can review lecture. (Amy)
- Online better than CD. We can clarify questions immediately. I feel I have better understanding, and feel more part of the process. Not isolated. (Catalina)
- The CD videos take too long to watch, would prefer online in class. (Consuelo)
- Video had fanning motion, but it didn't bother me. No sweating the small stuff. There are things that are nice but not crucial. (Cristina)
- I prefer Web setting (over traditional, & CD) for a class like this. (Edward)
- If done this way – I can't see any disadvantages. (Erica)
- I prefer traditional. (Between CD and online) I would have preferred online, knowing that I had the access to it, to review it if I wanted to later on. So, I would be getting the

best of both worlds. I would have the ability to go back and pause and see if there is stuff that I missed. (Hellen)

- I found no disadvantages. (Henry)
- I like the Internet setup. Lecture and chat is all that is needed. (Henry)
- The live online sessions of course are best. I like the live environment of being there and knowing that it's going on right now. (Henry)
- Rather have the online and prerecorded than the traditional. Online during the semester, and then also have the pre-recorded as the backup. That would be ideal. (Henry)
- If I wouldn't had the option and everything would have been operating properly I would have done it online. (Isaac)
- I like the traditional and use the prerecorded only as a backup. (Jessica)
- I prefer the live setting with a TA attending the chat for immediate questions. I also like the videos to be available for review. (Jo)
- The online Web setting is better than the CD because I can interact with the instructor. (Joe)
- I still got to interact with other people online. And so, I saw that as more valuable, because I got to see a lot more of what was going on in their heads through the writing, than I would in class. I think I almost got more out of the discussion that were online (than traditional). (Leslie)
- On the online, we could say, "hey, we couldn't hear the question." And then somebody would say something about it. I rather have the online setting than CD or traditional. (Leslie)
- Online is ok for straight discussion and for whenever there is discussion. (Leslie)
- As far as the classroom setting, I don't really miss it. I've attended enough classes. It's not for me, it's not a social event. I have other goals. (Mary)
- Different, but just as effective for learning, for me. (Mary)
- I really like this kind of method to learn the online over the traditional, because it is easier to learn the knowledge without leaving the house. (Nicholas)
- Prefer the online over the CD. (Olivia)
- I pretty much like taking the course this way. (Olivia)
- When we come on in the text chat, I feel comfortable. (Rebecca)
- You knew he was going to be there, and so you wanted to be there. It played as an incentive. (Rebecca)
- I would definitely have the live video feed over the others (CD and traditional). I thought you got the best of both worlds. It had the text-chat. (Rebecca)
- I think this is ideal for graduate students. (Rebecca)
- I liked this better (online) than the Video Conferencing courses – even with the Video Conferencing, you still have to be in a classroom, even if the professor is in another location. I really appreciate the ATTD department and the university going this extra mile for us. Teaching distance learning is a lot more work for the professors and requires a lot of resources. It is difficult enough just to try to talk, write on the whiteboard, and think all at the same time. And then to add having to worry about the camera, the microphone, the other technical stuff; e-mails/getting messages to the students; converting and posting the syllabus, class notes, power point slides, and other activities to HTML makes for a lot more work on the part of the professors! (Rebecca)

- There was not a thing I disliked. There are no disadvantages for me. (Rebecca)
- If the class was taught online, I might risk it, depending on what else was going on in my life at that time. (Rita)
- Courses would be available every semester where they were actually meeting as traditional classes or not – most important. (Samantha)
- I prefer a traditional setting, but this format works best for my life. (Teresa)
- Better than traditional because no hassle of coming to class. (Virginia)

• SUGGESTIONS

Statements made by students, recommending a variation on the implementation of the class format are included below.

- Meetings online shouldn't be too long, and not a whole month between meetings. Schedule was too flexible. (Charles)
- I think it's great to watch the class on CD, but I feel you don't have a class whenever you meet online, just have a time to communicate and interact with each other. Use that as interaction time. (Consuelo)
- Need more frequent potty breaks. (Cristina)
- Would like a microphone on class participants when they ask questions. (Cristina)
- In D.L. when they flipped the cameras back and forth, that was actually as close as you can come to the traditional. (Hellen)
- Having someone monitoring the questions. I felt like that was the most successful. Monitor can answer some of the questions without interrupting the instructor. (Jo)
- Needs to have a TA for online classes (handle the chat) it frees up the instructor. TA made me feel better and calm. (Joe)
- I wish it could be a little bit more frequent. I kind of like if this class moved more towards the live video conferencing kind of environment. It also kind of helps me pace myself out. (Leslie)
- Ideally, it would be if everyone had their own microphone, and we could hear what was going on. (Leslie)
- Current events are always impacting the way we are thinking and the way we understand things around us. So, the fresher the material the better it's going to be for the students. (Marcelino)
- I think Dr. Young should go online like chat, to see who is logged in, so Dr. Young can post question and students then answer, to take as participation pts. (Nicholas)
- If everyone were doing it that way (online), I think it would be easier trying to coordinate both (classroom and online student's questions). (Rita)

INSTRUCTIONAL TOOLS

WEBCT TESTING

The WebCT testing involved an application software that allowed students to take the class tests online. Tests were posted on the school's server and accessible on a time window of 4 days around the clock. Tests have their own clock with a maximum time of 120 minutes.

Students who had experienced paper-and-pencil testing were able to compare and evaluate their experience with WebCT testing. Students' statements in the form of advantages and disadvantages were collected through surveys and an interview. Subsequently, statements were grouped in several categories.

• ADVANTAGE FACTORS

The statements related to advantages of the WebCT testing imply that students perceived a tangible gain or intangible benefit by taking the test over the Web instead of the traditional paper-and-pencil environment. Advantages were further grouped under four broad categories. Only categories and sub-categories not described before are further explained here.

I.- CONVENIENCE

Convenience is defined as "saves work." Student responses related to convenience of format were organized into six sub-categories: Focused, Handwriting, Comfort of Familiar Environment, Printing, Travel Saver, Using Resources. Statements indicating convenience were placed in the six subcategories as they embodied the

characteristics in the descriptions. **Focused** – responses related to improved concentration and focus on the class material. **Handwriting** – responses related to typing as it improves test readability. **Comfort of Familiar Environment** – responses related to the convenience of viewing the lectures in one's own comfortable surroundings. **Printing** – responses related to the ability to print the test for later reference. **Travel Saver** – responses related to no driving to and from school-work-home. **Using Resources** – responses related to having all class resources including the CD, handy while taking the test.

A. Focused

- I like the WebCT test. I don't feel so nervous about the test. It just feels that the environment is more comfortable. (Alicia)
- I took it in the Willis Library and that was great. (Alicia)
- I could concentrate better, without somebody in the class going (coughing sound), or roughing, and shuffling. (Anastasia)
- In class there is all kinds of little distractions. I've had people try to cheat off me in class. I don't like to have to cover my paper, ... (Anastasia)
- I like being by myself when I'm taking a test. I don't like having people around me to distract me. (Charles)
- It was great to be in one's own quiet room and be able to concentrate, undistracted by classmates. (Elizabeth)
- It took some of the anxiety out of the test for me. (Erica)
- After I'm familiar with the software I can concentrate better. (Nicholas)

B. Handwriting

- I liked it a lot! I'm a left-handed person, so I write really hard. So, if I'm on paper and pencil and I erase, it doesn't all come off. So, it offers me that, that it's clean. (Amy)
- I type faster than I write. (Anastasia)
- I prefer typing than writing. (Charles)
- I like it because it's convenient. I prefer typing I'm faster at it. I get tired of writing. (Consuelo)

- If question was an essay, you wouldn't have to write or anything. When you write on a paper-pencil test sometimes you can't read what I write, not so in the computer. (Nicholas)

C. Comfort of Familiar Environment

- Friendlier setting. I suppose I am more comfortable at home than in the classroom. (Alexander)
- Convenience of taking it at home. (Amanda)
- More comfortable in my home. I can set the temperature. No noise problems. (Anastasia)
- In my own space I can spread out. (Anastasia)
- I can sit at home and do it. (Consuelo)
- Having the comfort of my own environment. (Elizabeth)
- Being able to lay all my stuff out at home. (Erica)
- I would choose WebCT over paper and pencil. I would be more comfortable at home, I'd know where all my stuff was. And since everything is open book, open notes, I can make sure I didn't (miss anything). If I have to come to school, I'd have to drag all my stuff then, I usually 9 times out of 10, have forgotten something at home. (Leslie)

D. Printing

- Could print out the test (after finished) and see what I missed and why I chose the answers I did. (Amanda)
- I printed it out with the answers, to know what I did wrong. (Anastasia)
- I printed the test, put computer aside, sat down at my desk, answered the questions, then came back and plugged in the answers. (Jo)
- Before I submitted the test, printed the test. Just to make sure what answer I took whether it was correct or not. (Nicholas)

E. Travel Saver

- Eliminates the drive to campus. (Alexander)
- No driving. (Jo)
- I don't need to drive to school. (Nicholas)
- No driving. (Teresa)

F. Using Resources

- I used the book and checked my answers. When I got finished I did print out a copy of it, because I got my score and I knew there were some I had answered wrong on the test. (Charles)
- Used my papers, book and reviewed parts of CD while taking it. (Diego)

- Being able to lay all my stuff out at home. (Erica)
- I would choose WebCT over paper and pencil. I would be more comfortable at home, I'd know where all my stuff was. And since everything is open book, open notes, I can make sure I didn't (miss anything). If I have to come to school, I'd have to drag all my stuff then, I usually 9 times out of 10, have forgotten something at home. (Leslie)

II.- FLEXIBILITY

Flexibility represents any advantage related to adjustability to conflicts. Flexibility subcategories include: Comment Box, Corrections and Changes, “More Alert” Time, Schedule Flexibility. Statements indicating flexibility, were placed under the subcategories as they embodied the characteristics in the description.

Comment Box - responses related to the capability of entering essay type answers on the WebCT test. **Corrections and Changes** – responses related to the option of changing answers on the test. **“More Alert” Time** - responses related to the flexibility of being able to choose one's own best time of the day for learning. **Schedule Flexibility** – responses related to being able to view lectures around one's work and family schedule.

A. Comment Box

- Being able to explain responses. (Consuelo)
- I liked the opportunity to explain what I meant (comment boxes) (Cristina)
- Added ability of comments for each question. (Elizabeth)
- I liked the chance of being able to back up and answer the question again. (Isaac)
- I liked being able to add comments to the MC questions, comment box. (Mary)
- The lines to make comments made me feel better about taking it. (Olivia)
- I loved the final, it had comment boxes. (Rebecca)
- Final was a better test for me, as I could give explanation supporting my responses. (Virginia)

B. Corrections and Changes

- You can go back and rethink an answer. Go back and change it. (Alexander)
- I did go back and forth and could change answers to questions. (Amanda)
- I can go back to the question and change my answer if I needed to. (Amy)
- I printed it out, went through it (with pencil), felt less apprehensive. Once I came up with the answers, I went back to the computer and put that in. (Catalina)
- Reviewed questions, changed them. (Diego)
- I liked being able to go back and review or change answers. (Velma)

C. “More Alert” Time

- Flexible schedule. I pick the time of day I am most mentally ready within the given time frame. (Charles)
- Great taking the test in the middle of the night. I’m a night person. (Joe)
- It’s convenient. Because you can take at your convenience, when you feel like you are best prepared and it’s the best time of day for you. (Mary)
- The fact that you could do it when you are more alert, best at. (Velma)

D. Schedule Flexibility

- You are given a window to take the test, ... to work around your own schedule. (Amanda)
- Convenience of taking it at the time of my own choosing. (Elizabeth)
- Took the test anytime I wanted to. (Isaac)
- I can take the test after the baby goes to bed. (Jo)
- Convenient. (Nancy)
- I’m going to take it on the web, because there is some convenience of that. (Olivia)
- I liked having the window of several days that was available to take the test. (Rebecca)
- I liked being able to take it whenever I felt like it. (Velma)

III.- INNOVATIONS

Statements that referred to unexpected occurrences related to taking the test and became an advantage of WebCT testing, where grouped under innovation. Under Innovation there were also the following factors: **Instant Grading** – receiving the test grade immediately after submitting it, when the test

format is all multiple choice. **Learning Technology** – responses related to gaining intentionally or unintentionally an understanding of the technology used for taking the test. Also, learning and/or liking the technology occurred as a consequence of being exposed to it.

A. Instant Grading

- I liked getting my grade right away and not having to wait. Instant feedback. (Amanda)
- The instant grading, I liked that option. (Anastasia)
- I liked the immediate feedback on the score. (Catalina)
- Multiple choice test easy to score, you get score immediately. (Virginia)

B. Learning Technology

- I liked it, I felt really comfortable with the technology. (Cristina)
- There was nothing lost in the “web-process” at all. (Elizabeth)
- It works. The technology works fine. (Mary)
- Just use my computer to take the test. (Nicholas)
- When reconnecting, if you just click on the URL box of the same netscape window you were in and highlight the URL that was up there and press enter, it will go back to where it was in the middle of the test without having to go back through WebCT. It won’t notice that you are gone. (Velma)

• **DISADVANTAGE FACTORS**

These statements imply that students perceived a tangible or intangible loss by taking the test over the Web instead of the traditional paper-and-pencil environment. Disadvantages were further grouped under the following two broad categories.

I.- SURROUNDINGS NOT CONDUCTIVE TO LEARNING

Problems with the learning environment which interfered with the students concentration and honest productivity during the test were grouped under three

subcategories. **Cheating** – responses related to the potential for students helping each other with the test taking. **Interruptions/Distractions** – responses related to problems in the students' chosen familiar environment for taking the test.

Problems which interfered with the smooth continuous test taking of the students.

Time Factor – responses related to the timing mechanism implemented on the test.

A. Cheating

- Disadvantage of allowing several days to take it, the fact that some people told others before those others had to take the test those little tricks they had discovered. (Nancy)
- A pretty major disadvantage, the communication among students during the week the test is being offered, which gives an edge to some students. (Rita)
- The fact that some people told others before those others had to take the test those little tricks they had discovered. (Samantha)

B. Interruptions/Distractions

- The home does have interruptions. (Alexander)

C. Time Factor

- The time factor made me a little anxious. (Erica)
- The timer put a lot more pressure on the exam. (Hellen)
- Test not on time. (Nicholas)
- Probably there is a little bit of a feeling of pressure of the time limit. (Olivia)

II.- TECHNICAL PROBLEMS

Problems that were either perceived as a potential disadvantage or actually experienced as a disadvantage by the students while taking the test in WebCT.

Technical problems were further grouped under the following subcategories.

Connection Problems – responses related to loosing the Internet connection

while taking the test. **Unfamiliar Environment** – responses related to

apprehensions and lack of knowledge about the structure and inner workings of

the WebCT software environment. **Can't Ask Questions** – responses related to

not being able to reach the teacher to clarify any questions during the test.

A. Connection Problems

- The email environment seems more solid (than WebCT), when saving (in WebCT) you are not sure if it gets your question saved or not. Yes it changes red to green, to let you know that you finished with that question. But, in the back of your mind you really wonder, Did it go in, is it there? And then you get hanged up with too many people submitting at one time, and its sitting there waiting, and waiting, and waiting. ... It doesn't seem like its refined to the point where I trust it. (Marcelino)
- The problem about taking it online is because you have the nervousness of whether or not you are going to be kicked out of the computer. I use aol and if you are idle for too long it's going to disconnect you. (Rebecca)
- Just because you are typing away, the system doesn't recognize that as an activity and it will cut you off, so save something frequently just to maintain that connection. (Velma)
- If you get cut off, anything that you haven't saved is gone. (Velma)

B. Unfamiliar Environment

- (Didn't understand how to use WebCT, didn't submit questions after changing them) (Arthur)
- Is my computer going to work? (Erica)
- My concern is that the technology works. If it doesn't and you've changed your day around ... (hired the babysitter, canceled family plans) (Jo)
- Need to familiarize (myself) with this type of software. Otherwise, I can not get this. (Nicholas)
- I hoped that after changing answers they got recorded. (Rebecca)
- Wished had practice testing before, even the Canfield first. Had no idea how it worked. (Erica)
- It would have been a beneficial step for us to have a practice test, so that we could just experience the structure of the setting.(Hellen)
- A practice test would have helped. (Jessica)

- The thing about the chat room that takes some getting use to is that once you've written something and submitted it. It's there. So, you've got to word very carefully, you've got to be very precise because it is published with your name right there. (Marcelino)
- I didn't know you could print the test. (Rebecca)

C. Can't Ask Questions

- No way to interact with teacher to ask for clarification. (Hellen)

• PREFERENCES (No difference/ "I love it!")

Statements made by students expressing their testing choice are included below.

- I kind of thought it was cool, being able to do it on the Web. It was fun. I rather take the test on the computer. (Amanda)
- I liked the testing method, it gave me the time. (Anastasia)
- I would prefer to take it on the Web. It would be easy. (Arthur)
- I am perfectly comfortable with taking a test on the computer as long as the test is well constructed. (Charles)
- I like it because it has a timer up on the side, that let's you know how many minutes you have left, and how many questions you have left, and if you skipped a question. (Consuelo)
- Between paper and pencil & WebCT testing, both ways are fine. I don't see any difference. (Diego)
- I love WebCT! (Edward)
- (Between paper-and-pencil and WebCT) I don't have a preference. It wouldn't matter (either way). (Elizabeth)
- I did not feel like the Web was a drawback. (Elizabeth)
- It seemed a lot less stressful than a traditional classroom "final" setting. (Elizabeth)
- I liked actually taking the test on there. (Erica)
- I loved the WebCT tests. (Henry)
- Psychologically speaking, they seem more structured, organized, and less ambiguous. (Henry)
- Taking the test on the computer was ok. (Isaac)
- Even with the tech glitches, I would still do the computer test. (Jo)
- I can't see any disadvantages. (Leslie)
- I would love to, Dr. Holcomb also. He did his final exam, where it was an e-mail exam where he emailed us the questions and then we word processed our responses and then emailed them back to him. (Marcelino)
- No drawbacks I can see. (Mary)

- I don't have strong feelings one way or the other. (Teresa)
- I thought it was fun. Convenient. (Velma)
- A lot less time to get the information down. In a sense it was less work. (Velma)
- I felt it was great. It was just fine. (Veronica)
- I would rather take it with paper and pencil. [Didn't show up for the paper & pencil, took it on the Web] (Hellen)
- Lived close by to campus I would prefer the paper and pencil. Just because of years and years of taking it. Familiarity. (Marcelino)
- I have a severe test anxiety. I think taking it on the WebCT added to that. (Rebecca)

• SUGGESTIONS

Statements made by students, recommending a variation on the implementation of the class format are included below.

- It will be easier, I think to just use a mouse. (Arthur)
- More tests would help student study more often. (Jessica)
- A practice test would help get used to the environment, before taking the class test. (Virginia)

WEBCT FORUM

The WebCT forum consists of an application software much like a bulletin board, that allowed students to communicate with other participants in the class. The bulletin board, although temporarily used, provided a medium for students experiencing technological problems to communicate with other students in the class. Although not all students knew (used) about the Forum, those who did expressed their feelings, which were grouped below as advantages and disadvantages. Statements related to potential uses of the Forum expressed by the students have been grouped under a suggestion category.

- ADVANTAGE FACTORS

Statements that imply students perceived a tangible gain or intangible benefit by communicating with other class participants using the Forum. Advantages were identified in the area of **Communication** – responses related to the exchange of information with other class participants; Students also felt comfortable enough to express their **Preferences** and **Suggestions** for the use of the Forum.

I.- **COMMUNICATION**

Statements related to communication were further grouped under three sub-categories as they fit the following descriptions: **Help Each Other** – responses related to posting questions on the material, viewing other students' questions and answers. **Interaction** – responses related to communication about the class material and class issues. **Socialization** – responses related to getting to know

other classmates. **Classroom News** – responses related to posting class news, updates and issues.

A. Help Each Other

- (I could use it for) things I could dialog with other students and not go to the professor for, every time. (Alexander)
- Instead of going to the teacher (first), if you have a question ask it on there, and see if someone can answer it. (Anastasia)
- Find out other questions that are coming out. (Catalina)
- Get some questions answered. (Catalina)
- Can discuss class content. (Jo)
- “What do you do when bla, bla ?” , “Did you look on chapter so and so?”
Students could help each other back and forth on that forum. (Marcelino)
- I think that was a good experience. Forum is a good chance to communicate not only about the technology, but a good opportunity to answer questions about the textbook. (Nicholas)
- Good to post any question we forgot, any question with the textbook. (Nicholas)
- Other people’s questions, I think that’s beneficial. (Veronica)

B. Interaction

- (Reading the messages helped feel connected with other students). (Alicia)
- Allows you to keep in contact (with other students and teacher). (Anastasia)
- You can get a little more of that connection with other people. (Catalina)
- Forum and Calendar good tools. ... You still need to know where you are expected to be, compared to everyone else. (Charles)
- It’s not necessary that I have to be in the classroom and see other students. It’s more what they are talking about that I am interested in. Which can be done just as well online, if not better. (Edward)
- It was nice to have it, especially with the test. A place where you could get an explanation of what’s going on. It’s nice to have a place where there could be feedback. (Elizabeth)
- Interaction via bulletin board or chat was slow but kept me involved with the class. (Joe)
- Good way of communication with Dr. Young or any student. (Nicholas)
- I was glad that was there so that in the end it wasn’t just me (could communicate with other students when the test wasn’t available at the arranged time). (Olivia)
- It was nice to have a place where you could read other people’s comments and make your own. (Velma)
- Class participation. (Veronica)
- When problems arise in this class setting, bulletin board (Forum) was a great help, being able to talk to other students. (Virginia)

C. Socialization

- Find out what others are doing. (Catalina)
- It's an information type place. It's more stationary than the online chat. It was kind of like passing notes. It still has that anonymity to it. (Consuelo)
- Forum great for talking to others, and the students. And for finding out what's going on, and how others feel. (Joe)
- You can talk to other students using the threaded Bulletin Board. It seems we all stay in touch more. (Rebecca)
- A way to get to know people. (Velma)

D. Classroom News

- Can air issues. (Anastasia)
- Instead of sending an email to all of us, he can post a message on the bulletin board. (Consuelo)
- Could talk to other people and understand what was going on with the test not being available. It wasn't a problem that my computer was having, or that I was having. It was a global problem for the class. (Veronica)

E. Time Independent

- Better, because I have more freedom, and I go read it when I want to. (Edward)

• DISADVANTAGE FACTORS

Statements expressing a concern or a perceived loss of a benefit otherwise not experienced in the traditional classroom environment. Three types of potential problems were identified. **Complaints** – responses related to unproductive, sometimes destructive, criticism. **Technical Problems** – responses related to any hardware, software related problems. **Isolation** – responses related to not enough interaction with other students.

