Computer-Supported, Time and Place Independent Distance Education for Adult Learners: A Demonstration Project in Teaching Financial Accounting Via the Internet

by

Timothy J. Ellis

A Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy

School of Computer and Information Sciences
Nova Southeastern University
1998
We hereby certify that this dissertation, submitted by Timothy J. Ellis, conforms to acceptable standards and is fully adequate in scope and quality to fulfill the dissertation requirements for the degree of Doctor of Philosophy.

Maxine S. Cohen, Ph.D.  
Chairperson of Dissertation Committee  
Date

Gertrude W. Abramson, Ed.D.  
Dissertation Committee Member  
Date

Steven R. Terrell, Ed.D.  
Dissertation Committee Member  
Date

Approved:

Edward Lieblein, Ph.D.  
Dean, School of Computer and Information Sciences  
Date

School of Computer and Information Sciences  
Nova Southeastern University  
1998
Certification Statement

I hereby certify that this dissertation constitutes my own product and that the words or ideas of others, where, used, are properly credited according to accepted standards for professional publications.

Signed

______________________________
Timothy J. Ellis
This study investigated the use of the Internet as a tool to provide adult students a time- and place-independent learning environment. The project addressed the problem that higher education often does not adequately meet the needs of the adult student due to the constraints typically associated with traditional, classroom-based environments. The goal of this project was to develop and validate a set of procedures that could be used to plan, implement, and manage a college-level, credit-bearing course that could be offered to the adult student in a time- and place-independent manner via the Internet.

Matrices for administrative, management, and learning issues attendant with an Internet-based learning environment were developed. The matrices were tested with a pilot project that entailed planning, implementing, and managing a course in financial accounting. An experimental section of the course was offered in a time- and place-independent manner via the Internet. To provide a basis for comparison, a control section of the same course, taught by the same instructor, was offered in a classroom-based environment.

Four tools were used to evaluate the pilot project. The college’s standard course evaluation form, which measures student satisfaction, was given to both groups, as well as an expanded evaluation that examined the students’ level of confidence regarding accomplishment of each of the learning outcomes. Both sections were given the same final exam and were graded using the same criteria. Ratings on both course evaluation forms, the grade on the final exam, and the grade for the course were compared using independent sample t-tests. No significant differences were noted in rating on the confidence evaluation or on either the final exam or the course grade. Satisfaction with the course, as recorded on the standard course evaluation form, was significantly higher for the classroom-based section than the Internet-based section.

A summative committee was convened to evaluate both the objective results and subjective impressions of the pilot project. Based upon the input of the summative committee, a questionnaire regarding the administration and management of an Internet-based, college-level course was developed. Requests for participation in the survey were e-mailed to 369 faculty and administrators with experience in Internet-based education;
53 completed surveys were returned. The results of this survey were used to add depth and refinement to the administrative and management matrices.

Two conclusions were evident as a result of both the pilot project and the survey of experienced providers of Internet-based college coursework. The planning matrices did indeed aid the development of an academically sound college course that could be taught in a time- and place-independent fashion using the resources available in the Internet. Several challenges inherent in this delivery system emerged. Most notably, it appeared to be more difficult to positively engage the student in the learning process in the Internet-based environment than in the traditional classroom. This difficulty was manifested in three ways. First, both the pilot project and responses to the survey indicated a rate of withdrawal from the course noticeably higher than typically found in classroom based courses. Second, the rating of the students participating in the pilot project on the student satisfaction section of the course evaluation was significantly lower than evaluations for the same instructor teaching the same course in a classroom setting. Third, both impressions from the pilot project and responses to the survey indicated a difficulty in establishing the intangible aspects of a college experience commonly referred to as a learning community.

This study did develop a schema for planning, implementing, and managing an academically sound, time- and place-independent, Internet-based learning environment. Further research was indicated to identify the appropriate mechanisms for making the environment more convivial for the student.
Acknowledgements

Academia mandates that a paper of this nature reflects the independent research efforts of the author. Although this project certainly satisfies that requirement, it would not have been possible to complete this study without the support, guidance, and assistance of several people.

The chair of my dissertation committee, Dr. Maxine Cohen, and committee members, Dr. Trudy Abramson and Dr. Steve Terrell, were always supportive, encouraging, and inspiring. Their expertise and direction contributed greatly to this project.

My colleagues at Fisher College were invaluable. I will always appreciate Professor Leonard Long’s willingness to venture into new territory by teaching the pilot project component of this study. Irene Checkovich, Susan Jordan, Nicholas Siciliano, David Smith, Prudence VanWinkle, and Dabney LaRochelle provided vital assistance in establishing the criteria for the project by serving on formative or summative committees. Dr. Antone Vieira, Dean of Continuation Education, was especially supportive throughout the course of this project.

Two fellow travelers in pursuit of academic excellence deserve special note. Madge Thombs and Mitch Pratt have been friends, colleagues, and counselors throughout the doctoral program for which this dissertation is the final project.

Finally, and most importantly, my family deserves special recognition. My wife, Evelyn, and sons, Sean and Nick, served as both support and inspiration throughout this process. The attainment of this degree represents their efforts as well as mine.
Table of Contents

Abstract  iv
List of Tables x
List of Figures xi

Chapters

I. Introduction 1
   Problem Statement 1
   Project Goals 2
   Relevance and Significance 3
   Barriers and Issues 5
   Research Questions 6
   Definition of Terms 7
      Adult Student 7
      Andragogy 7
      Asynchronous Learning Environment 7
      Distance Education and Distance Learning 8
      Internet-Based Learning 8
      Synchronous Learning Environment 8
      Time- and Place-Independent Learning Environment 9
      Web-Based Learning 9
   Summary 9

II. Review of the Literature 11
   Introduction 11
   Distance Learning 12
   Adult Education 20
   Computer-Aided Instruction 23
      Locus of Control 24
      Timing 25
      Role in the Learning Process 26
      Value Added 27
   Web-based Education 35
   Curriculum Planning and Development 42
   Summary 46

III. Methodology 48
   Development Procedures 48
      Criteria Establishment 48
Criteria Validation 49
Product Development 50
Product Evaluation 51
Assumptions 54
Limitations and Delimitations 55
Summary 56

IV. Results 58
The Matrices 58
  Administrative Issues 58
  Management Issues 64
  Learning Issues 69
Pilot Project 74
Survey Results 80
Summary of Results 88

V. Conclusion, Implications, Recommendations, and Summary 96
Conclusions 96
Implications 101
Recommendations 103
Summary 105
  Learning Matrix 110
Conclusions 112

Appendixes
Appendix A: Formative Committee Membership 114
Appendix B: Criteria Established by Formative Committee 115
  Administrative Issues 115
  Management Issues 116
  Learning Issues 116
Appendix C: National Council for Continuing Education and Training Board of Directors 118
Appendix D: Criteria Validation Questionnaire 120
Appendix E: Step-by-Step Developmental Process 123
  Planning Phase 123
  Implementation Phase 124
  Analysis Phase 124
Appendix F: Course Evaluation Form 125
Appendix G: Survey of Providers of Web-Based College Courses 128
  E-Mail Request 128
  The Survey 129
Appendix H: Student Handbook 137
Appendix I: Financial Accounting Learning Outcomes 140
Appendix J: Learning Outcomes by Classroom and Online Methodologies 145
Appendix K: Learning Outcomes by Online Methodology 158
Appendix L: Pilot Project Results 161
List of Tables

Table 1: Administrative Matrix  63
Table 2: Course Management Matrix  68
Table 3: Instructional Tools Available in an Internet-Based Environment  71
Table 4: Classroom Section Comments  77
Table 5: Internet-based Section Comments  78
Table 6: Administrative Issues  83
Table 7: Management Issues  84
Table 8: Administrative Matrix Incorporating Pilot Project and Survey Results  89
Table 9: Management Matrix Incorporating Pilot Project and Survey Results  92
Table 10: Administrative Matrix  106
Table 11: Management Matrix  107
Table 12: Instructional Tools Available in an Internet-Based Environment  111
List of Figures

Figure 1: Rating scale for the criteria validation questionnaire given to the Board of Directors of the National Council for Continuing Education and Training.  50

Figure 2: The development process for the learning issues matrix.  83
Chapter I
Introduction

Problem Statement

As the result of the combination of several factors, colleges and universities are being confronted with the need to make significant changes in the ways in which they function academically and administratively. The increasingly diverse demographics of the student population, the evolving perceived role of education, and the escalating costs for both the institution and the student all contribute to this evolutionary pressure (Brooks, 1997). In response to these challenges, numerous schools, both in this country and internationally, are actively investigating, and implementing, non-traditional academic programs. Gubernick and Ebeling (1997) documented this trend towards an expanded role for higher education: “…55% of the U.S.’ 2,215 four-year colleges and universities have courses available off-site. Over 1 million students are now plugged into the virtual college classroom, which compares with 13 million attending brick-and-mortar schools” (paragraph 5).

As suggested by Gubernick and Ebeling (1997), colleges and universities are increasingly looking towards distance learning environments, supported by the latest technology, as a means of meeting these emerging demands. The lure of technology-enhanced distance learning as a solution to many of these challenges is indeed seductive.
Roberts (1996) observed that this environment offers students ready access to an equitable system that is flexible, cost-effective, and conducive to continuous, life-long learning.

Although the promise of technology-enhanced distance learning is undeniable, the implementation of it as an effective and efficacious solution is not assured. Winn (1985) observed:

However impressive technologies for distance education are, there is a trap into which it is very easy to fall. We can become so intrigued by the marvelous devices that are now available that we lose sight of the simple yet essential principles that underlie effective communication and effective instruction (p. 2).

Twelve years later, Locatis and Weisberg (1997) echoed Winn’s (1985) warning, observing that the value of using technology to enhance education: “…still depends on how learning experiences are designed” (p. 103).

Higher education is evolving, and non-traditional, technology-intensive solutions will very likely play an important role in shaping its future. The challenge is to ensure that these initiatives do, in fact, offer the student a viable learning experience.

**Project Goals**

This project was a developmental study addressing the need for a system for planning, implementing, and managing a non-traditional, technology-intensive, academically sound college-level course of study. One of the strongest arguments for this type of educational program is to meet the needs of the adult learner. This study, therefore, focused on a system that provides the student with the freedom from the constraints of time and place, issues that are often essential to the older student’s educational process (Bowden & Merritt, 1995, p. 426). This project developed, cataloged,
and tested a set of procedures for implementing and managing a college-level, credit-bearing course that uses the personal computer and the Internet to provide the adult student with flexibility in time and place of learning.

The project developed the product in three steps. First, a *planning matrix* for analyzing desired learning outcomes of a college-course and then translating them to an Internet-based learning environment was developed. The planning matrix was tested by using it to plan and implement a college-level course that was offered entirely over the Internet as a *pilot project*. The experiences from the pilot project were then used to develop a meaningful *survey* that was given to a sample of administrators and faculty who are experienced in providing Internet-based college courses. The results of the survey were used to add depth to the planning matrix and offer insights to the effective use of the Internet and World Wide Web in a time- and place-independent educational environment, thereby providing insights for future planning efforts.

**Relevance and Significance**

There is a definite need for the potential benefits to be derived from developing a paradigm for a time- and place-independent, Internet-based learning environment for adult learners. McNair (1994), Zemke and Zemke (1995), and Boucouvalas and Krupp (1989) reported studies of the unique needs of adult-learners. Among the conclusions presented in these studies were that adult learners need flexibility in time, relevance of material, control over the educational process, and diversity in the educational process. Gordon, Morgan, and Ponticell (1995), on the other hand, identified the need for a supportive, small group tutorial environment for the adult student. Internet-based education presents the potential to meet these somewhat conflicting needs.
The Internet and World Wide Web have been utilized in both corporate training programs and college classes at the graduate and undergraduate levels (Ouellette, 1996). The University of Wisconsin-Stout, for example, has implemented LearningSpace™, an educational management tool developed by Lotus Development Corporation, as the core to its distance offering of a degree in Hospitality and Tourism. Sedlak and Cartwright (1997), in describing the program offered by the University of Wisconsin-Stout, emphasized that, by offering the courses in a time- and place-independent mode, students were able to incorporate their course activities with their work, thereby remaining current with the demands of both their educational program and their employment.

Aranda and Vigilante (1995) described an equally ambitious incorporation of Lotus Notes™ technology in an academic program at New York University’s School of Continuing Education. The Virtual College available through this university offers a degree in management to students worldwide entirely via Internet connections over ISDN telephone lines. The program includes both synchronous video conferencing and asynchronous activities, including access to video files, shared discussion groups and private lesson-submission areas. The Notes™ technology enabled the Virtual College to provide: “...an alternative to the classroom that combined the richness and collaboration of the best on-campus courses and the time/place independence and privacy of self-study courses” (Aranda & Vigilante, 1995, p. 47).

Perhaps the most ambitious example of incorporating technology in distance education is the Western Governors’ University. This virtual university is being developed cooperatively by thirteen states, with the express goal of offering students in
remote locations time- and place-independent education through the use of technology (Pipho, 1996).

In more specific terms, Fisher College, a private, two-year college, has Division of Continuing Education (DCE) campuses located throughout Eastern Massachusetts. Each campus is semi-autonomous; the Campus Director is responsible for hiring part-time, adjunct faculty to teach all the courses offered at that campus. All campuses, however, share a common set of degree programs, curricula, and syllabi for the various courses offered. Finding qualified personnel to teach certain courses is an ongoing problem for all DCE Campus Directors. Similarly, classes must often be cancelled due to lack of enrollment at a specific campus. The capacity to pool both instructors and students would significantly enhance the learning environment for the student and simplify academic management for the college. An Internet-based, time- and place-independent learning environment would present the potential to address these needs.

**Barriers and Issues**

Developing a schema for planning, implementing, and managing an Internet-based, credit-bearing college course presented several significant problems. The most prominent obstacles were:

1. Difficulty and lack of experience in producing coordinated, comprehensive Internet-based educational programs. There is a body of expertise in using the computer as an adjunct to traditional educational methodologies in the form of computer aided instruction programs (Fenrich, 1997; Abramson, 1995). The techniques applicable to using the computer as a support tool are not necessarily appropriate in using it to replace traditional educational approaches. Although there has been work on using
the Internet as a tool for delivering instruction (McManus, 1996), this research has been more focused on the mechanics of using the Internet rather than in effectively applying that technology to attaining educational objectives.

2. Difficulty in identifying appropriate instructional tools. Subject matter experts in any given academic discipline have significant experience in developing coursework to be delivered in the traditional, classroom setting. Subject matter experts with similar experience in developing courseware that takes advantage of the unique strengths and weaknesses of the Internet are rare and, in many cases, do not exist.

3. Difficulty in measuring learning. There is little agreement concerning what constitutes learning and exactly how to measure its presence and extent. College-level material entails more than merely learning facts; development of critical thinking ability is paramount. It is difficult to measure an individual’s capacity to analyze problems and plan and implement solutions without close, on-going contact with the individual.

**Research Questions**

Three research questions were addressed in this study.

1. What process is necessary to effectively plan a credit-bearing, college-level course provided via the Internet and World Wide Web in a time- and place-independent environment?

2. Can a time- and place-independent course satisfactorily meet established learning outcomes when administered to a population of adult learners over the World Wide Web?
3. What instructional methods have proven effective in promoting optimal learning in an Internet-based, time- and place-independent college course?

**Definition of Terms**

Some clarification of terms throughout this study is appropriate at this point. For the purposes of this study, the following definitions were used:

*Adult Student*

The concept of the adult, or nontraditional, student is undergoing continual revision. Traditionally considered a student in his or her late twenties, thirties, forties or older who usually takes one course at a time (McNair, 1994), colleges have increasingly found a blurring in the distinction between ‘traditional’ and ‘adult’ students (Wallace 1996). For the purposes of this study, adult learner was construed to mean a student who has a number of years separation between high school and college and has significant employment, family, and organizational responsibilities (Boucouvalas and Krup, 1989).

*Andragogy*

Knowles (1977), in a classic study of the techniques appropriate for teaching the adult learner, coined the term 'Andragogy': “…the art and science of helping adults learn” (p. 38).

*Asynchronous Learning Environment*

An asynchronous learning environment is one in which the student is not required to participate in class activities at specific times (Sedlak & Cartwright, 1997). Asynchronous does not necessarily indicate an absence of requirements for timely submission of work.
**Computer-Aided Learning**

Computer-aided learning is the use of the computer as a tool to enhance the learning process. The computer can be used to supplement a traditional learning environment (Hudson, 1996), or to substantially replace it (Laszlo & Castro, 1995). Unless otherwise noted, computer-aided learning was used in this study to indicate a replacement for the traditional classroom environment.

**Distance Education and Distance Learning**

Newlands & McLean (1996) described distance learning as a quasi-permanent separation of the teacher and the student during the term of the learning experience. Although distance education can take many forms, when used in this report it refers to a learning environment in which the student is not required to be in a specific location at a specific time: a time- and place-independent environment.

**Internet-Based Learning**

Dickinson (1997) described a learning environment in which all traditional classroom activities are emulated through Internet services, such as World Wide Web pages, discussion forums, electronic mail, and forms. Since access to the Internet is widely available, an Internet-based learning environment is in essence place-independent. An Internet-based learning environment can, however, include synchronous elements such as chat-rooms. It is, therefore, not necessarily, time-independent.

**Synchronous Learning Environment**

A synchronous learning environment is one in which a student must, in order to satisfactorily complete course requirements, participate in class activities at specifically scheduled times (Sedlak & Cartwright, 1997).
**Time- and Place-Independent Learning Environment**

A time- and place-independent learning environment is one in which the student can complete all requirements for a course without the necessity of committing to being at specific locations or being available for class activities at specific times. A time- and place-independent environment is, of necessity, a distance environment that might or might not include computer-aided enhancements.

**Web-Based Learning**

Although the World Wide Web is only a subset of the Internet, for the purposes of this study the terms Web-based and Internet-based learning were used interchangeably.

**Summary**

Chapter I served to introduce the study, establish its basic purpose and procedures, and define terms used in the study. The project addressed the goal of developing a schema for planning, implementing, and managing a time- and place-independent, Web-based college-level course for the adult learner. In addressing that goal, the study spoke to three research questions: what is the appropriate process for planning such a course, can a course delivered in this manner effectively help the adult student attain established learning outcomes, and what tools and techniques have been proven effective in the Web-based environment.

Chapter II offers a review of the related literature. It begins with a review of articles and research that establish the need for distance learning environments. The next section examines the phenomena of adult learners and the particular needs they have as students. The third and fourth sections summarize the research into the use of the computer in general and the application of the World Wide Web specifically as aids to
education. The fifth section explores the techniques utilized to plan and develop effective curricula. The final section summarizes the results of the review and draws conclusions regarding the viability and necessity of a schema for planning, implementing and managing technology-enhanced, time- and place-independent college courses.

Chapter III presents a detailed design of the study. Included in this chapter is a description of the criteria that will be used to develop the planning matrix and how that criteria will be validated. The steps in developing the product will be detailed, as will the techniques for evaluating the product. Finally, assumptions underlying this study and any known limitations and delimitations to the results will be noted.

Chapter IV summarizes the results of the study. The planning matrices developed are presented in this chapter. The results of the pilot project that tested these matrices are likewise outlined in Chapter IV.

Chapter V concludes this report with an analysis of the results presented in Chapter IV. Implications for future research are also outlined in this chapter.
Chapter II
Review of the Literature

Introduction

The scope of the proposed project touches upon several areas of study. It will be, first of all, an examination into the delivery of educational services in a non-classroom-based environment. The first section of this review, therefore, explores the history and practices of distance education.

The target population for the type of distance education that will be examined in this study is the non-traditional or adult student. The second section of this review, therefore, examines the characteristics and needs of the older student.

The method of delivery of distance educational services to the adult learner proposed in this study is heavily dependent on computer technology in general and the communications capacities offered by the Internet. The third and fourth sections of this review explore the general use of computers in education and the more specific application of the Internet to the learning process.

Ultimately, since this will be a study of educational services, it must be built upon a foundation of sound educational theory. The final section of this review examines educational theory, especially in reference to curriculum planning and development.
Distance Learning

Distance learning has been described as a quasi-permanent separation of the teacher and the student during the term of the learning experience (Newlands & McLean, 1996). Distance learning is certainly not a new concept in education. The University of London first offered a version of distance learning in the last half of the nineteenth century (Newlands & McLean, 1996). Distance learning has progressed from paper-based correspondence courses through audio- and videotapes, to live television broadcasts and computer-based programs (Roberts, 1996).

Historically, distance environments have differed from the traditional classroom setting in goals, methods, and student population. Knowles (1975) perhaps described the philosophy underlying distance education best:

Nontraditional education, on the other hand, assumes that the purpose of education is to provide learners with the skills and resources to develop their full and unique potentials. Its reason for coming into being was to provide individualization in both the ends and means of learning. It places the learner in the role of self-directed inquirer and the teacher in the role of facilitator and resource person for self-directed learners (p. 233).

Distance education has, likewise, traditionally appealed to a ‘non-traditional’ student (Roberts, 1996). Recently, however, the demographics of the students participating in distance programs have changed. Wallace (1996) reported the results of a study conducted at the University of Manitoba in Canada and concluded that distance programs are increasingly attracting students that previously would have enrolled in more traditional programs of study.

Comparison between independent study enrolment data and on-campus enrolment data revealed that the two populations do not simply mirror one another. Although both groups are getting younger, the rate of growth in independent study far outstrips the growth in on-campus enrolments, and course loads are increasing in
independent study but are decreasing in on-campus programs (Wallace, 1996, p. 22).

Distance education programs have been viewed with some askance. The separation of student and teacher and the lack of student-to-student interaction raised serious questions regarding the quality of the educational experience, especially in relation to a traditional, classroom-based program (Newlands & McLean, 1996).

Concern regarding the integrity of distance education programs, most notably ‘correspondence schools’, triggered a punitive response from the Federal Government in the most recent authorization of the Higher Education Act in 1992. That legislation disqualified schools from participation in Federally sponsored financial aid programs if over fifty percent of their enrollments or course offerings were delivered via a distance education system (Haworth, 1998; United States Department of Education, 1997a, 1997b).

Perhaps most importantly, a distance learning environment appears to foster isolation and to be antithetical to cooperative learning. Cooperative learning has been examined since the 1920’s. Since the early 1970’s, there has been heightened interest in the group learning processes, essentially based upon the ideology that “... heterogeneous groups teach life skills that are sometimes more relevant than content material” (Williams, 1996, p. 40). Increasingly, both teachers and school psychologists have recognized the value of cooperative learning: “Cooperative learning is a group learning process built on the belief that students learn better when they learn together” (Nastasi & Clements, 1991, p 110). Morales (1994) reported a noteworthy improvement in student’s academic achievement levels and ability to function in social settings resulting from
cooperative learning environments. Kochery (1997) emphasized the important role cooperative learning can play in enhancing a distance learning experience.

The sense of isolation and the lack of social support have frequently been cited as primary reasons for the disturbingly high drop-out rate during many distance education courses. Distance learners feel the lack of emotional intimacy that exists for personalized constructive feedback and they are often frustrated by the 'unapproachable' physical condition which detaches them from the instructor (p. 2).

On the surface, the computer, essentially a one-person tool that may promote a marked degree of social isolation, would not appear to be an effective instrument for promoting the social interaction fundamental to cooperative learning (Eddy & Spaulding, 1996). The ready accessibility to a wide range of communications services made possible by the Internet and practical for mass use by the World Wide Web presents the potential to overcome this isolation. Dede (1990) proposed that a properly structured, Internet-based distance environment can, in fact, offer a more valid learning experience in that it presents the potential to provide the students with greater opportunity for collaborative work with widely diverse cultures. This experience is, potentially, vital to successful competition in the increasingly global community workers will face in the future.

Studies by Merrick (1996) and Phillips (1998) reinforced Dede’s (1990) research. In analyses of several case studies of businesses that have benefited from using distance education to offer inservice training to employees, both Merrick and Phillips demonstrated that Internet-based educational programs can be delivered in a cost-effective, flexible and accessible manner.
Computer-supported distance programs are becoming increasingly more available. Hesser and Kontos (1997) in describing the masters and doctoral programs available through Nova Southeastern University, observed:

Distance education relies upon the premise that effective learning will take place given appropriate individualized instruction, combined with the individual's personal discipline and motivation to work independently. The value of individualization is realized when a student can engage in learning at any time or in any place that may fit the individual's own unique needs, whether at home, at work, or in a center for learning (p. 250).

Several elite universities, including Johns Hopkins, Cornell, Duke, Rice, and Stanford Universities, are now offering both individual courses and complete degree programs in a computer-enhanced, distance modality. Blumenstyk (1997) identified several motivations for this rather unexpected development, most notably the desire to tap new revenue streams by providing specialized education to niche markets.

Although computer-enhanced distance education programs offer promise, there are several concerns. Guernsey (1997) cautioned that the Internet has the potential to foster ‘diploma mills’ which lack rigorous academic standards and virtually create a system in which a student purchases a desired degree. Even well-intentioned academic pursuits are suspect. McKenna (1997) observed that instructors, for example, try to reinforce the learning process by directing instruction to multiple senses; can this multidimensional instruction be accomplished over a phone line or on a computer screen. Furthermore, instructors use non-verbal cues from students to judge comprehension; how can instructors monitor student comprehension without this data. Davison (1996) further explored some of the potential conflicts inherent in technology-supported, distance education. The central conflict, or paradox, is that, as an instructor, it is essential to develop an empathic relationship with students and it is particularly difficult to do so with
students working via electronic communications at a distance. Davison (1996) warned that, although computer-aided distance education approaches might satisfy the needs of both the students and the universities, one should not confuse good education with good marketing.

Using information technologies simply to satisfy the 'genuine needs of the end-user' reinforces the marketplace ideology increasingly evident in much of higher education policy and practice. 'Genuine needs of the end-user' talk is of the same discourse that equates the teacher/student relationship with a client/provider one and a discourse that is inimical to the fundamentally educative purpose of universities (Davison, 1996, p. 147).

Brewer and Erickson (1997) reported the results of a pilot project in offering a graduate level education course in a distance environment. The University of Montana offered a course in Curriculum and Instruction to a group of thirty students at a remote campus location. The students met in a classroom setting, but the instructor was 110 miles away at the main campus, communicating with the students via interactive television, electronic mail, and computer-supported learning aids. The authors presented both negative and positive lessons learned from the project. A concern regarding the development of an effective learning community within the class was evident: "Most of the challenges that occurred during the spring semester of 1996, however, arose from the different visions of teaching and learning that students, administrators, and instructors brought with them to the classroom" (Brewer and Erickson, 1997, p. 21). On the other hand, the authors noted a definite value: "Finally, and most importantly, because the professor is not in the room delivering the instruction, this mode of delivery empowers learners to construct their knowledge and become technology literate" (Brewer and Errickson, 1997, p. 22).
Miller and Husmann (1996) summarized the issues surrounding computer-aided
distance education quite effectively in their analysis of the need for a holistic approach to
planning and implementing distance programs.

The discussion of distance education must move beyond the current dimensions
of offering faculty support and new telecommunications systems. It must begin
serious dialogue about the value of all involved in teaching and learning and the
power of the learning environment (p. 109).

Computer-enhanced distance education offers the potential to overcome many of
the problems traditionally associated with remote learning environments. Winn (1985),
however, cautioned: "...it is only through the sound application of basic principles of
communication and instruction, not through bigger and fancier gadgets, that we will be
able to enhance distance education through technology" (p 3). Winn emphasized six basic
principles of effective education that must be considered in a distance education
environment: gain and keep students' attention, communicate objectives and expectations
to students, present information at a level appropriate to the student, constantly allow
feedback, provide opportunities to apply information either during or after the session,
and provide students with assessments of their work as quickly as possible.

