A Case Study of Community College Adult Learners Online

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Dedications

I would like to dedicate this dissertation to my family. My family is not restricted to blood relations, but is limited to people who believed in me no matter what. These beautiful people believed in me when I began this journey and never left my side. For this, I thank you from the bottom of my heart.

To my grandparents, Beulah and Maurice (Molly) Becker, who taught me to embrace the joys of life, I would like to give special thanks. They always made me feel like I could do anything I set my mind to. Even though they are not with me in body, they have traveled this entire journey with me in spirit and in my heart.

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To Delaware County Community College, thank you for granting me permission to conduct research within your school. To the Delaware County Community College adult online students, the sincerity and knowledge that you provided me was invaluable and will result in change.

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Abstract

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This case study investigated whether there was sufficient instruction and resources to provide a meaningful learning experience for adult learners online at a Philadelphia-suburban community college. This study addressed the factors that are changing the landscape of higher education: Web-based education competition, the increase of online course offerings, and the escalation of adult students in higher education. The research study was designed as a mixed methods case study. This mixed methods design included qualitative student interviews, qualitative analysis of course and institutional materials and artifacts, and quantitative analysis of Web course evaluation questionnaires.

The results of the study were that students ranked technology dimensions above both course/program management and instruction/instructor dimensions. In addition, the following themes emerged at this college: (1) the Web courses were flexible and convenient for most learners, (2) for most students, the instructor employed learning strategies that facilitated understanding the material, provided sufficient interaction between the instructor and the students, and provided sufficient interaction between the instructor and the students, (3) most participants believed it was necessary to be self-motivated, and self-directed, (4) and in most instances, students had a high level of administrative support, access to essential instructional resources and reliable technology that sufficiently facilitated their learning activities.

However, evidence indicated a need for course learning strategies that include multiple perspectives and case-based learning that closely resemble real-life events (Campbell, 1999). As a result, it appears the instructors and students would benefit from increased support in developing these types of learning activities.

Within the context of this study, the conclusions were that: in most instances, adult students had meaningful learning experiences in the Web environment; a robust technology platform supported learning and was a critical factor in whether students learn well; and the course design and instructor significantly contributed to student achievement and satisfaction within a Web learning environment. As institutions of higher education continue to expand their Web-based educational offerings, they should continue to seek feedback from their students. Recommendations for further research conclude the report.

1. Introduction

The Problem and Its Context

The advent of Web-based education competition has contributed to the speed with which many traditional colleges have adopted online course offerings in an attempt to compete for the student market segment they previously dominated. In the past several years Columbia, Cornell, New York Universities and the University of Maryland University College have all created for-profit companies to sell distance education courses with an eye toward online courses (The Chronicle of Higher Education, July 20, 2001). However, learners expect distance education to be convenient, individualized, interactive and high in quality (Rogers, 2001). Furthermore, the population of adult students entering higher education continues to escalate. The problem, then, is whether and to what extent traditional colleges are competitively meeting online adult student expectations and individual learning needs.

Research on the enrollment in distance learning courses has revealed these students are primarily between the ages of twenty-five and fifty, and working full-time (Hardy & Boaz, 1997; Moore & Kearsley, 1996). These characteristics differ significantly from those of the traditional college student. Research has also shown that for schools to successfully provide effective and satisfying learning experiences via the Web, learning environments must contain essential dimensions that contribute to the student's ability to understand the material and to perform learning tasks. However, Web learning is frequently considered merely a delivery format and therefore more likely to be practiced as a traditional transmission styled model

instead of a progressive student-centered or constructivist learning model (Richards, 2002). As a result, current Web learning environments are increasingly at odds with the needs of non-traditional students.

Consumerism is a growing force in the future of educational institutions, and the arrival of the Web has removed geographical barriers to these consumers. Without geographical control, institutions of higher education will be far more susceptible to consumer pressures than they have been in the past (Turoff, 2000). Since the development of the Web and its subsequent use as an instructional delivery format, colleges and universities continue to struggle with the creation and support of quality online educational offerings in order to remain competitive.

The Web has provided increased access and new formats for online courses, technical support, enrollment, and resources. In addition, there is a growing diversity among the student population in higher education. Therefore, the consumer is driving the higher education market and she will select an education provider based on the satisfaction of her individual learning needs. The issue, then, is whether sufficient instruction and resources are available to provide a meaningful learning experience for adult online learners.