I.- COMPLAINTS

- In this class it wasn't well utilized (gripping). (Jo)

- It really seemed like a gripe session, rather than any kind of collaborative learning. (Marcelino)

II.- TECHNICAL PROBLEMS

- Sometimes, I didn't because it made me type. (He hates typing) (Arthur)
- The format was pretty confusing. (Velma)

III.- ISOLATION

- I don't think that I ever would have a question about the course content posted there and to hear other people's responses to it. (Elizabeth)
- It is impersonal. I want to know who that person is. (Velma)

• PREFERENCES

Statements made by students expressing their liking of the Forum use are included below.

- I liked it! (Arthur)
- It's a useful, helpful tool. (Catalina)
- That was kind of neat. (Consuelo)
- I see it as a plus. (Elizabeth)
- Using the Forum was wonderful. (Veronica)

• SUGGESTIONS

Statements made by students, recommending a variation on the use of this instructional tool are included below.

- There ought to be designated times when we should meet on the bulletin board. If not, somebody gets on it on Monday and says something that's really important, or has a question that's burning, and nobody looks at it until a week later. It doesn't work. (Alexander)
- Almost require (students) to go to the Forum once a week, to get in the habit. (Catalina)
- Would have liked to see people using the Forum. I would like a little more interaction among the class. Communication. (Charles)
- I kind of wish we had used it more to talk about content and ideas. (Edward)

- Again maybe some of the discussions could have been directed by Dr. Young so that they were actually productively discussing things. (Edward)
- Someone needs to take the lead, let's share possible test questions. (Jo)
- Even though we only have lectures like 4 times or whatever, to add every couple of weeks or half way between lectures say will have a discussion group going, from this time to this time for who ever is interested to discuss these topics. ... like a the topic of the week. if you knew here is what we are going to be talking about, and just post your thoughts, then people would have a reason for going. (Leslie)
- If there could be some guidance, and maybe some examples and modeling from the professor, as to how to use it as a collaborative type environment, that would be good. (Marcelino)
- I still hope Dr. Young can go online to see our participation. If he didn't go that place, I think nobody will be willing to go that place, because it's a waste of time. (Nicholas)
- The best way is for Dr. Young to put there some question to discuss or to comment to the class. (Nicholas)

CHAPTER 5

INTRODUCTION

This research, while being the first of its kind in this area of technology, did not seek to establish some irrefutable truths, but rather to uncover and to identify some of the factors of how the students value the use of the Internet in the delivery of all class instruction. This research sought to identify these factors before more resources are invested in any one specific delivery format. Further, and as a result of uncovering these factors, more research both quantitative and qualitative can then be conducted to establish more conclusively or to prove or disprove the validity of these findings.

DATA INTERPRETATION

All statements made by the students in their surveys, interviews, and email communication were carefully read multiple times to determine the category of “best-fit.” Although redundant in some cases, in relation to other participant’s statements in the same category, all student statements were listed under the corresponding category. By doing so, this researcher could show a visual percentage of validity through the triangulation of similar assertions compiled from different sources of student opinion.

The lack of volume under a specific category, especially in the case of the more unusual categories, does not invalidate the category but does indicate the need for further research in that particular area. By presenting all student statements in each category, the

researcher has provided the reader with ample evidence by which to judge the appropriateness of the categories developed.

INFLUENCING FACTORS OF ASYNCHRONOUS WEB TEACHING

The factors sought out by this researcher, as to how students value a course taught asynchronously, were gathered in this study under the CD/Internet class format as the only class setting that used asynchronous modality in CECS 5300. These factors grouped as advantages and disadvantages were related to Convenience, Flexibility, Learning Enhancement and Psychology for advantages and to Isolation, Learning Environment and Technology problems for the disadvantages.

Under closer scrutiny and finer differentiation of the advantages, the CONVENIENCE factor (intrinsically related to “saves work” in the students’ course experience) included 1) Family – responses related to the student’s direct relationship with other members of his or her family. 2) Focus – responses related to improved concentration and focus on the class material. 3) Comfort of Familiar Environment – responses related to the convenience of viewing the lectures in one’s own comfortable surroundings. 4) Economy – responses related to a savings of resources, including a) Economy of *Time*, b) Economy of *Travel* (no driving to and from school-work-home), c) Economy of *Money*, d) Economy of *Intellectual-Energy* (not spending any mental resources in listening to other students’ participation in class and avoiding class annoyances and distractions), e) Economy of *Eco-System* (contributing to saving the environment). Statements made by students and grouped under these categories implied a

direct positive relationship between the derived benefit and the CD/Internet class format experienced this semester.

The FLEXIBILITY factor (which allowed students to adjust the course experience to changes in their lifestyles and personal preferences) was evident to students in the following subcategories or factors: 1) Class Backup – responses related to having the lectures available in case class had to be missed. 2) Comprehension/Understanding – responses related to the ability to go over the class material more than once for improved understanding. This category benefited students best when *Reviewing Lectures* was possible and *Content Accuracy* was attainable by repeatedly viewing the lectures in full or short increments, depending on need. 3) Learning Self-Assessment – assertions made by students that, with this class format, they had acquired the same amount of knowledge that they would have attained in a traditional classroom setting. 4) “More Alert” Time – responses related to the ability to choose the most appropriate time for the student when learning can productively occur. 5) Schedule Flexibility – responses related to establishing a lecture-viewing schedule around one’s work and family schedule. 6) Viewing Flexibility – responses related to the ability to stop or pause viewing the lectures, for any amount of time, due to any type of interruption.

The LEARNING ENHANCEMENT factor (all those advantages that represent new approaches to a classroom routine and that turned out to be beneficial to the student) was more evident to students in activities such as follows: 1) Better Note Taking, for which the video-pause feature was key. 2) increased personal Discipline – setting and following a viewing schedule. 3) Multi-Tasking – concurrently performing two or more

activities while effectively dividing one's attention. 4) Technology Factors – while using the technology required to “attend” classes in this format, the student learned to use the new technologies, and, in the process, developed a liking for them.

The PSYCHOLOGY factor (advantages that have, from the student's perspective, beneficially affected the personality or psyche of the participant) was referred to by students as 1) Posing Questions a) at the student's chosen time but not necessarily during class time, b) once the student had collected his/her thoughts, c) in a more private setting without a face-to-face encounter with the teacher and other students; 2) Obtaining Teacher Support due to a more frequent and structured connection between students and teacher in this setting than when attending classes in a traditional format; 3) Decreased Participation or the choice of not listening to other student's questions, anecdotes, comments and other off-the-track distractions, by fast-forwarding or skipping over portions of the recorded lecture; 4) An increase in Self-esteem or improved self-confidence and self-image by attending class through this format, in a non-threatening environment. (For a student, previous traumatic classroom methodologies had made learning a detrimental experience).

These categories and sub-categories, named as the positive factors of this study, were tallied individually and are presented in Table 1 (below) and further illustrated in Charts 1 through 8 (Appendix E). The importance of any particular factor is illustrated in the tallied amounts. The categories of Convenience and Flexibility represent the two most frequently cited positive factors for the CD/Internet class format. Under closer scrutiny, Economy of Travel (29), Economy of Time (16), and Comfort of Familiar

CD/INTERNET FORMAT

ADVANTAGE FACTORS		294
<u>CATEGORY/Subcategory</u>	<u># of Statements</u>	<u># of Students/34</u>
CONVENIENCE	95	
Family	10	9
Focus	11	10
Comfort of Familiar Environment	16	14
Economy	58	
<i>Time</i>	16	12
<i>Travel</i>	29	26
<i>Money</i>	6	6
<i>Intellectual-Energy</i>	6	1
<i>Eco-System</i>	1	1
FLEXIBILITY	118	
Class Backup	5	5
Comprehension/Understanding	37	
<i>Reviewing Lectures</i>	16	15
<i>Content Accuracy</i>	21	18
Learning Self-Assessment	13	10
“More Alert” Time	6	6
Schedule Flexibility	35	27
Viewing Flexibility	22	17
LEARNING ENHANCEMENT	62	
Better Note Taking	11	9
Discipline	8	7
Multi-Tasking	13	13
Technology Factors	30	19
PSYCHOLOGY	19	
Posing Questions	7	6
Teacher Support	6	5
Participation	5	5
Self-esteem	1	1

Table 1

Environment (16) ranked the highest, all under Convenience. Travel refers to not having to drive to class, which entails a waste of Time, Money and Intellectual-Energy, all four being the Convenience sub-factors. The close relationship of the four Convenience sub-factors is revealed in a remark by (Marcelino): “I just find that without that much windshield time, I’m learning more because I’m not tired from the trip.”

Comfort of Familiar Environment, which ranked as high as Economy of Time, referred to being able to choose the most comfortable environment for viewing the lectures, as (Anastasia) expressed, “More comfortable to be at home. Privacy, quiet.” Although the remark was true for most students, others found the most comfortable environment to be the office after hours, when they could be by themselves, again “Privacy, quiet” being important.

Under Flexibility, the Comprehension/Understanding sub-factor, through Reviewing Lectures (16) and Content Accuracy (21), was rated third behind Schedule Flexibility (35) and Viewing Flexibility (22). To students, the flexibility of viewing the lectures around their work and family schedule was first, closely followed by being able to interrupt lecture-viewing if need be (whether because of a personal necessity or other type of interruption beyond their control). Third, the ability to review lectures and to stop and pause lectures while viewing was important because it facilitated gaining a deeper understanding of the class material. “If I don’t understand something, I can go back and turn, and I can listen twice or even more times. But in a classroom, if I skipped something, it’s gone” (Alicia).

For the CD/Internet class format, even though the two most important factors identified were Convenience and Flexibility, this research has found that all of the following are the positive factors of asynchronous Web based class formats:

CONVENIENCE: Family; Focus; Comfort of Familiar Environment; Economy of Time, Travel, Money, Intellectual-Energy and Eco-System. FLEXIBILITY: Class Backup; Comprehension/Understanding through Reviewing lectures and Content Accuracy; Learning Self-Assessment; “More Alert” Time; Schedule Flexibility; and Viewing Flexibility. LEARNING ENHANCEMENT: Better Note-Taking, Discipline, Multi-Tasking, and Technology. PSYCHOLOGY: Posing Questions, Teacher Support, Participation and Self-esteem.

Although some of these factors were predominantly chosen as being the most important, students mentioned other factors less frequently. For example, Better Note-Taking and Content Accuracy were related to the most important factors whereas Multi-Tasking, Economy of Eco-System and Self-esteem were simply worth mentioning because of their singularity. In the case of Multi-Tasking, even though a high percentage of the class participants attempted Multi-Tasking, it became apparent that students who were successful at Multi-Tasking were performing activities that required different sensory attention. (Samantha) remarked, “While listening to the videos, actually I ironed.” Economy of Eco-System supports the concept that not driving to school helps in the long run by reducing environmental pollution, which may support the selection of Economy of Travel as a valued factor. In the future, Economy of Travel can be promoted as a justification for Economy of Eco-System. The Self-esteem factor brings to light how

the class format helped a student overcome a bad classroom experience by being in the “Privacy, quiet” of the student’s own Familiar Environment. “Apprehensions of old classroom experience are gone. In India teachers use corporal punishment with a stick, not very friendly. A classroom of 60 students. Still today is like that back home” (Virginia).

All the factors are intertwined, and the more relevance of one over another seems to be related to each student’s previous personal experiences, current lifestyle, including overbooked schedules and commitments. For example, the Flexibility of Schedule and Viewing, in combination with the Convenience of watching from anywhere seems to be tailor-made to the fast-paced, nomadic, student population. Students in general, do not live near the university campus; in addition, they hold jobs that take them, daily, farther away. These factors, in conjunction with the unavoidable and less predictable family engagements, business trips, and unplanned family moves, usually would have added up to a wasted academic semester. With the Convenience and Flexibility of the CD/Internet setting, students participating in this research who found themselves in those predicaments were able to complete the semester successfully.

Although knowing the dominant factors is important to identify properly the target student population and the benefits of the class format under study, knowing other less dominant factors can be instrumental in further addressing other, not easily identifiable, needs in certain student populations. All factors are important to different student populations and only further study of all factors can ascertain their true significance.

The disadvantage factors of the CD/Internet class format were pin-pointed as ISOLATION, LEARNING ENVIRONMENT, and TECHNOLOGY. ISOLATION – a feeling of being alone and disconnected from the teacher and other students due to a perceived lack of interaction and/or communication - was experienced in the form of: 1) Absence of Body Language Cues from the speaker, which eliminated the ability to discern emphasis and other meaning attached to the oral communication. 2) Absence of Hearing Classroom Discussions – the absence of on-going class discussions and questions on the pre-recorded lectures contributed to students feeling left out and isolated. 3) Absence of Immediate Questioning – immediate clarification of points made by the teacher was not possible because the lectures were pre-recorded. Although email and phone calls were to be used as the alternate tools for submitting questions to the teacher, not all students felt these were adequate. 4) Lack of Interaction – this category relates to communication between student and teacher, and between students, beyond class discussions and immediate questioning. Some students in the course perceived there were a) a lack of socializing opportunities – getting to know other students and the teacher on a personal level - and b) a lack of feedback on the student's progress in the course.

LEARNING ENVIRONMENT involves all those situations where the student's progress in the course was negatively affected by the environment chosen by the student in which to view the videos. Learning Environment further includes these factors: 1) Interruptions/Distractions - responses related to problems in the student's personal environment directly interfering with the smooth, continuous viewing of the lecture. 2)

Lack of Focus – responses related to inability to concentrate on the content of the videos being viewed. 3) Missed Material – responses related to technical problems or student perceptions that contributed to gaps in viewing the lecture. 4) Procrastination – responses related to the student’s own lack of motivation.

The TECHNOLOGY factor included technology problems that were either perceived as a potential disadvantage or actually experienced as a disadvantage by the students – affected students in the form of: 1) loss of Language understanding – difficulty understanding lectures over the Internet, 2) Net Congestion/Buffering – difficulty accessing the videos directly from the department’s server over the Internet, 3) Not in-Synch Video and Audio – difficulty with the video and audio not playing simultaneously on the same portion of the video, 4) Poor Video Quality – difficulty with the small size, low resolution and jerkiness of the video image, 5) Video Segment Issues – difficulty with confusing labeling, gaps, outdated material, irrelevant discussion, 6) Other Hardware/Software Issues – difficulty getting comfortable with the technology and the need to make upgrades to permit viewing the lectures.

These categories and sub-categories named as the detrimental factors of this study were tallied individually, presented in Table 2 (below) and further illustrated in Charts 1 through 4 (Appendix F). Isolation and Technology were the two most cited disadvantages of the CD/Internet class format. Under closer analysis of each factor, Lack of Interaction (41) and Absence of Immediate Questioning (21) ranked highest under Isolation. Lack of Interaction referred to the “bonding” in any degree among students and with the teacher, a process experienced in most traditional class settings. Lack of Interaction was also

CD/INTERNET FORMAT

DISADVANTAGE FACTORS		189
<u>CATEGORY/Subcategory</u>	<u># of Statements</u>	<u># of Students/34</u>
ISOLATION	76	
Absence of Body Language Cues	5	5
Absence of Hearing Classroom Discussions	7	7
Absence of Immediate Questioning	23	22
Lack of Interaction (no feedback, no socializing)	41	26
LEARNING ENVIRONMENT	40	
Interruptions/Distractions	12	12
Lack of Focus	8	7
Missed Material	8	7
Procrastination	12	12
TECHNOLOGY	73	
Language	4	4
Net Congestion/Buffering	20	19
Not in-Synch Video and Audio	6	6
Poor Video Quality	17	14
Video Segments Issues	13	11
Other Hardware/Software Problems	13	8
PREFERENCES	22	18
SUGGESTIONS	8	7

Table 2

described by the students as 1) a lack of socialization, which (Cristina) explained, “You don’t get to know other people in the class. I do enjoy getting together with other students. So, that’s the one downside for me. But, that’s ok” or as (Anastasia) also stated, “I feel it’s a shame I kind of missed out on him as a teacher. I don’t feel he would know me from anybody”, and 2) a lack of teacher feedback about the general student progress

in the class, “I do miss the classroom dynamics. I wonder if I’m learning all that I need, what the prof wants me to know, all that’s necessary” (Teresa).

Absence of Immediate Questioning also ranked high under Isolation. Absence of Immediate Questioning, although obviously present in this class format, didn’t seem to affect all class participants with equal intensity. While some students adjusted to the class format’s variation of asking questions through email, phone calls or by dropping in on the teacher, other students felt a major loss when “attending” the lectures outside of the teacher’s reach where clarifications or elaboration on complex issues could have been possible. These strong negative feelings were best expressed by (Alicia) who said, “Can’t ask questions. Felt like an outsider, not like a student but a viewer.” Other students such as (Henry) reported being able to cope with the lack of opportunity for immediate clarification: “Can’t ask questions, not a big disadvantage though. If I just review, I’ll usually get the answer.” To the students who remarked on the feeling of Isolation brought on by the class setting the absence of opportunities for exchanging thoughts, sharing experiences, and to a certain degree “bonding” with the class participants, either tainted or negated their overall course experience.

In addition, under Technology problems, Net Congestion/Buffering (20) and Poor Video Quality (17) ranked highest, closely followed by Video Segment Issues (13) and Other Hardware/Software Problems (13). Net Congestion and Buffering was only experienced when students accessed the videos directly from the department’s server and over the Internet, a situation which was remedied within the first month of the semester when the teacher distributed the lecture videos on CD-ROMs. Poor Video Quality or the

small size of video image on the screen and the jerkiness of the video motion played differently on students' computers depending on the connection rate. For students with a T1 line and for those who later received the CD-ROM, the Video Quality was not an issue. Students in the lower end of the modem speed spectrum – 33Kb and lower speeds – who connected to the department's server to view the lectures experienced the poorest Video Quality of all research participants. As (Leslie) best summarized, "Maybe because I was over a slow modem (28.8) at home, it's almost like I was getting screen shots of what was going on rather than a full motion video. With a T1 connection at work, it was basically like running the videos off of the CD."

Therefore, as the Video Quality was acceptable for some students, it was seen as an annoyance and a distraction for other students. These students coped by listening to the lectures and by ignoring the teacher on the computer screen. Still, for this latter group the quality of the videos was not assessed equally. To some the quality did not taint their positive perception of the class format while to others it completely turned them off to the whole Web course experience. Additional personality and learning styles testing of all class participants revealed a possible relationship between these and the students' video quality perception. Also, students' personal lifestyles and need for convenience and flexibility seemed to have an inverse correlation with the importance they placed on the video quality.

Other negative Video Segment Issues reported by students included confusing labeling of the segments, gaps in the video between segments, hard to hear irrelevant discussions taped in the videos. Also reported was the less tangible perception of some

students that pre-recorded lectures wouldn't be able to capture current events as they relate to the course material. Although the lectures taped recorded the full class periods with class discussions, teacher recitations, and classroom dynamics included exactly as experienced every semester in the CECS5300 course, most students with these negative experiences still were able to overcome them. For example, the irrelevant discussions were sometimes edited by the students by fast-forwarding over them or multi-tasking while these were occurring. In either case, the student ingeniously adapted to the setting. (Edward), matter-of-factly stated, "Too much video for not enough content. Hearing other people's experiences not important. Cut off the fat by editing videos." Yet, the issue of not capturing current events was intrinsically related for other students with a deeper need for interaction, participation, and, in general, preference for the traditional classroom environment. "The lectures are stale, since they are for somebody else, they are not for me" (Elizabeth).

Other Hardware/Software Problems included students' reporting major difficulties with their computer hardware at home while trying to view the lectures. Other statements simply described the students' inexperience and uneasiness in using the class technology. As (Nancy) best summarized, "I don't like having to email him. I don't like having to do everything through the computer."

Of the two major disadvantages experienced, Isolation can best be handled in two ways: First, we could detect what student personality, learning style or lifestyle best adapts to the CD/Internet class format. As a result, then we could offer courses with a student profile captive on the course schedule identifying the course as adaptive to those

certain personality characteristics. Secondly, we could establish more frequent “interaction” sessions for students to overcome some of the Isolation subcategories discussed earlier. Technology related problems can best be addressed through technology training. Students with the most technology expertise reported and perceived the least number of problems. Still, as technology progresses and new cutting edge advances on Internet connections, video resolution, software applications and other hardware upgrades become available, the overall Web class experience will also considerably improve.

CONCLUSIONS

In summary, the two major disadvantages of the CD/Internet class format included Isolation and Technological problems. Participants who expressed extreme frustration with Isolation and Technical problems also had one or more of the following characteristics: 1) extroverts (as determined by the Canfield’s Learning Styles Inventory Survey), 2) visual learners and highly disturbed by the quality of the video image, 3) lived near campus, 4) had some serious technical problems with the delivery and/or their computer at home, 5) inexperienced computer users who did not understand some or any of the software used in the class.