Arreola (1995) effectively summarized the impact of computer technology on
distance education by emphasizing the need for training instructors that will be offering
technology-enhanced distance education programs. The following guidelines for effective
distance teaching were identified: become familiar with the equipment to be used by both
the instructor and the students, design the course in such a manner that the various
features of the technology are effectively used to enhance specific learning objectives,
and prepare all materials well in advance.
The ambivalence regarding the value of distance education can perhaps best be illustrated by the proposed changes to the reauthorization of the Higher Education Act currently under consideration (Haworth, 1998; United States Department of Education, 1998). The new legislation, if approved, would significantly liberalize availability of financial aid for courses and degree programs pursued in a distance environment, removing the restriction that institutions participating in Federally sponsored financial aid programs could offer no more that fifty-percent of their courses or enrollments to students involved in distance programs. The law would, however, mandate regional accrediting associations to enact stricter regulations for distance programs. The Western Commission for Higher Education (WICHE) (Krauth, 1996) and the Interregional Committee on Distance Learning (1998) have taken a leadership role in developing this universal set of standards. The following standards, as outlined by the Interregional Committee on Distance Learning (1998) have already been adopted by the North Central Regional Accrediting Association and are under review at all regional accrediting associations (Krauth, 1998):

Curriculum and Instruction

- Programs provide for timely and appropriate interaction between students and faculty, and among students.

- The institution’s faculty assumes responsibility for and exercises oversight over distance education, ensuring both the rigor of programs and the quality of instruction.

- The institution ensures that the technology used is appropriate to the nature and objectives of the programs.

- The institution ensures the currency of materials, programs, and courses.

- The institution's distance education policies are clear concerning
ownership of materials, faculty compensation, copyright issues, and the utilization of revenue derived from the creation and production of software, telecourses, or other media products.

- The institution provides appropriate faculty support services specifically related to distance education.
- The institution provides appropriate training for faculty who teach in distance education programs.

Evaluation and Assessment

- The institution assesses student capability to succeed in distance education programs and applies this information to admission and recruiting policies and decisions.
- The institution evaluates the educational effectiveness of its distance education programs (including assessments of students’ learning outcomes, student retention, and student satisfaction) to ensure comparability to campus-based programs.
- The institution ensures the integrity of student work and the credibility of the degrees and credits it awards.

Library and Learning Resources

- The institution ensures that students have access to and can effectively use appropriate library resources.
- The institution monitors whether students make appropriate use of learning resources.
- The institution provides laboratories, facilities, and equipment appropriate to the courses or programs.

Student Services

- The institution provides adequate access to the range of student services appropriate to support the programs, including admission, financial aid, academic advising, delivery of course materials, and placement and counseling.
- The institution provides an adequate means for resolving student complaints.
- The institution provides to students advertising, recruiting and admissions
Adult Education

The adult learner, a student in his or her late twenties, thirties, forties or older (McNair, 1994), presents higher education with a different set of challenges than the traditional, eighteen to twenty-five year old student colleges and universities historically served. Knowles (1977) did initial codification of the special needs of adults as students. Knowles coined the term andragogy to describe the body of techniques necessary for teaching the adult learner. "Andragogy is, therefore, the art and science of helping adults learn" (p. 38)

These differences between adult students and the more traditional college student take many forms. Knowles (1977) maintained that there are four crucial factors that differentiate the way in which adults learn from the manner in which children learn:

- The institution ensures that students admitted possess the knowledge and equipment necessary to use the technology employed in the program, and provides aid to students who are experiencing difficulty using the required technology.

Facilities and Finances

- The institution possesses the equipment and technical expertise required for distance education.
- The institution's long range planning, budgeting, and policy development processes reflect the facilities, staffing, equipment and other resources essential to the viability and effectiveness of the distance education program.

(Interregional Committee on Distance Learning, 1998)
21

...1.) his self-concept moves from one of being a dependent personality toward one of being a self-directing human being; 2.) he accumulates a growing reservoir of experience that becomes an increasing resource for learning; 3.) his readiness to learn becomes oriented increasingly to the developmental tasks of his social roles; and 4.) his time perspective changes from one of postponed application of knowledge to immediacy of application, and accordingly his orientation toward learning shifts from one of subject-centeredness to one of problem-centeredness (p. 39).

Bowden and Merritt (1995) observed that adult students differ from the traditional college student in four ways: age, needs, desires, and goals. The impact of these differences on the academic process is evident:

The four points of age, needs, desires, and goals converge on the following points for instructors: 1) the instructor must not be intimidated by the students, 2) the instructor must be prepared to show how a concept or theory applies to the everyday world, 3) the instructor must be able to demonstrate practical knowledge of the subject he or she is teaching, and 4) the instructor must respect and use the knowledge already gained by his or her adult students (Bowden & Merritt, 1995).

Boucouvalas and Krup (1989) further explored the special considerations necessary for the adult student. Adults are influenced by a constellation of factors, including relationship responsibilities as parents and spouses, and organizational affiliations and commitments. Adult learners must be viewed in the context of these specific factors regarding their position in space and time.

Brookfield (1989) related the results of studies concerning the aspects of a learning environment that are most important to the adult learner. "...first, the learners involved reported that the educational activities most meaningful for them were those in which they could make a direct connection to their past experiences or current concerns" (p. 206). "Second, learning episodes the learners recalled as being of greatest personal significance were those in which they had to confront and work through some kind of challenge" (p. 206).
The educational requirements of the adult learner extend beyond the practical considerations enumerated by Knowles (1977), Bowden and Merrit (1995), Boucouvalas, Krup (1989), and Brookfield (1989). There is evidence that the process of assimilating knowledge is different for the more mature learner than for the younger student. Griffin (1983) emphasized the need for unique curriculum considerations for adult learners, within the context of lifelong education.

Zemke and Zemke (1995) further explored the specific andragogical needs of the adult student. They concluded that, although a single-faceted theory was inadequate for identifying the unique needs of the adult learner, some general principles regarding the adult as a student are apparent. Timing is vital in adult education; adults usually have rather small ‘windows-of-opportunity’ during which they are receptive to learning a new task. The learning process must incorporate practical application of the subject matter and be problem-centered. Finally, facilitation, as opposed to the lecture approach, is much more likely to be successful for the older student. Zemke and Zemke’s conclusions were consistent with those made by Tennant (1991):

The idea of self-directed, autonomous learning is firmly entrenched in the adult education literature. It is one of only a few core concepts that have laid the foundations for the identity of adult education as a distinct field of practice and inquiry (p. 194).

Griffin (1991) explored the impact of social theory on adult learning, planning, and development. The author highlighted a very significant paradox regarding the goals for adult learning:

For example, the literature of adult education often refers to the need for people to adapt to changing circumstances, particularly those of economic and technological change in the workplace. At the same time, adult learning practices are determined by a conception of individual autonomy and self-direction (p. 260).
Beder (1989) reviewed the purposes and expectations for adult education since its recognized inception in the 1920s. Beder identified four basic purposes for adult education: "the basic purposes of adult education can be collapsed into four major categories: (1) to facilitate change in a dynamic society, (2) to support and maintain the good social order, (3) to promote productivity, and (4) to enhance personal growth" (p. 39).

Garrison (1989) provided a clear link between the needs of the adult learner and the strengths offered by a distance education approach. The author rather narrowly defined a distance education environment as one that met three criteria: non-contiguous communication between instructor and student, availability of two-way communication between instructor and student, and use of technology to institute the two-way communication. The author highlighted how a distance learning environment promoted lifelong learning and enhanced self-directedness, two widely acknowledged elements important to the adult student.

Sork and Caffarella (1989) explored the steps involved in planning an adult-education program. The authors identified six steps: "The six steps are (1) analyze planning context and client system, (2) assess needs, (3) develop program objectives, (4) formulate instructional plan, (5) formulate administrative plan, and (6) design a program evaluation plan" (p. 234).

**Computer-Aided Instruction**

A review of the literature of computer-aided, or online, instruction reveals a wide range of ways in which computers have been incorporated into the educational process.
Weiland (1995) observed that the traditional classroom training ground is slowly being replaced by a more multifaceted approach that includes computers, interactive instructional tools, and multimedia training. These changes are being made for several reasons: ease of scheduling, reduced expense, reduced space demands, and greater responsiveness to individual needs.

The four schema detailed below provide a good working definition for analyzing the various ways in which computers have impacted education. Although these categories —locus of control, timing, role in the learning process, and value added— overlap in several areas, they do provide a broad perspective of the various aspects that affect the value of a computer-aided learning experience.

*Locus of Control*

Schwier (1993) suggested three online learning environments: prescriptive, democratic, and cybernetic. Prescriptive implementations, notably drill-and-practice computer-aided-instruction programs, are instructor-centric and rigid. Democratic environments offer the student options in navigating through the experience, thereby fostering a greater degree of self-directed exploration. The student is, however, still bound by the limits of the instructor/author’s perspective and knowledge. Cybernetic environments, finally, are almost organic in nature. They incorporate expert systems, heuristic designs, and virtual reality, creating an environment that adapts to the student’s actions. In a cybernetic environment, the educational experience varies based upon a student’s actions.

Increasingly, learning theory is emphasizing the importance of actively involving the student in the learning process. In reference to adult learners, this active involvement
is especially important. Zemke and Zemke (1995) and Boucouvalas and Krupp (1989) studied the unique needs of adult learners and concluded that this student population requires flexibility in time, relevance of material, and control over the educational process. Cybernetic computer-based learning environments as described by Schwier (1993) present the potential to meet these needs.

**Timing**

Online learning resources can be either synchronous or asynchronous in nature (Sedlak & Cartwright, 1997). Synchronous environments require the student to be available to participate in the learning activities at specific times; asynchronous environments are time-independent. Both synchronous and asynchronous systems are in extensive use, each with its own strengths and weaknesses.

Newlands and McLean (1996) described a synchronous, online learning system in which distance learners were supported by a combination of audio conferencing and a shared electronic ‘white-board’. These enhancements to the distance learning environment offered students meaningful feedback on their progress on course work, promoted collaborative learning, and essentially alleviated both teachers’ and students’ reservations about the quality of a distance learning program.

An example of an asynchronous online learning environment can be found in New York University’s Virtual College (Aranda & Vigilante 1995). The Virtual College offers distance education via a Lotus Notes™-based, multimedia database available through telephone connections. By making participation in the course work totally asynchronous, greater student-to-student interaction was observed, students were able to better incorporate the course work in meaningful, job-related activities, resulting in “... a
learning environment that was more accessible, richer, and more engaging ...” (Aranda & Vigilante, 1995, p. 46).

Role in the Learning Process

Online educational courses can play one of three possible roles in the overall learning process. The computer can be used to enhance traditional educational systems, to replace them, or to offer learning experiences not previously available.

Delclos and Hartman (1993) conducted a study of the effectiveness of augmenting traditional lectures in an educational psychology course with multimedia presentations. They discovered that students from the multimedia course used more research and theory to support their analyses and integrated their presentations of observation and theory better than those in the traditional course.

Aranda and Vigilante (1995) and Pipho (1996) described two separate instances of online learning systems that totally replace conventional educational delivery systems by means of ‘virtual colleges’. New York University’s Virtual College (Aranda & Vigilante, 1995) engaged in a re-engineering of education, bringing to question the necessity of many traditionally held beliefs about education, including: the need for a classroom, the need for live meetings held on a fixed schedule, and the value of organizing course content in a linear, instructor-paced fashion. The goal of both New York University’s Virtual College and the Western Governors’ University (Pipho, 1996), is to broaden access to higher education by the use of online learning resources as an alternative to traditional classroom experiences.

Computer-aided education offers the potential to explore areas unavailable in the traditional classroom setting. Hatfield (1996) described the use of multimedia in pre-
service education of mathematics teachers. Prospective teachers experienced, in a virtual classroom setting, the effective use of educational approaches such as mathematical modeling, group problem solving, and the use of manipulatives. This virtual experience enabled the students to grasp the concepts and internalize the thought processes underlying the subject matter to a much greater extent than students learning the same material in a traditional classroom. The multimedia-based virtual classroom offered a realistic setting in which the student felt safe to experiment with new approaches, thereby promoting greater personal involvement in the instruction.

In a similar vein, Scardamalia and Bereiter (1996) described the process of ‘knowledge building’ fostered by use of networked computer resources in a Computer Supported Intentional Learning Environment (CSILE) under development in Canada. This system extends the educational environment to include elementary and high school students, their parents and teachers, college students, instructors, medical school students, staff members from several libraries, businesses, and governmental agencies. All these resources share a common network and, although each has private areas on the network, the vast majority of the data is available to all for search, query and comment. The goal of the CSILE is to “… enable participants to gain knowledge and understanding and also form important new working relationships, but without being overwhelmed by long lists of notes requiring responses“ (Scardamalia & Bereiter, 1996, p 7).

Value Added

Regardless of the goals, locus of control, timing, and role in the learning process of a computer-aided instructional medium, the value the product adds to learning is paramount. There are, perhaps, an infinite number of ways something can add value to
the learning process. There is, furthermore, a very legitimate discussion regarding the net result, positive or negative, of the computer in education. This discussion will review four areas in which the computer has been shown to add value to the learning process: supporting distance learning, supporting cooperative learning, providing enhanced feedback to students, and enriching the learning experience.

Distance educational environments have, as mentioned in the *Distance Learning* section above, been viewed with concern by much of the education establishment. The primary concern centers on the separation of student and teacher. The increased use of computer technology presents the potential to alleviate these concerns regarding the legitimacy of a distance learning experience. Computer-based distance learning has progressed to the point that thirteen states have collaborated in the creation of a ‘virtual university’ — the Western Governors’ University — that was designed to fulfill two main purposes:

* to broaden access to higher education by fostering the use of advanced technology for the delivery of educational services and
* to provide mechanisms for the formal recognition or certification of learning achieved, regardless of the source (Pipho, 1996, p 7).

Ehrmann (1996) identified three significant obstacles to be addressed by post-secondary education in the new century: access to educational services, meeting the changing needs for education, and controlling costs of education. The author identified computer-enhanced, distance education as a very viable solution for all three of these challenges. In examining the capacity of computer-enhanced distance learning environments to provide quality education, Ehrmann (1996) posited four elements inherent in a quality program: person-to-person, real-time communication; asynchronous communication in the form of homework assignments; broadcast information in the form
of textbooks, lectures, and videotapes; and learning-by-doing exercises. Computer-enhanced, distance programs offer the greatest potential benefit in the learning-by-doing category, and present the greatest challenge in the real-time communications aspect.

Schrum and Lamb (1997) reviewed the efforts in place at the United States Air Force Academy to develop distance education services enhanced by networks equipped with groupware software. The authors observed: "The network has utility even in an educational setting which prides itself on small, face-to-face classes. One of the primary uses at this time appears to be possibilities for collaboration after class hours on research projects and papers" (p. 27).

Although the personal computer presents the potential to promote a marked degree of social isolation, several studies have found the opposite to be true. Pence (1993) studied the impact of incorporating multimedia presentations — computer simulations, for example — and group activities in a traditional, lecture-based introduction to chemistry class. The author discovered a significant reduction in the number of course failures and withdrawals and significantly greater group discussion for the groups that experienced the combined multimedia presentation compared to the control group that experienced the traditional classroom lecture format.

In a similar study, Hudson (1996) observed the effect of incorporating multimedia presentations and collaborative learning activities on high school mathematics classes. The students participating in this study viewed a multimedia presentation, then used that presentation as the basis for a group problem-solving exercise. The group then developed a solution to the problem, using computer technology — a spreadsheet program — as a
tool. The author found, “... that the use of collaborative group work with multimedia has the potential for generating high levels of pupil motivation and collaboration” (p. 189).

Alavi (1994) reported a more inclusive use of online learning to promote cooperative learning: the use of a computer-based Group Decision Support System (GDSS). The study examined the impact of incorporation of a GDSS in the curriculum of an introductory Management Information Systems course offered to MBA students. The experimental group in the study had access to the GDSS to support their group case analysis, while the control group accomplished the same tasks without the benefit of the computer-based system. Alavi (1994) found that students exposed to the GDSS reported higher levels of satisfaction with the course and scored significantly better on the final exam than the control group.

Learning theory has long emphasized the importance feedback to the student plays in the learning process (Whaley & Malott, 1970). Online environments offer the potential for more immediate and richer feedback than the more traditional educational modalities.

Heller (1990) described the role hypermedia —an integrated computer-based environment including video, animation, graphics, sound, text, and, most importantly, linking — can play in enhancing feedback to students. The rich learning environment available through hypermedia promotes the process of discovery learning: “... an activity of the learner in which the learning environment provides opportunities for the exploration of alternatives and results in the understanding of relationships that were previously unrecognized” (Heller, 1990, p 433). In a discovery learning environment,
the student receives immediate and real feedback for his or her actions from the computer.

The richness of an online, discovery learning environment is not without its perils. Heller (1990) identified four potential disadvantages to the incorporation of hypermedia in education: “... disorientation, cognitive overload, flagging commitment, and unmotivated rambling” (p. 432). Further questions about the value computer technology can add to learning were presented by Wenger and Payne (1994), who conducted research on the benefits to learning to be derived from enhancing a hypertext document with a representation of its structure using a graphical browser. "The results indicate that the browser had no effect on recall, comprehension, or recall of text structure. However, the browser did increase the amount of text read by users and reduced the number of nodes repeated during reading." (p 224)

Jacobson and Spiro (1995) reported the findings of a research project conducted at the University of Illinois at Urbana-Champaign to determine the impact of nonlinear, multidimensional environments on learning. The study used a control group that was exposed to the material in an environment featuring minimal hypertextual features, and an experimental group subjected to the same material in a hypertext-rich environment featuring instructional material presented in multiple contexts to highlight different facets of the knowledge-base. The research indicated that the control environment appeared to promote better acquisition of factual material, while the hypertext-rich environment promoted greater facility in transferring the knowledge gained.
Laszlo and Castro (1995) examined the shift in the perceived role of education from producing "knowers", or people who possess a group of facts, to "learners", or people equipped to adapt to the rapidly changing environment in which they live.

As our educational system shifts its focus from the production of passive knowers to the facilitation of active learners, and as it reorients its mission from the hatching of workers with limited skills for specialized jobs to the formation of whole people capable of managing the complexities of life in rapidly changing environments, the process of personal development needs to become the cornerstone of the educational process (p. 12).

The authors highlighted how computer-based educational systems offer the potential to foster active learners by providing the opportunity "to learn at one's own pace and level in an interactive environment that engages as much of the learner's attention, imagination, and sensation of being relevantly present in the learning context as possible” (p. 10).

Multimedia — presentations that include text, graphics, videos, animation, sounds, and hyperlinks — offers the potential to imbue the learning environment with a greater range of experiences than otherwise possible. Learning experiences that would traditionally be too dangerous, too expensive, or of questionable morality can be provided safely and economically via multimedia.

Delclos and Hartman (1993) reported the use of an interactive multimedia system in an introductory course in educational psychology. Their hypothesis was based upon the observation that, although traditional teaching tools such as lectures and textbooks can facilitate learning the declarative content of a topic, they do not provide the perceptual experiences necessary for analyzing various learning situations. The study tested the use of interactive multimedia simulations to demonstrate the application of modern cognitive psychology to typical classroom interactions. Although preliminary in nature, the results of the study indicate interactive multimedia applications can indeed
engender greater analytical problem solving capacities than traditional educational methods.

In a similar study, Hatfield (1996) examined the effectiveness of interactive multimedia on pre-service training experiences for mathematics instructors. A central problem for such training endeavors was getting the students to experiment with different educational approaches in actual classroom situations. By simulating various classroom events with interactive, online multimedia presentations, the student was able to more freely experiment with alternative teaching techniques.

The potential benefits to be realized from incorporating computer technology in the learning process are not without hazards. Solomon (1994) reviewed recent examples of how technological advances did not perform as promised. Over the past twenty years, three innovations — the television, the microcomputer, and multimedia — offered the promise of significantly enhancing education but did not in fact fulfill that promise. The primary reason for this lack of significant impact, according to Solomon, relates to the culture of higher education, in which most faculty in research institutions and large institutions do not feel they have the time to engage in serious innovation.

Brunt (1996) emphasized the need of adult learners for personal support, especially early in the learning process. Since "... adult students bring with them what many practitioners would term 'baggage'; personal difficulties, financial hardship, lack of confidence and negative memories of their previous learning experiences" (p. 115), the need for personal support can be crucial. The author warned that, although distance approaches enhanced by technology such as the Internet, might be attractive to the adult
student for several reasons, many adult students might not be able to benefit because of the lack of meaningful, personal support.

Computer anxiety is another factor that can negatively impact the value of the computer in an educational environment. Although conventional wisdom suggests that computer anxiety will eventually evaporate as the computer becomes increasingly more omnipresent in our society, several studies indicate the opposite. Parish and Necessary (1996) administered the Computer Attitude Scale to 164 undergraduate students and detected a marked degree of anxiety, especially among those who do not own their own computers. These findings were consistent with those of Gos (1996), in which a survey of 185 college students indicated that prior experience, whether pleasant or unpleasant, was the strongest predictor of computer anxiety. Similar studies by Hemby (1998) and Doronina (1995) produced like results.

Connell (1996) and Pallas (1996) voiced similar concerns regarding the readiness of faculty to effectively use technology in the learning process. Connell (1996), in a report of a study of a computer-supported, distance learning project conducted at Northern Arizona University, observed the following difficulties:

…limited access to equipment and support services; fragmented planning regarding the appropriate uses of IT; poor communication among the various levels of the culture, even about 'good practice' in IT use; underestimating the difficulties posed by the learning curve for adoption of new technologies; unrealistic expectations about the technical products; and, the traditional faculty reward system (p. 163).

The results of this study lend support to Pallas’ (1996) observation that:

“…faculty and administrators need to be taking the time to analyze curricula, before spending money on technology. Unless there is a satisfactory answer to the question, 'Why am I using this technology?’, it should not be used” (p. 5).
**Web-based Education**

The World Wide Web is becoming an increasingly more popular resource for the provision of college-level courses. Gubernick and Ebeling (1997) reported that over 762 colleges and universities currently offer courses via the Internet. Hamalainen, Whinston, and Vashik (1996) observed that as our culture evolves, the demands placed upon education change. The amount of information necessary for successful competition in our society is growing rapidly and, in many cases, becomes obsolete just as quickly. To meet these demands, education must evolve, addressing emerging issues such as team-based organizations operating in a geographically-dispersed environment. Technology, specifically electronic publishing and the Internet, offers the potential to meet these needs.

Reports of the effective use of the medium as an educational delivery system are readily available. Barnard (1997) reviewed several current efforts to provide college-level coursework via the Web, including the Western Governors' Association's Virtual University. In the review, the author identified two significant benefits attendant with Web-based coursework. First, many students are more likely to participate actively in class discussions: "Many students are more comfortable composing their thought on a topic after some reflection. There is less opportunity for a few individuals to dominate conversations..." (p. 32). Second, student-faculty interactions are often greater in the Web-based environment than in the large, lecture-hall classroom.

In a similar study, Powers and Mitchell (1997) reported the results of a Web-based, graduate-level course offered in a distance environment through Indiana State University. One of the authors of the report taught the course being reviewed, and the
second author was a student in that course in Accessing Information through Technology. The authors reviewed the various documents created as part of the course process, including e-mail, listserv contributions, and student journals. Four salient factors emerged from their analysis: a learning community did in fact develop even though the course was only five weeks in duration and the students met neither the instructor nor classmates in person; student-to-student interaction was more pronounced than in a traditional classroom setting, with students demonstrating a marked degree of willingness to help each other; the faculty student relationship evolved more to a peer-to-peer, mentoring nature as opposed to the more traditional student-teacher relationship; and the students indicated that taking a course over the Internet required more work on their part than in a traditional classroom setting.

Dickinson (1997) summarized the manner in which traditional classroom activities can be simulated over the Internet in a Web-based learning environment. The author maintained that Web pages can replace classroom lectures, graphics, and videos, e-mail and chat rooms can emulate discussion and student-teacher dialogue, and forms using Common Gateway Interface (CGI) scripting can be used to evaluate a student's progress. The article did not, however, offer detail in how to translate material an instructor developed to use in a classroom to the particular strengths and weaknesses inherent in a Web-based environment.

Dyrli and Kinnaman (1996) were even more enthusiastic regarding the potential of the World Wide Web in education. These researchers identified several factors associated with Web-based learning that enhance the educational process. Included in these issues are: information is distributed across the globe, not just in the school;
information is accessible in a webbed manner, not the traditional linear format; teachers and students can, in this environment, become much more involved as information producers than in the conventional classroom setting.

Owston (1997) was equally enthusiastic regarding the role the World Wide Web can play in education. While acknowledging that, although "…after more than 50 years of research on instructional media, no consistent significant effects from any medium on learning have been demonstrated" (p. 29), the Web has been demonstrated to offer the instructor at least three features that can be used to enhance the learning environment: the Web appeals to students, it is flexible, and it has the potential to foster development of critical thinking and problem solving skills.

Starr (1997) reinforced the observations of Dyrli and Kinnaman (1996) and Owston (1997). This author identified three primary advantages to be derived from providing educational services over the Web: "There are three keys to the educational value of the World Wide Web that are important to the instructional designer: hypertext, the delivery of multimedia, and true interactivity" (p. 8). These keys, according to Starr, enable Web-based instruction to more effectively address higher-level learning activities such as problem solving.

Stevens and Greenwood (1996) offered a more balanced analysis in a summary of the results of a four-year study of incorporating computer technology and Internet access into a distance learning environment. The study focused on two graduate-level, executive education programs available in New Zealand in which remote access to the University network, library databases, Internet resources, e-mail, lecture resources, and real-time computer-based conferencing were incorporated. The results of the study were somewhat
mixed. There was an indication that the computer-based distance education approach was viable, in that grades of participants improved significantly after the introduction of the technology. The results, however, were not uniform across all courses and programs. The authors concluded that success was found to be dependent on factors such as the culture within the program of study, the structure of the program, participant motivation, and the 'buy-in' of faculty.

Martinez and Sweger (1996), in a report of a study on the use of telecommunications in education conducted by Oklahoma State University School of Occupational and Adult Education in November, 1995, likewise identified several concerns regarding the Internet as an educational delivery mechanism. Several issues regarding the effective use of this technology were identified by participants in this study. Among the main difficulties cited were: lack of personal contact, need for faculty training on the effective use of the technology, costs associated with establishing and maintaining systems, and difficulty in addressing technical problems that occur while teaching.

The pedagogical and administrative techniques for providing educational services via the Internet are, indeed, different from those involved in the more traditional classroom setting. Unfortunately, much of the literature regarding provision of educational services via the World Wide Web focuses on the technical aspects of delivery.

McManus (1996) offered an excellent overview of the hardware, software, and programming necessary to present a course of instruction via the World Wide Web. Ouellette (1996) provided additional depth to the tools available for promoting learning via the Internet by describing how cooperative learning could be incorporated in a Web-
based course through the use of groupware products such as Lotus Development Corporation’s LearningSpace™. Scigliano, Levin, and Horne (1996) summarized the lessons learned regarding the use of the Internet and World Wide Web as a tool to promote student interaction in distance education environments. The authors identified four basic goals for use of the Internet and student Web pages in a distance education environment: improving student-to-faculty and student-to-student communication, offering students the opportunity to make their work available to others, introducing the student to the Internet in a meaningful way, and creating a forum in which students can work together in a synergetic manner. These authors further identified specific criteria for effectively implementing an Internet-based, interactive teaching environment. Of special importance in these criteria was the observation that a distance environment requires a special sensitivity on the part of the instructor to the difficulties in maintaining awareness of student progress and problems in an Internet-based environment.

Sullivan, Stewart, and Spille (1997) presented a brief overview of non-traditional educational delivery systems. The authors identified five key guiding elements affecting the quality of distance education programs: the design of the learning system, the support offered, the commitment of the organization, the attention paid to learning outcomes, and the manner in which technology is incorporated. In a similar effort, Porter (1997) reviewed distance learning and the use of technology, most specifically the Internet, as a learning support device in an almost cookbook approach to planning, funding and implementing an Internet-supported, distance learning environment. Once again, the depth of coverage was, however, somewhat disappointing. Porter (1997) addressed these issues in rather general terms, raising them as issues that must be taken into consideration.
when planning a Web-based course, without offering either technical guidance or insightful case studies.