Although some of the technological problems were quickly addressed, for example by recording the videos on the CD-ROM to avoid the Internet Net Congestion/Buffering problems, not all issues such as the video image quality were resolved. Still, 9 out of the 34 (26%) students participating in this research rated this class format as their number one choice of the three formats offered – CD/Internet, Web

online, traditional. Closer analysis of the characteristics of this population reveals that some of these students were introverts (as determined by the Canfield's Learning Styles Inventory Survey), and a few were mid introvert/extrovert; most were auditory learners, who had other commitments outside of school for which the format was ideal. The majority were married; some had children, full-time jobs, and lived over 30 minutes away from campus. For this group viewing the classes at their chosen time was vital given the constraints of other commitments in their lives. For students with these circumstances, who had a computer fully equipped for using the technologies at home, who had some computer expertise (at least 3 to 5 years) and who were comfortable using such basic technologies as email, bulletin boards, and the Internet, the CD/Internet class format proved the most adequate and beneficial.

The students with this profile named the convenience and flexibility of attending classes in this format as the most important factors. In other words, they valued the convenience of viewing at a more preferable location with the time flexibility required by their other many commitments. Some commitments were as common as needing to be around the family to more unpredictable commitments such as having to make a sudden family relocation to a different city or a last minute business trip. In any case, knowing that whatever the circumstances in life, access to education is possible, gives students the freedom to pursue a degree without the fear of losing credit hours when forced to transfer to another institution because of a move. In addition, this access simply allows students to further their education without the fear of inflexible class schedules that compete with unpredictable family commitments and equally unpredictable job schedules.

It is up to the faculty and schools involved, in this challenge of the future, which is becoming the present of our educational system, to do several things: First, assessment mechanisms need to be implemented to ensure the quality of the delivery and educational outcome. Second, enough communication avenues for students need to be made available to maintain vital contact with the teacher, a step that will ensure maximum understanding of the course material. Communication avenues with the professor need to be available through email, bulletin board, phone calls, in-person access, and, in more sophisticated settings, even sporadic and short, live, over-the-Web topic-discussion sessions. Technology related communication tools need to be constantly upgraded for optimal quality of delivery. The combination of the CD/Internet class format and communication avenues make the setting reliable and valuable to a specific type of student population for whom the disadvantages of isolation and current technological drawbacks do not off-set the enormous advantages of convenience and flexibility.

INFLUENCING FACTORS OF SYNCHRONOUS WEB TEACHING

The study also generated additional data as students experienced the online Web setting or synchronous broadcast of the class lecture over the Web. This synchronous online Web class format, which occurred April 9 and 10, was comprised of live broadcasting (video and audio) of the lecture and an online chat room accessible to all class participants. Afterwards, students were asked about their experience in this setting. Their statements, gathered through surveys and during the interview, were analyzed and categorized. These categories constitute the factors which influence how students value a synchronous Web based course.

The positive factors of the online class format included Convenience, Flexibility, Human Interaction, Learning Enhancement, Psychology; and the negative factors or disadvantages of this setting included Isolation, Learning Environment, Technology. Under CONVENIENCE – intrinsically related to “saves work” in the student’s course experience – the factors were 1) Family – responses related to the student’s increased time for relationships with other members of his or her family. 2) Focus – responses related to improved concentration and focus on the class material. 3) Comfort of Familiar Environment – responses related to the convenience of viewing the lectures in one’s own comfortable surroundings. 4) Economy – responses related to a savings of resources, either of a) Money/Time; or b) *Travel* (no driving to and from school-work-home); or c) *Eco-System* (contributing to saving the environment). 5) Similarity to Traditional Classroom – responses related to feeling as comfortable with the setting as when being in

the classroom or feeling that one is not missing out on any of the interaction or visual cues.

Under FLEXIBILITY - advantages related to adaptability to time conflicts – the factors were 1) Class Backup – responses related to being able to access class content when unexpected circumstances make it impossible to be in the classroom. 2) Learning Self-Assessment – responses related to satisfaction with the amount of material covered in the class using this format. 3) Schedule Flexibility – responses related to being able to view lectures around one's work and family schedule. 4) Viewing Flexibility – responses related to being able to stop or pause, to take a break or handle other types of interruptions, once viewing of the lecture has started.

Under HUMAN INTERACTION – advantages related to the exchange of information among class participants that benefits all involved – the factors were 1) Community Maker – responses related to interacting with others in the classroom for reasons other than questions on the material, resulting in a sense of connection and camaraderie, another form of interaction, a feeling that one knows the classmates. 2) Communication – responses related to the exchange of information among class participants through: a) *Interaction* – being able to have immediate connectivity/interaction with teacher and students; b) *Socializing* – interacting with professor or students for reasons other than course related material; c) *Immediate Questioning* – ability to ask the professor or other students questions about the class material as soon as need arises; d) *Body Language Cues* – body gestures generated by the

speaker that supports oral communication; e) *Class Discussions* – being able to hear or see, oral, or textual communication of other class participants.

Under LEARNING ENHANCEMENT - advantages that represent new approaches to a classroom routine and that turned out to be beneficial to the student – the factors were 1) Better Note Taking – responses related to improvement in the amount and quality of the notes taken over the class lectures. 2) Comprehension/Understanding – responses related to the ability to go over the class material more than once for improved comprehension or understanding of it. At different levels this was accomplished through a) *Reviewing Lectures* (viewing the whole lecture more than once); and through b) *Content Accuracy* (re-listening/reviewing the teacher’s sentence to understand, or because it was missed). 3) Discipline – responses related to developing a level of discipline to cover the class material. 4) Multi-Tasking - responses related to the ability to perform, concurrently or simultaneously, other tasks while viewing the lectures. 5) Technological Factors - responses related to gaining intentionally or unintentionally an understanding of the technology used in the class. Also, learning and/or liking the technology occurred as a consequence of being exposed to it in this class format.

Under PSYCHOLOGY - those advantages of the Online Web format that have, from the student’s perspective, beneficially affected the personality or psyche of the participant – the factors were 1) Posing Questions – responses related to being able to interact textually with the teacher or other students in one’s own time and space. 2) Teacher Support – responses related to availability, accessibility, and planning on the teacher’s part that helped make the experience with the setting a better one. Some 99% of

the students agreed that teacher availability and accessibility was very much true of their semester experience. Statements that were made beyond answering the question “Was the teacher accessible?” with a “Yes” or “No” have been compiled and placed in this section. 3) Participation – responses related to not having to orally participate in the class. 4) Self-esteem – responses related to the improvement of one’s level of confidence.

These positive factors of the online Web class format were tallied individually, presented in Table 3 (below) and further illustrated in Charts 1 through 10 (Appendix G). On examination of the tables and charts, Convenience, Human Interaction and Flexibility were the most frequently cited positive factors for the online Web class format. Under closer scrutiny, Economy of Travel (22), Comfort of Familiar Environment (16) and Similarity to Traditional Environment (17) ranked the highest, all under Convenience. Travel refers to not having to drive to class, which also entails a waste of Money and Time, and affects the environment referred to under Economy of Eco-System, all three representing the Convenience factors. As (Cristina) stated, “I feel I’m making the most of my time. I’m not wasting my time driving when I don’t have to.”

Although Travel is the common thread in this category, other statements found in it are also closely related to Time, Money, and the Eco-System. Comfort of Familiar Environment, which refers to being able to choose the most comfortable environment for viewing the lectures, ranked second with Similarity to Being in the Classroom, under Convenience. Comfort of Familiar Environment was best explained as a factor by statements such as “I felt more comfortable in my home than in class” (Amy). Although this remark was true for most students, others found that to them the most comfortable

ONLINE WEB FORMAT

ADVANTAGE FACTORS		230
<u>CATEGORY/Subcategory</u>	<u># of Statements</u>	<u># of Students/34</u>
CONVENIENCE	80	
Family	8	6
Focus	9	7
Comfort of Familiar Environment	16	14
Economy	30	
<i>Money/Time</i>	7	6
<i>Travel</i>	22	18
<i>Eco-System</i>	1	1
Similarity to Traditional Classroom	17	12
FLEXIBILITY	32	
Class Backup	6	6
Learning Self-Assessment	13	10
Schedule Flexibility	8	8
Viewing Flexibility	5	5
HUMAN INTERACTION	48	
Community Maker	2	2
Communication	46	
<i>Interaction</i>	24	15
<i>Socializing</i>	6	4
<i>Immediate Questioning</i>	10	9
<i>Body Language Cues</i>	1	1
<i>Class Discussions</i>	5	4
LEARNING ENHANCEMENT	52	
Better Note Taking	2	2
Comprehension/Understanding	15	
<i>Reviewing Lectures</i>	8	7
<i>Content Accuracy</i>	6	6
<i>Updated Lectures</i>	1	1

Discipline	3	3
Multi-Tasking	4	4
Technology Factors	28	15
PSYCHOLOGY	29	
Posing Questions	20	13
Teacher Support	4	3
Participation	2	2
Self-esteem	3	3

Table 3

environment was the office. Since the class was held after hours, the office for this group of students offered the comforts of privacy and quiet.

Also, while viewing from the office, some students had access to a T1 line which improved the quality of the video image and minimized broadcasting noise. Similarity to Traditional Classroom or the feeling that students had of being in the classroom also ranked high under Convenience, and it was best described by (Veronica), “Online Web at home refined is just as good and comparable as the traditional. Not much different than being in class.”

Learning Enhancement, which ranked slightly higher than Human Interaction, was the number two advantage factor of the Online Web class format, after Convenience. Technology Factors (28) under Learning Enhancement ranked the highest. Students participating in this class expressed a liking or simply an increased understanding of the technology used, which they saw as a benefit they did not seek out to gain. Overall, understanding and experiencing of the technology brought about liking it and a major educational gain as (Leslie) best explained, “That maybe one reason why I prefer to do

something on the Web, rather than just go to class. Because, the challenge in and of itself, just to get on line, and make sure that everything works. That to me, it's really cool!"

Human Interaction ranks as the third most important positive factor for this Online Web class format. Under Human Interaction, the Communication factor of the class format was referred to, by the students, the most often. Of all the Communication subcategories, the possibility of Interaction (24) among all class participants represented the second biggest advantage, after Technology Factors (28), for the students experiencing the online Web setting. Interaction, although a given in the traditional classroom setting, became a major benefit of this online setting because of the never before experienced possibility of interacting with the teacher and other students while "attending" the class from home or the office. The revolutionary circumstances surrounding this experience left students in awe of what it offered them and of how it could change their academic future.

Just as in the analysis of the factors uncovered for the asynchronous class setting, in the Online Web setting any one factor, ranked as a more important benefit than any of the other factors, still is closely related to the existence of the other factors. For instance, although Interaction was rated as one of the most important advantages of the Online Web setting, this was so because Interaction occurs from the Comfort of a Familiar Environment with a major savings of resources or Economy of Time/Money and specially an Economy of Travel and while keeping a Similarity to the Traditional Classroom setting. As just demonstrated, any of the factors offered by the class format is intrinsically related to all the other factors, and while one factor might attract student

populations with specific characteristics, no factor would be highly rated without the existence of the others. The existence, importance, relevance and relationship of all the factors is intertwined. Therefore, the positive factors influencing how students value a synchronous Web based course are represented by all the categories and subcategories listed in Table 3. Under CONVENIENCE: Family; Focus; Comfort of Familiar Environment; Economy: Money/Time, Travel, Eco-System; Similarity to Traditional Classroom were the factors. Under FLEXIBILITY: Class Backup; Learning Self-Assessment; Schedule Flexibility; Viewing Flexibility were the factors. Under HUMAN INTERACTION: Community Maker; Communication: Interaction, Socializing, Immediate Questioning, Body Language Cues, Class Discussions were the factors; Under LEARNING ENHANCEMENT: Better Note Taking; Comprehension/Understanding: through Reviewing Lectures, Content Accuracy and Updates Lectures; Discipline; Multi-Tasking and Technology Factors were the factors. Under PSYCHOLOGY: Posing Questions, Teacher Support, Participation, and Self-esteem were the factors.

Although some of these factors were not mentioned as often by the research participants, they not only have a support role to other factors, but open the door for future consideration of these as they may represent possible needs for other student populations. Only further study of all factors can ascertain their true significance.

The disadvantage factors of the Online Web class format were best described as ISOLATION, LEARNING ENVIRONMENT, TECHNOLOGY problems. ISOLATION in general refers to lack of instantaneous communication. Although communication and interaction were available in this live class setting, the time delay of 20 seconds in the

transmission, the impossibility of seeing and hearing everyone in the class, and the lack of other visual body language cues were pointed out by a few students as disadvantages. The disadvantages were categorized as the following sub-factors: 1) Absence of Body Language Cues – responses related to the lack of body language in some of the communication among members of the class. Face-to-face dialogue, although crucial to this group of students, was not possible. 2) Absence of Hearing Classroom Discussions - responses related to difficulty hearing all group comments through the live streaming video. 3) Absence of Immediate Questioning – responses related to inability to raise questions in a timely fashion due to the broadcasting time delay of 20 seconds. 4) Lack of Interaction – responses related to partial absence of shared communication among all class participants. Lack of Interaction includes absence of socialization opportunities. Lack of Interaction although present through the chat room was still not considered as ideal as in the traditional classroom setting by a few students.

LEARNING ENVIRONMENT involves all those situations where the students' progress in the course was negatively affected by the environment chosen by the student in which to view the videos. Learning Environment further includes these sub-factors: 1) Interruptions/Distractions – responses related to problems in the students' personal environment directly interfering with the smooth, continuous viewing of the lecture. 2) Lack of Focus – responses related to inability to concentrate on the content of the videos being viewed. 3) Missed Material – responses related to technical problems or student perceptions that contributed to gaps in viewing the lecture. 4) Lack of Time Flexibility – responses related to having to adjust to the online class schedule in order to view the live

broadcast. 5) Physical Problems – responses related to health related problems that seem to worsen with the prolonged use of the computer.

TECHNOLOGY refers to problems that were either perceived as potential disadvantages or that were actually experienced as a disadvantage by the students. Technology affected students in the form of 1) loss of Language understanding – difficulty understanding lectures over the Internet. 2) Net Congestion/Buffering – difficulty viewing the live lecture which would briefly pause audio and video. Only a couple of students experienced this once on the online Web setting, the remaining portion of the class received the broadcast smoothly. 3) Poor Video Quality – responses related to the small size, low resolution, jerkiness of the video image, and delay experienced with the broadcast. 4) Other Hardware/Software Problems – responses related to not being comfortable with the technology and having to do upgrades. 5) Typing – responses related to students having little keyboarding skills and experiencing difficulty typing questions in the chat room expediently enough to keep up with the lecture. 6) Delay – responses related to a 20 second delay between actual lecture broadcast and the time the computer would output the image and sound, becoming a nuance when students would ask a question and the teacher had already passed the topic.

These categories and subcategories named as the detrimental factors of the Online Web class format were tallied individually, presented in Table 4 (below) and further illustrated in charts 1 through 4 (Appendix H). The Isolation and Technology factors ranked highest among all the negative factors of this setting. But under closer scrutiny, only one sub-category under each of them contained the highest number of statements.

ONLINE WEB FORMAT

DISADVANTAGE FACTORS			91
<u>CATEGORY/Subcategory</u>	<u># of Statements</u>	<u># of Students/34</u>	
ISOLATION	32		
Absence of Body Language Cues	3	3	
Absence of Hearing Classroom Discussions	4	4	
Absence of Immediate Questioning	10	8	
Lack of Interaction	15	10	
LEARNING ENVIRONMENT	28		
Interruptions/Distractions	9	7	
Lack of Focus	6	4	
Missed Material	4	3	
Lack of Time Flexibility	7	7	
Physical Problems	2	2	
TECHNOLOGY	41		
Language	1	1	
Net Congestion/Buffering	7	7	
Poor Video Quality	4	4	
Other Hardware/Software Problems	17	14	
Typing	2	2	
Delay	10	6	
PREFERENCES	37	22	
SUGGESTIONS	12	10	

Table 4

Lack of Interaction (15), better understood as lack of opportunities for informal socialization with the teacher and other students, was the number one ranked disadvantage under Isolation. Lack of Interaction seemed to affect students with a deeper need to be involved in the classroom dynamics of students and teacher sharing other

visual cues that accompany communication. As (Arthur) explained, “You could not see their faces.” (Catalina) further added, “Never get to meet classmates face-to-face.” The Other Hardware/Software Problems factor (17) ranked as the highest disadvantage under Technology. Most of the statements in this subcategory (7 out of the 17) were related to apprehensions rooted in previous technological problems experienced with the CD/Internet class format, not with any problems experienced. Typical problems in this respect were expressed as, “I didn’t want to try the online because I was having much trouble with the other videos. And so I came” (Veronica), or “Possibility of technical problems” (Charles).

One person did experience momentary buffering at one time. The rest of the problems reported were mostly related to lack of experience with the technology and related to not knowing how to use the chat room or being unable to hear all live comments from the students in the classroom. As (Samantha) said, “In the chat room I don’t know the procedures.”

Of the two major disadvantages experienced, Isolation, a disadvantage still felt by some students in this setting and which referred mostly to the lack of visual body language cues, can never be totally addressed unless students attend classes in the traditional classroom setting. For the second disadvantage, the Technology problems can best be addressed by providing a technology training session during the semester for students to become familiar and comfortable with the technologies used in the course. Although no real problems were experienced by the students, apprehensions from the CD/Internet experience seemed to have played a big role in the students’ preconceived

negative attitudes towards the Online Web setting. Of the 34 students who participated in this research, four students were absent for the Online Web class. During the Online Web sessions of April 9th and 10th, 30 students logged into the chat room but only 22 of those participated by entering comments and questions. In other words, 88% of the students in the class logged into the chat but only 64% (22 out of 34) actually used the chat room. This implies that although all 34 students expressed their views and comments about the Online Web class format, only 64% of those were willing and did actually fully experience the setting.

CONCLUSIONS

It appears that the Online Web class format presented less disadvantages and was more widely accepted by the students, proportionally speaking, than the CD/Internet class format. Eighteen of the 34 students (53%) participating in this research chose the Online Web setting as their number one choice of class format over the CD/Internet class format and the Traditional class format. Even more significant is the fact that these 18 students are a subset of the 22 students who actually experienced the setting.

Over and over again students, through their survey responses and during the interview, expressed matter-of-factly “The live online sessions of course are best. I like the live environment of being there and knowing that it’s going on right now. Rather have the online and prerecorded than the traditional. Online during the semester, and then also have the pre-recorded as the backup. That would be ideal.” (Henry) Students were aware that the Online Web lectures were also being recorded and stored in the server for later reviewing.

All the advantages of the CD/Internet setting apply here, as far as convenience and flexibility, given that the live lectures are also available for later viewing. Plus, the Online Web class format offers extra advantages the CD/Internet format does not, the possibility of immediate interaction with the teacher and other students through the chat room. The chat room, as used in this setting, did allow for some socialization for the students and teacher at an informal level, but most importantly it also allowed the students to ask the teacher questions over the material as it was being presented.

Overall 24 out of the 34 students participating in this research said they liked the course being taught on the Web. They either chose the Online Web class format or the CD/Internet class format as their number 1 choice for taking the course. In other words, 71% of the 34 students participating in this study actually preferred one or the other Web formats for taking the class. Only six students out of the 34 (17%), expressed their dislike for both Web settings by selecting the Traditional class format as their only number one choice. Of the six only two students (5%) would never take another course offered in either of the Web formats. The other four of the six would be willing to take one or the other format if the circumstances in their lives made it impossible to come to campus.

An examination of the statistics indicates that both Web formats have the common denominator of Convenience as their most valuable characteristic. Students with a hectic lifestyle and numerous commitments embrace the Web taught course as an alternative to wasting hours in driving to and from school, and to be able to stay closer in touch with their family and comfortable environment. Although generalizations are difficult, in most cases, students who made the most of either the CD/Internet class

format or the Online Web class format, were 1) married and, in most instances, past the need for socialization. As one mom commented, “I have a different set of priorities in my life than when I first went to college. I have a job, 3 children and a husband. Any amount of time I don’t waste counts” (Cristina); 2) who either had children and/or lived far away; 3) who felt very comfortable with technology; 4) who had a full-time job; 5) who enjoyed the privacy and quiet of their familiar environment; 6) who enjoyed multi-tasking while viewing the lectures; 7) who sought the advantage of reviewing lectures at a more productive time for them and knowing that they would never miss a class.

A growing trend appears to be in more complex lifestyles in which people, because of their jobs, have to either travel extensively or change jobs more frequently than their previous generation did. As these changes also affect their families, all involved find it difficult to further their studies. Yet for other people, long hours at work, extra curricular job related activities, their children’s activities and other engagements also make it impossible to commit to a semester long class, let alone to a two year long Master’s degree program. Classes taught through the Web synchronous and asynchronously offer students an alternative to coming to the classroom. Students from anywhere in the United States and for that matter, the world can connect to the department’s server and view the live or pre-recorded lectures they otherwise would have to miss. Both Web based formats offer students the possibility of communicating with the teacher through email, and also the possibility of communicating with other students in the classroom through the chat room and/or the bulletin board. Under either setting the teacher has the capability of testing through the computer.

In the fast-paced society of today, where people's job commitments constantly take them farther away from their communities and for longer periods of time, where people's lives seem to always be running in the fast lane, the Web based courses (asynchronous and synchronous) present a viable alternative when thinking of taking a class or completing a degree. Although no one class format will ever be ideal for everyone, as seen from the previous statistics, being able to offer as many alternatives as possible would benefit a greater number of people and therefore meet the needs of more of the population. While offering Web based courses alternatives like multiple sections of the same course need to be considered. For example, an on-campus section, for students who need and want to physically meet due to their learning style or personality type, can be offered while at the same time the class is being broadcast over the Internet to students who signed up under a different section and have chosen to stay home. In either case, the roles can easily be interchangeable. Students who would normally come to class and have to unexpectedly miss a class would have the choice to view the class on the Web, or students who normally view the class on the Web may decide at one point to come to campus for a class period to meet other students. In any case, students could be offered the best of both worlds, and students who would otherwise not be able to continue their education would then have a chance to do so.

Universities offering Web based courses have the responsibility to ensure that the delivery and quality of the educational program is not hindered in any way by the use of the new technologies. Therefore, universities at the administrative level would have to commit to periodical upgrades of hardware and software to ensure optimal video and

audio quality. At the faculty level the commitment is also great. Professors involved would constantly have to upgrade their technological skills needed for the delivery of their lectures, devise new ways for measuring student participation and student knowledge over the Internet, and be willing to modify their teaching style to captivate and adapt to the demands of an “invisible” student population. A student in this study best summarized this, “I liked this better (online) than the Video Conferencing courses – even with the Video Conferencing, you still have to be in a classroom, even if the professor is in another location. I really appreciate the CECS department and the university going this extra mile for us. Teaching distance learning is a lot more work for the professors and requires a lot of resources. It is difficult enough just to try to talk, write on the whiteboard, and think all at the same time. And then to add having to worry about the camera, the microphone, the other technical stuff; e-mails/getting messages to the students; converting and posting the syllabus, class notes, power point slides, and other activities to HTML, makes for a lot more work on the part of the professors!” (Rebecca).

Lastly, students “attending” classes over the Web would have to develop a certain level of discipline to commit to doing the work, “attend” the classes, and complete the course even though the external pressures of the classroom (teacher and other students) are not there. Therefore, it seems logical to think that students who would successfully complete the course requirements over the Web without some of the natural pressures of the teacher’s classroom presence and other peer motivation would have to show a high level of initiative, which in turn would mold them into self-sufficient individuals, highly competent to survive in today’s world.

INFLUENCING FACTORS OF WEB BASED INSTRUCTIONAL TOOLS

Students enrolled in the 1999 Spring semester of CECS 5300 not only experienced the asynchronous CD/Internet class format, and the synchronous Online Web class format but concurrently experienced other instructional tools such as email, Net Meeting, Forum, chat room, and WebCT testing. Feedback from the students on the use of the chat room was grouped with the online class format statements, and a full successful session with Net Meeting was never possible because of the unforeseen manufacturer limitations. However, and although not initially intended as part of the research, data were collected on the students' experience with the Forum and WebCT testing.

WEBCT FORUM

The Forum was found mostly by accident by students wanting to take the test on the computer through WebCT. The student could not find the test at the agreed upon time. Instead the student after clicking on every option offered by the WebCT homepage found the bulletin board called the Forum, where other students who had also found it by accident had posted messages about the missing test. The test was not posted as promised, at the previously announced date and time but was finally posted almost 24 hours later. For 24 hours, students in the class would intermittently go to the Forum, read messages, and post some of their own. To some students it was a relief to know from other students that they had not missed the test and that the test had not been posted because of a glitch in the system. To other students, the Forum became a source of interaction, and camaraderie seemed to flourish. Yet, to very few students, the Forum

also became a place to vent their frustrations with the course. Out of the 34 students participating in the study, 1) eight students (38%) never found the Forum, 2) thirteen students (38%) actually posted messages on the Forum, 3) and nineteen students (56%) commented about the Forum in the surveys and during the interview.

The comments and statements about their experience with the Forum and their thoughts about the potential uses of the Forum were subsequently grouped as advantages and disadvantages. The categories represent the factors indicative of how students value this instructional tool.

The positive factors of this instructional tool involved communication and consisted of Help Each Other, Interaction, Socialization, Classroom News, and Time Independent. These factors were defined as 1) Help Each Other – responses related to posting questions on the material and to viewing other students' questions and answers. 2) Interaction – responses related to communication among class participants on the class material and on other class issues. 3) Socialization – responses related to getting to know other classmates. 4) Classroom News – responses related to posting class news, updates and issues.

These categories, named as the positive factors of the Forum, were tallied individually, presented in Table 5 (below) and further illustrated in charts 1 through 3 (Appendix I). Examination of the tables and charts indicates Interaction (12) was the most frequently cited positive factor for the Forum. Typical comments made included, “You can get a little more of that connection with other people” (Catalina) or “When problems arise in this class setting, bulletin board (Forum) was a great help, being able to

talk to other students” (Virginia). Interaction as a factor did not exist in isolation, other factors intrinsically related included, Help Each Other, Socialization, and Classroom News, all different forms of interaction.

WEBCT FORUM FORMAT

ADVANTAGE FACTORS			30
<u>CATEGORY/Subcategory</u>	<u># of Statements</u>	<u># of Students/34</u>	
HELP EACH OTHER	9	7	
INTERACTION	12	12	
SOCIALIZATION	5	5	
CLASSROOM NEWS	3	3	
TIME INDEPENDENT	1	1	
DISADVANTAGE FACTORS			6
<u>CATEGORY/Subcategory</u>	<u># of Statements</u>	<u># of Students/34</u>	
COMPLAINTS	2	2	
TECHNICAL PROBLEMS	2	2	
ISOLATION	2	2	
PREFERENCES	4	4	
SUGGESTIONS	10	8	

Table 5

Given the isolation experienced by students in different degrees due to the class formats used this semester, the Forum, although briefly, allowed them to experience the possibilities of interacting with each other. Although the Forum was used for a little under twenty-four hours, its participants were able to share the Classroom News that the

test was not available, Help Each Other decide what to do while waiting for the test, and even be humorous to lighten up the mood; in other words, Socialization was the result. Students were checking the bulletin board and posting their own messages at all hours of the day and night, making the Forum a truly Time Independent instructional tool. Although not expressed by the students, an argument could be made that Space Independent is another characteristic of the Forum, because students could easily access the Forum from anywhere in the world with the help of a computer, an Internet connection, and an Internet browser. All these intrinsically related categories describe advantages or positive factors of the Forum.

The negative factors of the Forum included Complaints, Technical Problems, and Isolation. 1) Complaints – responses related to unproductive, sometimes destructive, criticism. Complaints occurred as a result of the test not being made available as announced. Therefore, although some students decided to wait patiently for the test to be available, others out of frustration simply decided to air their feelings. 2) Technical Problems – responses related to difficulties with the WebCT software. Only one complaint truly applied to having a problem with the software. One student reported having a problem understanding the tree structure of the message posting system, which in time and with practice could be easily overcome. 3) Isolation – responses related to not having enough interaction with other students. Although most students were overwhelmingly happy to have discovered a way to communicate with other students in the class, still one student reported preferring the face to face encounters rather than using the Forum.

All three negative factors of the Forum contained equal amounts of registered statements (see chart 4, appendix I). As can be seen on Table 5, and on charts 1 and 2 (Appendix I), there were five times fewer disadvantages reported than advantages. All three disadvantages could easily be resolved through careful training, planning, and monitoring of the Forum. Future courses utilizing this instructional tool would benefit from a ten minute demonstration at the beginning of the semester on the use of this and other technologies. In subsequent weeks of the semester, a topic discussion on the Forum, could be initiated by the instructor to encourage student participation. By the same token, other messages from the instructor to the class could also be posted for everyone to read at their convenience - therefore, eliminating any possibility of not reaching all students.

CONCLUSIONS

The preliminary figures of this study suggest the use of the Forum as potentially beneficial to all class participants. The Forum or bulletin board because of its time independent characteristic becomes an ideal tool that can be accessed by anyone at anytime, even with the busiest schedule. Just as before with the different class formats where flexibility in viewing and scheduling were vital to the majority of the student population, the Forum seems to support perfectly this flexibility. The Forum is also space independent because it can be accessed by anyone from anywhere with an Internet browser. On the other hand, complaints related to the isolation experienced with the previously described class formats can partly, if not completely, be remedied by encouraging the use of the Forum where all students and teacher can interact. Periodic

teacher supervision of the posted messages and encouraging notes from the teacher to participating students could make the bulletin board a most productive instructional tool for all involved.

WEBCT TESTING

In CECS 5300, students were required to take two exams over the course material. These exams were posted utilizing WebCT at an announced time for students to access over the Web. The tests were made available within a time window of four days. Students would then within that window access the course's WebCT homepage with their class ID. Once they were allowed onto the homepage, they would click on the Tests button. The test would then display on their computer screen and although there was not a forced time limit on the students, the software did keep track of how long the student had access to the test. Students were strongly encouraged not to exceed the 90 minutes limit or risk losing a point per extra minute over the limit.

Students from anywhere and at anytime within the four day window the test was available could take the test. Some students took it on the weekend, others after work on a weekday, others at 4 in the morning and yet others at midnight. Students were able to take the test at their more "alert" time and therefore felt more ready to do well. Since students took the test in their most comfortable environment, home or work, they commented that the privacy and quiet of the familiar environment contributed to their doing well. More statements and comments about the students' WebCT testing experience were collected and grouped as advantages and disadvantages of this

instructional tool. The advantages and disadvantages represent the factors students use to value WebCT testing.

The advantage factors of WebCT testing included CONVENIENCE, FLEXIBILITY, INNOVATIONS. Under CONVENIENCE - defined as “saves work” to the student – the factors were 1) Focus – responses related to improved concentration and focus on the class material; 2) Handwriting – responses related to typing as it improves test readability. 3) Comfort of Familiar Environment – responses related to the convenience of viewing lectures in one’s own comfortable surroundings. 4) Printing – responses related to the ability to print the test for later reference. 5) Travel Saver – responses related to not driving to and from school-work-home in order to have access to the test. 6) Using Resources – responses related to having all class resources, including the CD, handy while taking the test.

Under FLEXIBILITY – which represents any advantage related to adaptability to conflicts – the factors were 1) Comment Box – responses related to the capability of entering essay type answers on the WebCT test. 2) Corrections and Changes – responses related to the option of changing answers on the test. 3) “More Alert” Time – responses related to the flexibility of being able to choose one’s own best time of the day for taking the test. 4) Schedule Flexibility – responses related to viewing lectures or taking the test around one’s work and family schedule.

Under INNOVATIONS – unexpected occurrences related to taking the test that became an advantage of WebCT testing – the factors were 1) Instant Grading – responses related to receiving the test grade immediately after submitting it, when the test format is

all multiple choice. 2) Learning Technology – responses related to gaining intentionally or unintentionally an understanding of the technology used for taking the test. Also, learning and/or liking the technology occurred as a consequence of being exposed to it.

The disadvantage factors of the WebCT testing environment included SURROUNDINGS NOT CONDUCTIVE TO LEARNING, and TECHNICAL PROBLEMS. Under SURROUNDINGS NOT CONDUCTIVE TO LEARNING – which refers to problems with the learning environment that interfered with the students’ concentration and honest productivity during the test – the factors were 1) Cheating – responses related to the potential for students to help each other with the test taking. 2) Interruptions/Distractions – responses related to problems in the students’ chosen familiar environment for taking the test, problems which interfered with the smooth continuous test taking of the students. 3) Time Factor – responses related to the timing mechanism implemented on the test.

Under TECHNICAL PROBLEMS – which refers to problems that were either perceived as a potential disadvantage or actually experienced as a disadvantage by the students while taking the test in WebCT - the students’ statements were further grouped under the following subcategories. 1) Connection Problems – responses related to losing the Internet connection while taking the test. 2) Unfamiliar Environment – responses related to apprehensions and lack of knowledge about the structure and inner workings of the WebCT software environment. 3) Can’t Ask Questions – responses related to not being able to reach the teacher to clarify any questions during the test.

All of the above categories and subcategories were named as the positive and negative factors of WebCT testing. Each category was tallied individually, presented in Table 6 (below), further illustrated in charts 1 through 9 (Appendix J). More than half of the statements grouped under Technical Problems had to do more with apprehensions and previous negative experiences with the technologies in the course than with real problems experienced while taking the test.

Examination of the tables and charts, reveals that of the two categories under disadvantages of WebCT testing, the one mentioned the most often was Technical Problems(15), more specifically under Technical Problems the Unfamiliar Environment (10) was referred to the most often. The structure of the WebCT environment although not hard to learn, does require a quick introduction for students to feel comfortable. Students' statements ranged from not knowing what to do once on the test screen, to having apprehensions as to whether the test saved or did not save their responses. As (Rebecca) said, "I hoped that after changing answers they got recorded." (Arthur) also said, "Didn't understand how to use WebCT, didn't submit questions after changing them." In future semesters, students could be asked to take a practice test or some other assessment through WebCT to gain familiarity with the environment before taking the course tests. Several students mentioned this need for a practice test, "It would have been a beneficial step for us to have a practice test, so that we could just experience the structure of the setting" (Hellen).

No other WebCT disadvantage ranked as high as the Unfamiliar Environment. Time Factor was addressed during the semester by extending the amount of time for

WEBCT TESTING FORMAT

ADVANTAGE FACTORS			68
<u>CATEGORY/Subcategory</u>	<u># of Statements</u>	<u># of Students/34</u>	
CONVENIENCE	33		
Focus	8	6	
Handwriting	5	4	
Comfort of Familiar Environment	8	7	
Printing	4	4	
Travel Saver	4	4	
Using Resources	4	4	
FLEXIBILITY	26		
Comment Box	8	8	
Corrections and Changes	6	6	
“More Alert” Time	4	4	
Schedule Flexibility	8	8	
INNOVATIONS	9		
Instant Grading	4	4	
Learning Technology	5	5	

DISADVANTAGE FACTORS			23
<u>CATEGORY/Subcategory</u>	<u># of Statements</u>	<u># of Students/34</u>	
SURROUNDINGS NOT CONDUCTIVE TO LEARNING	8		
Cheating	3	3	
Interruptions/Distractions	1	1	
Time Factor	4	4	
TECHNICAL PROBLEMS	15		
Connection Problems	4	3	
Unfamiliar Environment	10	8	
Can’t Ask Questions	1	1	
PREFERENCES	25	19	
SUGGESTIONS	3	3	

Table 6

taking the test from 90 minutes to 120 minutes for the second test of the course. Other disadvantage factors are more related to the students' selected environment Interruptions/Distractions and Connection Problems. Can't Ask Questions should be true of any testing environment to ensure a uniform testing environment for all students in the class, so although Can't Ask Questions was considered a negative factor, it turns out to be beneficial in terms of supporting equality of test conditions. Cheating, which only occurred with two students during the semester, can best be addressed by narrowing the window during which the test is being offered. This would ensure students do not have the time to phone each other to share any test information.

CONCLUSIONS

In general, students enjoyed taking the test on the computer using the WebCT software environment. The preferences section contains many statements that confirm this, "I kind of thought it was cool, being able to do it on the Web. It was fun. I'd rather take the test on the computer" (Amanda). Few students still expressed some apprehension with statements such as, "I would rather take it (the test) with paper-and-pencil" (Hellen). But, when the choice was given for the final examination, to come either to campus to take the paper-and-pencil test version or to stay home for the computerized test version, no one showed up for the campus paper-and-pencil test version. Obviously, to the students, the convenience and flexibility of being able to take the test from the comfort of their own homes, without the drive to campus, at their "More Alert" time of choice, and

without the distractions of a room full of stressed students, proved to weigh heavier than all of the disadvantages put together.

It is important also to realize that the number of technological glitches experienced throughout the semester influenced students' perceptions whenever they were presented with new technological challenges, especially if the students felt insecure with their own technical expertise. All in all, WebCT testing proved to be beneficial for all students in the classroom as seen by the fact that when given the choice all students opted to take the final examination on the computer.

INSTRUCTIONAL TOOLS - CONCLUSION

Both instructional tools, the Forum and the WebCT testing proved to be beneficial to students, and their use could be further improved through careful planning of its use and training of the student population on their effective use. For synchronous and asynchronous Web based courses to successfully deliver the instructional material, the courses need to have instructional tools that will support the Web based modality and allow students and teacher to maintain vital communication. Instructional tools might include email for private communication with the teacher, the Forum for class news and topic discussions, chat rooms for interaction during online lectures, and WebCT testing for assessment. Instructional Web based tools should be included in all Web based courses, just as the phone, paper notes, whiteboard and paper-and-pencil tests are a vital part of the traditional classroom environment.

RECOMMENDATIONS FOR FURTHER RESEARCH

Any of the factors uncovered in this research need further studying, if nothing else for the simple fact that this is the first study of its kind, and data collected from a population of 34 participants can hardly be generalized. However, given the methodical and impartial way in which the data were collected, closely following accepted qualitative procedures, the data collected provide a solid beginning for future qualitative and quantitative explorations into this area.

All 34 students participating in this research were given the Canfield Learning Styles Inventory test to determine their classroom preferences and learning modality and were also given a portion of the Myers-Briggs test to determine their personality profile. The researcher's intention for administering the tests was to be able to see whether there was a connection between learning and personality styles and the students' class format preferences. Although no definite patterns were discovered after administering the tests, some peculiarities and small patterns were detected that suggest further research. The patterns included:

ASIAN STUDENTS

During pilot studies conducted during the two semesters immediately before Spring '99, Asian students had volunteered information to this researcher about their difficulty in understanding English over the Web. As part of the interviews conducted this semester with foreign students, the question "Is it harder to understand spoken English over the Web than it is in person?" was included. Although there were Indians,

Arabs, and Asian students in the group of participants with native languages other than English, only the Asian students reported having difficulties understanding the spoken English. Difficulty which they overcame by reviewing, several times, portions of the lecture. Other foreign students did not experience any difficulty. Because in the pilot studies only foreign students had reported difficulties in this area, the researcher did not think to ask this question to all class participants. Still, one of the native speaking, Anglo, students voluntarily offered that she had also noticed that spoken English over the Web had a different sound. She compared it to “sounds like someone is speaking into a tin box” (Velma)

The researcher is now left with the questions, 1) Are Asian students the only non-native English speaking students who experience this difficulty? Do other students, native or non-native speakers, experience any of these difficulties? Some reasons behind this difficulty may be that Asian students are not exposed to the English language in their native country at all, where other foreign students clarified that they had been exposed to English at an early age in grade school through high school, because it is part of their educational core curriculum to take English. Is this exposure the only difference? Or is it that speakers of foreign languages with a completely different alphabet will experience this difficulty?

INTROVERTS

There were a total of 10 introverts among the 34 students participating in this research, of which 9 students ranked the CD/Internet class format or the online Web class

format either 1 or 2. In other words, 9 out of the 10 introverts in this research preferred the Web based class format over the traditional classroom setting. The one introvert unaccounted for was also the one with the most technical inexperience, but who reported a willingness to try again a Web based course.

AUDITORY LEARNERS

There were 14 auditory learners in this group, of which 9 preferred the Organization and Detail of the classroom setting, as measured by the Canfield test. Of these 14, 12 participants preferred the Web based course (either CD/Internet or Online) over the traditional setting. The remaining two students had encountered major technical problems, together with a lack of technical expertise and knowledge. Of these two, one was still willing to try again in the future, to take another Web based course.

RECOMMENDATIONS

Further research is needed to determine whether any of these observations can be generalized to the whole student population. For instance, although findings seem to have concurred that auditory-introverts feel more comfortable in their familiar environment while Web viewing a class, other factors in their personal lives, such as marital status, how far they live and the number of outside commitments, also play a big role in their decision whether or not to enroll in a Web based course. On the other hand, visual-extroverts seemed to, in general, prefer coming to the traditional classroom setting, but

again, exceptions were found, primarily influenced by the student's marital status, how far they live, and number of outside commitments.

When evaluating class formats it is important to keep in mind that the settings need to be tested with student populations of different semesters, and where only one setting will be in use. Although the Online Web class format in the end was more widely preferred than the asynchronous class setting, students participating in this research were very apprehensive of testing any new technologies after the glitches experienced in their initial asynchronous experience. Even though all 34 participants experienced the asynchronous class setting, only 22 of the 34 students (64%) were willing to experience fully the synchronous class format. As some of the remaining 12 students put it, they didn't want to subject themselves to any more of these "pioneering efforts in technology use."

Different questions beyond the scope of this research remain unanswered. Should factors such as personality type, learning style, nationality, classroom preferences, lifestyle, commuting distance to school, and unpredictable job schedule be considered in determining the value students place on a Web based course? Is there a formula to combine all of these factors? More research into the importance of each of these factors needs to be conducted with larger and more diverse student populations. Research should attempt to uncover the inter-relationship of all factors. Meanwhile, on-campus and Internet sections of a course can be offered to cater to all possible students' preferences. Still, finding out answers to these questions can help universities promote Web based courses to the appropriate population and avoid student frustrations of enrolling in the

wrong sections. Offering a Web based course section can either benefit a student population, which has thus far stayed away from the academic world, or enhance the experience of those students who with enormous effort and will power had to adapt to the existing course offering conditions.

Overall the results of this research look promising for the future of Web based courses, certain target populations, identified in this study, do seem to benefit, want, enjoy, and look forward to more courses offered over the Web. Students with a highly demanding lifestyle of unpredictable job schedules, with a family, who live far from the university campus, who are auditory-introverts, disciplined, highly detailed, and organized in their classroom preference do better with Web based courses, than students with opposite characteristics. Lifestyle seems to be the determining factor for wanting to enroll in a Web based course, for even though the student's learning style does not accommodate well with the Web based class format, students with major outside commitments are willing to compromise their learning preference in favor of furthering their education. The Web based instructional tools discussed earlier seem especially to help this last type of students better adjust to the Web based course setting.

Beyond the conclusions of this research we need to keep in mind that students in a Web based class format or any class format have to have the willingness, perseverance, and driving energy to succeed. As one student participating in this research remarked, "The content was not influenced by the presentation type, for me" (Rita). Another student added, "If one's intent is to learn, one will be successful in either environment (Web and traditional)" (Henry). It is that type of spirit and attitude that will define the

student's level of success, in any learning environment, far beyond any personality type or learning style that has been previously determined. In the end only the indomitable human spirit can succeed beyond pattern predictions and statistical indicators of success.

APPENDIX A
WEB CONSENT FORM

Web Research Consent Form

Dear CECS 5300 Student:

The Web and other new technologies with the use of the Internet are making it possible for educators to offer classes that do not require the physical presence of the student in the classroom. Many variations in the use of these technologies also have a direct effect on the number of hours spent in the traditional classroom setting vs. the number of hours spent watching from a distance the classroom lectures. In your case your class has agreed to physically meet a number of times and to web-view (a term to indicate view through a connection on the Internet), the rest of the lectures.

You have a unique chance to help determine whether this alternate classroom setting is helpful to students. The research being conducted is designed to record your perceptions of this alternate method of attending classes. Your input will be vital to educators planning similar classes in the future that promote positive learning experiences.