Ragothaman and Hoadley (1997) reviewed methods in which the World Wide Web and other Internet services have been employed by colleges offering business courses. The authors identified eight methods in which these technologies have been used: expanding the scope of case analysis, posting material on a Web page, promoting cooperative-learning through the use of e-mail, using the anonymity provided by e-mail to encourage reticent students to participate in class discussions, access curriculum materials via the Web, enhance depth of coverage on a topic by e-mail from electronic guest lectures, access to vast research assets, and flexibility in providing executive education where and when needed by the students.

Stone and Bishop (1997) specified the process of designing a Web-based training course. The authors identified seven steps for developing any item of computer-based courseware: needs assessment, determine scope and creative treatment for course content, develop a rapid prototype, storyboard the course, build the course, test the course for usability, and perform quality assurance testing.

Trentin (1997) emphasized that the successful incorporation of a Web-based course requires attention to three aspects of the network structure: the physical connection to the network, the basic telecommunication services to be included, and the manner in which those services will be utilized to meet the educational goals of the course. The first two aspects are largely technological in nature, while the third is decidedly methodological.

Structuring a communication environment for both network-based educational activities and tele-teaching does not just require technological know-how, but also
(and perhaps above all) calls for the capacity to design and plan communication between participants at a logical level. This is an ability possessed chiefly by those who are well-versed in the issues surrounding educational design and management, as opposed to those with greater technical know-how, as important as this contribution may be (p. 25).

Although providing educational services via the World Wide Web is indeed technologically feasible, it is not necessarily an effective tool for promoting learning. Hayes (1997) highlighted concerns regarding the trend toward Web-based education, most specifically as manifested by the Western Governors’ University. The author emphasized:

In a real university setting, students learn at five levels: (1) information and acquisition of skills, the most rudimentary and obvious component of an education; (2) mastery of communication skills through oral reports, classroom discussion, and research papers; (3) better understanding of individuals of different ages, races, sexes, and cultures to an extent not possible when learners and teachers know one another only by e-mail; (4) greater breadth and depth of learning from courses sequenced logically into a curriculum; and (5) guided discussions that prompt students to reflect on the values and ethical implications of issues and ideas. The ‘virtual university’ is targeted only at the first of these levels, thereby providing instruction but not education (paragraph 9).

Kilian (1997) presented a balanced view of the pros and cons of providing an education program via the World Wide Web. Some salient points raised by the author included: "It's [Web-based course] NOT organized like a F2F [face-to-face] course. We may try to impose some kind of hierarchical, linear order on it, but the online medium remains essentially hypertextual" (p. 32). Regarding the instructor-student relationship, Kilian observed, "…online education is changing our roles. It's encouraging an egalitarian mentor-apprentice relationship, in which it's sometimes hard to tell who's mentoring whom" (p. 32).

Education via the World Wide Web entails a reassessment and reordering of the roles of both student and teacher and the methodologies used to facilitate learning. As
Hamalainen, Whinston, and Vashik (1996) warned, technology alone will not solve the problems confronting education in our changing culture. New educational models that effectively use the technology must be developed.

The convergence of computing, communication, and document management technologies and the pervasiveness of computer networks - the Internet in particular - have an extraordinary potential for transforming education to meet the growing need for customized, on-demand learning. However, educational resources, combined with powerful tools for electronic publishing, delivery, and collaboration, are just building blocks of the solution. A new model of course production, delivery, and presentation is needed to combine an individualized approach, flexibility, and ease of dissemination without sacrificing the effectiveness of learning (p. 59).

**Curriculum Planning and Development**

Although computer technology presents the potential to enhance learning experiences, especially for the adult learner, potential is not a guarantee of success. The capacity to extend the learning environment that computers offer will be meaningful only if the technology is applied in an effective manner. Brooks (1997) emphasized that: “While it may seem that virtual education in some form is inevitable, those of us who value the best principles of teaching and learning can act to ensure that the tools technology offers are used wisely and productively” (p. 7).

Soloway, et al. (1996) emphasized the importance of grounding the design of educational applications in accepted learning theory. These authors examined the applicability of the computer within the educational paradigm of constructivism. Constructivism is based upon the perspective that learning is an active process in which the student builds knowledge more through the use of information than the passive reception of it. Smock (1981), in a review of the constructivism theory, likewise identified the importance of active participation by the student in the educational process.
The development of figurative thought, and the capacity for creativity, is dependent upon the interaction between the student and the environment. Active interaction between the student and the subject being learned has been shown to be a vital aspect of an effective education program.

Halsall and Hustler (1996), in a review of the state of higher education in Great Britain, emphasized the need to refocus education from the old, passive-learner perspective to a student-centered, active-learner paradigm, the need to base evaluation of learning on a criterion-referenced assessment and competences, the importance of viewing learning as a life-long enterprise, and the need for increasing flexibility in times and places of learning to better meet the expanding needs of students. In a similar vein, Hustler and Hodkinson (1996) reviewed the arguments offered in support of student-centered learning practices, including active learning, cooperative learning, and flexible learning. These authors identified three primary justifications for this learning perspective when applied to a higher education setting: it is supportive of democratic principles and social justice, it is more likely to promote life-long learning efforts, and it is more oriented toward the needs of business and career development.

Bloom, Engelhard, Furst, Hill, and Krathwohl (1956) presented a matrix for categorizing levels of cognitive development and identified applicable learning objectives for each level. The authors identified six increasingly more complex categories of understanding: knowledge, comprehension, application, analysis, synthesis, and evaluation. Bloom (1994) later amplified the taxonomy by recognizing the importance of the individuality of the learner:

The more modern view of the learner is that his or her ability is neither permanent nor highly stable; rather, it is highly alterable when proper stimulation and
experience are provided. Furthermore, the teaching of higher mental processes need not be limited to the gifted or otherwise "deserving." Finally, recent research in the area of cognitive psychology will likely enhance our understanding of higher mental processes. Past research has demonstrated that as higher mental processes are emphasized and taught, lower level skills can be learned concomitantly (p. 8).

Anderson (1997) outlined several changes to Bloom's taxonomy that will be included in an upcoming revised Handbook. This author emphasized that the concept of knowledge is being expanded over that originally posited by Bloom. The distinction between knowledge content and process was made, indicating two dimensions to knowledge. "Most, if not all, educational objectives can be stated in the form: the student will VERB the NOUN PHRASE, where the verb corresponds with the cognitive process (dimension 1) and the noun phrase corresponds with the relevant knowledge (dimension 2)" (paragraph 8).

The availability of personal attention is a widely accepted aspect of an effective learning environment. Bloom (1984) reported the results of a study that compared a traditional classroom environment with one enriched with one-to-one tutoring. The students involved in the tutoring environment averaged two standard deviations higher on achievement tests than those in the traditional classroom. The value of personalized instruction was further emphasized by Gordon, Morgan, and Ponticell (1995), who related the success of individualized instructional programs in teaching a wide variety of material to management, employees, and unions within business and industry.

Currie (1995) reported the results of a case study in which the several different theories of learning were assessed based upon post-training reports from participants in a series of 20 one-day training modules for managers in the health care field. The author concluded the following, based on the written feedback of the participants. Learning was
more effective when learners applied concepts and techniques in a relevant way, using the learning cycle to structure the session into steps. Learning was most likely to take place when learners engaged in an activity which suited their learning style. Positive feedback definitely enhanced learning, but most participants had the greatest difficulty in learning because of an expressed feeling that they would not be able to make meaningful changes in their workplace even after the training.

Incorporating established learning theory in the planning process for computer-aided instruction is, indeed, practical. Chen (1995) detailed a rubric for developing and analyzing computer-based learning environments that included consideration of cognitive theory, pedagogical technique, and student activity. The author described a three-dimensional matrix to be used in characterizing a learning environment. The first dimension represents the type of knowledge to be acquired: domain, operating, affective content, or implementation knowledge. Since acquisition of each of these types of knowledge can be facilitated with a different pedagogical approach, the second dimension for the matrix is teaching strategy: setting goals, instruction, demonstration, explanation, illustration, and questioning, for example. The third dimension of the matrix, physical attributes of the presentation, includes textual, graphical, images, animation, and sound.

Locatis and Weisberg (1997) reviewed the use of the Internet as a tool to provide distance education services in light of an evolving educational paradigm. These researchers maintained that education is undergoing a paradigm shift from teacher-centered, passive learning to an active, learner-centered perspective. The goals for learning are, likewise, shifting from simple acquisition of facts to development of
problem-solving capacities. Although the Internet has, to date, largely been used as an extension of the old paradigm, with the bulk of interaction limited to teacher-centered e-mail and instruction contained on Web pages, there is the potential to use this tool in the new.

Locatis and Weisberg (1997) identified five areas in which the Internet could enhance learning. The Internet provides access to a larger and richer array of information resources. Since there is not a single authoritative source, students are almost forced to develop the capacity to make decisions regarding which source to consult, thereby enhancing both decision making and problem solving abilities. The communication capabilities of the Internet can promote cooperative team learning. Finally, the dispersion of authoritative sources of information allows the teacher to assume the role of mentor rather than authority figure.

Summary

A review of the literature does suggest that the adult is a distinct type of learner and distance education does indeed differ from traditional, classroom-based delivery modalities. The techniques, policies, and procedures used in a traditional educational setting quite possibly would not be the most effective and efficient methods of providing educational services to the mature student in a distance environment. The specifics, however, of what would constitute an optimal distance learning environment for an adult are still not adequately articulated.

The application of the computer to the educational process both in general terms and as a device to enhance communication via the World Wide Web, was also examined. There is adequate evidence in the literature that the computer in general and the Web in
specific can enhance the learning environment in both the classroom and distance setting. There was, however, ample indication that incorporating technology in the educational program without adequate planning and development produces unsatisfactory results. Although there is an abundance of research regarding curriculum planning, the specifics of how to optimally use the computer and the Internet in a distance environment for adult learners are still not adequately articulated.

This study will address this absence of specifics regarding the provision of computer-enhanced, distance learning services to adult college students. The primary contribution of the study will be a schema for analyzing, planning, implementing, and delivering a time- and place-independent, credit-bearing, college-level course over the Internet.
Chapter III
Methodology

This chapter begins with an examination of the procedures that were followed in developing the matrix for planning, implementing, and managing an Internet-based, time- and place-independent, college-level course. The chapter concludes with an exploration of the assumptions made regarding the product and its development and any known limitations or delimitations on the applicability of the product.

Development Procedures

The development of the matrix for planning, implementing, and managing a time- and place-independent, Internet-based course included four elements. The initial step was to establish the criteria or goals and objectives the matrix must attain. Following the development of these criteria, the method of validating or assessing the meaningfulness of the proposed goals and objectives was addressed. The third step in the development process was to produce the matrix, and the final step entailed evaluating the product.

Criteria Establishment

Three general goals were established for this project.

1. The matrix produced in the project could be used to develop a college-level, credit-bearing course that meets the same learning outcomes established for similar courses offered in a traditional, on-campus delivery method.
2. The matrix produced in the project could be used to develop a college-level, credit-bearing course that could be successfully completed by the adult student in a time- and place-independent manner. The adult learner would be able to meet all course requirements and attain all learning outcomes without the necessity of attending scheduled classes or traveling to specific locations.

3. The matrix developed effectively incorporates the strengths and overcomes the weaknesses inherent in the Internet and World Wide Web as an instructional delivery mechanism.

Since Fisher College, the institution participating in this study, had not previously offered coursework in either a distance environment nor through the World Wide Web, involvement of a wide cross-section of College personnel in the planning process was vital to the ultimate success of the project. A group of seven experienced faculty and staff members (Appendix A) were assembled as a formative committee for this project. The committee generated a criteria list for the project in the form of questions regarding the provision of time- and place-independent educational services over the World Wide Web (Appendix B). A modified Delphi Process (The Consummate Design Center, 1996) was used to develop group consensus on the most significant issues to be addressed in a computer-supported, time- and place-independent educational delivery system.

Criteria Validation
The questions developed by the formative committee were validated by a review conducted by the Board of Directors of the National Council for Continuing Education and Training (NCCET) (Appendix C), meeting in Boston, Massachusetts. These questions were rated by the NCCET Board of Directors on a Likert-type scale with the
five categories indicated in Figure 1. Any question receiving an average score of less than 2.0 was considered invalid and removed from the criteria list. Refer to Appendix D for a copy of the questionnaire.

<table>
<thead>
<tr>
<th>Rating</th>
<th>Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not of any concern</td>
</tr>
<tr>
<td>2</td>
<td>Must be investigated, but does not have to be resolved prior to proceeding with planning or implementation</td>
</tr>
<tr>
<td>3</td>
<td>Of moderate concern and must be addressed prior to implementing the program</td>
</tr>
<tr>
<td>4</td>
<td>Of great concern and must be resolved prior to implementing the program</td>
</tr>
<tr>
<td>5</td>
<td>Of over-riding concern and an acceptable resolution is unlikely</td>
</tr>
</tbody>
</table>

**Figure 1** Rating scale for the criteria validation questionnaire given to the Board of Directors of the National Council for Continuing Education and Training.

**Product Development**

The planning matrix for implementing and managing an Internet-based, time- and place-independent college course was developed in three major steps, each of which was comprised of two or more sub-steps. An overview of these major steps follows; a detailed timeline for product development is included in Appendix E.

The first step entailed developing a model that satisfied the criteria for a time- and place-independent course established by the formative committee. Three categories of criteria were included: administrative issues, management issues, and instructional issues. A separate sub-matrix was developed for each category.

The sub-matrices for the administrative and management issues are relatively simple. The sub-matrix for the instructional issues, on the other hand, is rather complex. Four products were developed for this sub-matrix: a list of learning outcomes; a list of Internet-based tools appropriate for an educational environment; a matrix comprised of
learning outcomes, classroom methodologies, and Internet-based methodologies; and finally, a listing of learning outcomes organized by Internet-based methodology.

Upon completion of the three sub-matrices, the second step of the development process was to test the planning matrix by using it to develop and offer to adult students an Internet-based, time- and place-independent college course as a pilot project. This step is further detailed in the Product Evaluation section of this chapter.

Upon completion of the pilot project, the third step in product development was executed. As anticipated, the pilot project generated as many questions as it answered. This step entailed identifying questions left unanswered by the pilot project or that become apparent during the course of the pilot. These questions were then used to develop a survey that was administered to experienced providers of Internet-based, time- and place-independent college courses. This step is also further detailed in the Product Evaluation section of this chapter.

Product Evaluation

The planning matrices were used to develop and provide a course in Financial Accounting over the Internet as a pilot project. The course description for AC121 as described in the Fisher College Catalog is:

An introduction to the fundamentals of accounting with the emphasis on financial statement preparation. The course will focus on the conceptual framework involved in the classification and summarization of financial data and will require the use of the computer for course assignments and projects. Valuation of assets, liabilities, recognition of revenues and expenses are emphasized (Fisher College, p. 77)

This course was deemed an appropriate vehicle for the pilot project because:
1. The Program Director for Accounting is a computer-literate, skilled instructor who is experienced in incorporating both the computer and group learning activities in the course.

2. There is a wealth of computer-based instructional support tools including online tutorials and spreadsheet templates available for this topic.

3. There is a nationally recognized set of learning outcomes established for the course (California Society of CPAs Committee of Accounting Education, 1996).

4. There is a body of students for this course of adequate size to support simultaneous delivery of a traditional, classroom-based section and an Internet-based section. Fisher College targets a minimum of ten students per section; at least twenty students will participate in the study.

Although this project is not a research study, experimental and control class sections were used to offer a basis to evaluate the efficacy of the planning matrices. The experimental section was comprised of 19 adult students taking the AC121 course exclusively via the Internet. The control group consisted of eight adult students taking the same course in a traditional classroom setting. Participation in both groups was voluntary. Students from all eleven of the College’s Division of Continuing Education campuses were able to register for the experimental section of the course. Students registering for the AC121 course at the Hyannis, Massachusetts campus of the College were placed in the control section unless they specifically requested the Internet-based section of the class. All students paid the standard College tuition for the course and received a letter grade of “A” through “F” and three college credits upon satisfactory completion.
Both sections were taught by the Program Director of the College's Accounting Program, used the same text, completed the same assignments, and were given the same examinations. At the end of the course, both sections completed the same course evaluation form (Appendix F). The course evaluation was comprised of two parts: the standard Fisher College Course Evaluation, and a learning-outcomes-specific evaluation that was developed for this project.

The text that was used included computer-based tutorials and spreadsheet templates; both sections of the class incorporated these online educational aids. The primary factor that was varied between the groups was the method of student-to-teacher and student-to-student interaction. The control group utilized the traditional classroom-based, person-to-person interaction supplemented by e-mail access to the instructor, while the experimental group utilized only Internet-based communication, including e-mail, discussion forums, online lecture outlines, and Microsoft PowerPoint™ presentations.

The results of the assignments, exams, and course evaluations were compared for both quantifiable and subjective differences. T-tests were used to compare experimental group versus control group performance on the final exam, the grade for the course, and both parts of the course evaluation.

Subsequent to the pilot project the administrator responsible for managing the course, the Accounting Program Director, the Dean of the Division of Continuing Education, and this researcher met as a summative committee. The summative committee analyzed both the objective results and subjective impressions resulting from the pilot project. A questionnaire (Appendix G) regarding planning, implementing, and managing
an Internet-based course was developed and administered, via the World Wide Web, to administrators and instructors who have managed or taught Web-based college courses. The participants for the survey were selected from two sources: the World Lecture Hall, a listing of Web-based courses offered worldwide that is maintained by the University of Texas (1997); and selected Nova Southeastern University faculty. Nova Southeastern University has extensive experience in providing distance education (Hesser & Kontos, 1997; Scigliano, Levin, & Horne, 1996). The responses to the questionnaire were used to add depth to the matrices for planning, implementing, and managing a time- and place-independent, Internet-based course by providing a wider perspective to the tools and techniques utilized in this educational environment.

The following resources were necessary for this project:

1. Two sections of AC121 from Fisher College.
3. Course-management software. Web Course in a Box™, a product developed by Virginia Commonwealth University and made available to colleges and universities at no charge, was used for the pilot project.

Assumptions

This following assumptions underlay this study:

1. The students volunteering to participate in the Internet-based course had a basic familiarity with the personal computer and the use of the Internet and World Wide Web and understood that this delivery system required a willingness to work independently.
2. Although participants in both the Web-based and classroom-based sections of the course were volunteers, it was assumed they represented a random sampling of adult students from the same population.

3. The participants in the provider’s survey were volunteers solicited on the basis of their self-representation as experienced Internet-based educators. It was assumed that those participating in the survey were as represented and comprise a meaningful sample.

**Limitations and Delimitations**

The following limitations to the scope and applicability of this study are noted:

1. An introductory course in financial accounting was used as the pilot project for this study. One of the reasons this course was selected for the pilot project is that there is already a wealth of computer-based learning aids available for the subject. Generalizations to other subjects may be of limited value, even in similar conditions.

2. The student-participants in the pilot-project segment of this study were recruited from the existing student population at Fisher College. Fisher College is a small, private, two-year institution that features as one of its strongest attractions small class size and close personal attention. Generalization of the results of this study to other student populations may be of limited value.

3. The standard eight-week term utilized throughout Fisher College’s Division of Continuing Education was followed in the pilot-project portion of this study. Generalization of the results to similar courses offered in longer or shorter time frames may be of limited value.

The following delimitations to the scope and applicability of this study are noted:
1. All students participating in the pilot-project component were required to register in person at one of the Fisher College Division of Continuing Education campuses. There was no provision for registration via the World Wide Web.

2. In order to provide a level of confidence that each student did his or her own work in the pilot-project course, all students were required to take the final exam for the course at one of the Fisher College Division of Continuing Education campuses.

3. Although students new to Fisher College were welcome to register for the pilot-project course, financial aid was made available only to those students who had taken at least one previous course at the College.

**Summary**

As articulated in Chapter I, this study attempted to answer three questions:

1. What process is necessary to effectively plan a credit-bearing, college-level course provided via the Internet and World Wide Web in a time- and place-independent environment?

2. Can a time- and place-independent course satisfactorily meet established learning outcomes when administered to a population of adult learners over the World Wide Web?

3. What instructional methods have proven effective in promoting optimal learning for adult students in an Internet-based, time- and place-independent college course?

The answers to these three questions entailed the development of a planning matrix for implementing and managing a time- and place-independent, Internet-based college course. The criteria for the planning matrix was developed by a formative committee comprised of faculty and administrators experienced in the delivery of
educational services to an adult population. The criteria was then reviewed for validity by a second committee comprised of the Board of Directors of the National Council for Continuing Education and Training.

A planning matrix comprised of three sub-matrices was developed, based upon these criteria. The planning matrix was evaluated by use of a pilot project. A section of Financial Accounting was developed using the matrix and offered exclusively via the Internet. Student satisfaction and attainment of learning outcomes were compared to a control group that took the same course from the same instructor during the same time frame in a traditional classroom environment.

A summative committee reviewed both the objective results and subjective impressions of the pilot project and developed a list of questions for experienced providers of Internet-based college courses. A survey was administered via the World Wide Web to a group of educators experienced in the provision of time- and place-independent educational services via the Internet. The results of the survey were then used to further refine the planning matrix.
Chapter IV

Results

The first section of this chapter provides a detailed description of the three planning matrices developed in this study. Included in the second section is a report of the results of the pilot project instituted to test the matrices. The third section presents the results of the follow-up survey given to experienced providers of time- and place-independent, Internet-based college courses. The final section summarizes the results of the pilot project and survey responses in the form of updates to the planning matrices.

The Matrices

Separate matrices addressing administrative, management and learning issues were developed in this study. Each matrix was constructed from questions raised by the formative committee. In the sections that follow, the applicable questions are presented and discussed. The full planning matrix itself, comprised of the issues raised and the resolutions developed, appears at the end of each section.

Administrative Issues

Issue: Will credits earned in a non-traditional learning environment be transferable to other colleges?

Discussion: This issue presented a critical path in the decision to proceed; failing an affirmative resolution, the entire program would have been aborted. The issue was addressed in terms of accreditation. If the regional accrediting body accepts courses taken
in a distance environment, other schools will accept them as college credits. The Interregional Committee on Distance Learning (1998) developed a set of guidelines for all regional accrediting bodies to follow when evaluating distance programs, including time- and place-independent, Internet-based courses. As long as the general guidelines regarding curriculum and instruction, evaluation and assessment, library and learning resources, student services, and facilities and finances are met by the institution, distance courses offered by that institution are fully transferable.

**Issue:** Will potential or current employers of the students accept a non-classroom based learning environment?

**Discussion:** The business community has historically been more receptive to non-traditional educational environments than has academia. Merrick (1996) and Phillips (1998) both detailed the values of time- and place-independent, Internet-based training in terms of reduced costs, enhanced flexibility, and wider distribution. Although credits earned through distance environments might be viewed with skepticism by some employers, the literature indicates the opposite.

**Issue:** Will potential or current students accept a non-classroom based learning environment?

**Discussion:** Time- and place-independent, Internet-based courses are undoubtedly not appropriate for all current or potential college students. There is, however, a sizable number of students for whom this method of study is either the best or the only acceptable alternative. Gubernick and Ebeling (1997) observed that over 1 million students currently attend college in a virtual classroom setting.
**Issue:** Will a time- and place-independent learning experience meet the needs of the workplace?

**Discussion:** The literature strongly indicates that this type of educational delivery system definitely addresses several needs present in the workplace. Phillips (1998) observed “the Internet is proving to be a low-cost, flexible, and highly effective medium for employee training in a range of subjects” (p. 41). This observation reinforces the results of a study conducted by Sedlak and Cartwright (1997) in which students working in the hotel and restaurant field completed an Internet-based program in Hospitality and Tourism Management. Both students and employers expressed satisfaction with the arrangement, especially in that it permitted students to remain current with both their academic and work responsibilities.

**Issue:** Is financial aid available for this type of educational experience, and are there any special provisions that must be observed?

**Discussion:** With certain restrictions, students taking Internet-based courses are eligible to participate in federally sponsored financial aid programs. United States Department of Education regulations (1997a, 1997b) specify two significant conditions regarding financial aid for this type of educational endeavor. The student must be enrolled in a program of study leading to an associate, bachelor’s or graduate degree. The institution must offer less than 50% of its courses or course enrollments via “correspondence course”, including Internet-based courses. The requirement for institutions to provide less than 50% of its courses in a “correspondence” delivery mode is under review. The Higher Education Act currently being reviewed by Congress would
remove that restriction for eligibility to participate in financial aid programs (Haworth, 1998; United States Department of Education, 1998).

**Issue:** Is the same tuition and fee structure used in traditional learning environments appropriate in the non-classroom environment?

**Discussion:** Tuition and fee costs for Internet-based college courses vary markedly. Sullivan, Steward and Spille (1997) compiled data on 121 colleges and universities that offered either individual courses or degree programs via an Internet-based, distance approach. Tuition rates ranged from $40 per credit at community colleges to a high of over $4000 for a semester of graduate-level work at a private institution.

The relationship between charges for Internet-based and on-campus classes is equally varied. McBride, in an informal review of distance education alternatives, observed that some schools charge more while others less for Internet-based classes than for the classroom-based equivalent. The Ad Hoc Administrative Committee on Distance Learning and Instructional Technology of the University System of Georgia (1997), for example, concluded that, since Internet-based classes required the acquisition of new technology, students should pay the traditional tuition plus an additional Distance Learning Fee. Duke University offers an MBA program in both traditional and Internet-based formats; the Internet-based alternative costs the student over 50% more than the traditional program (Gubernick & Ebeling, 1997).

**Issue:** How will students be registered, pay tuition and fees, purchase textbooks, and accomplish other routine business transactions with the college?

**Discussion:** Sullivan, Stewart and Spille (1997) listed over 120 colleges and universities offering Internet-based college coursework. A review of several World Wide
Web sites of these institutions revealed that the vast majority offered Web-based, electronic commerce tools for accomplishing the routine business exchanges between student and school. Establishing an electronic commerce system capable of handling these transactions is, however, a complex process, as detailed by Poje (1998). It is generally advisable to venture into a Web-based electronic commerce system with a relatively simple project. The complexities inherent in registering students, collecting tuition and fees, and ordering textbooks makes this project a poor candidate for a college’s first venture into electronic commerce.

Issues regarding uncertainty about the validity of contracts and evidence submitted entirely in electronic format are also troubling. Hummer (1997) emphasized that the traditional rules regarding contracts do not necessarily apply to Web-based transactions since the transaction might have been accomplished without human intervention and therefore does not represent the “meeting of the minds” historically associated with a contract. As an example, Hummer (1997) related an incident that occurred at the University of Michigan. The University received an e-mail message from a potential student from China declining an $18,000 scholarship. That student later denied sending the e-mail and ultimately sued her roommate for allegedly sending a false message over a shared e-mail account. In light of concerns of this nature, Kroll (1997) recommended implementing initial electronic commerce systems in a well planned, gradual manner, preferably in combination with more traditional forms of interaction such as personal contact.
<table>
<thead>
<tr>
<th>Issue</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will credits earned in a non-traditional learning environment be transferable to other colleges?</td>
<td>Yes, based upon adherence to regional accreditation guidelines.</td>
</tr>
<tr>
<td>Will potential or current employers of the students accept a non-classroom based learning environment?</td>
<td>Yes, based upon the willingness of business and industry to utilize non-traditional means of delivering training.</td>
</tr>
<tr>
<td>Will potential or current students accept a non-classroom based learning environment?</td>
<td>A qualified yes based upon the mixed nature of the literature on this issue.</td>
</tr>
<tr>
<td>Will a time- and place-independent learning experience meet the needs of the workplace?</td>
<td>Yes, again based upon the willingness of business and industry to use creative modalities for delivery of training.</td>
</tr>
<tr>
<td>Is financial aid available for this type of educational experience, and are there any special provisions that must be observed?</td>
<td>A qualified yes, based upon current federal regulations regarding time- and place-independent learning environments.</td>
</tr>
<tr>
<td>Is the same tuition and fee structure used in traditional learning environments appropriate in the non-classroom environment?</td>
<td>Yes, based upon a review of the tuition practices at numerous colleges and universities.</td>
</tr>
</tbody>
</table>
How will students be registered, pay tuition and fees, purchase textbooks, and accomplish other routine business transactions with the college?