If you choose to participate in this research, you will be asked to answer questions about the classroom setting and your personal experience in a survey and in-depth e-mail interview. Your participation is completely voluntary and confidential. Participant's names will not be used in reporting the results of this research. Your teacher will not be given access to your personalized comments. Your grade in this course will neither be enhanced nor negatively affected by this research. You may, if you choose so, withdraw at any time from this research with no repercussions to your class grade or class standing.

This project has been reviewed and approved by the UNT Committee for the Protection of Human Subjects 940/565-3940. If you wish to participate please sign this consent form. Your consideration is appreciated and your contribution will be invaluable to future educators and students.

Thank you,

Mrs. Vicky Cereijs
cereijs@unt.edu
(940) 565-4908

APPENDIX B

PARTICIPANT DEMOGRAPHIC SURVEY

Participant Demographic Survey

Name: _____

E-mail address: _____

I.- System-User Information

I.1 When could you be interviewed? State best place, day of the week and time.

I.2 Sex: ___ female ___ male

I.3 Age: ___ under 20 years ___ 20 to under 40 years
 ___ 40 to 55 years ___ over 55 years

I.4 How long have you been using computers?

<input type="checkbox"/> under a year	<input type="checkbox"/> 1 – 3 years
<input type="checkbox"/> over 3 and up to 5 years	<input type="checkbox"/> over 5 years

I.5 How comfortable do you feel using computers? (circle only one number)

1	2	3	4	5	6	7
barely						understand
understand						very well

I.6 Do you have access to a computer and modem? If yes, where?
 ___ home ___ company ___ library ___ school ___ other _____

I.7 What is the baud rate of your modem? (check one)
☐ no modem ☐ 28000 ☐ 33600 ☐ 56K ☐ T1, T3, ISDN or Better

I.8 What degree program are you in? (check one)
☐ certificate ☐ bachelors ☐ masters ☐ Ph.D. ☐ non-degree

I.9 What is your native language? _____

I.10 How would you rate your understanding of spoken English? (circle only one number)

1	2	3	4	5	6	7
barely understand						understand very well

I.11 How long do you drive to come to class? (answer only one)
I live nearby or _____ minutes away

- I.12 Do you consider yourself an extrovert or an introvert?
- | | | | | | | |
|-----------|---|---|---|---|---|-----------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| introvert | | | | | | extrovert |

[missed I.13 in the numbering]

- I.14 Which of the following factors affect your asking questions or making comments in any class you physically attend? (check all that apply)
- | | | |
|--|--|--|
| <input type="checkbox"/> class size | <input type="checkbox"/> interest in subject | <input type="checkbox"/> relationship with professor |
| <input type="checkbox"/> peer pressure | <input type="checkbox"/> shyness | <input type="checkbox"/> personality of the teacher |
| <input type="checkbox"/> fear of asking the wrong question | <input type="checkbox"/> aversion to interrupt the class | |
| <input type="checkbox"/> other, specify _____ | | |

II.- Site-User Reaction

- II.1 Do you feel you can learn as much from viewing a pre-recorded class discussion on the Web as you do from a discussion in a traditional classroom setting?
- ☐ Yes ☐ No
- comment:

- II.2 Do you feel you can learn as much from attending a lecture in a traditional classroom setting as you do by watching a pre-recorded lecture on the Web?
- ☐ Yes ☐ No
- comment:

- II.3 If your job, or family life, or other circumstances made it hard for you to attend regular classes at the University, would you consider watching a pre-recorded lecture on the Web a viable substitute?
- ☐ Yes ☐ No
- comment:

- II.4 Would you take another class using this technology?
- ☐ Yes ☐ No
- comment:

III.- Site-User Comments

III.1 What advantages did viewing the lectures at home have for you?

III.2 What disadvantages did viewing the lectures at home have for you?

III.3 What questions should this survey have asked that it did not?

III.4 Please answer your questions posed in III.3.

APPENDIX C
INTERVIEW PROTOCOL

Interview Protocol

Name: _____

E-mail: _____

I.- General Questions

I.1 Why did you take this course?
Can you tell me why not some other?

I.2 What is your technical background?

II.- Site-User Reaction

II.1 About how many times have you visited this class' video-Web-site? _____

II.2 About how many times did you try to attend class on the Web but were not successful? (If apply, why were you not successful?)

II.3 How many of these class' videos have you watched?

- ☐ all of them
- ☐ 10 or more videos
- ☐ 6 - 10 videos
- ☐ 10 - 5 videos

II.4 Which one of the following, in terms of how they hinder your learning, is in most need of improvement in the videos for this course? (Check only one)

- ☐ Audio clarity
- ☐ Smoothness of motion
- ☐ Size of image
- ☐ Hearing audience's questions

II.5 Did you encounter any problems with the technology? If so, explain.

II.6 How has the Web affected how you participate in class?

II.7 Do you feel you can learn as much from viewing a pre-recorded class discussion on the Web as you do from a discussion in a traditional classroom setting?

☐ Yes ☐ No

comment:

II.8 Do you feel you can learn as much from attending a lecture in a traditional classroom setting as you do by watching a pre-recorded lecture on the Web?

☐ Yes ☐ No

comment:

II.9 If it was hard for you to attend regular classes at the University, would watching a pre-recorded lecture on the Web be a viable substitute?

☐ Yes ☐ No

comment:

II.10 Would you take another class using this technology?

☐ Yes ☐ No

comment:

II.11 Have you taken other distributed leaning classes? ☐ Yes ☐ No

If **YES**, which: _____

What was the setting? (home & the Web, classroom & a TV, etc.) EXPLAIN

How does it compare to this setting? (better, worse) _____

Which setting do you prefer? Why? _____

III.- Site-User Comments

III.1 What advantages did viewing the lectures at home have for you?

III.2 What disadvantages did viewing the lectures at home have for you?

III.3 What questions should this survey have asked that it did not?

III.4 Please answer your questions posed in III.3.

IV.- Site Description

In viewing the lecture-videos, how would you rate the following?

Statements	strongly agree							strongly disagree
Web viewing a class saves time.	1	2	3	4	5	6	7	NA
I had convenient access to the videos.	1	2	3	4	5	6	7	NA
Listening to spoken English on the Web is harder to understand than in person.	1	2	3	4	5	6	7	NA
I am able to isolate myself from distractions to view class.	1	2	3	4	5	6	7	NA
Not having to drive to class is very convenient.	1	2	3	4	5	6	7	NA
I can benefit from reviewing lectures many times.	1	2	3	4	5	6	7	NA
I feel less inhibited participating in class through E-mail.	1	2	3	4	5	6	7	NA
I have Internet connection problems from home.	1	2	3	4	5	6	7	NA
Listening to the lecture videos was more important than viewing them.	1	2	3	4	5	6	7	NA
It is hard to find time to review the class videos on the Web.	1	2	3	4	5	6	7	NA
Listening to Dr. Young on the lecture videos I felt right at home.	1	2	3	4	5	6	7	NA
I need more technical preparation to Web-view classes at home.	1	2	3	4	5	6	7	NA
Other	1	2	3	4	5	6	7	NA
	1	2	3	4	5	6	7	NA

Statements	not important							extremely important
With this technology, I can take classes that don't fit my schedule.	1	2	3	4	5	6	7	NA
Having a handout on the technicalities of Web access to class.	1	2	3	4	5	6	7	NA
Having home access to the Web class.	1	2	3	4	5	6	7	NA
Having access to the Web class from work.	1	2	3	4	5	6	7	NA
Isolating myself from distractions at home to view class.	1	2	3	4	5	6	7	NA
Having E-mail access to the teacher.	1	2	3	4	5	6	7	NA
Asking the instructor questions during the lecture.	1	2	3	4	5	6	7	NA
Having on-line conferences with the teacher.	1	2	3	4	5	6	7	NA
Having acceptable quality of the videos' images.	1	2	3	4	5	6	7	NA
Other	1	2	3	4	5	6	7	NA
	1	2	3	4	5	6	7	NA

V.- Learning Style Type Indicator

For each question, circle the description that best fits you (**A** or **B**).

- 1.- **A** I study best with other people.
 B I study best by myself.

- 2.- When I study with other people, I get the most out of:
 A listening to what others have to say.
 B expressing my thoughts.

- 3.- When I study with other people, I get the most out of:
 A quick, trial-and-error thinking.
 B thinking things through before I say them.

- 4.- I prefer to start my learning by doing something:
 A active and then considering the results later.
 B thoroughly and then doing something active with it later.

- 5.- **A** I can study for very long stretches, and interruptions are not
 welcomed.
 B I need frequent breaks when I study, and interruptions don't
 bother me.

- 6.- I prefer to:
 A demonstrate what I know.
 B describe what I know.

- 7.- I like to:
 A set my own standards for my learning.
 B know what other people expect of me.

APPENDIX D
ONLINE CLASS SURVEY

Course: **CECS 5300**

Name:

E-mail:

What do you think?

Please answer this survey candidly and extensively (questions 9 through 13). Follow the instructions italicized and enclosed in parentheses. Once you've finished answering this survey, save this file (File – Save As) under your last name and e-mail it back to Vicky

Cereiyo as an attachment, to: cereiyo@unt.edu.

Thank you for your time and willingness to participate in this research.

1. When did you watch the class on-line on the Web? **April 9th, 10th, not at all**
(*Underline those that apply*)

(*For questions #2 through #8, underline and bold your answers*)

- | | | |
|--|-----|----------|
| 2. Did you view the class on-line? | YES | NO |
| 3. Did you use the chat room to ask questions? | YES | NO |
| 4. Were you able to view the class on-line and use the chat room simultaneously? | YES | NO |
| 5. Were you able to view the class on-line without problems? | YES | NO |
| 6. Were you able to use the chat room without problem | YES | NO |
| 7. Were you able to use both simultaneously without problems? | YES | NO |
| 8. Were you attending class in MH 309? | YES | When? NO |
- Where?

(*For questions #9 through #13, type your answers in the blank spaces below each question*)

9. What did you **like** and **dislike** about the class setting?
10. How does this on-line Web setting compare to the CD-ROM videos class setting? (better, worse, same, and **why**)
11. How does this on-line Web setting compare to the traditional class setting? (better, worse, same, and **why**)
12. If the format (on-line class setting) used April 9th and 10th was the normal format used when teaching CECS 5300 what would the advantages and disadvantages be?

Advantages:

Disadvantages:

13. Other comments:

APPENDIX E
CD/INTERNET CLASS FORMAT
ADVANTAGE FACTORS

**CD/Internet
Factors & Categories**

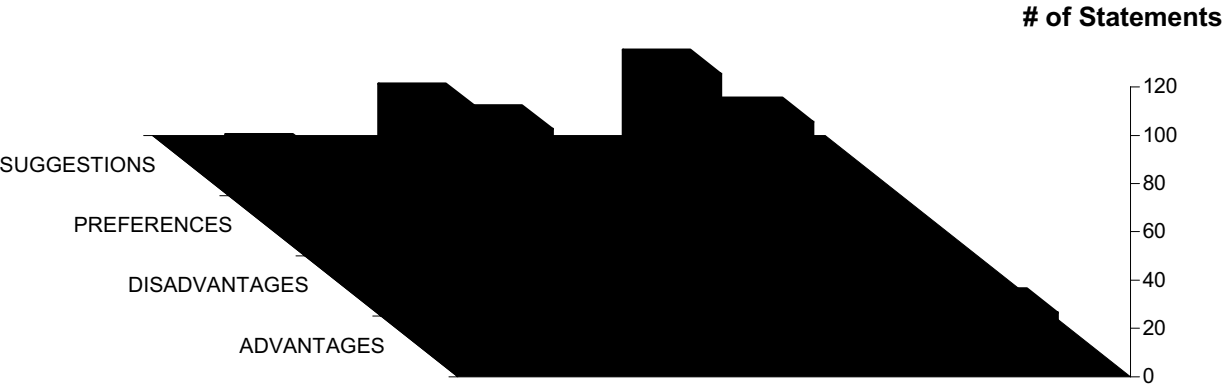


Chart 1

**CD/Internet Advantages
Advantage Factors
Categories & Subcategories**

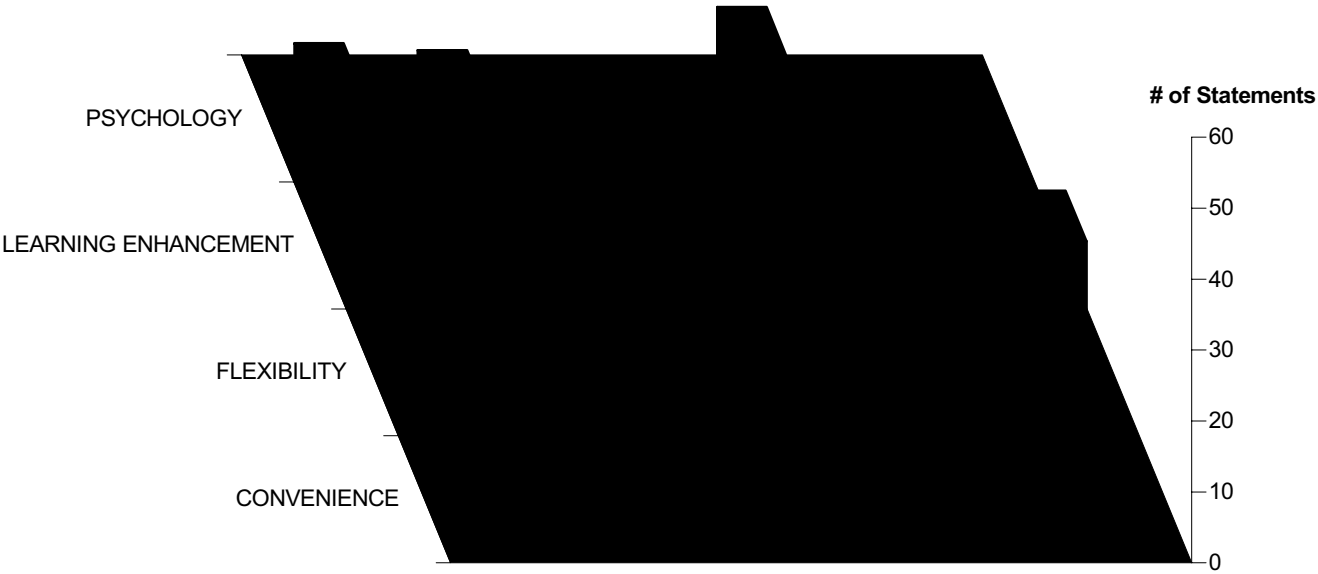


Chart 2

CD/INTERNET Class Format Advantage Factors

of Statements

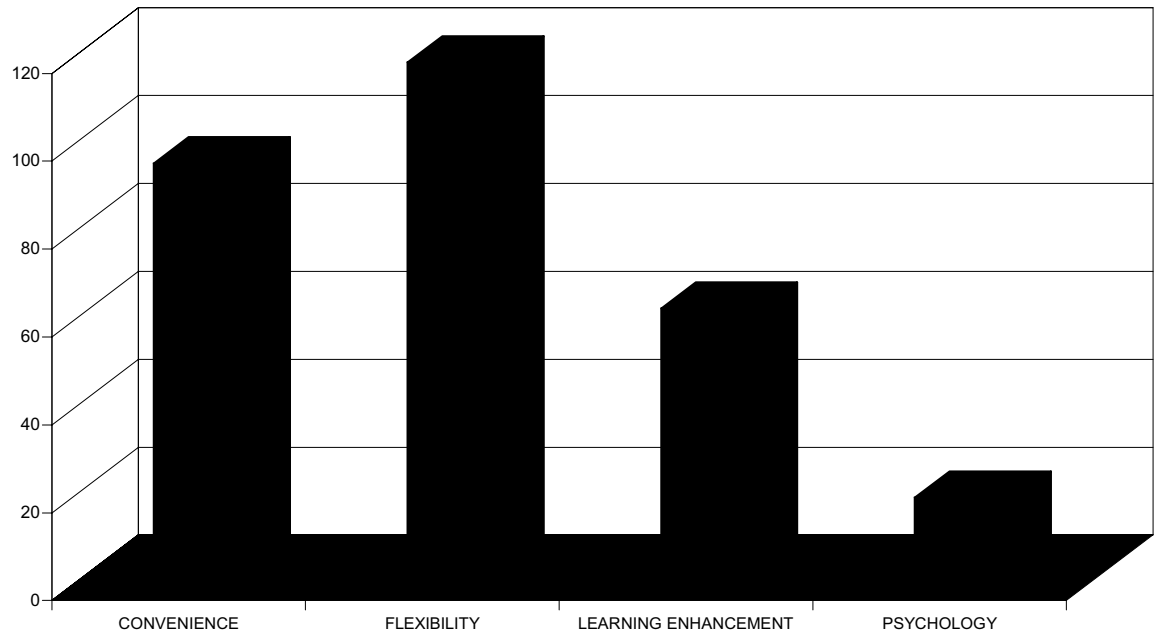


Chart 3

CD/INTERNET Class Format Advantage Factor CONVENIENCE

of Statements

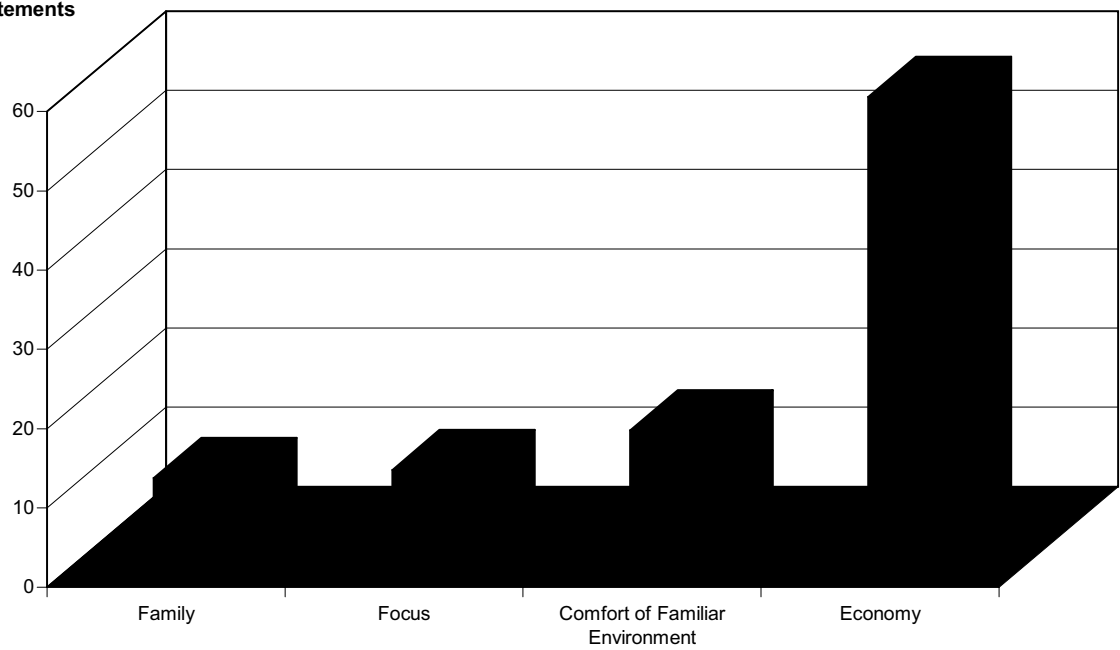


Chart 4

**CD/INTERNET Class Format
Advantage Factor
CONVENIENCE - Economy**

of Statements

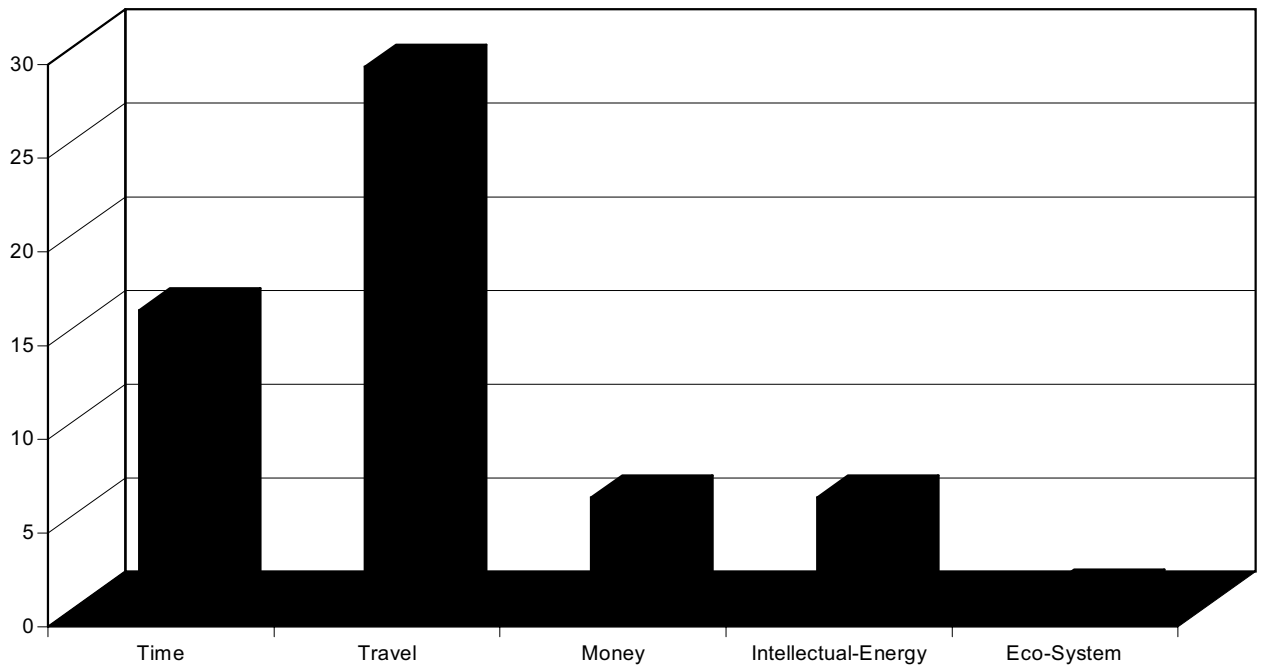


Chart 5

**CD/INTERNET Class Format
Advantage Factor
FLEXIBILITY**

of Statements

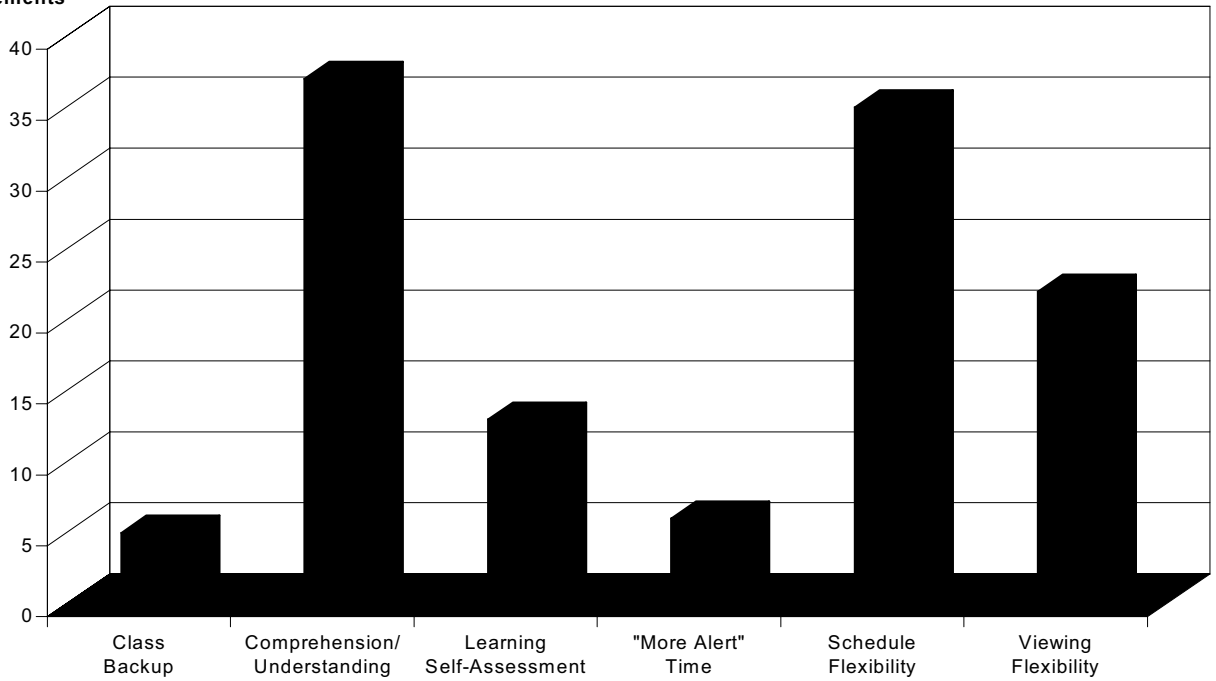


Chart 6

**CD/INTERNET Class Format
Advantage Factor
LEARNING ENHANCEMENT**

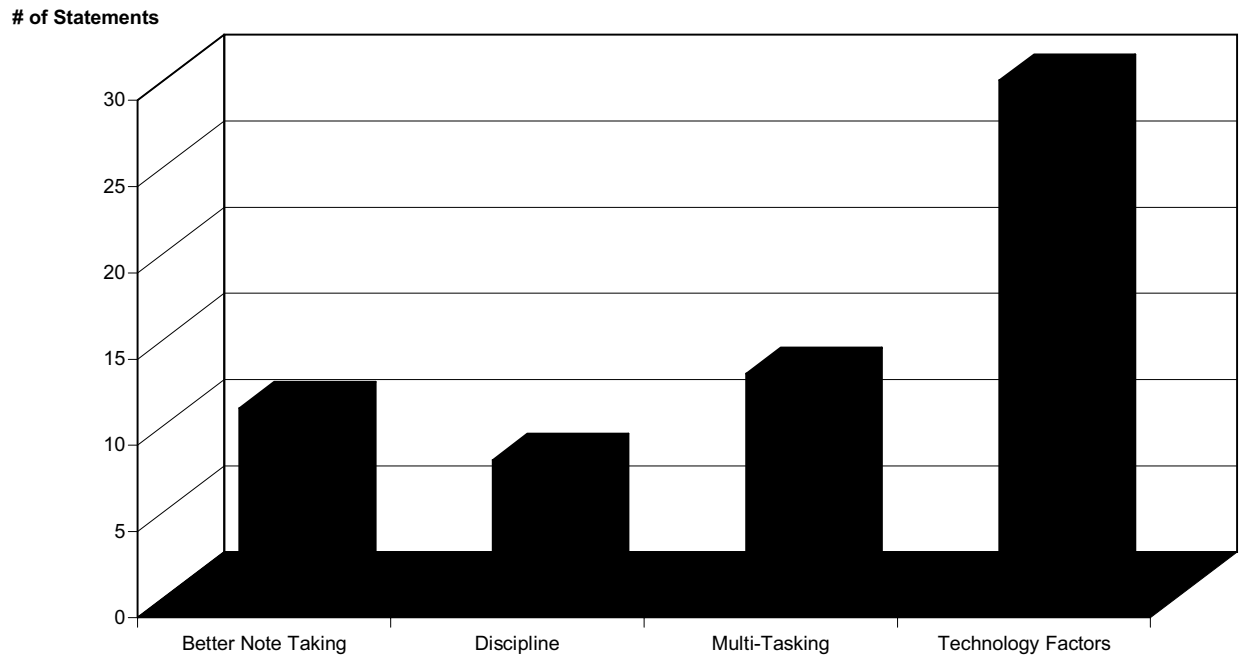


Chart 7

**CD/INTERNET Class Format
Advantage Factor
PSYCHOLOGY**

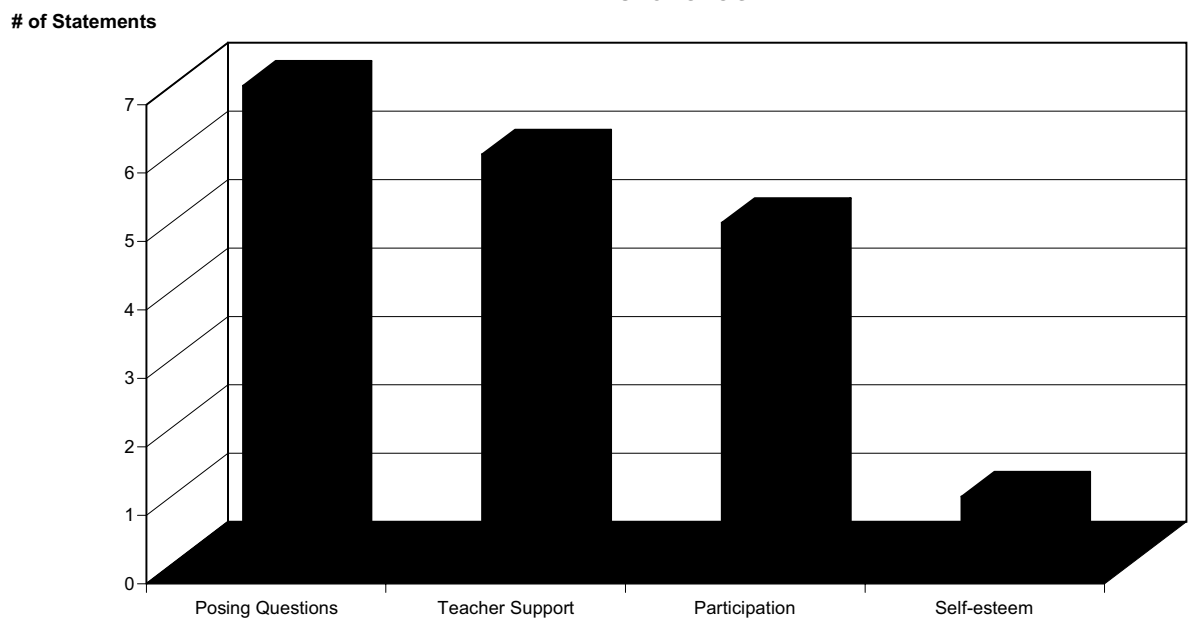


Chart 8

APPENDIX F
CD/INTERNET CLASS FORMAT
DISADVANTAGE FACTORS

CD/INTERNET Class Format Disadvantage Factors

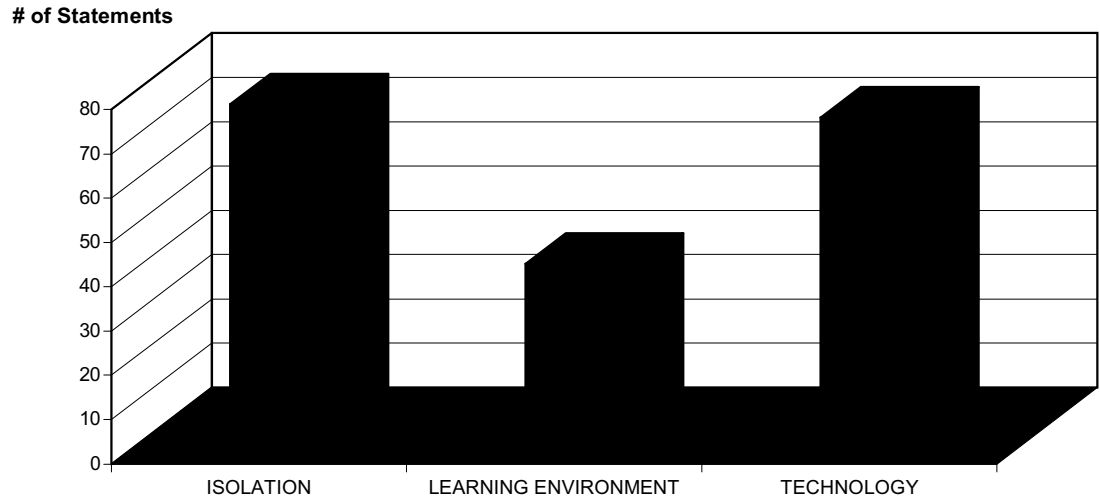


Chart 1

CD/INTERNET Class Format Disadvantage Factors ISOLATION

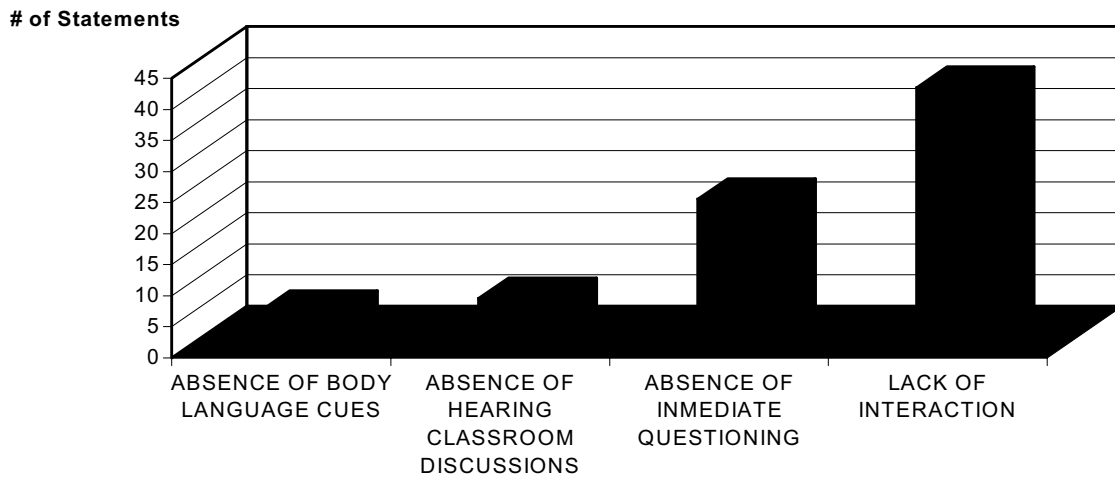


Chart 2

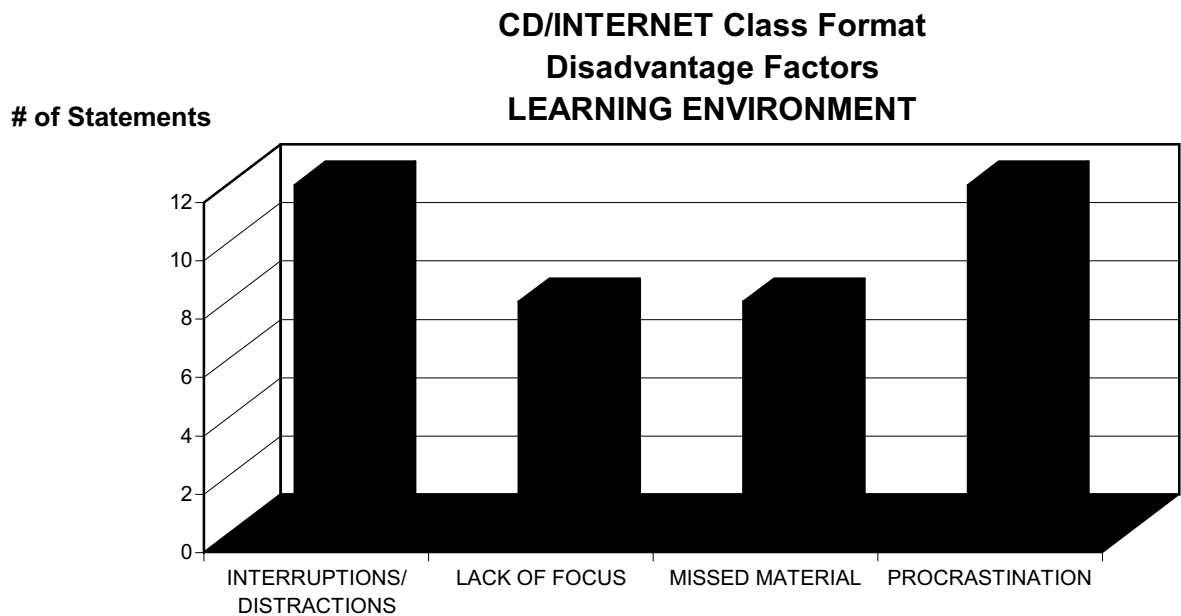


Chart 3

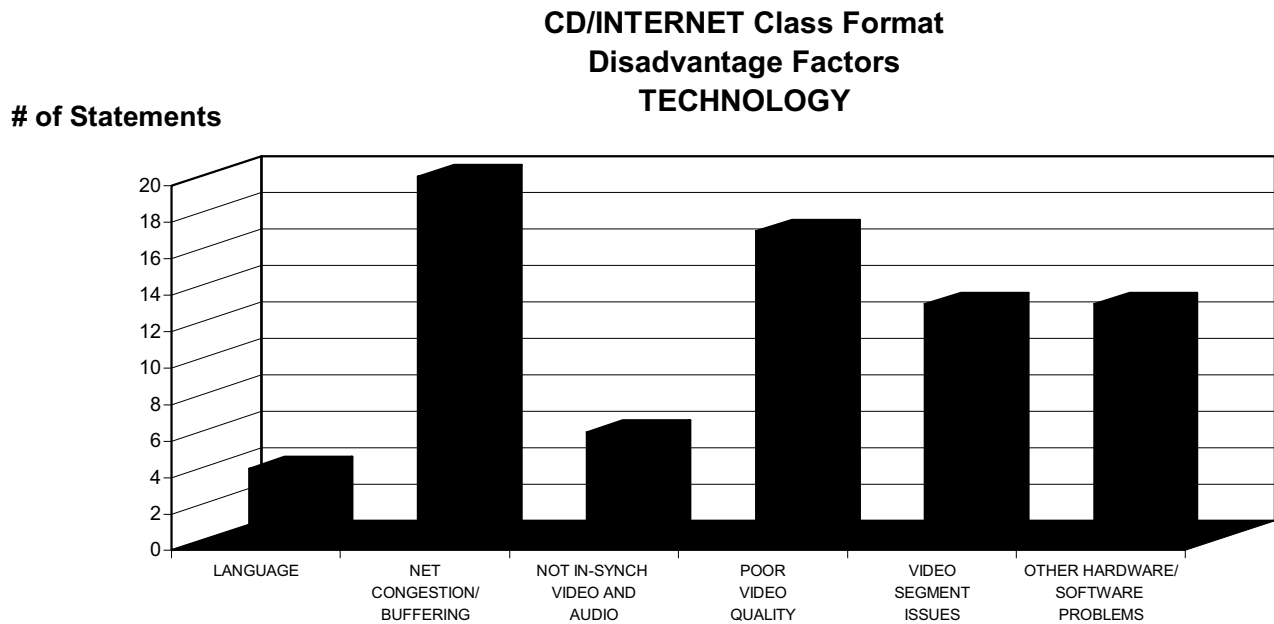


Chart 4

APPENDIX G
ONLINE WEB CLASS FORMAT
ADVANTAGE FACTORS

Online Web Class Format Factors & Categories



Chart 1

Online Web Class Format Advantage Factors

of Statements

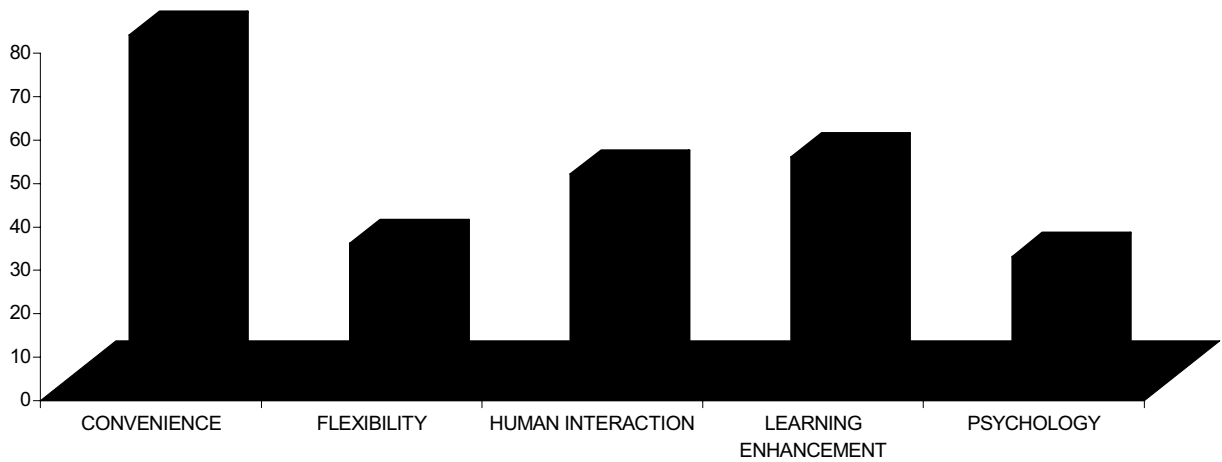