Three options are available: provide all services entirely via the Internet, provide the services using only traditional mechanisms, or a hybrid of the two.

Management Issues

Issue: How do we ensure a student’s work is his or her own?

Discussion: Ensuring the authorship of work has, perhaps, always been a problem in academia. When the work has been accomplished in a distance environment and submitted via the Internet, this difficulty assumes new proportions. By its very nature, the Internet promotes a marked degree of anonymity in the form of hidden or disguised identities (Doskoch, 1998; Guernsey, 1996). While hiding such characteristics as gender, race, disabilities, and age might promote a more open exchange of ideas, an essential characteristic of scholarship is a willingness to be personally associated with one’s statements (Guernsey, 1996).

Distance education in general, and Internet-based programs in specific, have often been viewed with askance as potential ‘diploma mills’ by academia. Guernsey (1997) and Sullivan, Stewart and Spille (1997) related several examples of Internet-based academic programs that, in essence, conferred degrees based upon nothing more than the payment of tuition. When coupled with the increasing concerns regarding the use of the Internet as a tool for confidence schemes (Pescovitz, 1998), it is apparent that it is essential to rigorously ensure the quality and authorship of the student’s work.
Several solutions were considered for this issue. Historically, distance education programs have relied heavily on the use of proctors for one or more exams. Passwords can also be used effectively to minimize the potential of work being submitted by someone other than the student without his or her knowledge. Since Fisher College has remote campus locations throughout Eastern Massachusetts, it was decided to effectively utilize that asset in the pilot project and have students report to a campus location to take the final exam. This issue was designated for further exploration in the survey of experienced providers of Internet-based, time- and place-independent college courses.

**Issue:** How much prior knowledge must be assumed and required for students to participate in this type of learning experience?

**Discussion:** An Internet-based distance education program is, obviously, not the appropriate learning environment for everyone. Porter (1997) suggested that the motivating factors for taking a course in a distance environment together with the student’s capacity to work independently strongly impact the success of the student. Wallace (1996) examined the demographics of distance learners and discovered that a wide spectrum of age-categories, family and work profiles, and academic background are represented in distance environments.

Harris (1997) and Robinson (1992) analyzed the background predictive of success in a distance learning environment by studying personality characteristics of successful students. Harris (1997) administered the Sixteen Personality Factors Questionnaire to students at 68 different campus sites and concluded that the students who are successful in distance programs are self-sufficient, non-compulsive, and well organized in daily activities. These results are consistent with the research conducted by Robinson (1992) in
which 294 students engaged in a distance learning program at Canada’s Open College were surveyed. The results of the survey indicated that students selected this type of educational approach primarily for reasons of convenience, were predominately intrinsically motivated, and were not particularly interested in self-directed learning environments.

Effective screening of applicants, in the Fisher College environment, was difficult. Fisher College has an open-enrollment policy; any high school graduate can register for any course, as long as course pre-requisites are met. Since the course selected for the pilot project, Financial Accounting, had no pre-requisites, by college policy no student could be denied registration. To address this issue, a student handbook (Appendix H) was developed as a tool to help potential students make an informed decision regarding the appropriateness of this learning environment.

**Issue:** What hardware, software and special equipment must a student have to participate in the non-classroom learning environment?

**Discussion:** The equipment a student must have in order to participate in an Internet-based, time- and place-independent learning environment is rather minimal and easily articulated. The University of Massachusetts, Dartmouth (1997) succinctly identified the necessary equipment as follows: a computer equipped with an 80486 or faster CPU, at least 4 megabytes of RAM, and a modem. Software required included Windows 3.1 or higher and a World Wide Web browser such as Netscape Navigator 3.0 or Microsoft Internet Explorer 3.0. In addition, the student must have an account with an Internet Service Provider.
**Issue:** Can traditional grading criteria be legitimately applied to this learning environment?

**Discussion:** An exhaustive review of both print and electronic literature did not produce any references regarding differential grading criteria based upon educational delivery mechanism. Extensive research has been done regarding differences in learning based upon age of the learner (Knowles, 1977; McNair, 1994; Zemke & Zemke, 1995) and type of delivery system (Arreola, 1995; Davison, 1996; Miller & Husmann, 1996). The use of traditional criteria for evaluating the acquisition of knowledge was, apparently, left as an unspecified assumption.

For the purposes of the pilot project it was determined that, in the absence of any indication to the contrary in the literature, traditional grading criteria would be used. This issue was designated for further exploration in the survey of experienced providers of Internet-based, time- and place-independent college courses.

**Issue:** How effectively can the instructor monitor the student’s involvement and progress through the course?

**Discussion:** Porter (1997) and Dickinson (1997) detailed the manner in which various Internet tools can be used to simulate the teacher-student interactions present in a traditional learning environment. Both authors observed that electronic mail and online discussion forums were particularly effective in maintaining communication between the student and the teacher.

For the purposes of the pilot project, it was determined that electronic mail and online discussion forums would be used to monitor student’s involvement. This issue was
designated for further exploration in the survey of experienced providers of Internet-based, time- and place-independent college courses.

**Issue:** How can students receive academic advising?

**Discussion:** As in the instance of monitoring student progress, the research of Porter (1997) and Dickinson (1997) is also applicable to the issue of academic advising. Electronic mail and online discussion forums were again emphasized as effective tools for maintaining communication between the student and the teacher.

For the purposes of the pilot project, it was determined that electronic mail and online discussion forums would be used to monitor student’s involvement. This issue was designated for further exploration in the survey of experienced providers of Internet-based, time- and place-independent college courses.

<table>
<thead>
<tr>
<th>Table 2: Course Management Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Issue</strong></td>
</tr>
<tr>
<td>How do we ensure a student’s work is his or her own?</td>
</tr>
<tr>
<td>Issue</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>How much prior knowledge must be assumed and required for students to</td>
</tr>
<tr>
<td>participate in this type of learning experience?</td>
</tr>
<tr>
<td>What hardware, software and special equipment must a student have to</td>
</tr>
<tr>
<td>participate in the non-classroom learning environment?</td>
</tr>
<tr>
<td>Can traditional grading criteria be legitimately applied to this</td>
</tr>
<tr>
<td>learning environment?</td>
</tr>
<tr>
<td>How effectively can the instructor monitor the student’s involvement</td>
</tr>
<tr>
<td>and progress through the course?</td>
</tr>
<tr>
<td>How can students receive academic advising?</td>
</tr>
</tbody>
</table>

**Learning Issues**

Five learning issues were identified by the formative committee.

1. Will the lack of person-to-person contact prevent cooperative learning?

2. How suitable will a class without classroom activities be for learning advanced material that requires critical thinking and applying facts, not just acquiring facts?
3. Will the student receive timely, meaningful, and insightful feedback for his or her work?

4. How will the teacher monitor the processes the student goes through to complete an assignment?

5. Will the learning experience be limited by the range of material that can be presented to the student, based upon the limits of a delivery system that does not include normal classroom activities?

The resolution for all these issues was, in fact, the same. Chen (1995) emphasized that the effective application of technology to education must be based upon matching carefully articulated learning outcomes with the tool that offers the appropriate pedagogical approach. Three elements were, therefore, necessary to resolve the learning issues: a well-constructed listing of learning outcomes for the course, a detailed listing of the pedagogical strengths of the various tools available for use in the course, and a matrix that associated the learning outcome with the optimal tool.

The Program Director for Accounting at Fisher College, developed the specification of learning outcomes for the Financial Accounting course that served as the pilot project in this study. He followed the guidelines for outcome-based learning presented by Bloom et al. (1956) and Anderson (1997). He included in the specification the guidelines for first-year accounting programs from The California Society of CPAs’ Committee of Accounting Education (1996) and the Fisher College (1997) mission statement. Appendix I contains a complete listing of the learning outcomes developed for the pilot project course.
Porter (1997) and Dickinson (1997) presented overviews of the application of various Internet services as instructional tools. Based upon the analyses of these authors, a listing of the pedagogical strengths of the various instructional tools available for the Internet-based course was developed.

Table 3: Instructional Tools Available in an Internet-Based Environment

<table>
<thead>
<tr>
<th>Instructional Tool</th>
<th>Discussion of Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-mail</td>
<td>1. Simulate student-to-instructor question-and-answer.</td>
</tr>
<tr>
<td></td>
<td>2. Encourage cooperative learning by providing a</td>
</tr>
<tr>
<td></td>
<td>mechanism for student-to-student interaction.</td>
</tr>
<tr>
<td>Chat room</td>
<td>1. Encourage cooperative learning by simulating</td>
</tr>
<tr>
<td></td>
<td>classroom student-to-student interaction.</td>
</tr>
<tr>
<td></td>
<td>2. Simulate classroom student-to-instructor interaction.</td>
</tr>
<tr>
<td></td>
<td>Note: since chat rooms are real-time, they are not, by</td>
</tr>
<tr>
<td></td>
<td>definition, time-independent. In accordance with the</td>
</tr>
<tr>
<td></td>
<td>goals of this study they were, therefore, relegated to</td>
</tr>
<tr>
<td></td>
<td>optional status.</td>
</tr>
<tr>
<td>Discussion forum</td>
<td>Encourage cooperative learning by simulating classroom</td>
</tr>
<tr>
<td></td>
<td>student-to-student and student-to-instructor interaction.</td>
</tr>
<tr>
<td>Online notes</td>
<td>Convey course content normally delivered by lecture or</td>
</tr>
<tr>
<td></td>
<td>demonstration.</td>
</tr>
<tr>
<td>Online presentations</td>
<td>Convey course content normally delivered by demonstration.</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Instructional Tool</th>
<th>Discussion of Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computerized tutorials run locally using online tutorial supplied with the text</td>
<td>Convey course content normally delivered by supervised in-class activities.</td>
</tr>
<tr>
<td>Homework problems and practice sets, completed locally on the computer, using templates supplied with the text, then submitted via e-mail</td>
<td>Provide avenue for constructive learning environment through supervised, hands-on learning opportunities.</td>
</tr>
<tr>
<td>Links to outside sources, including Web pages developed by the text publisher and various companies</td>
<td>Provide access to external reference sources normally associated with a campus library.</td>
</tr>
<tr>
<td>Objective questions on online exams</td>
<td>Encourage and measure acquisition of the learning outcomes that are content oriented.</td>
</tr>
<tr>
<td>Completion, short answer and essay questions on exam</td>
<td>Encourage and measure acquisition of the learning outcomes that are process oriented.</td>
</tr>
<tr>
<td>Formal paper</td>
<td>Encourage and measure acquisition of the learning outcomes that are process oriented.</td>
</tr>
</tbody>
</table>
Graded assignments  Provide avenue for constructive learning environment through supervised, hands-on learning opportunities.

The learning issues planning matrix was developed by combining the established learning outcomes with the appropriate instructional tool or tools available in the Internet-based environment. To facilitate the process of analyzing each learning outcome and assigning the most appropriate methodology, a five-element matrix was developed. The first element identified the learning outcome. Element two listed the classroom-based methodologies used to facilitate acquisition of the learning outcome. The next element contained the Internet-based methodology used to facilitate acquisition. The final two elements identified the methodologies used to measure learning in the classroom- and Internet-based environments. Figure 2 illustrates the process used to develop this matrix. The matrix developed for the Financial Accounting course appears in Appendices J and K.

Figure 2. The development process for the learning issues matrix.
Pilot Project

Fisher College offered two sections of Financial Accounting (AC121) during the January 1998 term to provide a basis for evaluating the efficacy of the planning matrices. The experimental section was comprised of adult students taking the AC121 course exclusively via the Internet. The control group consisted of adult students taking the same course in a traditional classroom setting. Participation in each group was voluntary. Students from all 11 of the College’s Division of Continuing Education campuses were able to register for the experimental section of the course. The control section of the course was offered through the Hyannis, Massachusetts campus; students registering for the AC121 course at that campus were placed in the control section unless they specifically requested the Internet-based section of the class. All students paid the standard College tuition for the course and received a letter grade of “A” through “F”. Three college credits were awarded upon satisfactory completion.

The control and experimental sections of the class were compared on four elements. Since both sections took the same final exam and were evaluated using the same criteria, the grade on the final exam and grade for the course were the first two factors analyzed. Both sections also completed the same course evaluation instrument. This instrument was a two-part evaluation of the course (Appendix F). The first part was comprised of the standard Fisher College Course Evaluation form, which measures student satisfaction with the course. The second part of the evaluation was a learning outcome-based course evaluation form developed for this study to measure student confidence in attaining course objectives. The ratings on the two parts of the course evaluation form were the third and fourth factors analyzed.
Independent sample, two-tailed t-tests were used to measure each of these elements. The level of significance was set at 0.05 for rejection of the null hypothesis. The data were evaluated with a computer-based statistical analysis program named WINKS. The results of the four analyses are summarized below; the printouts from the statistical analysis program are contained in Appendix L.

The results of comparing control section with experimental section performance on the final exam did not indicate a significant difference. In specific, the control section recorded a mean score of 72.57 with a standard deviation of 4.86. The experimental section recorded a mean of 76.40 with a standard deviation of 21.83. The test for equality of variance produced an \( F \) value of 20.17 and a \( p \) value of 0.002, thereby indicating an inequality of variance. The unequal variance t-test calculated a \( t \) value of \(-0.54\) and a \( p \) value of 0.604.

The results of comparing control section with experimental section performance on the final grade for the course likewise did not indicate a significant difference. The letter grade received by each student was converted into a numeric equivalent on the traditional 11-point scale on which an "A" = 11. The control section recorded a mean score of 6.86 with a standard deviation of 2.97. The experimental section recorded a mean of 7.4 with a standard deviation of 3.83. The test for equality of variance produced an \( F \) value of 1.67 and a \( p \) value of 0.548, thereby indicating an equality of variance. The equal variance t-test calculated a \( t \) value of \(-0.31\) and a \( p \) value of 0.758.

The results of comparing the control section and the experimental section ratings on the student satisfaction section of the course evaluation did indicate a significant difference. This portion of the evaluation utilized a five-point, Likert-type scale with a
score of five indicating optimal satisfaction. The control section recorded a mean score of 4.51 with a standard deviation of 0.23. The experimental section recorded a mean of 3.54 with a standard deviation of 1.04. The test for equality of variance produced an $F$ value of 20.99 and a $p$ value of 0.001, thereby indicating an inequality of variance. The unequal variance t-test calculated a $t$ value of 2.84 and a $p$ value of 0.017, which is indeed significant at the 0.05 level.

The results of comparing the control section and the experimental section ratings on the learning outcomes section of the course evaluation did not indicate a significant difference. This portion of the evaluation also used a five-point, Likert-type scale with a score of five indicating greatest confidence. The control section recorded a mean score of 3.59 with a standard deviation of 0.65. The experimental section recorded a mean of 3.41 with a standard deviation of 1.28. The test for equality of variance produced an $F$ value of 3.85 and a $p$ value of 0.115, thereby indicating an equality of variance. The equal variance t-test calculated a $t$ value of 0.34 and a $p$ value of 0.736.

In summary, the analysis of the average scores for the control and experimental sections on the final exam, course grade, and rating on the learning outcomes section of the course evaluation did not reveal a significant difference. The average rating on the student satisfaction section of the course evaluation was, however, significantly higher for the control compared to the experimental section.

A review of the subjective comments from the course evaluations from the control and experimental sections reinforced the impression that students in the Internet-based section did not enjoy the experience as much as the students in the classroom-based section. Seven students completed the classroom-based section of the course. Of those
students, three wrote comments on the course evaluation. As can be seen in the following
table, all of the comments were of a favorable nature. The comments are reproduced
exactly as written.

**Table 4: Classroom Section Comments**

<table>
<thead>
<tr>
<th>Student 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>[The teacher] is an excellent teacher. He made sure we all understood the work and if we didn’t he would take time out to go over it until we did.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>[The teacher] encouraged students to stay after class to learn the material. He also offered to come in on Saturdays.</td>
</tr>
<tr>
<td>[The teacher] was an excellent teacher. I found the work rather hard and complicated. I was unable to understand a lot, even after he explained it 4 or 5 times.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>This was a[n] interesting class. I feel I learned a good amount during the time we had. The only true problem was understand [sic] the reading. It was more confusing then anything. It didn’t make sense half the time. I learned that it was easier to do the homework we learned in class then read. The teacher gave very good ex. on the board. It was more the book. The only other thing is it would have been nice if the classes were longer.</td>
</tr>
</tbody>
</table>

Ten students completed the Internet-based section. Of those students, seven wrote additional comments on the course evaluation. Of the comments made, four were highly critical, one was balanced, and two were favorable.
Table 5: Internet-based Section Comments

Student 1

The class itself (the Internet and Web page) was wonderful, accessible and easy to use. You may want to consider a different instructor, one that may actually take time with the students before the last week of class. It is obvious there is very little I learned from this class. There were various times I contacted the teacher for help or with questions and always received nothing but vague answers and finally an offer for help 1 week ago. A WEEK AGO! My grade in this class will result from nothing but all of the extra time, effort, and money I had to put into the class and not from anything on the instructor’s part. I am sure my grade will reflect that of a student having NO previous accounting background (as the instructor was aware) teaching herself an entire accounting course.

Student 2

I expect a D only because I didn’t learn anything because the professor was inaccessible. The book was very difficult to follow without input from the teacher. Slides and notes were of no use because they didn’t elaborate on any issues. If you offer this computer-based class again DO NOT have [the teacher] teach it. I have learned nothing while taking this class. The instructor was very elusive and made it quite clear that I was on my own. If I do pass it will be by the Grace of God. I had to use my textbook for every single question. As far as any balance sheets I have no idea if I even have the right concept down.
Student 3

The course was very informative. Correspondence between the teacher and me was very good, quick and efficient.

Student 4

We never got together as a class.

No interaction with other students (e-mailed everyone twice).

Only 1 discussion with teacher.

Class subject involves theories and concepts that require an instructor’s explanation.

This subject requires an instructor. Questions can be answered when asked — not by e-mail.

Student 5

I thought that this was a great class! A little bit rough at times, but with effort I was able to get through it. I thought the teacher was very polite and very encouragable [sic] to me for the work I did. If possible I would like to see more Internet classes in the future!

Student 6

The entire computer program did not function properly from time to time, more often than not.

This course should have one requirement, a must, one should have their own P.C.
Student 7

It was hard for me being over the net because I didn’t get a chance to actually learn. I missed out on a lot. Difficulties understanding.

It needs improvement. Lets say lesson 1 talks about assets. Go to a room or something and have an explanation step-by-step, just as in a class.

The instructor I have no doubt knows what he is doing however most/majority of students over the net didn’t have a clue. For every chapter there could have been a clear explanation to what we read and the homework.

I had lots of questions in my mind that weren’t answered. If I get a second chance I would like to retake this class with instructor present.

---

Survey Results

As anticipated, the pilot project called into question several elements from the three planning matrices and raised additional issues not previously considered. Upon completion of the pilot project, a summative committee was formed to review the matrices developed in light of the lessons learned in the pilot project. The summative committee consisted of four individuals: Mr. Leonard Long, the instructor in the pilot project and Program Director for the College’s Accounting Program; Ms. Dabney LaRochelle, the campus director for the Boston, Massachusetts Division of Continuing Education Campus; Dr. Antone Vieira, the Dean of the College’s Division of Continuing Education; and this researcher.

Two items of numeric data assumed importance in the discussion of the pilot project. Although the pilot project was not constructed as an experiment, the fact that the
Internet-based section of the course recorded a significantly lower rating on the student satisfaction part of the course evaluation was of concern to the summative committee. This difference assumed added impact when coupled with the withdrawal rate observed for the Internet-based section. The Financial Accounting course had been taught 31 times prior to the pilot project. The percentage of withdrawals from those previous classes ranged from 0% to 45%, with an average withdrawal rate of 15%. The 50% withdrawal rate recorded in the Internet-based section of the course, although not entirely out of range with previous classroom-based offerings, added credence to the concern that students were not satisfied with the Internet-based experience.

Several possible explanations for this apparent dissatisfaction with the Internet-based environment were discussed. It was suggested that the nature of the subject was too difficult for a student to grasp in a distance environment or that perhaps a smaller segment of the subject might have been a more appropriate unit of instruction for this delivery system. Lack of student familiarity with the computer and the Internet, inadequate academic advising, size of the class, and delays in feedback from the instructor were discussed as possible explanations. This concern and the possible causes led to the development of 10 of the 25 survey questions.

A second significant concern arose from the impression of all members of the summative committee that cooperative learning and the atmosphere of a learning community were largely missing in the Internet-based section of the course. Much of the group work planned for the Internet-based section was not implemented, and the quantity and quality of discussion forum contributions were quite disappointing.
Several possible explanations were explored for this apparent dearth of cooperative learning activity. The eight-week duration of the course was discussed as a contributing factor, as was the policy of allowing students to work on the material at their own pace. The necessity of reviewing the use of pedagogical tools, including real-time interaction, was also discussed. This concern and the possible causes led to the development of nine of the survey questions.

The 19 questions identified above, together with six background questions were assembled into a survey (Appendix G). To provide some structure to the responses but still allow free input, each question offered both a range of choices and the opportunity to enter unstructured input. Requests for participation in the survey were e-mailed to 369 faculty and administrators with previous experience in Internet-based education. The requests for participation were e-mailed during the first week of May 1998 with a target date for response of June 1, 1998. Fifty-three completed surveys — 14% — were received by the target date. The detail of the survey results can be found in Appendix M.

The issues identified by the summative committee were categorized along two axes. As described above, the concerns centered on one of two categories: student satisfaction and cooperative learning. The issues also were separated into the same categories already established by the formative committee: administrative issues, management issues, and learning issues. The responses to the survey are summarized in the following tables. To maintain continuity with the matrices developed at the formative stage, the issues are first divided into administrative and management categories. Within each of these tables, the category of the concern — student satisfaction or cooperative learning — is indicated for each issue.
Table 6: Administrative Issues

<table>
<thead>
<tr>
<th>Issue</th>
<th>Category</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you place limits on the subjects taught via the Web?</td>
<td>Student satisfaction</td>
<td>A clear majority of respondents (60%) placed no limits on subjects taught.</td>
</tr>
<tr>
<td>Do you limit class size?</td>
<td>Student satisfaction</td>
<td>This issue was almost evenly divided between those who allowed relatively large classes of over 25 students (49%) and those who restricted classes to fewer than 25 students (42%).</td>
</tr>
<tr>
<td>What, if any, time limits are placed on course completion?</td>
<td>Cooperative learning</td>
<td>The vast majority of respondents (88%) indicated that standard semesters or quarters were used for Internet-based courses.</td>
</tr>
<tr>
<td>What percentage of students who enroll in a Web-based class do not complete the class?</td>
<td>Student satisfaction</td>
<td>The plurality of respondents (30%) indicated a course completion rate of at least 90%. A significant number of respondents (19%) did indicate rather high withdrawal rates of over 30%.</td>
</tr>
<tr>
<td>Where do you recruit students for Web-based courses?</td>
<td>Student satisfaction</td>
<td>Two sources for recruiting students were evident: from the existing student body (75%), and through advertisements on the World Wide Web (51%).</td>
</tr>
</tbody>
</table>
### Table 7: Management Issues

<table>
<thead>
<tr>
<th>Issue</th>
<th>Category</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do you ensure that a student’s work is his or her own?</td>
<td>Cooperative learning</td>
<td>Special provisions for ensuring authorship appeared to be important to the majority of the respondents; only 21% indicated to the contrary. The two most widely used mechanisms were having the student complete the final exam on campus (51%) and using network passwords (45%).</td>
</tr>
<tr>
<td>What size ‘chunk’ of material do you find most appropriate for a Web-based course?</td>
<td>Student satisfaction</td>
<td>The vast majority of respondents (83%) indicated that special provisions for Internet-based courses were not in place.</td>
</tr>
<tr>
<td>How do you evaluate the effectiveness of a Web-based course?</td>
<td>Student satisfaction</td>
<td>The vast majority of respondents (89%) utilized standard student evaluations of the course and instructor.</td>
</tr>
<tr>
<td>Issue</td>
<td>Category</td>
<td>Discussion</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>----------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Do you have special requirements for students taking a course over the Web?</td>
<td>Student satisfaction</td>
<td>A strong majority of respondents (79%) indicated some form of special prerequisite for participation in Internet-based courses.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Personal access to an Internet account was the most commonly recorded prerequisite at 51%, closely followed by personal access to a personal computer at 47%.</td>
</tr>
<tr>
<td>How do you provide academic advising?</td>
<td>Student satisfaction</td>
<td>E-mail was the most frequently utilized tool with an 83% response rate. A clear majority of the respondents (70%) indicated the need to supplement asynchronous advising with some form of synchronous advising such as person-to-person or telephone contact.</td>
</tr>
<tr>
<td>How do you encourage cooperative learning?</td>
<td>Cooperative learning</td>
<td>Three tools available in an asynchronous environment were widely used: e-mail (89%), online discussion forums (77%), and group assignments (60%). One synchronous tool, chat rooms, also is widely used, appearing on 49% of the surveys.</td>
</tr>
<tr>
<td>How often must a student submit work?</td>
<td>Cooperative learning</td>
<td>Submission of work on at least a weekly basis was clearly the most popular solution, appearing on 74% of the surveys.</td>
</tr>
<tr>
<td>Issue</td>
<td>Category</td>
<td>Discussion</td>
</tr>
<tr>
<td>-------</td>
<td>----------</td>
<td>------------</td>
</tr>
<tr>
<td>Which of the following tools do you use to facilitate learning in a Web-based class?</td>
<td>Cooperative learning</td>
<td>With the exception of virtual reality simulations, each of the listed alternatives appeared on the majority of the surveys. E-mail — 94%, Forums — 81%, Tests — 66%, Multimedia — 55%, Virtual Reality Simulations — 9%, Notes — 70%.</td>
</tr>
<tr>
<td>Which of the following tools do you use to evaluate learning and determine course grade?</td>
<td>Cooperative learning</td>
<td>All of the listed alternatives appeared to be in wide use. E-mail — 45%, Forum participation — 75%, Formal papers — 66%, Examinations — 75%.</td>
</tr>
<tr>
<td>What do you do when a student does not participate in the class for an extended period of time?</td>
<td>Student satisfaction</td>
<td>Both synchronous and asynchronous tools appear to be widely used. E-mail is by far the most commonly used technique, appearing on 81% of the surveys, but telephone contact received a significant (45%) number of responses.</td>
</tr>
<tr>
<td>Issue</td>
<td>Category</td>
<td>Discussion</td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Do you have requirements regarding how quickly an instructor must</td>
<td>Student satisfaction</td>
<td>The plurality of respondents to the survey (34%) indicated no special provisions were in place regarding this issue. An equal number of respondents indicated targets of no more than 48 hours for response to student requests.</td>
</tr>
<tr>
<td>respond to a student question or request for help?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How do you handle due-dates for work required in the course?</td>
<td>Cooperative learning</td>
<td>The majority of surveys (57%) indicated the use of strictly enforced due dates. An additional 30% of the responses indicated use of due dates in some form in the course.</td>
</tr>
<tr>
<td>How do you use real-time interaction, such as chat rooms?</td>
<td>Cooperative learning</td>
<td>Real-time interaction was included in some role in 49% of the surveys, but only 15% included mandatory real-time events. Thirty-two percent of the respondents did not include any real-time events in their courses.</td>
</tr>
</tbody>
</table>
Which of the following do you use to foster a learning community in a Web-based setting?

- Cooperative learning
- A surprisingly large number of surveys (32%) indicated the use of an in-person meeting of class participants at some time during the course. The asynchronous methods used included:
  - Discussion forums — 77%,
  - Group assignments — 62%,
  - Personal Web pages — 43%.

### Summary of Results

Matrices were developed that covered the administrative, management, and learning issues associated with planning, implementing, and managing a time- and place-independent, Internet-based college course. The matrices were then tested by using them to develop and offer a college course in Financial Accounting over the Internet as a pilot project.