Chart 2

**Online Web Class Format
Advantage Factors
CONVENIENCE**

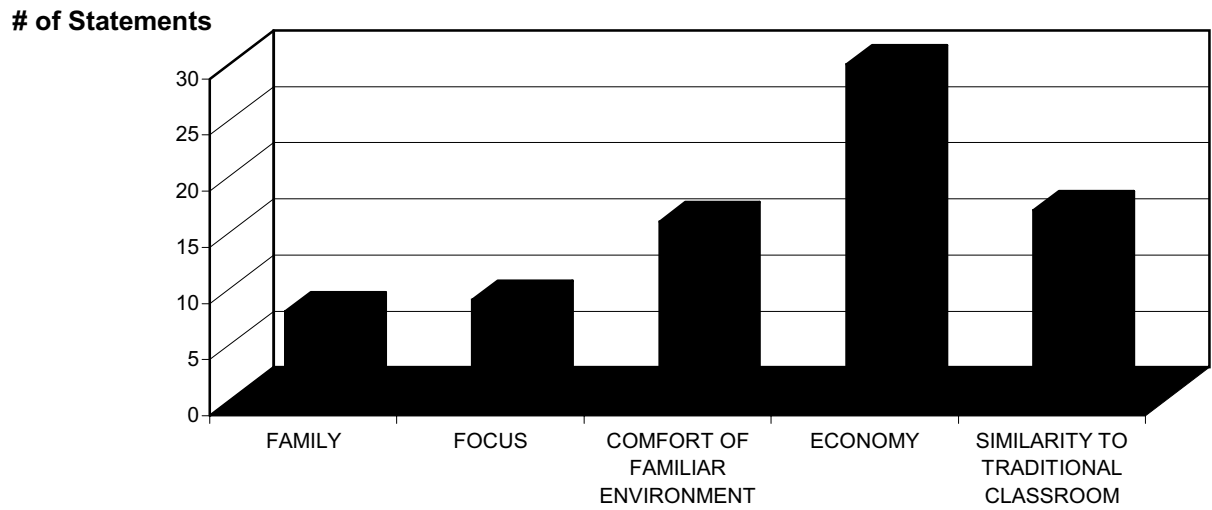


Chart 3

**Online Web Class Format
Advantage Factors
CONVENIENCE - Economy**

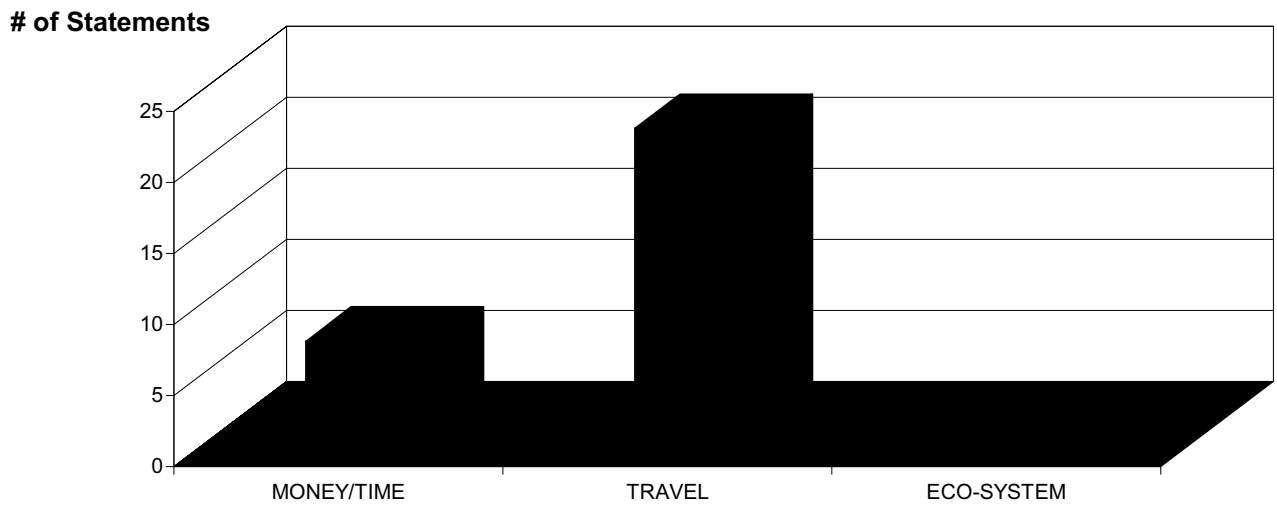


Chart 4

Online Web Class Format
Advantage Factors
FLEXIBILITY

of Statements

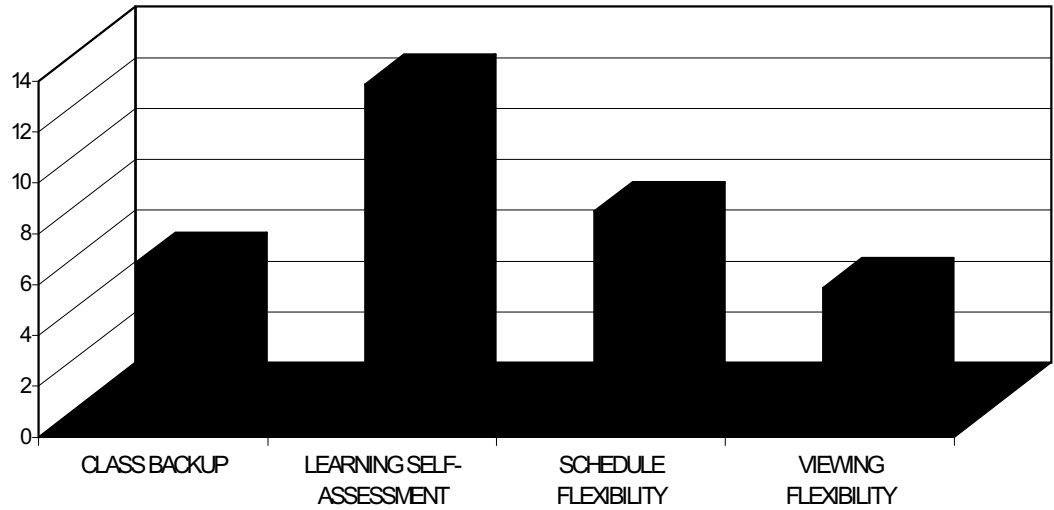


Chart 5

Online Web Class Format
Advantage Factors
HUMAN INTERACTION

of Statements

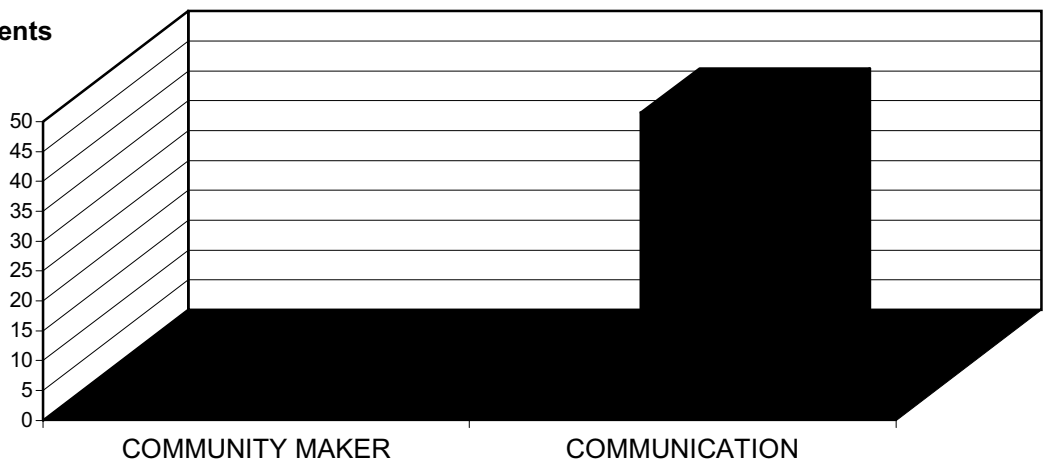


Chart 6

**Online Web Class Format
Advantage Factors
HUMAN INTERACTION - Communication**

of Statements

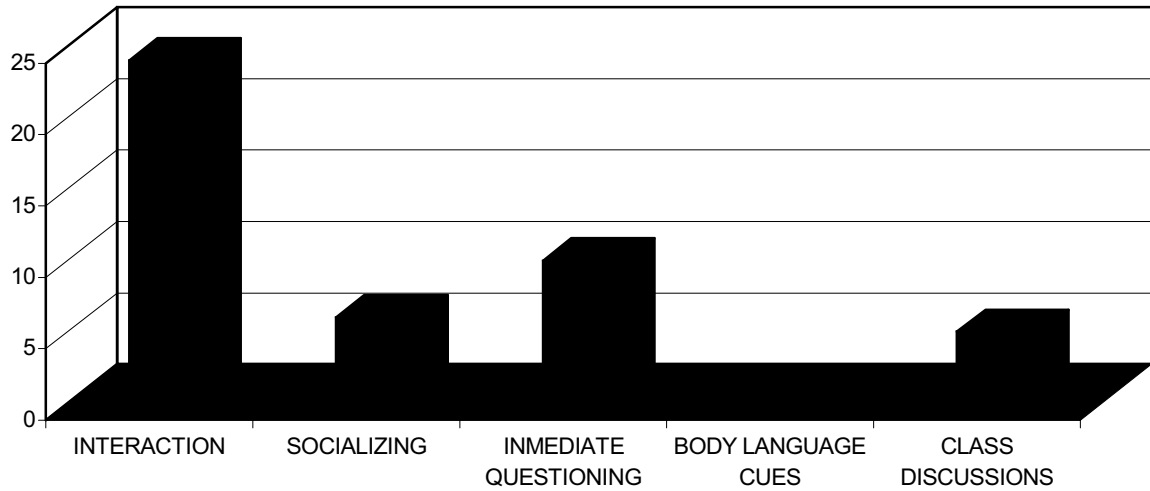


Chart 7

**Online Web Class Format
Advantage Factors
LEARNING ENHANCEMENT**

of Statements

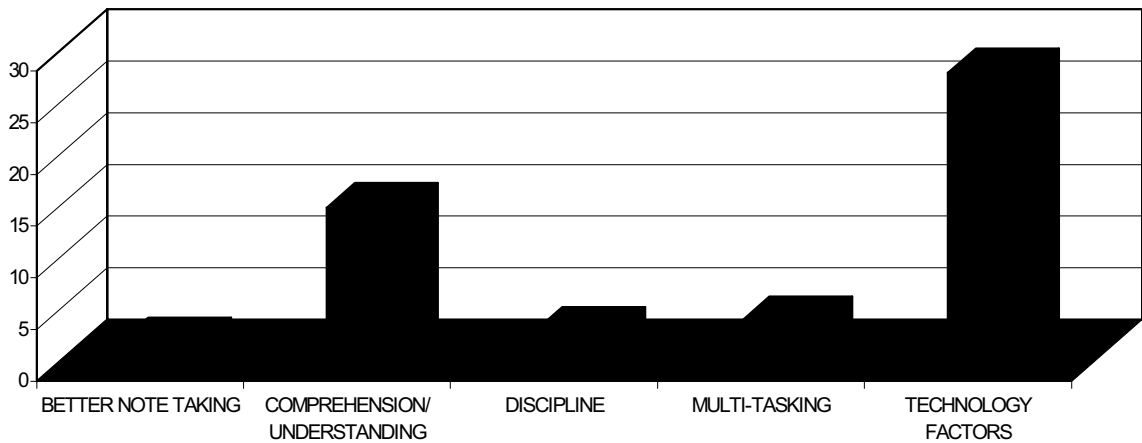


Chart 8

**Online Web Class Format
Advantage Factors
LEARNING ENHANCEMENT - Comprehension/Understanding**

of Statements

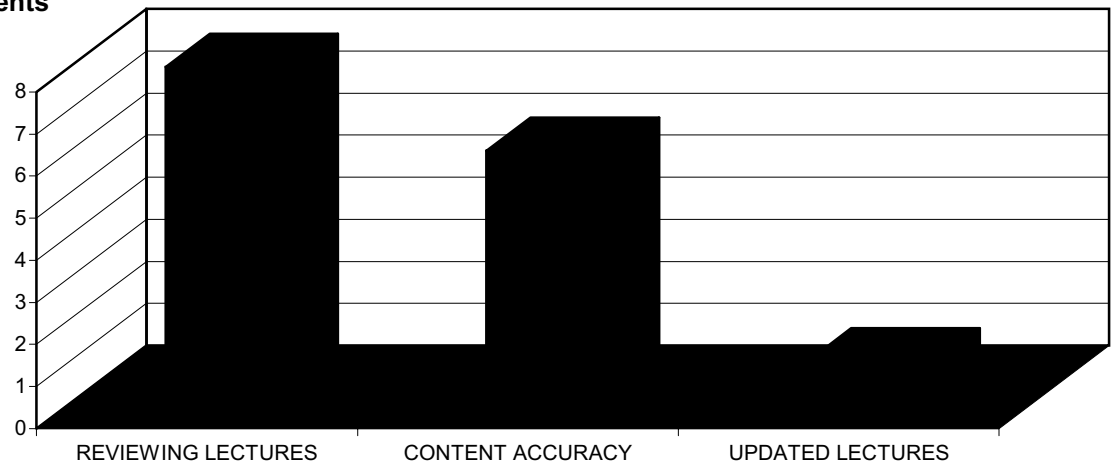


Chart 9

**Online Web Class Format
Advantage Factors
PSYCHOLOGY**

of Statements

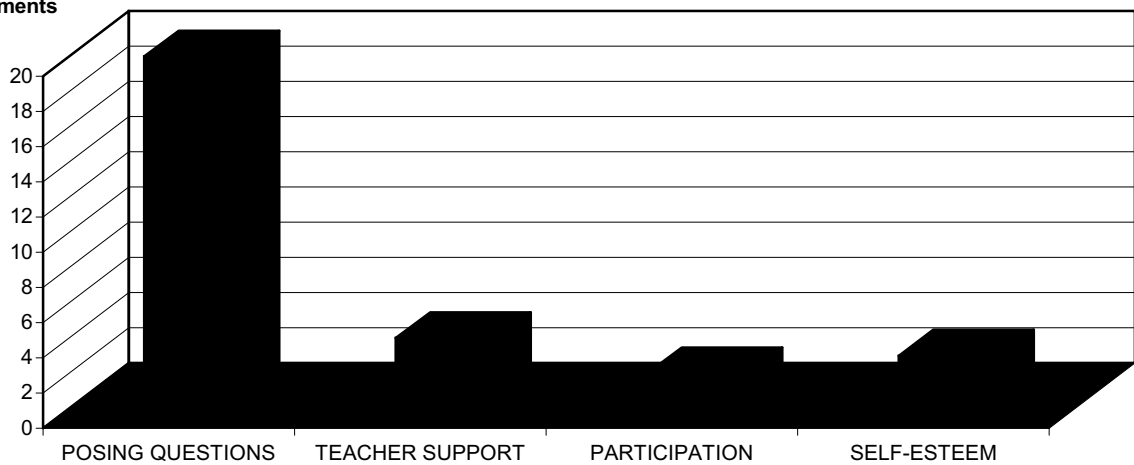


Chart 10

APPENDIX H
ONLINE WEB CLASS FORMAT
DISADVANTAGE FACTORS

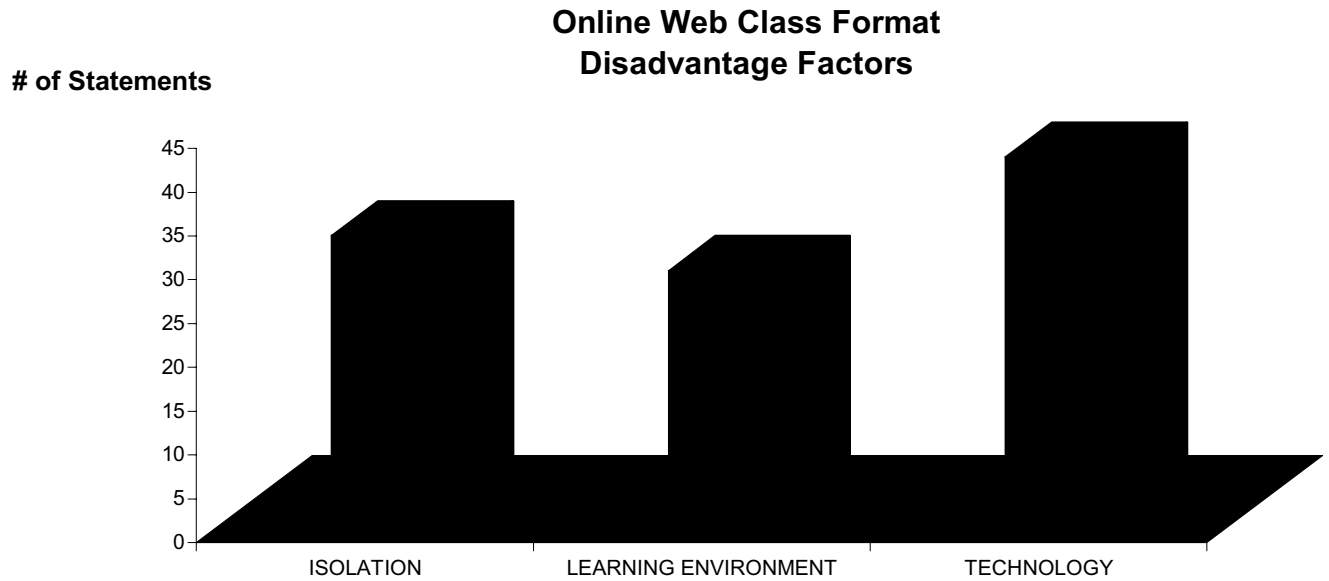


Chart 1

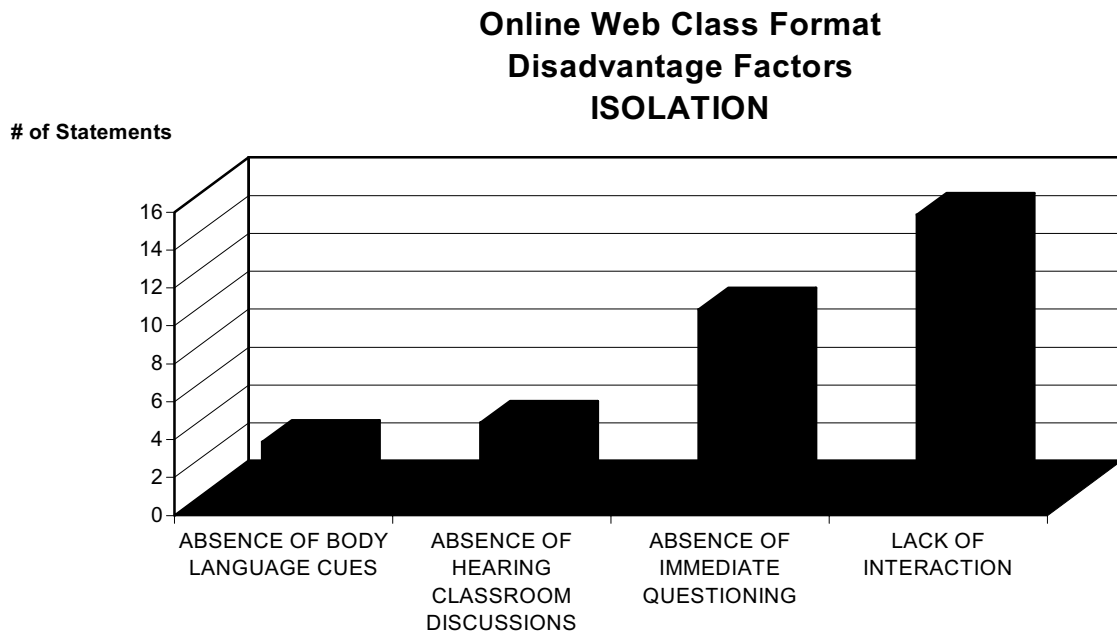


Chart 2

Online Web Class Format Disadvantage Factors LEARNING ENVIRONMENT

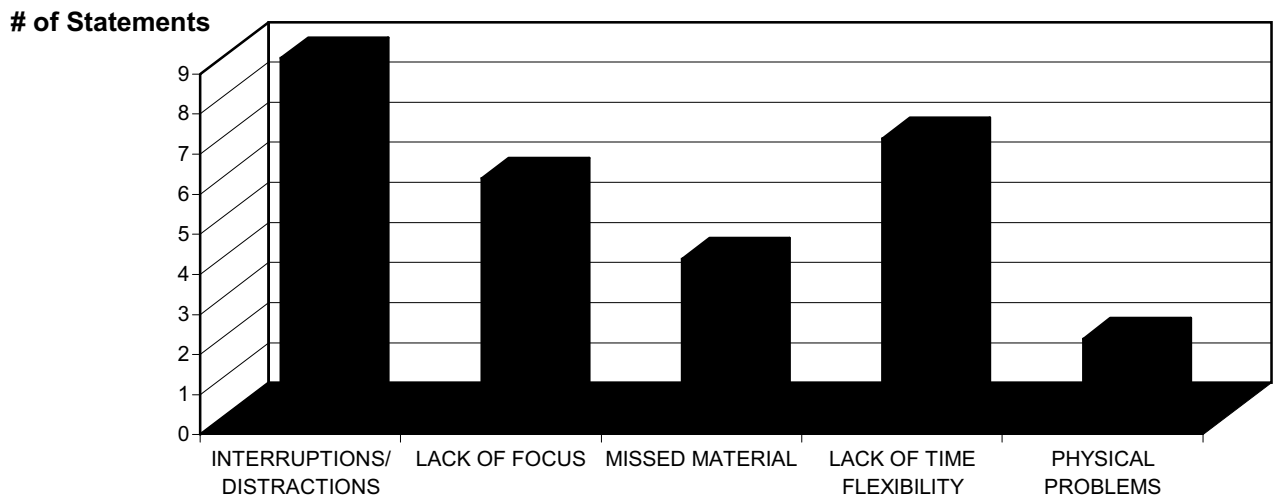


Chart 3

Online Web Class Format Disadvantage Factors TECHNOLOGY

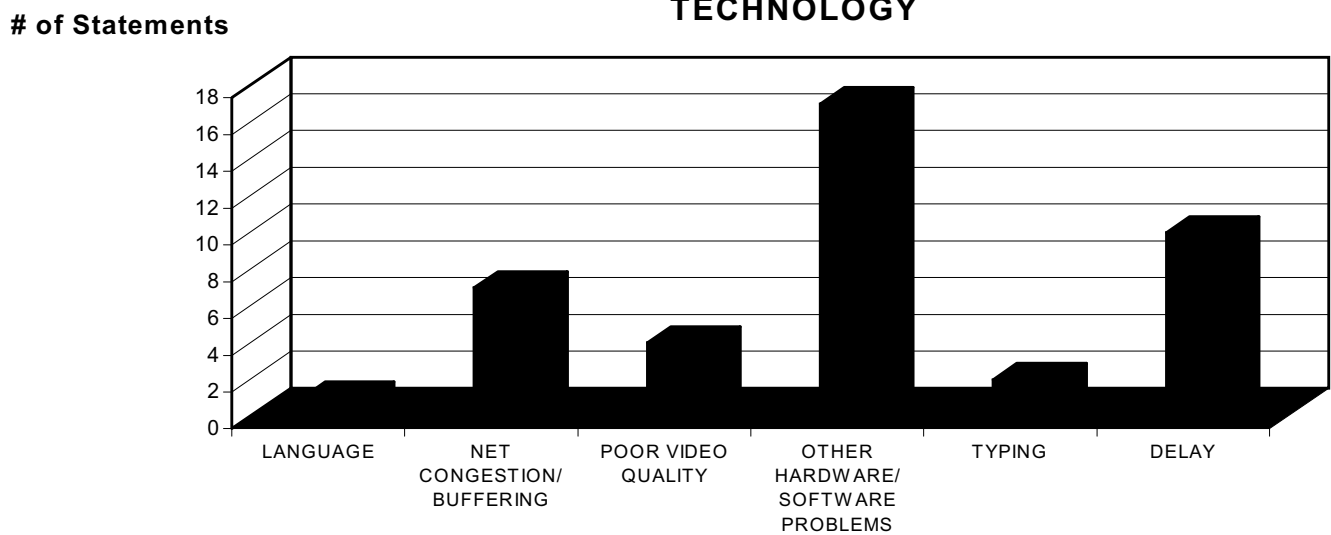


Chart 4

APPENDIX I
INSTRUCTIONAL TOOL
WEBCT FORUM
ADVANTAGE AND DISADVANTAGE FACTORS

WebCT Forum - Instructional Tool Factors & Categories