The results of the pilot project generated two concerns. Based upon the direct evidence of student input on course evaluations and the indirect evidence of a greater-than-normal rate of withdrawal from the course, it appeared that, although students did satisfactorily master the subject matter, they were somewhat dissatisfied with the educational experience. Furthermore, based upon subjective impressions of the faculty and administrators involved in the pilot project, a learning community did not appear to develop during the pilot project.
The possible causes for these concerns were discussed and formed into a list of survey questions. The survey was completed by 53 faculty and administrators with experience in providing college courses via the Internet. The results of the survey were then used to revise the planning matrices.

The revised planning matrices for administrative and management issues follow.

**Table 8: Administrative Matrix Incorporating Pilot Project and Survey Results**

<table>
<thead>
<tr>
<th>Issue</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will credits earned in a non-traditional learning environment be transferable to other colleges?</td>
<td>Yes, based upon adherence to regional accreditation guidelines.</td>
</tr>
<tr>
<td>Will potential or current employers of the students accept a non-classroom based learning environment?</td>
<td>Yes, based upon the willingness of business and industry to utilize non-traditional means of delivering training.</td>
</tr>
<tr>
<td>Will potential or current students accept a non-classroom based learning environment?</td>
<td>A qualified yes based upon the mixed nature of the literature on this issue.</td>
</tr>
<tr>
<td><strong>Issue</strong></td>
<td><strong>Resolution</strong></td>
</tr>
<tr>
<td>-----------</td>
<td>---------------</td>
</tr>
<tr>
<td>Will a time- and place-independent learning experience meet the needs of the workplace?</td>
<td>Yes, again based upon the willingness of business and industry to use creative modalities for delivery of training.</td>
</tr>
<tr>
<td>Is financial aid available for this type of educational experience, and are there any special provisions that must be observed?</td>
<td>A qualified yes, based upon current federal regulations regarding time- and place-independent learning environments.</td>
</tr>
<tr>
<td>Is the same tuition and fee structure used in traditional learning environments appropriate in the non-classroom environment?</td>
<td>Yes, based upon a review of the tuition practices at numerous colleges and universities.</td>
</tr>
<tr>
<td>How will students be registered, pay tuition and fees, purchase textbooks, and accomplish other routine business transactions with the college?</td>
<td>Three options are available: provide all services entirely via the Internet, provide the services using only traditional mechanisms, or a hybrid of the two.</td>
</tr>
<tr>
<td>Do you place limits on the subjects taught via the Web?</td>
<td>A clear majority of respondents (60%) placed no limits on subjects taught.</td>
</tr>
<tr>
<td>Issue</td>
<td>Resolution</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Do you limit class size?</td>
<td>Evenly mixed between those who limit class size to fewer than 25 students and those who permit larger classes.</td>
</tr>
<tr>
<td>What, if any, time limits are placed on course completion?</td>
<td>The vast majority of respondents (88%) indicated that standard semesters or quarters were used for Internet-based courses.</td>
</tr>
<tr>
<td>What percentage of students who enroll in a Web-based class do not complete the class?</td>
<td>Although 30% of the respondents indicated a course completion rate of at least 90%, 19% indicated withdrawal rates of greater than 30%.</td>
</tr>
<tr>
<td>Where do you recruit students for Web-based courses?</td>
<td>Recruiting from the current student body was the most popular source, identified by 75% of the respondents. Advertising for students on the Web was also popular, appearing on 51% of the surveys.</td>
</tr>
<tr>
<td>How do you evaluate the effectiveness of a Web-based course?</td>
<td>The vast majority of respondents (89%) utilized standard student evaluations of the course and instructor.</td>
</tr>
<tr>
<td>What size ‘chunk’ of material do you find most appropriate for a Web-based course?</td>
<td>The vast majority of respondents (83%) indicated that special provisions for Internet-based courses were not in place.</td>
</tr>
</tbody>
</table>
Table 9: Management Matrix Incorporating Pilot Project and Survey Results

<table>
<thead>
<tr>
<th>Issue</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do we ensure a student’s work is his or her own?</td>
<td>Students take final exam for the course on campus.</td>
</tr>
<tr>
<td>The majority of survey respondents (51%) followed the procedure used in the pilot project and had the students take the final exam on campus. Network passwords were used by 45% of the respondents.</td>
<td></td>
</tr>
<tr>
<td>How much prior knowledge must be assumed and required for students to participate in this type of learning experience?</td>
<td>Self-selection based upon the description of the learning environment was used in the pilot project to address these two issues. The survey strongly indicated (79% of the respondents) that special prerequisites for either familiarity with the Internet or personal access to specific hardware, software, or other equipment are placed on participation in Internet-based courses.</td>
</tr>
<tr>
<td>What hardware, software and special equipment must a student have to participate in the non-classroom learning environment?</td>
<td>Yes, based upon the lack of evidence in the literature to the contrary.</td>
</tr>
<tr>
<td>Issue</td>
<td>Resolution</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>How effectively can the instructor monitor the student’s involvement and progress through the course?</td>
<td>With electronic mail and online discussion forums.</td>
</tr>
<tr>
<td>How can students receive academic advising?</td>
<td>The survey indicated that e-mail, the tool used in the pilot project was very popular (83% of the respondents), but a majority of the surveys did indicate the need to supplement asynchronous advising with either person-to-person or telephone contact.</td>
</tr>
<tr>
<td>How do you encourage cooperative learning?</td>
<td>The survey indicated that e-mail (89%), discussion forums (77%), and group assignments (60%) were widely used. Chat rooms, a synchronous tool, were used by 49% of the respondents.</td>
</tr>
<tr>
<td>How often must a student submit work?</td>
<td>Submission of work on at least a weekly basis was clearly the most popular solution, appearing on 74% of the surveys.</td>
</tr>
<tr>
<td>Which of the following tools do you use to facilitate learning in a Web-based class?</td>
<td>The following tools appear to be in popular use: E-mail — 94%, Forums — 81%, Tests — 66%, Multimedia — 55%, Notes — 70%.</td>
</tr>
<tr>
<td>Issue</td>
<td>Resolution</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Which of the following tools do you use to evaluate learning and determine course grade?</td>
<td>E-mail — 45%, Forum participation — 75%, Formal papers — 66%, Examinations — 75%.</td>
</tr>
<tr>
<td>What do you do when a student does not participate in the class for an extended period of time?</td>
<td>E-mail is by far the most commonly used technique, appearing on 81% of the surveys, but telephone contact received a significant (45%) number of responses.</td>
</tr>
<tr>
<td>Do you have requirements regarding how quickly an instructor must respond to a student question or request for help?</td>
<td>The plurality of respondents to the survey (34%) indicated no special provisions were in place regarding this issue. An equal number of respondents indicated targets of no more than 48 hours for response to student requests.</td>
</tr>
<tr>
<td>How do you handle due-dates for work required in the course?</td>
<td>The majority of surveys (57%) indicated the use of strictly enforced due dates. An additional 30% of the responses indicated use of due dates in some form in the course.</td>
</tr>
<tr>
<td>How do you use real-time interaction, such as chat rooms?</td>
<td>Real-time interaction was included in some role in 49% of the surveys, but only 15% included mandatory real-time events. Thirty-two percent of the respondents did not include any real-time events in their courses.</td>
</tr>
</tbody>
</table>
### Issue Resolution

<table>
<thead>
<tr>
<th>Issue</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which of the following do you use to foster a learning community in a Web-based setting?</td>
<td>Discussion forums — 77%,</td>
</tr>
<tr>
<td></td>
<td>Group assignments — 62%,</td>
</tr>
<tr>
<td></td>
<td>Personal Web pages — 43%,</td>
</tr>
<tr>
<td></td>
<td>In-person class meeting — 32%.</td>
</tr>
</tbody>
</table>
Chapter V

Conclusion, Implications, Recommendations, and Summary

Conclusions

Multiple needs of both adult students and institutions of higher education can be met with college-level courses provided in a time- and place-independent manner via the Internet. The attractiveness of this delivery mechanism is so alluring to both of these parties that Internet-based courses are becoming increasingly more available, despite numerous concerns regarding this type of distance education environment.

This study addressed these concerns by developing a set of planning matrices covering administrative, management, and learning issues attendant with implementing and managing a time- and place-independent, Internet-based college course. The matrices were tested in a pilot project. The experiences of the pilot project were used to develop a survey that was given to experienced providers of Internet-based, time- and place-independent college courses. The responses to the survey added further depth to the planning matrices.

Three research questions formed the foundation for the development of the planning matrices. The questions, together with a discussion of the answers to be drawn from the results of the study follow.
1. What process is necessary to effectively plan a credit-bearing, college-level course provided via the Internet and World Wide Web in a time- and place-independent environment?

The separation of the planning process into matrices for administrative, management, and learning issues proved to be a meaningful, workable categorization. The issues covered in the matrices were not exhaustive. Based upon the responses of both the Board of Directors of the National Council for Continuing Education and Training (Appendix D) and the participants in the Survey of Providers of Web-Based Courses (Appendix G), the matrices did address the major issues attendant with providing adult students time- and place-independent, Internet-based college courses.

Many if not most of the issues addressed in the three matrices did not have a single, or even recommended, resolution. In some instances, most notably those concerned with financial aid and accreditation, the resolution is dependent upon revisions to existing regulations currently under consideration by the controlling authorities. A definitive resolution was not uncovered for other issues including: what if any limits should be placed on the courses offered or students participating in this delivery system, how to ensure authorship of work, and how to build a learning community and promote cooperative learning. For most of the issues identified, however, any of the options discussed would appear to be appropriate, based upon the culture and resources of the institution. Although the matrices do not offer guidance regarding specific actions to be taken in planning, implementing and managing Internet-based college courses, they do effectively outline the developmental process and offer a range of possible solutions.
2. Can a time- and place-independent course satisfactorily meet established learning outcomes when administered to a population of adult learners over the World Wide Web?

The pilot project offered a mixed answer to this question. Results on the final exam, the course grade, and student confidence as displayed in the learning outcomes section of the course evaluation were not significantly different between the two sections. Students in the Internet-based section did, apparently, satisfactorily meet the learning outcomes established for the course.

Enthusiasm regarding the results of the pilot project must be tempered. The Internet-based section recorded an unusually high withdrawal rate of 50%. The Internet-based section also recorded a significantly lower score on the student satisfaction portion of the course evaluation. Students in the Internet-based section did not, apparently, enjoy the learning experience as much as their counterparts in the classroom-based section.

Several factors might have caused this apparent dissatisfaction with the Internet-based section. A review of the comments on the course evaluations revealed a stark contrast between the perception of the instructor among the students in the classroom-based section and the students in the Internet-based section. Arreola (1995) emphasized the importance of instructor preparation in a technology-enhanced distance environment. The instructor for this course might have been ill prepared or poorly suited to teach in this environment.

Several of the comments on the course evaluations from the Internet-based section indicated a need for in-person contact with the instructor. Students for this project were recruited from current Fisher College Division of Continuing Education (DCE)
students. Since Fisher College has an open-enrollment policy and this course had no pre-requisites, no restrictions were placed on enrollment. An effort was made to help students self-screen for the Internet-based section through the use of a student handbook (Appendix H). The pool of potential students was, however, rather restricted in that many of the College’s students select Fisher because of the small class size and close personal attention afforded by the school. This student profile is not ideal for a program of study that entails a significant amount of independent work. Several of the students participating in the Internet-based section of this course might have been poor candidates for this particular learning environment.

Finally, several of the learning experiences planned for the Internet-based section of the class were either underutilized or not implemented. The plan included extensive use of discussion forums, instructor-initiated e-mail case study vignettes, and optional real-time chat sessions. In practice, forum participation was minimal, only two e-mail vignettes were utilized, and no chat sessions were scheduled or conducted. Two factors were identified as possible causes. The course was offered as a self-paced experience with only the completion date set as a deadline; the instructor found it difficult to utilize the tools designed to promote cooperative learning when students were progressing at different paces. The course also was offered over the standard eight-week DCE term; the instructor found this time constraint to be a severely limiting factor. Some of the design decisions regarding the provision of this course might have been ill conceived.

Hayes (1997) warned that higher education entails more than the simple acquisition of facts. A true university setting includes a learning community that promotes interpersonal communication, exposure to different cultural perspectives, and
exploration of different values and ethics through open discussion. Without this learning community, Hayes warned, one would be providing instruction without education. The results of the pilot study suggest that, although the requisite facts were acquired in the Internet-based environment, the education associated with the learning community developed in a traditional classroom setting might well have been absent.

3. What instructional methods have proven effective in promoting optimal learning in an Internet-based, time- and place-independent college course?

Many of the instructional tools used in the more traditional classroom-based setting were effectively emulated in an Internet-based, time- and place-independent environment. The results of both the pilot project and the survey reinforced Dickinson’s (1997) observations. E-mail can simulate instructor-student and student-student interaction, discussion forums can simulate classroom interaction, links to external Web pages can serve as an acceptable substitute to library resources, and online tests can replace classroom-based exams.

Although the Internet-based tools such as e-mail and discussion forums can simulate classroom-based interactions, both the pilot project and survey of providers of Web-based college courses indicated the process is not automatic. Forum participation was disappointingly sparse in the pilot project, a condition reinforced by comments on several surveys. Although e-mail was effectively used in the pilot project, several students expressed the desire for real-time interaction with the instructor in the form of telephone or in-person contact. The importance of these low technology, synchronous forms of communication was strongly indicated in survey responses.
Several instructional tools used in a classroom setting worked equally well in the Internet-based environment. Lecture outlines and presentations, most notably Microsoft PowerPoint™ slide shows, effectively conveyed course content via the Internet. Similarly, online tutorials and other computer-based instructional aids supplied with the text appeared to work as effectively in the Internet-based environment as in the traditional classroom setting.

The use of computer technology both in the pilot project and reported in the survey of Web-based providers was, however, rather pedestrian. The computer and the Internet were, largely, used as a substitute for classroom activities; creative use of the specific strengths of the computer and the Internet was minimal. The more exotic features such as interactive video, full multimedia presentations, and virtual reality simulations were not used in the pilot project because of the necessity of affording acceptable access to students connecting to course resources via standard telephone service and modems. The survey of experienced providers of Web-based college courses likewise indicated a reluctance to use these more sophisticated features.

**Implications**

This study represents a start at identifying and addressing the issues that must be resolved in order to effectively utilize the Internet as a tool for providing time- and place-independent college experiences to adult learners. Applicable administrative, management, and learning issues concerned with the implementation and management of an Internet-based, college-level course were identified and possible resolutions for each were explored.
The feasibility of meeting established learning objectives within this type of distance environment was demonstrated. Students in an Internet-based, time- and place-independent environment were able to successfully complete a course of study attaining the same learning outcomes with equal proficiency to the students completing a classroom-based section of the course.

Noteworthy dangers inherent in this type of delivery system were identified. Students appear to have less likelihood of completing an Internet-based class than an equivalent classroom-based class. Furthermore, many of the process components of the college experience such as cooperative learning, interpersonal interactions among students and between students and instructor, and development of a learning community appeared to be greatly reduced in this environment.

The applicability of several instructional tools in an Internet-based environment was explored. Internet-specific tools such as e-mail, discussion forums, personal Web pages, online chat rooms, and multimedia presentations were matched with the appropriate category of learning outcome. The application of traditional instructional tools including lecture notes, group assignments, research papers, and examinations to an Internet-based environment was explored.

It must be recognized that this study is indeed only a start in the process of codifying Internet-based education. Several of the issues identified in the planning matrices defied definitive resolution through both the pilot project and the survey of experienced providers of Web-based courses. Three administrative and one management issue notably warrant further investigation:

1. Administrative: Should limits be placed on the subjects taught via the Web?
2. Administrative: What is an appropriate class size for this environment?

3. Administrative: How can students for Web-based courses be identified and recruited?

4. Management: What are the appropriate requirements regarding how quickly an instructor must respond to a student question or request for help?

**Recommendations**

Two particularly troublesome, and probably interrelated, issues surfaced during the course of this study. The number of students failing to complete the Internet-based pilot project course was alarmingly high. Within that course, the cooperative learning observed and the perceived presence of a developing learning community was distressingly low. Possible causes for these areas of concern and suggested future research efforts to address them are explored in the following paragraphs.

Four possibilities are indicated as explanations for these concerns. The students participating in the class might have been either ill prepared or poorly suited to the environment, the instructor might have been ill equipped to teach in the environment, the instructional design might have been flawed, or the instructional tools might not have been used appropriately. Each of these possible explanations offers insight into areas for further research.

Regarding the type of student best suited to a time- and place-independent, Internet-based learning environment the following areas are indicated for further research.

1. What, if any, personality profile correlates with success as a student in this type of a distance education environment?
2. What, if any, correlation exists between the motivating factors for taking a time- and place-independent, Internet-based course and ultimate success in the course?

3. What, if any, correlation exists between a student’s learning style and his or her success in this type of college course?

4. What, if any, requirements for computer hardware, software, Internet access, or previous experience are placed on students by schools that are successfully offering Internet-based courses?

Regarding the qualities and qualifications of instructors in Internet-based courses, three questions are indicated for further research.

1. What, if any, training do schools that are successfully offering Internet-based courses offer the instructors teaching the courses?

2. What, if any, personality profile correlates with success as an instructor in this type of a distance education environment?

3. What, if any, correlation exists between an instructor’s teaching style and his or her success in this type of college course?

Regarding optimal instructional design for a time- and place-independent, Internet-based course, the following areas of further research are indicated.

1. What are the appropriate criteria for selecting courses for delivery in this method?

2. What criteria can be used to determine appropriate measures for typical course management issues such as pacing of instruction, enforcement of due dates, and ‘office hours’?

Regarding the appropriate application of instructional tools in an Internet-based environment, the following areas of further research are indicated.
1. What are the strengths, weaknesses, appropriate applications, and effective methods of using each of the various Internet-based instructional tools?

2. What unique learning experiences can be provided using the strengths of the computer and the Internet that could not be provided in a traditional classroom setting?

Summary

Economic, social, and cultural pressures have combined to make nontraditional delivery systems of higher education increasingly more attractive to both colleges and potential adult students. The ready availability of computer technology and Internet accessibility have been used to address this need in the form of virtual colleges and universities (Brooks, 1997; Gubernick & Ebeling, 1997).

The promise of technology-enhanced distance learning is undeniable, but potential does not necessarily ensure success. Winn (1985), and Locatis & Weisberg (1997) warned of the dangers inherent in becoming so enamored with technology that sound educational principles are ignored. The challenge is to ensure that the promise of increased access to higher education offered in an Internet-based, virtual college is, in fact, a viable learning experience.

The goal of this study was to develop a schema for planning, implementing, and managing academically sound, time- and place-independent, Internet-based college coursework for the adult student. The project entailed development of three planning matrices. The first matrix focused on administrative issues, the second on management issues, and the third on learning issues.
The planning matrices were tested by developing and offering a course in Financial Accounting to adult students. The course could be completed in a time- and place-independent fashion with the assistance of the Internet. As anticipated, the delivery of this pilot project class raised as many questions as it answered. Based upon the lessons learned in the pilot project, a survey was developed and administered to educators and administrators experienced in the provision of Internet-based college courses. The responses to this survey further refined the planning matrices. The following sections contain a summary of the planning matrices for administrative, management, and learning issues.

**Table 10: Administrative Matrix**

<table>
<thead>
<tr>
<th>Issue</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will credits earned in a non-traditional learning environment be transferable to other colleges?</td>
<td>Yes, based upon adherence to regional accreditation guidelines.</td>
</tr>
<tr>
<td>Will potential or current students accept a non-classroom based learning environment?</td>
<td>A qualified yes. There was an unusually high drop rate of 50% in the pilot project. Coupled with the results of the survey, which indicated withdrawal rates greater than 30% are common, it is evident that this type of course is not appropriate for all students.</td>
</tr>
<tr>
<td>Issue</td>
<td>Resolution</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Is financial aid available for this type of educational experience,</td>
<td>A qualified yes, based upon current federal regulations regarding time- and place-independent learning environments.</td>
</tr>
<tr>
<td>and are there any special provisions that must be observed?</td>
<td></td>
</tr>
<tr>
<td>Should limits be placed on the subjects taught via the Web?</td>
<td>A clear majority of the survey respondents (60%) placed no limits on subjects taught.</td>
</tr>
<tr>
<td>Should class size be limited?</td>
<td>Survey responses were evenly mixed between those who limit class size to fewer than 25 students and those who permit larger classes.</td>
</tr>
<tr>
<td>What, if any, time limits are placed on course completion?</td>
<td>The vast majority of respondents (88%) indicated that standard semesters or quarters were used for Internet-based courses.</td>
</tr>
<tr>
<td>Where do you recruit students for Web-based courses?</td>
<td>Recruiting from the current student body was the most popular source, identified by 75% of the respondents. Advertising for students on the Web was also popular, appearing on 51% of the surveys.</td>
</tr>
</tbody>
</table>

Table 11: Management Matrix
<table>
<thead>
<tr>
<th>Issue</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do we ensure a student’s work is his or her own?</td>
<td>In the pilot project, the students were required to take the final exam on campus. The majority of survey respondents (51%) followed a similar procedure. Network passwords were used by 45% of the respondents.</td>
</tr>
<tr>
<td>What prior knowledge must be assumed and required for students to participate in this type of learning experience?</td>
<td>In the pilot project, a self-selection based upon a student handbook description of the learning environment was used. The survey strongly indicated (79% of the respondents) that special prerequisites are placed on participation in Internet-based courses.</td>
</tr>
<tr>
<td>How can students receive academic advising?</td>
<td>Electronic mail and online discussion forums were used in the pilot project. The survey indicated that e-mail was very widely used (83% of the respondents), but a majority of the surveys did indicate the need to supplement asynchronous advising with either person-to-person or telephone contact.</td>
</tr>
<tr>
<td>How do you encourage cooperative learning?</td>
<td>The survey indicated that e-mail (89%), discussion forums (77%), and group assignments (60%) were widely used. Chat rooms, a synchronous tool, were used by 49% of the respondents.</td>
</tr>
<tr>
<td>Issue</td>
<td>Resolution</td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>How often must a student submit work?</td>
<td>Submission of work on at least a weekly basis was clearly the most popular solution, appearing on 74% of the surveys.</td>
</tr>
<tr>
<td>Which of the following tools do you use to facilitate learning in a Web-based class?</td>
<td>The following tools appear to be in popular use: E-mail — 94%, Forums — 81%, Tests — 66%, Multimedia — 55%, Notes — 70%.</td>
</tr>
<tr>
<td>What, if any, requirements regarding how quickly an instructor must respond to a student question or request for help?</td>
<td>The plurality of respondents to the survey (34%) indicated no special provisions were in place regarding this issue. An equal number of respondents indicated targets of no more than 48 hours for response to student requests.</td>
</tr>
<tr>
<td>How do you handle due-dates for work required in the course?</td>
<td>The majority of surveys (57%) indicated the use of strictly enforced due dates. An additional 30% of the responses indicated use of due dates in some form in the course.</td>
</tr>
<tr>
<td>How do you use real-time interaction, such as chat rooms?</td>
<td>Real-time interaction was included in some role in 49% of the surveys, but only 15% included mandatory real-time events. Thirty-two percent of the respondents did not include any real-time events in their courses.</td>
</tr>
</tbody>
</table>
**Learning Matrix**

The primary goal for this matrix was to produce a course that a student could complete without the necessity of attending regularly scheduled classes by matching the strengths and capabilities of the Internet with established learning outcomes. To effect that goal, three products were necessary. A detailed list of learning outcomes for the course being offered was essential. Since an introductory course in Financial Accounting was selected for the pilot project, the guidelines for first-year accounting programs from The California Society of CPAs’ Committee of Accounting Education (1996) proved invaluable in specifying learning outcomes. The second component of the learning matrix was a list of instructional tools and methodologies that could be used to provide educational services in a time- and place-independent, Internet-based environment. The research of Dickinson (1997) and Porter (1997) was referenced extensively in this specification. These two products were combined into the learning matrix. The learning matrix contained five items: learning outcome, method for facilitating learning within the classroom, method for measuring learning within the classroom, method for facilitating learning using the Internet, and method for measuring learning using the Internet.

Based upon this learning matrix, the following resources were selected for use in the Internet-based class:
<table>
<thead>
<tr>
<th>Instructional Tool</th>
<th>Discussion of Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-mail</td>
<td>1. Simulate student-to-instructor question-and-answer.</td>
</tr>
<tr>
<td></td>
<td>2. Encourage cooperative learning by providing a mechanism for student-to-student interaction.</td>
</tr>
<tr>
<td>Chat room</td>
<td>1. Encourage cooperative learning by simulating classroom student-to-student interaction.</td>
</tr>
<tr>
<td></td>
<td>2. Simulate classroom student-to-instructor interaction.</td>
</tr>
<tr>
<td>Note: since chat rooms are real-time, they are not, by definition, time-independent. In accordance with the goals of this study they were, therefore, relegated to optional status.</td>
<td></td>
</tr>
<tr>
<td>Discussion forum</td>
<td>Encourage cooperative learning by simulating classroom student-to-student and student-to-instructor interaction.</td>
</tr>
<tr>
<td>Online notes</td>
<td>Convey course content normally delivered by lecture or demonstration.</td>
</tr>
<tr>
<td>Online presentations</td>
<td>Convey course content normally delivered by demonstration.</td>
</tr>
<tr>
<td>Computerized tutorials run locally using online tutorial supplied with the text</td>
<td>Convey course content normally delivered by supervised in-class activities.</td>
</tr>
<tr>
<td>Homework problems and practice sets</td>
<td>Provide avenue for constructive learning environment through supervised, hands-on learning opportunities.</td>
</tr>
</tbody>
</table>
### Instructional Tool Discussion of Uses

<table>
<thead>
<tr>
<th>Instructional Tool</th>
<th>Discussion of Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Links to outside sources, including Web pages developed by the text publisher and various companies</td>
<td>Provide access to external reference sources normally associated with a campus library.</td>
</tr>
<tr>
<td>Objective questions on online exams</td>
<td>Encourage and measure acquisition of the learning outcomes that are content oriented.</td>
</tr>
<tr>
<td>Completion, short answer and essay questions on exam</td>
<td>Encourage and measure acquisition of the learning outcomes that are process oriented.</td>
</tr>
<tr>
<td>Formal paper</td>
<td>Encourage and measure acquisition of the learning outcomes that are process oriented.</td>
</tr>
<tr>
<td>Graded assignments</td>
<td>Provide avenue for constructive learning environment through supervised, hands-on learning opportunities.</td>
</tr>
</tbody>
</table>

### Conclusions

The results of both the pilot project and the survey of experienced providers of Web-based college coursework led to two conclusions. A college course can indeed be taught in an academically sound fashion in a time- and place-independent fashion using the resources available in the Internet. There are, however, several challenges inherent in this delivery system. Most notably, it appears to be more difficult to positively engage the student in the learning process in the Internet-based environment than in the traditional classroom.
This difficulty was manifested in three ways. First, both the pilot project and responses to the survey indicated a rate of withdrawal from the course noticeably higher than typical for classroom based courses. Second, the rating of the students participating in the pilot project on the student satisfaction section of the course evaluation was significantly lower than evaluations for the same instructor teaching the same course in a classroom setting. Third, both impressions from the pilot project and responses to the survey indicated a difficulty in establishing the intangible aspects of a college experience commonly referred to as a learning community.

It should be emphasized that this study was designed as a developmental, not a research project; conclusions from the results should be viewed with caution. The study did present a strong indication that the Internet can be used as a delivery mechanism for credit-bearing college coursework. The concerns regarding positively engaging the student in the learning environment do tend to indicate that further work in developing this delivery system is necessary.
## Appendix A

### Formative Committee Membership

<table>
<thead>
<tr>
<th>Name</th>
<th>Position and Experience</th>
<th>Previous Exposure to Distance Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms. Irene Checkovich</td>
<td>College Registrar with 20 years experience</td>
<td>None</td>
</tr>
<tr>
<td>M.Ed., Systems Development and Adaptation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mr. Timothy Ellis</td>
<td>Instructor with 8 years experience</td>
<td>Student</td>
</tr>
<tr>
<td>C.A.G.S., Rehabilitation Administration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ms. Susan Jordan</td>
<td>English as a Second Language Instructor with 12 years experience</td>
<td>Student</td>
</tr>
<tr>
<td>M.A., Women’s Studies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mr. David Smith</td>
<td>Instructor with 12 years experience</td>
<td>None</td>
</tr>
<tr>
<td>C.A.G.S., History</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ms. Prudence VanWinkle</td>
<td>Program Director, Early Childhood Education, with 6 years experience</td>
<td>None</td>
</tr>
<tr>
<td>M.Ed., Educational Leadership</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. Nicholas Siciliano</td>
<td>Instructor with 26 years experience</td>
<td>None</td>
</tr>
<tr>
<td>Ph.D., Psychology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. Antone Vieira</td>
<td>Dean of Continuing Education with 14 years experience</td>
<td>Administrator and student</td>
</tr>
<tr>
<td>Ed.D., Higher Education Administration</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix B

Criteria Established by Formative Committee

The formative committee, comprised of seven experienced college educators and administrators as identified in Appendix A, developed a set of eighteen criteria for a time- and place-independent, Internet-based college course for adult students. These criteria were developed in an iterative fashion, modeled after the Delphi process (The Consummate Design Center, 1996). Three categories of criteria emerged: administrative issues, management issues, and learning issues. The criteria, phrased in the form of questions, included:

**Administrative Issues**

1. Will credits earned in a non-traditional learning environment be transferable to other colleges?
2. Will potential or current employers of the students accept a non-classroom based learning environment?
3. Will potential or current students accept a non-classroom based learning environment?
4. Will a time- and place-independent learning experience meet the needs of the workplace?
5. Is financial aid available for this type of educational experience, and are there any special provisions that must be observed?

6. Is the same tuition and fee structure used in traditional learning environments appropriate in the non-classroom environment?

**Management Issues**

1. How will students be registered, pay tuition and fees, purchase textbooks, and accomplish other routine business transactions with the college?

2. How do we ensure a student’s work is his or her own?

3. How much prior knowledge must be assumed and required for students to participate in this type of learning experience?

4. What hardware, software and special equipment must a student have to participate in the non-classroom learning environment?

5. Can traditional grading criteria be legitimately applied to this learning environment?

6. How effectively can the instructor monitor the student’s involvement and progress through the course?

7. How can students receive academic advising?

**Learning Issues**

1. Will the lack of person-to-person interaction prevent cooperative learning?

2. How suitable will a class without classroom activities be for learning advanced material that requires critical thinking and applying facts, not just acquiring facts?

3. Will the student receive timely, meaningful and insightful feedback for his or her work?
4. How will the teacher monitor the processes the student goes through to complete an assignment?

5. Will the learning experience be limited by the range of material that can be presented to the student, based upon the limits of a delivery system that does not include normal classroom interaction?
## Appendix C

National Council for Continuing Education and Training

### Board of Directors

<table>
<thead>
<tr>
<th>Name</th>
<th>Position and Experience</th>
<th>Previous Exposure to Distance Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms. Shirley Behrend</td>
<td>Contract Administrator with 15 years experience</td>
<td>None</td>
</tr>
<tr>
<td>M.Ed., Educational Admin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mr. William Flynn</td>
<td>Dean with 18 years experience</td>
<td>None</td>
</tr>
<tr>
<td>M.A., Theatre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. James Gray</td>
<td>Dean of Continuing Education with 17 years experience</td>
<td>Student and instructor</td>
</tr>
<tr>
<td>Ed.D., Adult and Continuing Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mr. Thomas Howard</td>
<td>Dean of Cooperative and Continuing Education with 10 years experience</td>
<td>Administrator</td>
</tr>
<tr>
<td>M.Ed., Vocational Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. Steven Hoyle</td>
<td>Director of Community Development with 29 years experience</td>
<td>Administrator</td>
</tr>
<tr>
<td>Ph.D., English</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. Diana Kelly</td>
<td>Associate Dean, Continuing Education and Special Programs with 8 years experience</td>
<td>None</td>
</tr>
<tr>
<td>Ph.D., Higher Education Administration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ms. Ellen Long</td>
<td>Dean of Instruction with 17 years experience</td>
<td>Administrator and student</td>
</tr>
<tr>
<td>M.A., Psychology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ms. Karen Merkle</td>
<td>Vice President, Extended Learning and Innovative Coordinator with 14 years experience</td>
<td>Administrator</td>
</tr>
<tr>
<td>M.A., Health Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. Andrew Meyer</td>
<td>Vice President for Continuing Education and Workforce Development with 11 years experience</td>
<td>None</td>
</tr>
<tr>
<td>Ed.D., Adult and Continuing Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Position and Experience</td>
<td>Previous Exposure to Distance Education</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------------------------------------------------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Dr. Ruth Nicholson</td>
<td>Assistant Vice President for Educational and Economic Development Services with 3 years experience</td>
<td>Administrator</td>
</tr>
<tr>
<td>Ed.D., Higher Education Administration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. Ann Smart</td>
<td>Dean of Extended Learning and Information Services with 13 years experience</td>
<td>Administrator and student</td>
</tr>
<tr>
<td>Ph.D., Post Secondary Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. Donald Tanner</td>
<td>Dean of Continuing Education with 28 years experience</td>
<td>Administrator</td>
</tr>
<tr>
<td>Ph.D., Learning Psychology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mr. Dan Timko</td>
<td>Dean of Community Services with 22 years experience</td>
<td>Administrator</td>
</tr>
<tr>
<td>M.S., Higher Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. Antone Vieira</td>
<td>Dean of Continuing Education with 15 years experience</td>
<td>Administrator and student</td>
</tr>
<tr>
<td>Ed.D, Higher Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dr. Elias Villarreal</td>
<td>Dean of Weekend College and Special Projects with 22 years experience</td>
<td>None</td>
</tr>
<tr>
<td>Ph.D., Adult Continuing Education</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix D

Criteria Validation Questionnaire

Fisher College
Computer Technology

Time- and Place-Independent Distance Education

Increasingly, colleges and universities are asked to meet the needs of the non-traditional student: an older student with many, often conflicting demands on his or her time. These students typically have a multitude of adult responsibilities such as child-care and full-time jobs to manage. These students do view college as an essential component of the ability to get and retain meaningful jobs and are, therefore, highly motivated to learn. Their existing responsibilities, however, make it impossible for them to commit to attending a class in a specific place at a specific time each week over an extended period of time. These adult students need an educational opportunity that is both time- and place-independent; a program that can be completed during the times the student has available, at either their own home or place of employment.

On the accompanying page are listed several questions regarding the development, implementation and management of offering college course in which the students are freed from the constraints of time and place. Please rate each of these items on a scale of 1 to 5, using the criteria detailed below. Questions 19 and 20 are intentionally left blank. Please include any questions you have that are not listed on the questionnaire in those spaces.

<table>
<thead>
<tr>
<th>Rating</th>
<th>Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Not of any concern</td>
</tr>
<tr>
<td>2</td>
<td>Must be investigated, but does not have to be resolved prior to proceeding with planning or implementation</td>
</tr>
<tr>
<td>3</td>
<td>Of moderate concern and must be addressed prior to implementing the program</td>
</tr>
<tr>
<td>4</td>
<td>Of great concern and must be resolved prior to implementing the program</td>
</tr>
<tr>
<td>5</td>
<td>Of over-riding concern and an acceptable resolution is unlikely</td>
</tr>
</tbody>
</table>
Time- and Place-Independent Distance Education

Personal Data Form

Name: ________________________________________________

<table>
<thead>
<tr>
<th>Educational Background</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Degree Earned:</td>
</tr>
<tr>
<td>Subject:</td>
</tr>
<tr>
<td>Other Graduate Degrees or Certificates Earned:</td>
</tr>
<tr>
<td>Degree: Subject:</td>
</tr>
<tr>
<td>Degree: Subject:</td>
</tr>
<tr>
<td>Degree: Subject:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Professional Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Position:</td>
</tr>
<tr>
<td>Tenure in current position:</td>
</tr>
<tr>
<td>Previous education or training positions</td>
</tr>
<tr>
<td>Position: When held: How long:</td>
</tr>
<tr>
<td>Position: When held: How long:</td>
</tr>
<tr>
<td>Position: When held: How long:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Experience with Distance Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you ever been involved in providing education or training in a distance education setting?</td>
</tr>
<tr>
<td>Subject taught: Your role:</td>
</tr>
<tr>
<td>When: How long:</td>
</tr>
<tr>
<td>Have you ever been a student or trainee in a distance education setting:</td>
</tr>
<tr>
<td>Subject learned:</td>
</tr>
<tr>
<td>When: How long:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
</tr>
<tr>
<td>6.</td>
</tr>
<tr>
<td>7.</td>
</tr>
<tr>
<td>8.</td>
</tr>
<tr>
<td>9.</td>
</tr>
<tr>
<td>10.</td>
</tr>
<tr>
<td>11.</td>
</tr>
<tr>
<td>12.</td>
</tr>
<tr>
<td>13.</td>
</tr>
<tr>
<td>14.</td>
</tr>
<tr>
<td>15.</td>
</tr>
<tr>
<td>16.</td>
</tr>
<tr>
<td>17.</td>
</tr>
<tr>
<td>18.</td>
</tr>
<tr>
<td>19.</td>
</tr>
<tr>
<td>20.</td>
</tr>
</tbody>
</table>
## Appendix E

### Step-by-Step Developmental Process

<table>
<thead>
<tr>
<th>Event (Phase or Step)</th>
<th>Starting Date</th>
<th>Ending Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Planning Phase</strong></td>
<td>September 8, 1997</td>
<td>January 12, 1998</td>
</tr>
<tr>
<td>Establish formative committee and develop criteria for the product</td>
<td>September 8, 1997</td>
<td>October 15, 1997</td>
</tr>
<tr>
<td>Gain administrative approval for the course</td>
<td>September 8, 1997</td>
<td>September 25, 1997</td>
</tr>
<tr>
<td>Identify learning objectives for pilot course</td>
<td>September 8, 1997</td>
<td>October 8, 1997</td>
</tr>
<tr>
<td>Develop evaluation criteria for textbook selection for pilot course</td>
<td>October 8, 1997</td>
<td>October 15, 1997</td>
</tr>
<tr>
<td>Identify online methodologies available for use in the pilot course</td>
<td>October 8, 1997</td>
<td>October 22, 1997</td>
</tr>
<tr>
<td>Develop matrix matching online methodologies with learning objectives</td>
<td>October 8, 1997</td>
<td>November 7, 1997</td>
</tr>
<tr>
<td>Select textbook for course</td>
<td>October 15, 1997</td>
<td>November 15, 1997</td>
</tr>
<tr>
<td>Validate criteria for the product through review by the Board of Directors of the National Council for Continuing Education and Training</td>
<td>November 2, 1997</td>
<td>November 15, 1997</td>
</tr>
<tr>
<td>Advertise the availability of the pilot course</td>
<td>November 1, 1997</td>
<td>January 15, 1998</td>
</tr>
<tr>
<td>Obtain IRB approval for the course evaluation forms</td>
<td>November 8, 1997</td>
<td>January 12, 1998</td>
</tr>
<tr>
<td>Develop course guidelines and write a Student Handbook detailing those guidelines</td>
<td>November 8, 1997</td>
<td>November 22, 1997</td>
</tr>
<tr>
<td>Event</td>
<td>Starting Date</td>
<td>Ending Date</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Install instructional material, including</td>
<td>December 1, 1997</td>
<td>January 12, 1998</td>
</tr>
<tr>
<td>lecture outlines and PowerPoint™ presentations on</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the Web server.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop student evaluation form based upon</td>
<td>December 15, 1997</td>
<td>January 26, 1998</td>
</tr>
<tr>
<td>learning objectives for the course.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welcome students to the course and direct them to</td>
<td>January 12, 1998</td>
<td>January 26, 1998</td>
</tr>
<tr>
<td>direct them to the Student Handbook.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>campus-based.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final exam, all course work due.</td>
<td></td>
<td>March 12, 1998</td>
</tr>
<tr>
<td>Analysis Phase</td>
<td>September 8, 1997</td>
<td>May 31, 1998</td>
</tr>
<tr>
<td>Create questionnaire for other providers of Web-</td>
<td>September 8, 1997</td>
<td>March 25, 1998</td>
</tr>
<tr>
<td>based college courses.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obtain IRB approval for questionnaire for</td>
<td>March 25, 1998</td>
<td>April 25, 1998</td>
</tr>
<tr>
<td>providers of Web-based college courses.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solicit responses to questionnaire from</td>
<td>April 25, 1998</td>
<td>May 31, 1998</td>
</tr>
<tr>
<td>other providers of Web-based college courses.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completion of Report</td>
<td>May 13, 1998</td>
<td>September 1, 1998</td>
</tr>
</tbody>
</table>
Appendix F

Course Evaluation Form

<table>
<thead>
<tr>
<th>Course Evaluation Form</th>
<th>Fisher College</th>
</tr>
</thead>
</table>

Directions: 1.) Read each question. 2.) Fill in the appropriate space on this form. This evaluation is confidential. Do not sign your name on this form. Responses: 5=excellent, 4=good, 3=average, 2=fair, 1=poor. Any additional responses should be made on this form.

<table>
<thead>
<tr>
<th></th>
<th>Excellent</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How well was the course organized?</td>
<td>9.</td>
<td>1.</td>
</tr>
<tr>
<td>2. To what extent has this course challenged you to think about course concepts?</td>
<td>10.</td>
<td>1.</td>
</tr>
<tr>
<td>3. How much has this course improved your ability to think critically and analyze information?</td>
<td>11.</td>
<td>1.</td>
</tr>
<tr>
<td>5. Were the class meetings effective in dealing with the content of the course?</td>
<td>13.</td>
<td>1.</td>
</tr>
<tr>
<td>7. To what extent did you prepare yourself prior to each class?</td>
<td>15.</td>
<td>1.</td>
</tr>
<tr>
<td>8. What grade do you expect to receive in this class?</td>
<td>16.</td>
<td>A B C D F</td>
</tr>
</tbody>
</table>

Additional comments:

<table>
<thead>
<tr>
<th></th>
<th>Excellent</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>17. How well did the course outline clearly state class topics, assignments and grading procedures?</td>
<td>22.</td>
<td>1.</td>
</tr>
<tr>
<td>18. How effective were the course readings (textbook, additional readings, handouts) as learning aids?</td>
<td>23.</td>
<td>1.</td>
</tr>
<tr>
<td>19. How effective were the papers and class projects/presentations as learning aids?</td>
<td>24.</td>
<td>1.</td>
</tr>
<tr>
<td>20. How effective were the computer exercises as learning aids? If not applicable, skip.</td>
<td>25.</td>
<td>1.</td>
</tr>
<tr>
<td>21. How effective were the audiovisual materials (videos, slides, overheads) as learning aids? If not applicable, skip.</td>
<td>26.</td>
<td>1.</td>
</tr>
</tbody>
</table>

Additional comments:

<table>
<thead>
<tr>
<th></th>
<th>Excellent</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>27. How well-prepared was the instructor?</td>
<td>34.</td>
<td>1.</td>
</tr>
<tr>
<td>28. How well did the instructor appear to understand the subject matter?</td>
<td>35.</td>
<td>1.</td>
</tr>
<tr>
<td>29. To what degree did the instructor provide an opportunity for student questions?</td>
<td>36.</td>
<td>1.</td>
</tr>
<tr>
<td>30. How well did the instructor respond to student questions?</td>
<td>37.</td>
<td>1.</td>
</tr>
<tr>
<td>31. To what degree did the instructor set high quality standards?</td>
<td>38.</td>
<td>1.</td>
</tr>
<tr>
<td>32. To what degree did the instructor meet with and help you when requested?</td>
<td>39.</td>
<td>1.</td>
</tr>
<tr>
<td>33. To what degree did the instructor create a positive, friendly learning environment?</td>
<td>40.</td>
<td>1.</td>
</tr>
</tbody>
</table>

Additional comments:
Please indicate how confident you feel about your ability to do the following. **Responses: 5 = Yes; 4 = I think so, after some research; 3 = I don’t think so, but it sounds familiar; 2 = No; 1 = I am totally unfamiliar with the topic.**

1. Identify the types of decisions investors and creditors make.  
2. Describe what information in the financial statements or related disclosures meets the needs of both investors and creditors.  
3. Discuss the role of ethics in the preparation of financial statements.  
4. Identify and discuss how US accounting measurement techniques and financial statements differ from those practiced in other countries.  
5. Describe how information sources other than the annual report can be used to learn more about the nature of an entity’s business.  
6. Identify the differences between the objectives of tax accounting and financial accounting.  
7. Explain how a tax return is actually a special version of the income statement.  
8. Define the following key terms: assets, budget, collateral, financing, limited liability and lease.  
9. Distinguish among profit, governmental and other nonprofit entities by identifying their goals and the content of their financial reports.  
10. Identify the characteristics, advantages, and disadvantages of the corporation, partnership and sole proprietorship forms of entity.  
11. Classify business transactions into operating, investing and financing activities.  
12. Describe the key differences in the financial statements of merchandising, manufacturing, non-financial service, and financial service companies, and explain how these differences are reflected in the operating, investing and financing activities of each type of entity.  
13. Discuss the information typically found in the balance sheet, income statement, statement of owner’s equity and statement of cash flows.  
14. Apply the fundamental accounting equation to analyze the effects of accounting transactions on the elements of the balance sheet.  
15. Apply the fundamental accounting equation to prepare a balance sheet that reports the condition of any entity.  
16. Apply the income statement equation to discuss the criteria used to determine when revenues are recognized and apply the criteria to a specific entity to determine when its revenue should be recognized.  
17. Apply the income statement equation to discuss the process used to recognize expenses.  
18. Apply the income statement equation to prepare an income statement that reports the results of operations for any entity.  
19. Distinguish between the accrual and the cash basis of income measurement by preparing both an accrual and cash basis income statement from the same set of business transactions.  
20. Differentiate the balance sheet from the income statement by classifying account titles into assets, liability, capital, revenues and expenses.  
21. Describe how the amounts reported on the income statement and balance sheet are determined by distinguishing among the valuation methods for each of the major asset and liability accounts.  
22. Describe how the amounts reported on the income statement and balance sheet are determined by identifying the generally accepted valuation method for each of the major asset and liability accounts.  
23. Describe how the amounts reported on the income statement and balance sheet are determined by describing how the balance in each major asset, liability, capital, revenue and expense account is calculated.
Please indicate how confident you feel about your ability to do the following.

**Responses:** 5 = Yes; 4 = I think so, after some research; 3 = I don't think so, but it sounds familiar; 2 = No; 1 = I am totally unfamiliar with the topic.

<table>
<thead>
<tr>
<th>Question</th>
<th>Confident Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>24. Link the following related financial statements: balance sheet, income statement, statement of cash flows, and statement of equity.</td>
<td>①①①①</td>
</tr>
<tr>
<td>25. Classify cash receipt and payment transactions, and significant non-cash transactions into the appropriate statement of cash flow activity.</td>
<td>①①①①</td>
</tr>
<tr>
<td>26. Identify manners in which financial accounting information is used to make business and personal decisions.</td>
<td>①①①①</td>
</tr>
<tr>
<td>27. Calculate a financial statement ratio for liquidity (current and acid test ratio) and discuss its usefulness and limitations in making decisions.</td>
<td>①①①①</td>
</tr>
<tr>
<td>28. Calculate a financial statement ratio for activity or turnover (average collection period) and discuss its usefulness and limitations in making decisions.</td>
<td>①①①①</td>
</tr>
<tr>
<td>29. Calculate a financial statement ratio for financial leverage (debt to equity) and discuss its usefulness and limitations in making decisions.</td>
<td>①①①①</td>
</tr>
<tr>
<td>30. Calculate a financial statement ratio for profitability (profit margin ratio) and discuss its usefulness and limitations in making decisions.</td>
<td>①①①①</td>
</tr>
<tr>
<td>31. Calculate a financial statement ratio for valuation (price/earnings ratio) and discuss its usefulness and limitations in making decisions.</td>
<td>①①①①</td>
</tr>
<tr>
<td>32. Explain how percentage analysis can be used to uncover important relationships and trends on financial statements.</td>
<td>①①①①</td>
</tr>
<tr>
<td>33. Explain how inventories and accounts receivable can be mismanaged and described how a manager can use financial statement analysis to monitor and control these assets.</td>
<td>①①①①</td>
</tr>
<tr>
<td>34. Explain the relationship between net income and cash flow and discuss how a highly profitable, fast-growing business might face liquidity problems that could force it into bankruptcy.</td>
<td>①①①①</td>
</tr>
<tr>
<td>35. Identify limitations of the financial statements found in the annual report.</td>
<td>①①①①</td>
</tr>
<tr>
<td>36. Discuss how the need for relevance and reliability affect the design of an accounting information system.</td>
<td>①①①①</td>
</tr>
<tr>
<td>37. Discuss the basic principles of internal control and describe the attributes of an effective and efficient internal control system.</td>
<td>①①①①</td>
</tr>
<tr>
<td>38. Analyze the strengths and weaknesses of an internal control system.</td>
<td>①①①①</td>
</tr>
<tr>
<td>39. Distinguish between the recording and reporting phases of the accounting cycle.</td>
<td>①①①①</td>
</tr>
<tr>
<td>40. Explain the significance of debits and credits as they are used in an accounting system.</td>
<td>①①①①</td>
</tr>
<tr>
<td>41. Prepare the four common financial statements.</td>
<td>①①①①</td>
</tr>
<tr>
<td>42. Identify the problem, alternative ways of solving the problem, alternative positions and position arguments for a controversial issue.</td>
<td>①①①①</td>
</tr>
<tr>
<td>43. Identify the assumptions and possible position underlying an ethical issue.</td>
<td>①①①①</td>
</tr>
<tr>
<td>44. Evaluate a speaker’s or writer’s content for appearance of underlying assumptions and facts versus opinions</td>
<td>①①①①</td>
</tr>
<tr>
<td>45. Analyze an unstructured problem that has no single correct answer.</td>
<td>①①①①</td>
</tr>
</tbody>
</table>

**Additional Comments:**

<table>
<thead>
<tr>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Appendix G

Survey: Providers of Web-Based College Courses

The participants for the survey were selected from the listing of Web-based courses offered world-wide that is maintained by the University of Texas (1997). The World Wide Web sites listed at that site were accessed and the instructor and, when available administrators, responsible for the course were solicited for input via e-mail.

E-Mail Request

Dear Colleague,

I am in the process of completing my dissertation for a Doctorate in Computing Technology in Education. My research focuses on the provision of credit-bearing, college-level courses entirely over the Internet. As part of the study, a set of questions regarding educational, support, and administrative issues in this type of distributed education environment was developed by a group of seven experienced faculty members and college administrators. The Board of Directors of the National Council for Continuing Education and Training reviewed and validated these questions. A set of twenty-five questions regarding the provision of coursework over the Internet was developed from this process.

Since your institution already provides Web-based coursework, your input is invaluable. Please take a few minutes to complete the brief questionnaire located at http://webschool.fisher.edu/page2.html. Be assured that your responses will be treated confidentially and used only as part of aggregate results. Your name or institution will in no way be associated with any specific response.

Thank you in advance for you help in gathering this background information on the techniques and successes of Web-based distance education efforts. If you would like a copy of the results of this study, please so indicate on the questionnaire.

The questionnaire is available online at http://webschool.fisher.edu/page2.html. I will be collecting data throughout the month of May, 1998. Please complete the survey prior to June 1, 1998.
If you have any questions regarding this research, please contact me at tellis@fisher.edu If you have any colleagues who have also provided Web-based courses, please forward this e-mail to them.

Timothy Ellis  
Computer Technology Program Director  
Fisher College  

And

Ph.D. Candidate  
Nova Southeastern University  
Computing Technology in Education  

The Survey

1. Name of your school (Optional):

2. Your name (Optional):

3. Your position at the school:
   - Faculty
   - Administration
   - Other:

4. How long have you been offering Web-based courses?
   - Less than 1 year
   - 1 to 2 years
   - 2 to 3 years
   - More than 3 years
5. How many Web-based courses have you offered?
   - 1
   - 2
   - 3 to 5
   - More than 5

6. How do you ensure that a student's work is his or her own? (Check all that apply)
   - Student does the final exam at the school
   - Student identifies a proctor for the final exam
   - Use of network passwords to limit access
   - Provisions under consideration
   - No special provisions necessary
   Other (Please specify) _____________________________________________

7. How do you encourage cooperative learning? (Check all that apply)
   - Online discussion forums
   - E-mail
   - Chat rooms
   - Group assignments
   - Provisions under consideration
   - No special provisions necessary
   Other (Please specify) _____________________________________________

8. How often must a student submit work:
   - More than once a week
   - At least weekly
   - At least monthly
   - Provisions under consideration
   - No special provisions necessary
   Other (Please specify) _____________________________________________
9. Do you place limits on the subjects taught via the Web? (Check all that apply)

☐ Limited to only introductory classes
☐ Limited to certain subject areas
☐ Limited to certain instructors
☐ Provisions under consideration
☐ No limits

Other (Please specify)

10. Do you have special requirements for students taking a course over the Web? (Check all that apply)

☐ Personal access to an adequately equipped personal computer
☐ Personal access to an Internet account
☐ Previous experience in using the World Wide Web
☐ Provisions under consideration
☐ No special provisions necessary

Other (Please specify)

11. How do you provide academic advising? (Check all that apply)

☐ E-mail
☐ Chat room
☐ In person contact
☐ Telephone contact
☐ Mail
☐ Provisions under consideration
☐ No special provisions

Other (Please specify)
12. Do you limit class size?

☐ Less than 15
☐ 15 to 25
☐ More than 25
☐ Provisions under consideration
☐ No limit

13. Which of the following tools do you use to facilitate learning in a Web-based class? (Check all that apply)

☐ E-mail
☐ Discussion forums
☐ Tests and quizzes
☐ Multimedia presentations
☐ Lecture notes
☐ Virtual reality simulations

Other (Please specify)

14. Which of the following tools do you use to evaluate learning and determine course grade? (Check all that apply)

☐ Quality and quantity of e-mail responses
☐ Participation in discussion forums
☐ Formal papers
☐ Examinations

Other (Please specify)
15. What, if any, time limits are placed on course completion? (Check all that apply)

☐ Standard semester (14 to 15 weeks)

☐ Standard quarter (11 to 12 weeks)

☐ Term less than a typical quarter

☐ Term greater than a typical semester

☐ Provisions under consideration

☐ No time limits

16. What percentage of students who enroll in a Web-based class do not complete the class?

☐ Fewer than 10%

☐ 10% to 20%

☐ 20% to 30%

☐ 30% to 40%

☐ 40% to 50%

☐ More than 50%

☐ Unknown

17. What do you do when a student does not participate in the class for an extended period of time? (Check all that apply)

☐ Contact via e-mail

☐ Contact via phone

☐ Contact via mail

☐ Administratively withdraw the student from the class

☐ Fail the student

☐ Provisions under consideration

☐ No special provisions necessary

Other (Please specify)
18. Where do you recruit students for Web-based courses (Check all that apply)

☐ From existing students enrolled in traditional, classroom-based courses
☐ Advertisements on the Web
☐ Newspaper, radio or television advertisements
☐ Targeted industries
☐ Provisions under consideration
☐ No special provisions necessary

Other (Please specify) ____________________________

19. Do you have requirements regarding how quickly an instructor must respond to a student question or request for help?

☐ Within 24 hours
☐ Within 24 to 48 hours
☐ Within 2 to 3 days
☐ Within 3 to 5 days
☐ Within a week
☐ Provisions under consideration
☐ No special provisions necessary

Other (Please specify) ____________________________

20. How do you evaluate the effectiveness of a Web-based course? (Check all that apply)

☐ Student evaluation of the instructor and/or course
☐ Standardized tests
☐ Comparison of student performance with students taking the same course in a classroom setting
☐ Provisions under consideration
☐ No evaluation

Other (Please specify) ____________________________
21. What size 'chunk' of material do you find most appropriate for a Web-based course?