Chart 1

WebCT Forum - Instructional Tool

of Statements

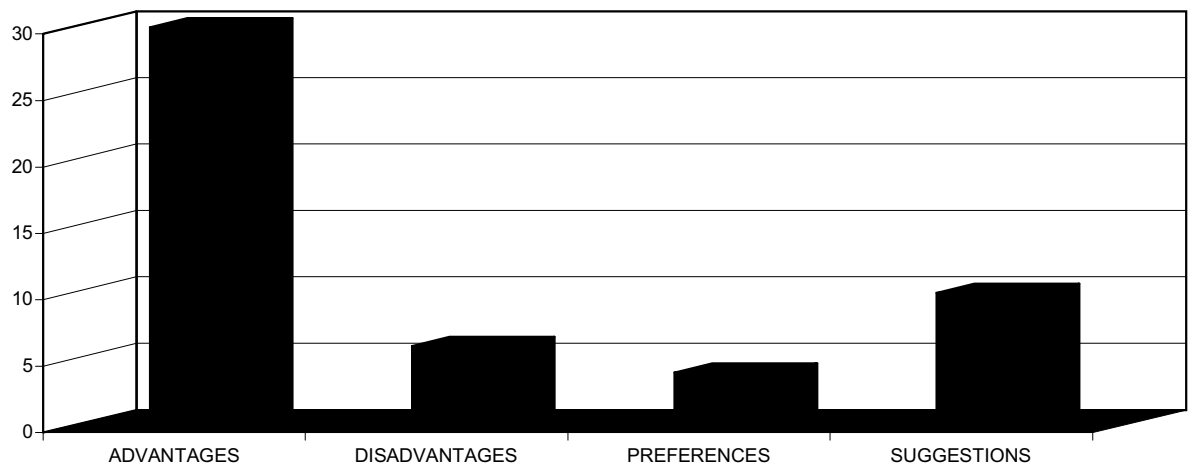


Chart 2

WebCT Forum - Instructional Tool Advantage Factors

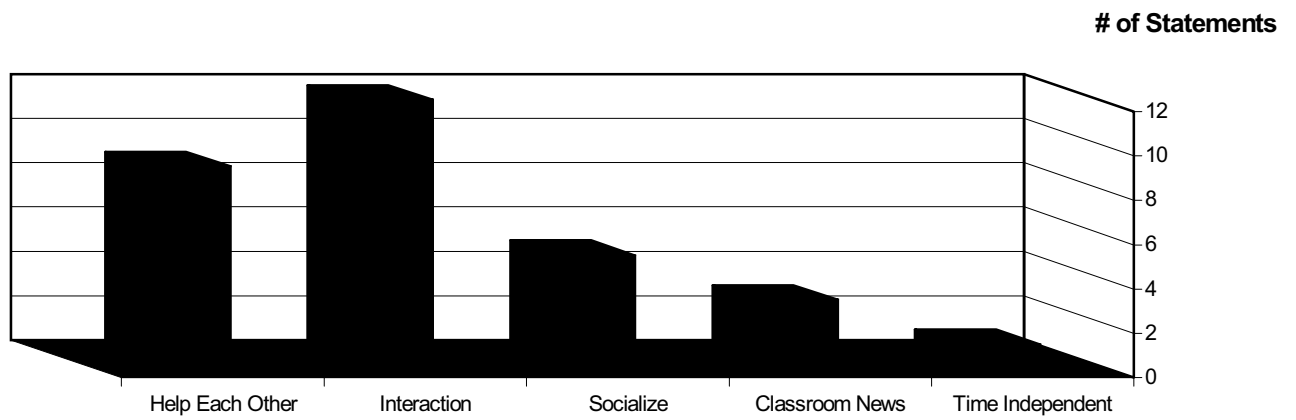


Chart 3

WebCT Forum - Instructional Tools Disadvantage Factors

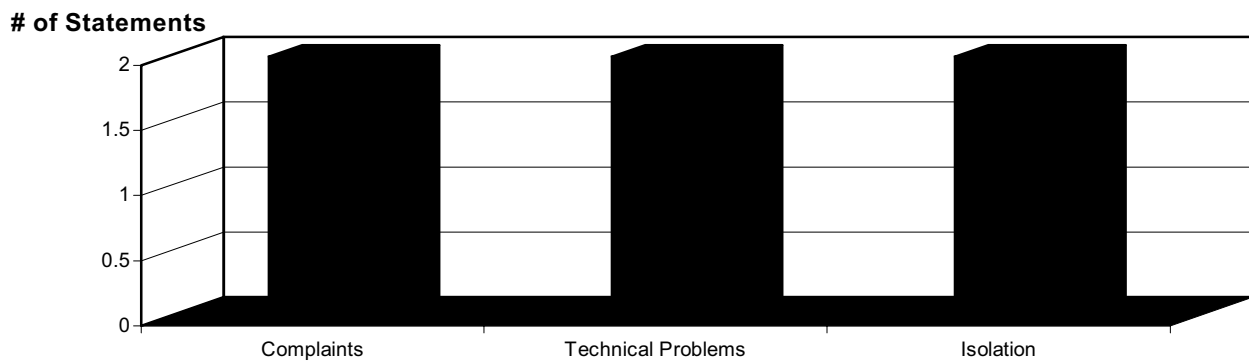


Chart 4

APPENDIX J

INSTRUCTIONAL TOOL

WEBCT TESTING

ADVANTAGE AND DISADVANTAGE FACTORS

**WebCT Testing - Instructional Tool
Factors & Categories**



Chart 1

**WebCT Testing - Instructional Tool
Factors & Categories**

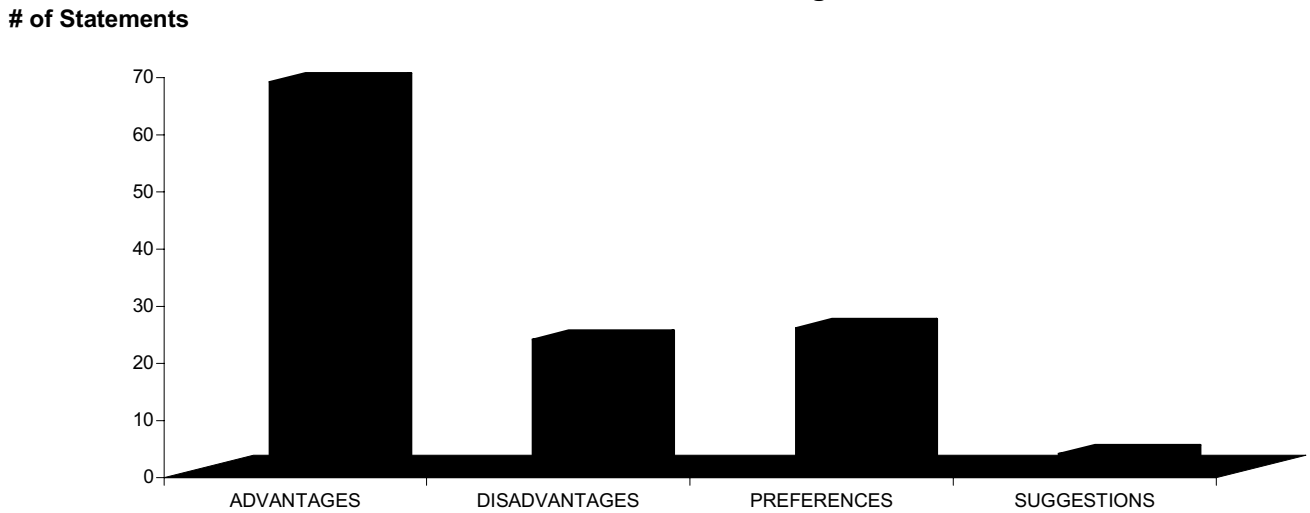


Chart 2

WebCT Testing - Instructional Tool Advantage Factors

of Statements

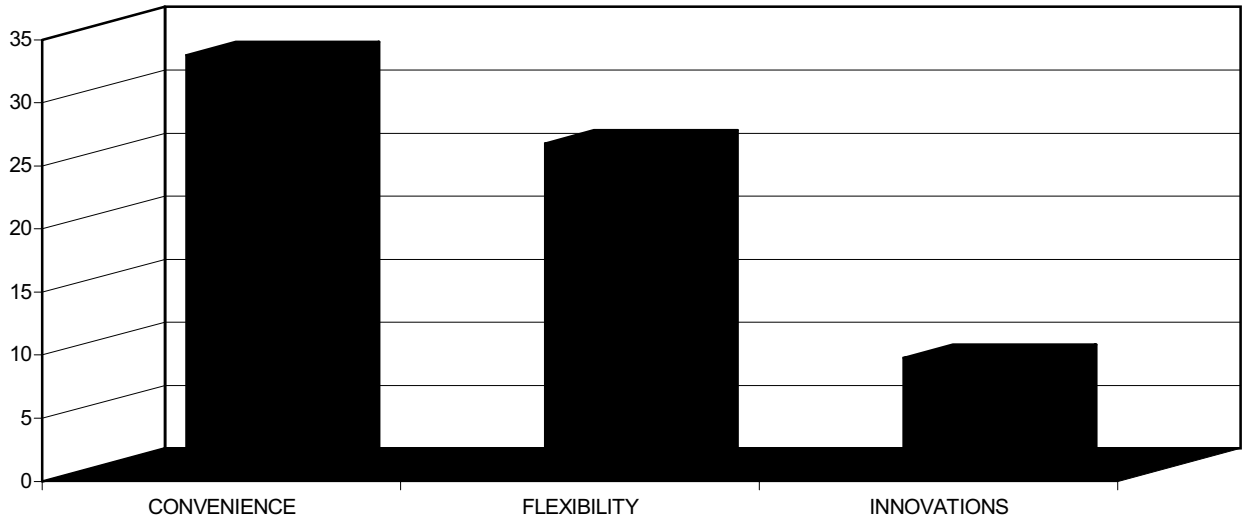


Chart 3

WebCT Testing - Instructional Tool Advantage Factors CONVENIENCE

of Statements

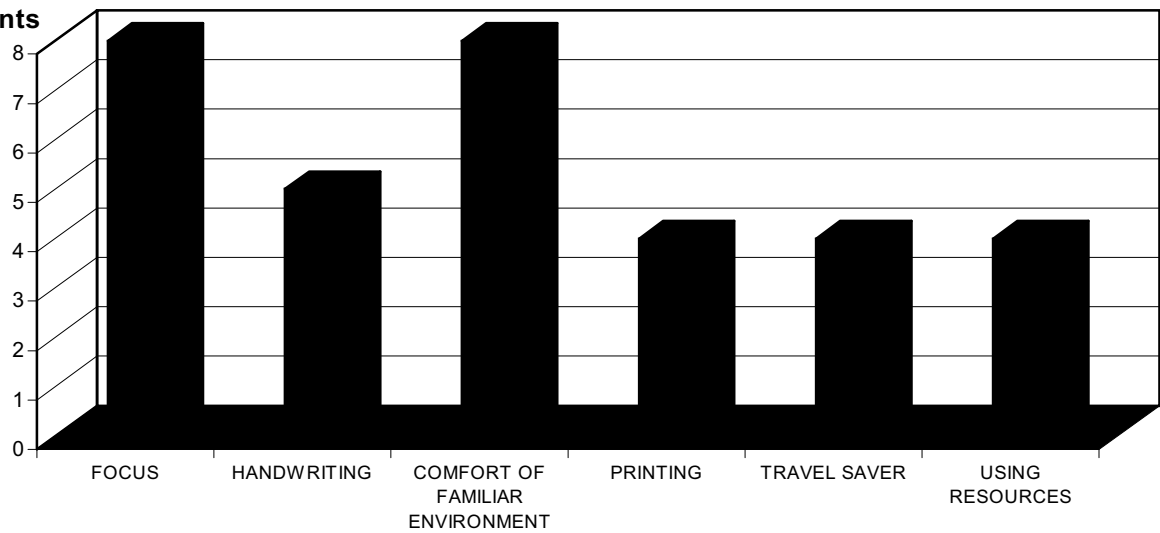


Chart 4

**WebCT Testing - Instructional Tool
Advantage Factors
FLEXIBILITY**

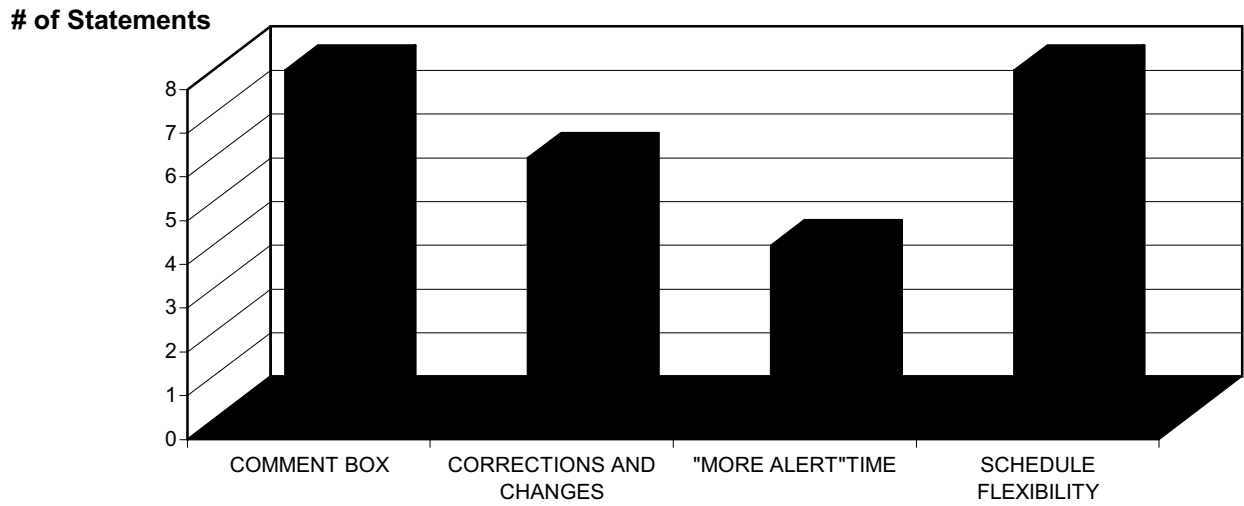


Chart 5

**WebCT Testing - Instructional Tool
Advantage Factors
INNOVATIONS**

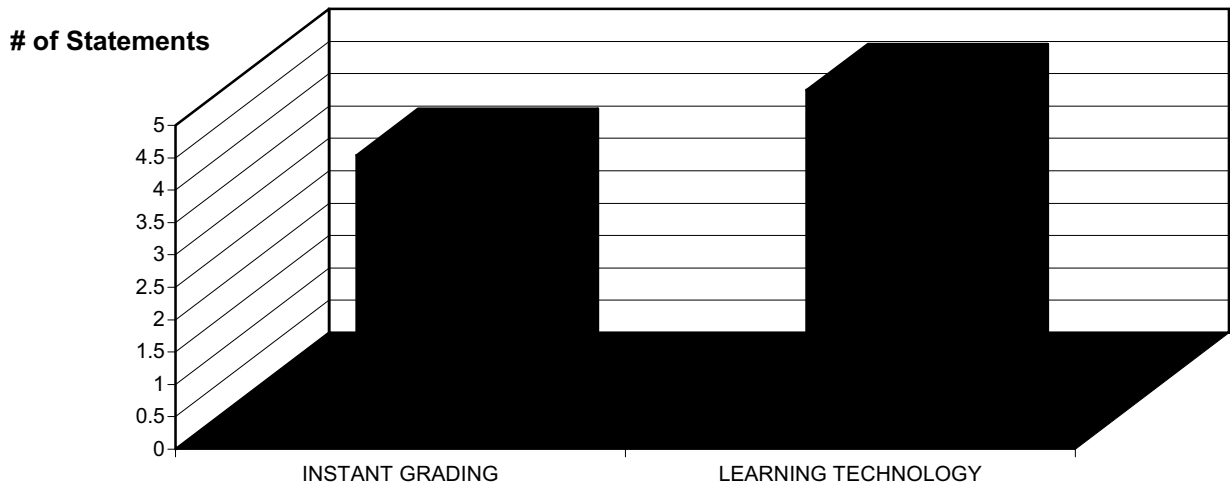


Chart 6

WebCT Testing - Instructional Tool Disadvantage Factors

of Statements

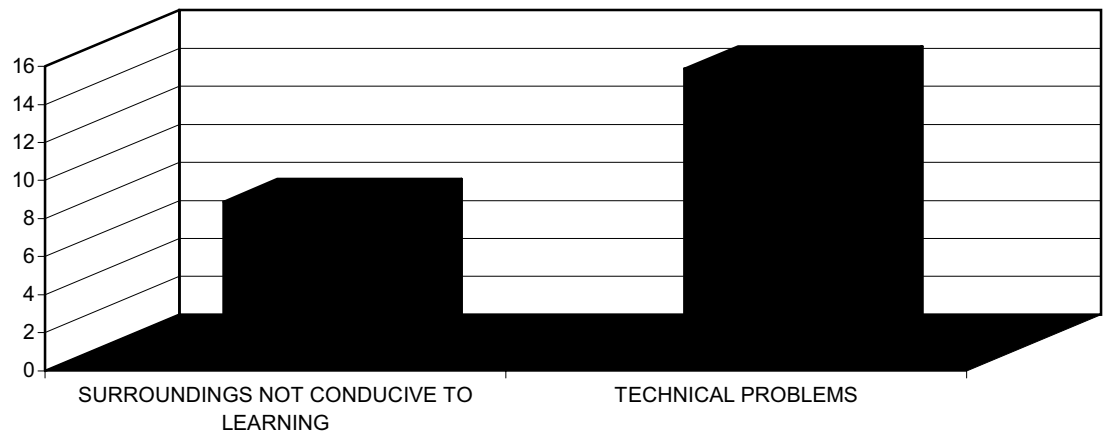


Chart 7

WebCT Testing - Instructional Tool Disadvantage Factors SURROUNDINGS NOT CONDUCTIVE TO LEARNING

of Statements

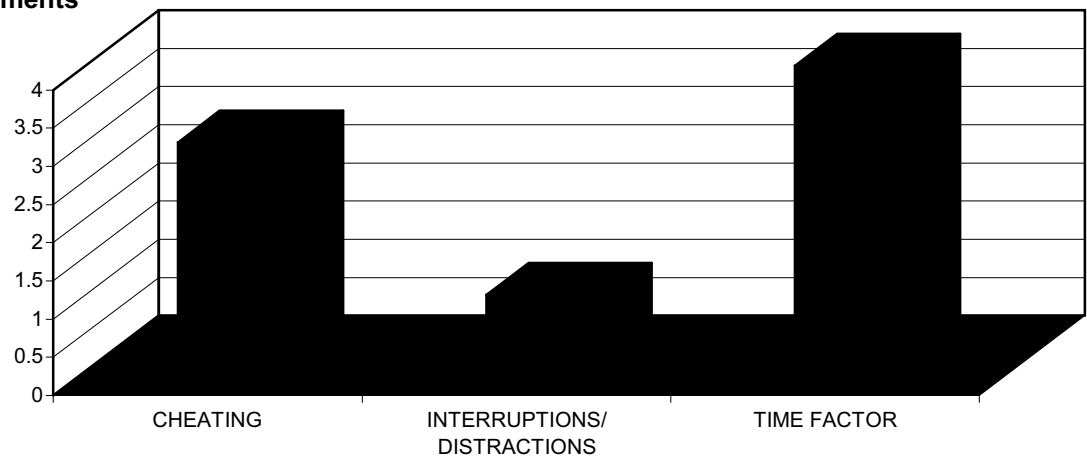


Chart 8

**WebCT Testing - Instructional Tool
Disadvantage Factors
TECHNICAL PROBLEMS**

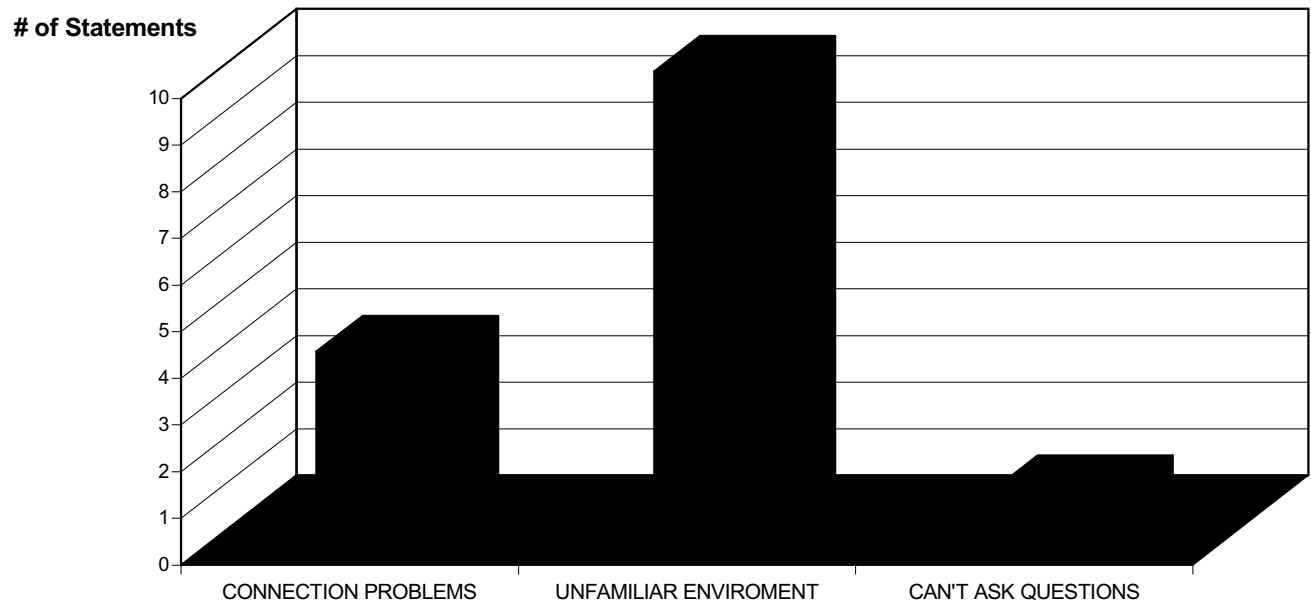


Chart 9

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