- 3-semester/4-quarter credits
- 2 credits
- 1 credit
- Provisions under consideration
- No special provisions necessary

22. How do you handle due-dates for work required in the course?

- Strictly enforced due dates, with penalties for late work
- Target dates, with no penalty for late submissions
- Self-paced study with only a completion date for the course as a whole
- No time constraints
- Provisions under consideration
- No special provisions

Other (Please specify) ____________________________

23. How do you use real-time interaction, such as chat rooms?

- Mandatory participation as an integral part of the course
- Optional participation as an integral part of the course
- Optional participation in a supporting role
- Not used in the course
- Provisions under consideration
- No special provisions necessary

Other (Please specify) ____________________________
24. Which of the following do you use to foster a learning community in a Web-based setting? (Check all that apply)

- An in-person meeting of all participants at some time during the course
- Personal Web pages for all participants
- Online discussion forums
- Group assignments
- Provisions under consideration
- No special provisions necessary

Other (Please specify)

__________________________________________________________________________

25. We would be glad to share the results of this research with you. If you would like a copy of the results, please check the box below and fill in your e-mail address.

- Send me the results of this survey

E-mail address

Submit Query

Please send any questions you have regarding this survey to:
Timothy Ellis
Fisher College
Computer Technology Program Director
Appendix H

Student Handbook

1. Just what is an Internet-based course?
   In an Internet-based course, you, the student, do not attend any regularly scheduled classes. Your entire contact with both other students and the instructor is conducted over the Internet. For example, all course work, with the exception of the final exam, is transmitted to and from you via the Internet. In order to offer a degree of assurance that the work submitted is indeed your own, the final exam must be taken at one of the DCE campus locations.
   (Go to http://www.fisher.edu/conted/location.htm for campus locations)

2. Why try this approach?
   An Internet-based approach has the potential of offering several benefits.
   - Since you do not have to attend any regularly scheduled classes, you do not have to be in a specific place at a specific time each and every week. You can do the required work when and where it is convenient for you.
   - Since the class is offered in cyberspace, students from several campuses can easily participate in the same course. Courses are less likely to be cancelled due to insufficient enrollment.

3. What is the course being offered?
   Only one course, AC121 Financial Account, is being offered at this time. The course will have identical content and learning objectives as the AC121 already available in our traditional classroom settings.

4. Will the course still carry the same credits, be graded in the traditional fashion and satisfy degree requirements and be as transferable to other colleges as if the student took it in a classroom?
   Yes, you will receive the same credit, grade and satisfy any requirements.

5. How will the course be different?
   The only real difference in the Internet-based AC121 and classroom-based AC121 classes will be in the manner in which you communicate with the instructor and other students in the class. In the Internet-based class, you will communicate with each other and the teacher using such Internet tools as e-mail, Web pages, and Online Discussion Forums.
6. If you have problems, will you have someone to contact for help?
   Yes. There will be several types of help available.
   • For problems involving course content, you can contact the course instructor,
     Mr. Len Long, via e-mail at: Llong@fisher.edu
   • For problems related to the mechanics of taking a course over the Internet,
     you can:
     • Refer to the Web Course in a Box Student’s Guide located at
       http://www.madduck.com/wcb/docs/stuguide.html Or
     • Contact the program manager for this project, Tim Ellis, via e-mail at:
       Tellis@fisher.edu

7. What length of time will you have to complete the course?
   You will have the same 8-week term to complete all course requirements as we
   offer all DCE students.

8. What about refunds for withdrawing from the class?
   The College catalog specifies the following refund policy: prior to the 2nd class
   meeting – 90%; prior to the 3rd class meeting – 50%; after the 3rd class, no refund.
   Since the Internet-based section will not have official class meetings, this policy
   must be modified somewhat as follows: within the 1st week – 90%; within the 2nd
   week – 50%; after the 2nd week, no refund.

9. How much does the class cost?
   There is no difference in cost for this section of AC121: $435 for the 3-credit
   course.

10. Is financial aid available?
    If you are otherwise eligible for financial aid, you can receive aid for this course.
    Please contact the Campus Director of the Fisher College campus nearest you for
    help with financial aid.

11. Why would you want to take the Internet-based AC121 section?
    There could be several possible benefits for you to elect to take a course in this
    fashion.
    • Freedom from constraints in time and place. Several of our students find it
      very hard to attend classes for 2 ½ hours, two nights a week for eight weeks,
      and would welcome the opportunity to learn the material and earn the credits
      at times and places convenient to them.
    • The availability of a class that would otherwise not be run because of
      inadequate enrollment.
    • The adventure of learning in a new, ‘hi-tech’ way.

12. How can you register?
    At this time, we only offer registration at a local campus, just like other classes.
13. What do you need to take the Internet-based AC121 section?

- A willingness to work independently.
- Access to a personal computer equipped with:
  - At least an 80486 cpu and 8mb of RAM
  - MicroSoft Windows 3.1 or Windows 95
  - Netscape Navigator 3.0 (or newer) or MicroSoft Internet Explorer 3.0 (or newer)
  - MicroSoft Excel or Lotus 123
- Internet access through a commercial Internet Service Provider

Note: You can have this access either through personal means or by using the College’s computers in the resource rooms or computer labs.
Appendix I

Financial Accounting Learning Outcomes

The primary goal of this course is to help students learn how accounting meets the information needs of various users by developing and communicating information that is useful for decision-making. This goal will be active by requiring the following outcomes as core competencies in the following areas:

1. Accounting’s role in society.
2. Fundamental business concepts.
3. Fundamental accounting concepts underlying financial statements.
4. Uses and limitations of financial statements.
5. Accounting information systems.
6. Communication skills
7. Group work skills
8. Problem solving skills

1. Accounting’s role in society

Part A - How does accounting meet information needs of investors and creditors?

1. Identify the types of decisions investors and creditors make and describe what information in the financial statements and/or related disclosures meets the information needs of each group.

2. Discuss what role ethics plays in the preparation of financial statements.

3. Identify and discuss examples of how U.S. accounting measurement techniques and financial statements differ from the measurement techniques and financial statements of other countries.

Part B - How does accounting meet the information needs of regulatory agencies and taxing authorities.

1. Describe how information sources other than the annual report (e.g. SEC form 10-k) can be used to learn more about the nature of an entity’s business.
2. Identify some of the differences between the objectives of tax accounting and financial accounting and give examples of the differences.

3. Explain how a tax return is actually a special version of the income statement.

2. **Fundamental business concepts:** How do businesses operate and how does accounting serve them.

   1. Explain the meaning of key business terms (e.g. assets, budget, collateral, financing, limited liability and lease).

   2. Identify the characteristics of the corporate, partnership and sole proprietorship forms of entity and discuss the advantages and disadvantages of each form.

   3. Classify business transactions into operating, investing and financing activities.

   4. Describe the key differences in the financial statements of merchandisers, manufacturers, non-financial service companies (e.g. United Airlines), and financial service companies. Explain how these differences reflect the operating, investing, and financing activities of each type of entity.

3. **Fundamental accounting concepts underlying financial statements:** What are the elements of, the relationships among, and the accounting concepts underlying the primary financial statements?

   1. Discuss what information is typically found in the balance sheet, income statement, statement of owner’s equity and the statement of cash flows.

   2. Apply the fundamental accounting equation to analyze the effects of accounting transactions on the elements of the balance sheet.

   3. Apply the fundamental accounting equation to prepare a balance sheet that reports the condition of any entity (e.g. a person, sole proprietorship, partnership, corporation).

   4. Apply the income statement equation to discuss the criteria used to determine when revenues are recognized and apply the criteria to a specific entity to determine when its revenue should be recognized.

   5. Apply the income statement equation to discuss the process used to recognize expenses.

   6. Apply the income statement equation to prepare an income statement that reports the results of operations for any entity.
7. Distinguish between the accrual and cash basis of income measurement by preparing both an accrual and cash basis income statement from the same set of business transactions.

8. Differentiate the balance sheet from the income statement by being able to classify account titles into assets, liability, capital, revenues and expenses.

9. Describe how the amounts reported on the income statement and the balance sheet are determined by distinguishing among the valuation methods for each major asset and liability accounts.

10. Describe how the amounts reported on the income statement and the balance sheet are determined by identifying the generally accepted valuation method for each of the major asset and liability accounts.

11. Describe how the amounts reported on the income statement and the balance sheet are determined by describing how the balance in each major asset, liability, capital, revenue and expense account is calculated (e.g. accounts receivable and depreciation).

12. Link the following related financial statements: balance sheet, income statement, statement of cash flows and the statement of owner’s equity.

13. Classify cash receipt and cash payment transactions, as well as, significant non-cash transactions into the appropriate statement of cash flow activity.

**4. Uses and Limitations of financial statements**: What are the uses and limitations of financial statements and related information in making both business and personal financial decisions?

1. Identify several ways in which financial accounting information is used to make business and personal decisions.

2. Calculate at least one financial statement ratio within each of the following five categories and discuss its usefulness and limitations in making decisions.
   a- Liquidity - e.g. current and acid test ratio
   b- Activity or Turnover - e.g. average collection period
   c- Financial leverage - e.g. debt to equity
   d- Profitability - e.g. profit margin ratio
   e- Valuation - e.g. price/earnings ratio

3. Explain how percentage analysis can be used to uncover important relationships and trends on the financial statements.
4. Explain how inventories and accounts receivable can be mismanaged and described how a manager can use financial statement analysis to monitor and control these assets.

5. Explain the relationship between net income and cash flow and discuss how a highly profitable, fast-growing business might face liquidity problems that could force it into bankruptcy.

6. Identify several limitations of the financial statements found in the annual report.

5. Accounting information systems.

Part A- How is the usefulness of information produced by an accounting system directly related to that system’s design?

1. Discuss how the need for relevance and reliability affect the design of an accounting information system.

2. Discuss the basic principles of internal control and describe the attributes of an effective and efficient internal control system.

3. Identify the strengths and weaknesses of an internal control system, and if appropriate, suggest improvements to the system.

Part B- How are business transactions input, processed by an accounting information system and output by that same system to produce financial statements?

To appreciate the role of technology in this process, students should work with one or more of the following tools; a spreadsheet, an accounting software package, a database or other technology.

1. Identify and apply the essential conditions necessary for a business event to qualify as an accounting transaction and therefore be recorded in the accounting information system.

2. Distinguish between the recording and the reporting phase of the accounting process or cycle by being able to complete the following:
   
   a- Record the effects of accounting transactions to individual information systems.
   
   b- Transfer the effects of these explicit transactions to individual asset, liability, and owners’ equity accounts.
   
   c- Analyze whether an adjustment of correction is needed in a particular situation.
d- Record and transfer the effects of adjustments and correction to individual asset, liability, and owners’ equity accounts.

e- Prepare the financial statements.

3. Explain the significance of debits and credits as they are used in an accounting system.
### Appendix J

#### Learning Outcomes by Classroom and Online Methodologies

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcome</strong>: Identify the types of decisions investors and creditors make and describe what information in the financial statements and/or related disclosures meet the information needs of each group.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Online Methodology</th>
<th>Classroom Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture/discussion</td>
<td>Series of e-mail questions sent to all students periodically</td>
<td>Participation in classroom discussions</td>
</tr>
<tr>
<td>Addressed throughout term</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Outcome: Describe what information in the financial statements and/or related disclosures meet the needs of each group (investors & creditors) |

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Online Methodology</th>
<th>Classroom Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture/discussion</td>
<td>Forum topic, soliciting discussion contributions throughout the term</td>
<td>Essay question on exam</td>
</tr>
<tr>
<td>Addressed throughout term</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Outcome: Discuss what role ethics plays in the preparation of financial statements |

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Online Methodology</th>
<th>Classroom Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short case study (vignette)</td>
<td>Small group chat room</td>
<td>Matching question on exam</td>
</tr>
<tr>
<td>Group work</td>
<td>Vignette loaded onto Web site</td>
<td></td>
</tr>
<tr>
<td>Videos</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Online Methodology</th>
<th>Classroom Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group e-mail response to vignette, with a response from the group – teacher input – final group product</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Outcome: Identify & discuss how US accounting measurement techniques and financial statements differ from the techniques and statements of other countries

| Classroom Methodology | Lecture/discussion  
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Addressed throughout term</td>
</tr>
</tbody>
</table>
| Online Methodology    | On-line instructor’s notes  
|                       | Series of focused e-mail queries and responses |
| Classroom Evaluation  | Essay question on exam  
| Online Evaluation     | Exam  
|                       | E-mail responses |

### Outcome: Describe how information sources other than the annual report can be used to learn more about the nature of an entity’s business

| Classroom Methodology | Compare a SEC form 10K for a company with its financial statements and analyze differences  
|-----------------------|------------------------------------------------|
| Online Methodology    | Include in forum topics for discussion  
| Classroom Evaluation  | Participation in class discussion  
| Online Evaluation     | Forum contributions |

### Outcome: Identify some of the differences between the objectives of tax accounting and financial accounting

| Classroom Methodology | Lecture/discussion  
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Addressed throughout term</td>
</tr>
</tbody>
</table>
| Online Methodology    | On-line notes and presentation  
|                       | Vignette study question |
| Classroom Evaluation  | Homework  
|                       | Exam questions (essay)  
|                       | Vignette study question |
| Online Evaluation     | Exam question (essay)  
|                       | E-mail responses to vignette  
|                       | Homework problems |

### Outcome: Explain how a tax return is actually a special version of the income statement

| Classroom Methodology | Discussion/handout  
|-----------------------|--------------------|
| Online Methodology    | On-line notes and presentation  
| Classroom Evaluation  | Participation  
<p>|                       | Multiple choice quiz question |
| Online Evaluation     | Multiple choice question on an Online quiz |</p>
<table>
<thead>
<tr>
<th><strong>Outcome:</strong> Explain the meaning of key terms, including assets, budget, collateral, financing, limited liability, and lease</th>
</tr>
</thead>
</table>
| **Classroom Methodology** | Lecture/discussion  
Homework |
| **Online Methodology** | Exam question (fill in the blank or multiple choice) |
| **Classroom Evaluation** | On-line notes |
| **Online Evaluation** | Exam question (fill in the blank or multiple choice)  
Overall quality of e-mail responses |

<table>
<thead>
<tr>
<th><strong>Outcome:</strong> Distinguish among profit, governmental and other nonprofit entities by identifying their respective goals and by looking at the content of their financial reports</th>
</tr>
</thead>
</table>
| **Classroom Methodology** | Lectures  
Group activity  
Outside-class observation |
| **Online Methodology** | Online notes  
Outside observation |
| **Classroom Evaluation** | Group paper (1 page) in which the students have to find one of each type of entity and observe differences |
| **Online Evaluation** | Forum contribution |

<table>
<thead>
<tr>
<th><strong>Outcome:</strong> Identify the characteristics of the corporation, partnership and sole proprietorship forms of entity and discuss the advantages and disadvantages of each form</th>
</tr>
</thead>
</table>
| **Classroom Methodology** | Lectures  
Group activity  
Outside-class observation |
| **Online Methodology** | Online notes  
Outside observation |
| **Classroom Evaluation** | Exam question (essay)  
Participation in class discussion |
| **Online Evaluation** | Exam question (essay)  
Forum contribution |
**Outcome**: Classify business transactions into operating, investing, and financing activities

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Discussion/lecture</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Online Methodology</strong></td>
<td>Online notes and presentation</td>
</tr>
<tr>
<td>Classroom Evaluation</td>
<td>Completion questions on exam</td>
</tr>
</tbody>
</table>
| **Online Evaluation**  | E-mail response to small case study vignette  
Completion question on exam |

**Outcome**: Describe the key differences in the financial statements of merchandising, manufacturers, non-financial service companies, and financial service companies; explain how these differences reflect the operating, investing and financing activities of each type of entity

| Classroom Methodology | Lecture  
Demonstration in class |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Online Methodology</strong></td>
<td>Online notes and presentation</td>
</tr>
<tr>
<td>Classroom Evaluation</td>
<td>True/False and multiple choice questions on exam</td>
</tr>
</tbody>
</table>
| **Online Evaluation**  | True/False and multiple choice questions on exam  
E-mail response to small case study vignette |

**Outcome**: Discuss what information is typically found in the balance sheet, income statement, statement of owner’s equity and statement of cash flows

| Classroom Methodology | Lecture  
Demonstration  
Homework |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Online Methodology</strong></td>
<td>Online notes and presentation</td>
</tr>
<tr>
<td>Classroom Evaluation</td>
<td>Practice-set questions on exam</td>
</tr>
<tr>
<td><strong>Online Evaluation</strong></td>
<td>Practice-set questions on exam</td>
</tr>
<tr>
<td><strong>Outcome:</strong> Apply the fundamental accounting equation to analyze the effects of accounting transactions on the elements of the balance sheet</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td></td>
</tr>
</tbody>
</table>
| **Classroom Methodology** | Lecture and presentation  
Homework problems |
| **Online Methodology** | Online (local) tutorial  
Homework problems |
| **Classroom Evaluation** | Practice set questions on exam |
| **Online Evaluation** | Practice set questions on exam |

<table>
<thead>
<tr>
<th><strong>Outcome:</strong> Apply the fundamental accounting equation to prepare a balance sheet that reports the condition of any entity (e.g. a person, sole proprietorship, partnership, corporation)</th>
</tr>
</thead>
</table>
| **Classroom Methodology** | Lecture and presentation  
Homework problems |
| **Online Methodology** | Online (local) tutorial  
Homework problems |
| **Classroom Evaluation** | Practice set questions on exam |
| **Online Evaluation** | Practice set questions on exam |

<table>
<thead>
<tr>
<th><strong>Outcome:</strong> Apply the income statement equation to discuss the criteria used to determine when revenues are recognized; apply the criteria to a specific entity to determine when its revenue should be recognized</th>
</tr>
</thead>
</table>
| **Classroom Methodology** | Lecture and presentation  
Homework problems |
| **Online Methodology** | Online (local) tutorial  
Homework problems |
| **Classroom Evaluation** | Practice set questions on exam |
| **Online Evaluation** | Practice set questions on exam |

<table>
<thead>
<tr>
<th><strong>Outcome:</strong> Apply the income statement equation to discuss the process used to recognize expenses</th>
</tr>
</thead>
</table>
| **Classroom Methodology** | Lecture and presentation  
Homework problems |
| **Online Methodology** | Online (local) tutorial  
Homework problems |
| **Classroom Evaluation** | Practice set questions on exam |
| **Online Evaluation** | Practice set questions on exam |
### Outcome: Apply the income statement equation to prepare an income statement that reports the results of operations for any entity

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Lecture and presentation</th>
<th>Homework problems</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Online Methodology</strong></td>
<td>Online (local) tutorial</td>
<td>Homework problems</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classroom Evaluation</th>
<th>Practice set questions on exam</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Online Evaluation</strong></td>
<td>Practice set questions on exam</td>
</tr>
</tbody>
</table>

### Outcome: Distinguish between the accrual and the cash basis of income measurement by preparing both an accrual and cash basis income statement from the same set of business transactions

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Lecture</th>
<th>In-class solution to example problems</th>
<th>Group activity</th>
<th>Homework</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Online Methodology</strong></td>
<td>Notes online</td>
<td>Series of e-mail vignettes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classroom Evaluation</th>
<th>Practice-set questions on exam</th>
<th>Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Online Evaluation</strong></td>
<td>Practice-set questions on exam</td>
<td>Forum contributions</td>
</tr>
</tbody>
</table>

### Outcome: Differentiate the balance sheet from the income statement by being able to classify account titles into assets, liability, capital, revenues and expenses

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Lecture and presentation</th>
<th>Homework problems</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Online Methodology</strong></td>
<td>Online (local) tutorial</td>
<td>Homework problems</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classroom Evaluation</th>
<th>Practice set questions on exam</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Online Evaluation</strong></td>
<td>Practice set questions on exam</td>
</tr>
</tbody>
</table>
**Outcome:** Describe how the amounts reported on the income statement and balance sheet are determined by distinguishing among the valuation methods for each of the major asset and liability accounts

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Lecture</th>
<th>In-class solution to example problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Methodology</td>
<td>Series of e-mail vignettes</td>
<td>Online notes</td>
</tr>
<tr>
<td>Classroom Evaluation</td>
<td>Multiple choice questions on exam</td>
<td>Participation</td>
</tr>
<tr>
<td>Online Evaluation</td>
<td>E-mail responses to vignettes</td>
<td>Multiple choice questions on exam</td>
</tr>
</tbody>
</table>

**Outcome:** Describe how the amounts reported on the income statement and balance sheet are determined by identifying the generally accepted valuation method for each of the major asset and liability accounts

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Lecture</th>
<th>In-class solution to example problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Methodology</td>
<td>Series of e-mail vignettes</td>
<td>Online notes</td>
</tr>
<tr>
<td>Classroom Evaluation</td>
<td>Multiple choice questions on exam</td>
<td>Participation</td>
</tr>
<tr>
<td>Online Evaluation</td>
<td>E-mail responses to vignettes</td>
<td>Multiple choice questions on exam</td>
</tr>
</tbody>
</table>

**Outcome:** Describe how the amounts reported on the income statement and balance sheet are determined by describing how the balance in each major asset, liability, capital, revenue and expense account is calculated

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Lecture</th>
<th>In-class solution to example problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Methodology</td>
<td>Series of e-mail vignettes</td>
<td>Online notes</td>
</tr>
<tr>
<td>Classroom Evaluation</td>
<td>Multiple choice questions on exam</td>
<td>Participation</td>
</tr>
<tr>
<td>Online Evaluation</td>
<td>E-mail responses to vignettes</td>
<td>Multiple choice questions on exam</td>
</tr>
</tbody>
</table>
**Outcome**: Link the following related financial statements: balance sheet, income statement, statement of cash flows, and statement of equity

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Lecture</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In-class solution to example problems</td>
</tr>
<tr>
<td>Online Methodology</td>
<td>Online notes and presentation</td>
</tr>
<tr>
<td>Classroom Evaluation</td>
<td>Practice-set questions on exam</td>
</tr>
<tr>
<td>Online Evaluation</td>
<td>Practice-set questions on exam</td>
</tr>
</tbody>
</table>

**Outcome**: Classify cash receipts and payment transactions, as well as significant non-cash transactions into appropriate statement of cash flow activity

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Lecture</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In-class solution to example problems</td>
</tr>
<tr>
<td>Online Methodology</td>
<td>Online notes and presentation</td>
</tr>
<tr>
<td>Classroom Evaluation</td>
<td>Completion questions on exam</td>
</tr>
<tr>
<td>Online Evaluation</td>
<td>Completion questions on exam</td>
</tr>
</tbody>
</table>

**Outcome**: Identify several ways in which financial accounting information is used to make business and personal decisions

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Lecture</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In-class group activity</td>
</tr>
<tr>
<td>Online Methodology</td>
<td>Online notes and presentation</td>
</tr>
<tr>
<td>Classroom Evaluation</td>
<td>Participation</td>
</tr>
<tr>
<td></td>
<td>Multiple choice questions on exam</td>
</tr>
<tr>
<td>Online Evaluation</td>
<td>Forum contributions</td>
</tr>
</tbody>
</table>
**Outcome:** Calculate at least one financial statement ratio within each of the following five categories and discuss its usefulness and limitations in making decisions

- a- Liquidity
- b- Activity or Turnover
- c- Financial leverage
- d- Profitability
- e- Valuation

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Lectures</th>
<th>In-class solution to example problems</th>
<th>Homework problems</th>
<th>Independent research in the library</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Methodology</td>
<td>Online notes and presentation</td>
<td>Homework problems</td>
<td>Independent research in the library or via the Web</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classroom Evaluation</th>
<th>Semester project — paper analyzing financial statements of a company of the student’s choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Evaluation</td>
<td>Forum contributions</td>
</tr>
</tbody>
</table>

**Outcome:** Explain how percentage analysis can be used to uncover important relationships and trends on the financial statements

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Lectures</th>
<th>In-class solution to example problems</th>
<th>Homework problems</th>
<th>Independent research in the library</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Methodology</td>
<td>Online notes and presentation</td>
<td>Homework problems</td>
<td>Independent research in the library or via the Web</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classroom Evaluation</th>
<th>Semester project — paper analyzing financial statements of a company of the student’s choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Evaluation</td>
<td>Forum contributions</td>
</tr>
</tbody>
</table>
**Outcome:** Explain how inventories and accounts receivable can be mismanaged and described how a manager can use financial statement analysis to monitor and control these assets

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Lectures</th>
<th>In-class solution to example problems</th>
<th>Homework problems</th>
<th>Independent research in the library</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Online Methodology</strong></td>
<td>Online notes and presentation</td>
<td>Homework problems</td>
<td>Independent research in the library or via the Web</td>
<td></td>
</tr>
<tr>
<td><strong>Classroom Evaluation</strong></td>
<td>Semester project — paper analyzing financial statements of a company of the student’s choice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Online Evaluation</strong></td>
<td>Forum contributions</td>
<td>Formal paper</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Outcome:** Explain the relationship between net income and cash flow and discuss how a highly profitable, fast-growing business might face liquidity problems that could force it into bankruptcy

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Lectures</th>
<th>In-class solution to example problems</th>
<th>Homework problems</th>
<th>Independent research in the library</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Online Methodology</strong></td>
<td>Online notes and presentation</td>
<td>Homework problems</td>
<td>Independent research in the library or via the Web</td>
<td></td>
</tr>
<tr>
<td><strong>Classroom Evaluation</strong></td>
<td>Semester project — paper analyzing financial statements of a company of the student’s choice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Online Evaluation</strong></td>
<td>Forum contributions</td>
<td>Formal paper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcome: Identify several limitations of the financial statements found in the annual report</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Classroom Methodology</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lectures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-class solution to example problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homework problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent research in the library</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Online Methodology</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online notes and presentation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Homework problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent research in the library or via the Web</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Classroom Evaluation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semester project — paper analyzing financial statements of a company of the student's choice</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Online Evaluation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forum contributions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal paper</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outcome: Discuss how the need for relevance and reliability affect the design of an accounting information system</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Classroom Methodology</strong></td>
</tr>
<tr>
<td>Lecture</td>
</tr>
<tr>
<td>In-class group activity</td>
</tr>
<tr>
<td>In-class solution to example problems</td>
</tr>
<tr>
<td>Small case study vignette</td>
</tr>
<tr>
<td><strong>Online Methodology</strong></td>
</tr>
<tr>
<td>Online vignette</td>
</tr>
<tr>
<td>Online notes and presentation</td>
</tr>
<tr>
<td><strong>Classroom Evaluation</strong></td>
</tr>
<tr>
<td>Multiple choice or completion questions on exam</td>
</tr>
<tr>
<td><strong>Online Evaluation</strong></td>
</tr>
<tr>
<td>Forum contributions</td>
</tr>
<tr>
<td>Multiple choice or completion questions on exam</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outcome: Discuss the basic principles of internal control and describe the attributes of an effective and efficient internal control system</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Classroom Methodology</strong></td>
</tr>
<tr>
<td>Lecture</td>
</tr>
<tr>
<td>In-class group activity</td>
</tr>
<tr>
<td>In-class solution to example problems</td>
</tr>
<tr>
<td>Small case study vignette</td>
</tr>
<tr>
<td><strong>Online Methodology</strong></td>
</tr>
<tr>
<td>Online vignette</td>
</tr>
<tr>
<td>Online notes and presentation</td>
</tr>
<tr>
<td><strong>Classroom Evaluation</strong></td>
</tr>
<tr>
<td>Multiple choice or completion questions on exam</td>
</tr>
<tr>
<td><strong>Online Evaluation</strong></td>
</tr>
<tr>
<td>Forum contributions</td>
</tr>
<tr>
<td>Multiple choice or completion questions on exam</td>
</tr>
</tbody>
</table>
**Outcome**: Identify the strengths and weaknesses of an internal control system, and, if appropriate, suggest improvements to the system

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Lecture</th>
<th>In-class group activity</th>
<th>In-class solution to example problems</th>
<th>Small case study vignette</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Methodology</td>
<td>Online vignette</td>
<td>Online notes and presentation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom Evaluation</td>
<td>Multiple choice or completion questions on exam</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online Evaluation</td>
<td>Forum contributions</td>
<td>Multiple choice or completion questions on exam</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Outcome**: Record the effects of accounting transactions to individual information systems

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Lecture</th>
<th>Homework problems</th>
<th>In-class solution to example problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Methodology</td>
<td>Online notes</td>
<td>Online tutorial (local)</td>
<td>Homework problems</td>
</tr>
<tr>
<td>Classroom Evaluation</td>
<td>Homework problems</td>
<td>Practice set problem</td>
<td></td>
</tr>
<tr>
<td>Online Evaluation</td>
<td>Practice set problems</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Outcome**: Transfer the effects of explicit transactions to individual asset, liability, and owners’ equity accounts

<table>
<thead>
<tr>
<th>Classroom Methodology</th>
<th>Lecture</th>
<th>Homework</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Methodology</td>
<td>Online notes</td>
<td>Online tutorial (local)</td>
</tr>
<tr>
<td>Classroom Evaluation</td>
<td>Homework</td>
<td>Multiple choice exam question</td>
</tr>
<tr>
<td>Online Evaluation</td>
<td>Multiple choice exam question</td>
<td></td>
</tr>
<tr>
<td><strong>Outcome:</strong> Analyze whether an adjustment or correction is needed in a particular situation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Classroom Methodology</strong></td>
<td>Lecture</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Homework</td>
<td></td>
</tr>
<tr>
<td><strong>Online Methodology</strong></td>
<td>Online notes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Online tutorial (local)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Homework problems</td>
<td></td>
</tr>
<tr>
<td><strong>Classroom Evaluation</strong></td>
<td>Homework problems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Practice set problem</td>
<td></td>
</tr>
<tr>
<td><strong>Online Evaluation</strong></td>
<td>Small group forum contributions</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Outcome:</strong> Record and transfer the effects of adjustments and corrections to individual asset, liability, and owners’ equity accounts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Classroom Methodology</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Online Methodology</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Classroom Evaluation</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Online Evaluation</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Outcome:</strong> Prepare the financial statements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Classroom Methodology</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Online Methodology</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Classroom Evaluation</strong></td>
</tr>
<tr>
<td><strong>Online Evaluation</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Outcome:</strong> Explain the significance of debits and credits as they are used in an accounting system</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Classroom Methodology</strong></td>
</tr>
<tr>
<td><strong>Online Methodology</strong></td>
</tr>
<tr>
<td><strong>Classroom Evaluation</strong></td>
</tr>
<tr>
<td><strong>Online Evaluation</strong></td>
</tr>
</tbody>
</table>
Appendix K

Learning Outcomes by Online Methodology

This Appendix categorizes the learning outcomes specified for the Financial Accounting course in Appendix I into the various online methodologies used to either facilitate or measure learning, as detailed in Appendix J. The number-letter code refers to the learning objective from Appendix I.

**E-mail vignettes and questions**

<table>
<thead>
<tr>
<th>1A1</th>
<th>2A4</th>
<th>3A7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A3</td>
<td>2A5</td>
<td>3A9</td>
</tr>
<tr>
<td>1A4</td>
<td></td>
<td>3A10</td>
</tr>
<tr>
<td>1B2</td>
<td></td>
<td>3A11</td>
</tr>
</tbody>
</table>

**Discussion forum contributions**

<table>
<thead>
<tr>
<th>1A2</th>
<th>2A2</th>
<th>3A7</th>
<th>4A1</th>
<th>5A1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1B1</td>
<td>2A3</td>
<td></td>
<td>4A2</td>
<td>5A2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4A3</td>
<td>5A3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4A4</td>
<td>5B1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4A5</td>
<td>5B3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4A6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Online notes and presentations

1A4  2A1  3A1  4A1  5A1
1B2  2A2  3A7  4A2  5A2
1B3  2A3  3A9  4A3  5A3
   2A4  3A10 4A4  5B1
   2A5  3A11 4A5  5B2A
   3A12 4A6  5B2b
   3A13

Computerized tutorials run locally

3A2  5B2A
3A3  5B2b
3A4  5B2c
3A5  5B2d
3A6  5B2e
3A8

Homework problems and practice sets

1B2  3A1  4A2  5B2A
   3A2  4A3  5B2c
   3A3  4A4  5B2d
   3A4  4A5  5B2e
   3A5  4A6
   3A6
   3A7
   3A8
   3A12

Links to outside Web sources

2A2
2A3
Objective questions on online exams

1B3 2A1 3A10 4A1 5A1
2A5 3A11 5A2
5A3
5B1
5B2b
5B2d

Completion, short answer and essay questions on online exams

1A4 2A3 3A13
1B2 2A4

Formal paper

4A2
4A3
4A4
4A5
4A6
Appendix L

Pilot Project Results

Final Exam
GRAPH:~KGRAPH.TMP

WINKS 4.5 Unregistered Evaluation Copy
April 3, 1998
---------------------------------------------------------------------------
Independent Group Analysis
C:\WINKS\IMPORT1.DBF
---------------------------------------------------------------------------
Grouping variable is GROUP
Analysis variable is FINAL

Group Means and Standard Deviations
C: mean = 72.5714 s.d. = 4.8599 n = 7
E: mean = 76.4 s.d. = 21.8286 n = 10

Independent group t-test on FINAL
---------------------------------------------------------------------------
Test equality of variance: F = 20.17 with (9, 6) D.F. p = 0.002 (two-tail)
Note: Since the p-value for equality of variance is low, (less than 0.05) use the Unequal variance t-test results.

Independent Group t-test Hypotheses:
------------------------------------
Ho: There is no difference between means.
Ha: The means are different.

Equal variance: Calculated t= -.45 with 15 D.F. p = 0.658 (two-tail)
Unequal variance: Calculated t= -.54 with 10.2 D.F. p = 0.604 (two-tail)

For a one-sided test, you must adjust the p-value according to the direction of your alternative hypothesis.
Course Grade

GRAPH:~KGRAPH.TMP

WINKS 4.5 Unregistered Evaluation Copy                     April 3,1998
---------------------------------------------------------------------------
Independent Group Analysis                                         C:\WINKS\IMPORT1.DBF
---------------------------------------------------------------------------
Grouping variable is GROUP
Analysis variable is GRADE

Group Means and Standard Deviations

C: mean = 6.8571           s.d. = 2.9681           n =  7
E: mean = 7.4             s.d. = 3.8355           n =  10

Independent group t-test on GRADE
---------------------------------------------------------------------------
Test equality of variance: F = 1.67 with (9, 6) D.F.  p = 0.548 (two-tail)

Note: Since the p-value for equality of variance is greater than 0.05,
use the Equal variance t-test results.

Independent Group t-test Hypotheses:

Ho: There is no difference between means.
Ha: The means are different.

Equal variance: Calculated t= -.31 with 15 D.F.  p = 0.758 (two-tail)
Unequal variance: Calculated t= -.33 with 14.8 D.F.  p = 0.747 (two-tail)

For a one-sided test, you must adjust the p-value according to
the direction of your alternative hypothesis.
Course Evaluation Part I: Satisfaction with the Course

Independent Group Analysis

C: mean = 4.51  s.d. = .2274  n = 7
E: mean = 3.542 s.d. = 1.0418 n = 10

Independent group t-test on P1AVERAGE

Test equality of variance: F = 20.99 with (9, 6) D.F.  p = 0.001 (two-tail)

Note: Since the p-value for equality of variance is low, (less than 0.05) use the Unequal variance t-test results.

Independent Group t-test Hypotheses:

Ho: There is no difference between means.
Ha: The means are different.

Equal variance: Calculated t= 2.4 with 15 D.F.  p = 0.03 (two-tail)
Unequal variance: Calculated t= 2.84 with 10.2 D.F.  p = 0.017 (two-tail)

For a one-sided test, you must adjust the p-value according to the direction of your alternative hypothesis.
Course Evaluation Part II: Confidence in Attaining Course Objectives

Independent Group Analysis

Group Means and Standard Deviations

C: mean = 3.5886  s.d. = .6504  n = 7
E: mean = 3.407  s.d. = 1.2763  n = 10

Independent group t-test on P2AVERAGE

Test equality of variance: F = 3.85 with (9, 6) D.F.  p = 0.115 (two-tail)

Note: Since the p-value for equality of variance is greater than 0.05, use the Equal variance t-test results.

Independent Group t-test Hypotheses:

Ho: There is no difference between means.
Ha: The means are different.

Equal variance: Calculated t= .34 with 15 D.F.  p = 0.736 (two-tail)
Unequal variance: Calculated t= .38 with 14 D.F.  p = 0.707 (two-tail)

For a one-sided test, you must adjust the p-value according to the direction of your alternative hypothesis.
Appendix M

Survey Results

Response Frequencies

<table>
<thead>
<tr>
<th>Question</th>
<th>Total</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Position at the school</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty</td>
<td>45</td>
<td>85%</td>
</tr>
<tr>
<td>Administration</td>
<td>12</td>
<td>23%</td>
</tr>
<tr>
<td>Other</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>2. How long have you been offering Web-based courses?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 1 year</td>
<td>23</td>
<td>43%</td>
</tr>
<tr>
<td>1 to 2 years</td>
<td>12</td>
<td>23%</td>
</tr>
<tr>
<td>2 to 3 years</td>
<td>8</td>
<td>15%</td>
</tr>
<tr>
<td>More than 3 years</td>
<td>9</td>
<td>17%</td>
</tr>
<tr>
<td><strong>3. How many Web-based courses have you offered?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>13</td>
<td>25%</td>
</tr>
<tr>
<td>2</td>
<td>13</td>
<td>25%</td>
</tr>
<tr>
<td>3 to 5</td>
<td>7</td>
<td>13%</td>
</tr>
<tr>
<td>More than 5</td>
<td>20</td>
<td>38%</td>
</tr>
<tr>
<td><strong>4. How do you ensure that a student's work is his or her own?</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Check all that apply)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student does the final exam at the school</td>
<td>27</td>
<td>51%</td>
</tr>
<tr>
<td>Student identifies a proctor for the final exam</td>
<td>11</td>
<td>21%</td>
</tr>
<tr>
<td>Use of network passwords to limit access</td>
<td>24</td>
<td>45%</td>
</tr>
<tr>
<td>Provisions under consideration</td>
<td>10</td>
<td>19%</td>
</tr>
<tr>
<td>No special provisions necessary</td>
<td>11</td>
<td>21%</td>
</tr>
<tr>
<td>Other</td>
<td>22</td>
<td>42%</td>
</tr>
</tbody>
</table>
5. How do you encourage cooperative learning?
   (Check all that apply)
   Online discussion forums 41 77%
   E-mail 47 89%
   Chat rooms 26 49%
   Group assignments 32 60%
   Provisions under consideration 7 13%
   No special provisions necessary 3 6%
   Other 8 15%

6. How often must a student submit work?
   More than once a week 9 17%
   At least weekly 30 57%
   At least monthly 7 13%
   Provisions under consideration 1 2%
   No special provisions necessary 3 6%
   Other 8 15%

7. Do you place limits on the subjects taught via the Web?
   (Check all that apply)
   Limited to only introductory classes 1 2%
   Limited to certain subject areas 6 11%
   Limited to certain instructors 1 2%
   Provisions under consideration 5 9%
   No limits 32 60%
   Other 11 21%

8. Do you have special requirements for students taking a course over the Web?
   (Check all that apply)
   Personal access to an adequately equipped personal computer 25 47%
   Personal access to an Internet account 27 51%
   Previous experience in using the World Wide Web 16 30%
   Provisions under consideration 5 9%
   No special provisions necessary 12 23%
   Other 15 28%
9. How do you provide academic advising?  
   Check all that apply)  
   - E-mail: 44 (83%)  
   - Chat room: 14 (26%)  
   - In-person contact: 36 (68%)  
   - Telephone contact: 37 (70%)  
   - Mail: 17 (32%)  
   - Provisions under consideration: 3 (6%)  
   - No special provisions: 1 (2%)  
   - Other: 7 (13%)  

10. Do you limit class size?  
    - Less than 15: 4 (8%)  
    - 15 to 25: 18 (34%)  
    - More than 25: 12 (23%)  
    - Provisions under consideration: 2 (4%)  
    - No limit: 14 (26%)  

11. Which of the following tools do you use to facilitate learning in a Web-based class? (Check all that apply)  
    - E-mail: 50 (94%)  
    - Discussion forums: 43 (81%)  
    - Tests and quizzes: 35 (66%)  
    - Multimedia presentations: 29 (55%)  
    - Lecture notes: 37 (70%)  
    - Virtual reality simulations: 5 (9%)  
    - Other: 13 (25%)  

12. Which of the following tools do you use to evaluate learning and determine course grade? (Check all that apply)  
    - Quality and quantity of e-mail responses: 24 (45%)  
    - Participation in discussion forums: 40 (75%)  
    - Formal papers: 35 (66%)  
    - Examinations: 40 (75%)  
    - Other: 20 (38%)
13. What, if any, time limits are placed on course completion?
(Check all that apply)
- Standard semester: 31 (58%)
- Standard quarter: 16 (30%)
- Term less than a typical quarter: 9 (17%)
- Term greater than a typical semester: 6 (11%)
- Provisions under consideration: 4 (8%)
- No time limits: 1 (2%)

14. What percentage of students who enroll in a Web-based class do not complete the class?
- Fewer than 10%: 16 (30%)
- 10% to 20%: 9 (17%)
- 20% to 30%: 2 (4%)
- 30% to 40%: 6 (11%)
- 40% to 50%: 1 (2%)
- More than 50%: 3 (6%)
- Unknown: 15 (28%)

15. What do you do when a student does not participate in the class for an extended period of time? (Check all that apply)
- Contact via e-mail: 43 (81%)
- Contact via phone: 24 (45%)
- Contact via mail: 10 (19%)
- Administratively withdraw the student from the class: 19 (36%)
- Fail the student: 14 (26%)
- Provisions under consideration: 9 (17%)
- No special provisions necessary: 6 (11%)
- Other: 10 (19%)

16. Where do you recruit students for Web-based courses?
(Check all that apply)
- From existing students enrolled in traditional, classroom-based courses: 40 (75%)
- Advertisements on the Web: 27 (51%)
- Newspaper, radio or television advertisements: 14 (26%)
- Targeted industries: 13 (25%)
- Provisions under consideration: 8 (15%)
- No special provisions necessary: 6 (11%)
- Other: 5 (9%)
17. Do you have requirements regarding how quickly an instructor must respond to a student question or request for help?

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Yes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within 24 hours</td>
<td>8</td>
<td>15%</td>
</tr>
<tr>
<td>Within 24 to 48 hours</td>
<td>10</td>
<td>19%</td>
</tr>
<tr>
<td>Within 2 to 3 days</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Within 3 to 5 days</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Within a week</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Provisions under consideration</td>
<td>7</td>
<td>13%</td>
</tr>
<tr>
<td>No special provisions necessary</td>
<td>18</td>
<td>34%</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>19%</td>
</tr>
</tbody>
</table>

18. How do you evaluate the effectiveness of a Web-based course?

<table>
<thead>
<tr>
<th>Method</th>
<th>Yes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student evaluation of the instructor and/or course</td>
<td>47</td>
<td>89%</td>
</tr>
<tr>
<td>Standardized tests</td>
<td>10</td>
<td>19%</td>
</tr>
<tr>
<td>Comparison of student performance with students taking the same course in a classroom setting</td>
<td>20</td>
<td>38%</td>
</tr>
<tr>
<td>Provisions under consideration</td>
<td>11</td>
<td>21%</td>
</tr>
<tr>
<td>No evaluation</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>13%</td>
</tr>
</tbody>
</table>

19. What size 'chunk' of material do you find most appropriate for a Web-based course?

<table>
<thead>
<tr>
<th>Size</th>
<th>Yes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-semester/4-quarter credits</td>
<td>33</td>
<td>62%</td>
</tr>
<tr>
<td>2 credits</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>1 credit</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Provisions under consideration</td>
<td>6</td>
<td>11%</td>
</tr>
<tr>
<td>No special provisions</td>
<td>11</td>
<td>21%</td>
</tr>
</tbody>
</table>

20. How do you handle due-dates for work required in the course?

<table>
<thead>
<tr>
<th>Method</th>
<th>Yes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strictly enforced due dates, with penalties for late work</td>
<td>30</td>
<td>57%</td>
</tr>
<tr>
<td>Target dates, with no penalty for late submissions</td>
<td>10</td>
<td>19%</td>
</tr>
<tr>
<td>Self-paced study with only a completion date for the course as a whole</td>
<td>6</td>
<td>11%</td>
</tr>
<tr>
<td>No time constraints</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Provisions under consideration</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>No special provisions</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Other</td>
<td>14</td>
<td>26%</td>
</tr>
</tbody>
</table>
21. How do you use real-time interaction, such as chat rooms?

- Mandatory participation as an integral part of the course: 8 (15%)
- Optional participation as an integral part of the course: 10 (19%)
- Optional participation in a supporting role: 8 (15%)
- Not used in the course: 17 (32%)
- Provisions under consideration: 5 (9%)
- No special provisions necessary: 0 (0%)
- Other: 11 (21%)

22. Which of the following do you use to foster a learning community in a Web-based setting? (Check all that apply)

- An in-person meeting of all participants at some time during the course: 17 (32%)
- Personal Web pages for all participants: 23 (43%)
- Online discussion forums: 41 (77%)
- Group assignments: 33 (62%)
- Provisions under consideration: 5 (9%)
- No special provisions necessary: 2 (4%)
- Other: 10 (19%)

Comments

How do you ensure that a student's work is his or her own?

1. All exams are taken on-site at ACC or other authorized site
2. Western Governors' University doesn't offer courses. We broker with other providers of content.
3. Get writing sample at first on-campus kickoff meeting
4. The web site does not replace regular class meetings
5. Special projects
6. Provide assignments that are original/open-ended making it more difficult for the student to produce non-original work
7. Blind trust
8. My students are required to complete extensive projects
9. Verification of input through comparison to chats and web-board submissions
10. Honor system
11. Some tests are open book
12. We hold class meetings. School is small and identities/personalities are obvious.
13. Projects require so much effort that it is unlikely anybody would do the work for someone else
14. Project-based assessment
15. All projects and assignments are personalized
16. Advisor's oversight
17. Low-stakes quizzes assume collaboration
18. Our course is "web assisted" not really web "based"
19. I spot check references on submitted papers
20. Student arranges with us for a proctor for at least one exam
21. I can trust that each student does his/her own work as much as I trust that my traditional class students do their own work.
22. Most of our sites support place-based classes and augment traditional classroom activities
23. Some courses have no final exam

How do you encourage cooperative learning?
1. We will have chat and message board/listserv by fall
2. I don't. I tried online discussion forums but students didn't find them helpful
3. Term papers, projects, presentations all require group participation
4. Students create their own Web page, on which they post their assignments. We also communicate in real-time using the NSU ECR. Each session is recorded. Finally, and (non-private) email communications are posted.
5. Varies by course
6. Friends tend to take the course together; group work is not popular
7. Lab time together with other students
8. MOO classrooms

How often must a student submit work?
1. Varies from course to course, but a minimum of 5 papers/tests is required
2. Weekly is desired, some I allow 2 weeks max
3. Self-paced instruction
4. Four assignments in a twelve week period
5. Depends on format -- some courses are five months, others are three months. Due dates are spread out across the term.
6. As directed by the instructor - varies by course
7. Within the semester, it's asynchronous, allowing students to work in spurts
8. Typically, biweekly

Do you place limits on the subjects taught via the Web?
1. No limits but each department and our instruction committee must approve
2. College review of online conduct provisions per individual course with assistance available to correct deficiencies
3. Only our administrators can answer this.
4. No more than 25% of the credit load
5. Costs with union contract make virtual classes very expensive. Also so far we have required each course to be the same as the traditional format but have required a "capstone activity" of major paper or comprehensive final. That may limit courses.
6. Limited to certain parts of a course
7. Limited to those courses which faculty and academic administration agree can effectively be taught via the Web
8. Mostly upper-level courses
9. This is handled by administration
10. At this time we welcome anyone with an interest to establish a Web presence for their class
11. Instructors must have training

**Do you have special requirements for students taking a course over the Web?**
1. Some variation among courses
2. Previous access to WWW is desired in one class, required in my HTML class
3. Both [equipment and Internet access] can be obtained from the University free of charge
4. Self evaluation checklist to help a student determine if he or she will benefit from a web course
5. Attend an orientation meeting
6. Students beginning this fall will have a one week mandatory session with our help desk prior to the semester to verify abilities
7. Must complete pre-course activities that demonstrate competency in skills needed for success in course: e-mail, uploading, chat, rtf format, etc.
8. Students can use college computer labs
9. Access to computer and Internet, either through personal sources or through College facilities
10. Previous experience with using e-mail
11. Voluntary enrollment with knowledge that the course is computer intensive
12. Online registration and pre-course activities
13. Pre-course activities successfully completed involving computer use and testing of web access
14. Previous experience in using WWW helpful
15. Our students have access to lab facilities that provide basic Internet and software access. We design our efforts to reflect this technical reality.

**How do you provide academic advising?**
1. By instructor: e-mail. By counseling department: on-campus
2. Post to a limited-access bulletin board
3. Bulletin Boards, one-on-one personal contact via audio chat and/or text chat
4. There are many options. Students choose what they want from peer counseling online to automatic degree audit to coming in to talk with faculty.
5. By discussing student's assignments during ECR sessions.
6. Fax is used on occasion
7. Interacting in MOO classroom

**Which of the following tools do you use to facilitate learning in a Web-based class?**
1. This fall I plan to distribute my on-line students a CD-ROM with Math Anxiety Presentation including video, sound, exercises, etc. We keep multimedia on web to minimum because of modem access by students
2. Use pre-existing Web sites
3. CDs to supplement class work, textbooks
4. Depending on context
5. Problem based simulations and exercises
6. Essays and study questions
7. Interactive mathematical web pages (including graphs and equation manipulation, and animations)
8. HyperNews, Mirc, Class Lists
9. Texts, CD-ROM and Floppy Disks
10. Objective based instruction with guided practice
11. Students create their own Web page, on which they post their assignments. Real time discussions are conducted using the NSU ECR.
12. As determined by the instructor
13. Objects created in MOO

Which of the following tools do you use to evaluate learning and determine course grade?
1. Web-based forms
2. All exams for math course will be on-campus. For my HTML course projects are only requirement
3. Journals, activity reports
4. Special projects
5. Web page projects
6. Web-based art projects
7. Assignments
8. Web projects (prefer use of html for project submission, but do not require it -- many students can handle html quite well however)
9. Completion of study questions
10. Group projects, class attendance and participation
11. Assignments such as programs submitted and web pages posted
12. By reviewing and evaluating the projects posted by the students on their Web page.
13. As determined by the instructor
14. Conventional measures are adhered to
15. Web-based project
16. Traditional homework
17. Assignments submitted through e-mail and attachments
18. I require my students to submit 3 Web-site critique reports each semester.
19. These are part of the traditional place-based paradigm. We do not have anyone doing testing via the Internet.
20. Projects posted on the Web

What do you do when a student does not participate in the class for an extended period of time?
1. Varies by course
2. Administration follows up on this
3. Written notices of deficiencies e-mailed to the student before withdrawal -- done within one week of absence.
4. Give an "I" -- Incomplete. It turns into an 'F' unless the student completes the course
5. Student is given opportunity to catch up if desired, but dropped if there does not seem to be possibility of success
6. This is the first time for us, don't know exactly how it will work
7. Determined by the instructor
8. Within first 4 weeks if no activity the student is administratively dropped. If they fail to participate after the fourth week they are notified of impending failure. If they still do not respond they are then failed.

9. If I cannot get a hold of them, I will have no choice but to fail them.

10. This would fall to the instructor to decide

**Where do you recruit students for Web-based courses?**

1. Schedule of classes
2. My technology-based classes tend to close the first day of registration no matter what we do.
3. Senior High School students
4. Current distance learning students and the general population, as all Web courses listed in schedule booklet in special section
5. Schedule of classes; closed circuit television monitor advertisements, etc.
6. Again, our Web sites support traditional courses.

**Do you have requirements regarding how quickly an instructor must respond to a student question or request for help?**

1. No requirements but our goal is within a day or two. Some of us have weekends away from technology!
2. I try to respond within 2-3 days and during the week usually manage to respond within 1 day
3. 10 minutes
4. No requirement, but I try to respond between 24 to three days
5. [Responding within 24 hours is] my personal requirement, self-imposed.
6. Up to the instructor
7. Administrative question. Our school is so small and faculty so low-paid that they wouldn't dare make a rule. The instructors using Web instruction know more about it than the administrators do, because it's so new to our region.
8. The faculty try to respond within 24 hours, and that is what the administrators and support staff encourage as do the faculty. But we tell the students 2 to 3 days because when we told them 24 hours, they became very demanding and upset with delays of 2 to 3 hours.
9. Instructors encouraged to reply ASAP
10. Within good practice guidelines
11. Again, this is up to the individual instructor.

**How do you evaluate the effectiveness of a Web-based course?**

1. I use weekly feedback forms
2. Part of standard self-evaluation process and college evaluation
3. Our administrators are leaning toward "outcome-based" criteria for course effectiveness
4. Courses are courses are courses without regard to delivery technique. Same assignments. Same tests. Same evaluations. Only difference is how the instruction, assignments and tests are delivered - not how they are evaluated.
5. External evaluation firm conducts assessment of course effectiveness and student satisfaction
6. As determined by instructor and college policy/procedure
7. Tests are the same as used for conventional sections

**How do you handle due-dates for work required in the course?**
1. Also used self-paced study when appropriate
2. Varies by course
3. We are still working this out. For my online math course I will expect work to be no more than 1 week late. For my HTML course I accept work up until the 9-week finish date
4. Varies somewhat course to course, not self-paced, however
5. Allowing some flexibility as well
6. Attempt to create collaboration and cohort sets
7. Also have tried strictly enforced due dates
8. Explained in each instructor's syllabus
9. We have trouble connecting with our own server, so students can't be too heavily penalized when server is down or computer lab hours are too scarce.
10. Where content permits (i.e. literacy courses, programming courses, etc) students are allowed to finish course requirements early, but never late unless there are the typical problems warranting extensions in traditional classes (medical emergency, family emergency, radical job changes, etc.)
11. Policy varies with course instructor (mostly target dates with no penalty or minor penalty for late submission)
12. Determined by instructor
13. Enforced dates with easy access to pre-approved "late dates"
14. Once again, this is left to the instructor's discretion.

**How do you use real-time interaction, such as chat rooms?**
1. Very limited use and not likely to grow much
2. WGU uses interaction, but we don't teach courses.
3. I plan to use mostly asynchronous Web board/listserv but will experiment with chat. I point for us is that students can do this anytime so we don't require a specific time except for the few, sometimes one, on-campus meeting.
4. Tried it; students did not find useful
5. Plus chats which seem to work well to bond students
6. Again, depends on the instructor
7. We don't have a chat room, so in-person meetings, when scheduled, are mandatory except if student lives out of area.
8. Varies with course (required in one course)
9. Not set up for chat rooms yet
10. Determined by instructor
11. Ten chats offered; they must attend three of their choice
12. In our cases, real-time interaction is the actual weekly meeting of the course.

**Which of the following do you use to foster a learning community in a Web-based setting?**
1. Announcements and personal bios posted on Web
2. I want to start using group assignments
3. Forum has personal "business card" area that students are encouraged to use. Web pages are required for certain courses where web pages are required for traditional classes (web design, introduction to the internet, etc)

4. NSU ECR

5. In-person meetings optional; strategies vary by course and instructor

6. Community is built no differently from conventional sections.

7. I regard it as similar to a radio audience; the sense of community is based on connections with the materials

8. This is a classroom-based course supplemented by the web.

9. We are trying a variety of things to foster the development of a learning community within a class.
References