Background Context

Higher education is shifting from a traditional physical-campus worldview to one that incorporates Web technology and the Web into student learning and services. While distance education has been in existence for over one hundred years, the advent of Web-based instruction and service has provided learners with instantaneous interaction, communication and information. It appears that Web-

based learning environments are uniquely different from traditional classroom instruction and that these new electronic learning environments are bringing forth a whole new learning strategy. The traditional classroom has evolved towards constructivism and Web-based learning formats appear to be following suit.

The profile of the typical college student is also evolving. More adult learners are participating in higher education. According to Creighton and Hudson's study, *Participation Trends and Patterns in Adult Education: 1991 to 1999*, the overall increase in adult education has been widespread, occurring among virtually every group of adults examined in this report (Creighton & Hudson, 2001). In particular, participation rates increased among the following: all age groups except those ages 35-44; both men and women; all racial/ethnic groups; all education levels; all labor force groups; and all occupation groups except those in managerial or professional positions. Other noteworthy findings from this study: women participate at a higher rate than men; adults with higher levels of education participate at higher rates than adults with lower levels of education; full-time workers participate at a higher rate than those who are retired or otherwise out of the labor force; full-time workers participate at the same rate as part-time workers and the unemployed; and lastly, adults in higher status occupations participate at higher rates than those in lower status occupations.

Distance education at postsecondary institutions is also increasing. Forty-four percent of two and four year degree-granting institutions offered distance education courses in 1997-98, in contrast to thirty-three percent in the fall of 1995 (Lewis & Snow, 1999). Approximately three-quarters of the institutions that currently offer, or

plan to offer, distance education courses expect to start or increase their use of two-way interactive video, two-way online (computer-based) interactions during instruction, and other computer-based technologies to deliver their distance education courses in the next three years (Lewis & Farris, 1997).

Amid the increase of Web-based distance learning opportunities, are learners experiencing an interpersonal support community online? Learners need and expect interpersonal encouragement and assistance (Gunawardena, 1991; Moore & Kearsley, 1996). Interpersonal community plays a significant role in successful asynchronous distance education (Moller, 1998). Yet researchers are just beginning to investigate the means by which college decision-makers are providing supportive organizational frameworks and resources for online adult students. According to Weigel (2002), virtually all varieties of distance education have failed to bring depth and dimensionality to the experience of learning. He speculates that many distance education initiatives are the result of little more than an impetuous game of keeping up with the Joneses—motivated more by the primal fear of being left behind than by a desire to apply sound educational methodology.

Unfortunately, too often there are examples of society's low expectations for higher education—the lowest common denominator of the educational experience, the information transaction, is commonly seen as the fundamental element of learning; the assumption that e-learning is more about distance than depth betrays a preference for reach over richness (Weigel, 2002). The issue is whether higher education institutions, while attempting to flourish in the exponentially growing e-

education market, are carefully maintaining and continuously striving to consider student's online learning needs.

The gap in the literature appears to be a disconnect between what is offered as online programming and how it is being perceived by the adult learner. It is likely that academic and administrative university officers, who are interested in meeting adult learner needs, would be influenced by research exploring the alignment between their perceptions of effective online course delivery structures and the perceptions of the adult learner's online experiences. The positive alignments of these perceptions are of particular interest regarding retention and expansion initiatives. How colleges and universities construct their approach to learning in distance education formats is one of the central concepts in understanding student learning (Morgan, 1995).

Definition of Terms

The following is an alphabetical list of definitions that will be used for purposes of this study.

Accessibility is the extent to which a student can access services that an institution provides to address academic and non-academic needs.

Adult student is a person taking college or university courses who is 25 years of age or older. Synonym is adult learner.

Campus-based student is a person taking college or university courses, enrolled full-time for most of her academic career, taking most of his courses on the campus at the time chosen by the institution, who lives on or near the university campus.

Constructivist-based model is a learning environment that is student-centered.

Distance learning is when the student and the institutional source are separated by physical distance and may interact synchronously or asynchronously. Course delivery methods include the use of various kinds of technological delivery. Synonym is distance education.

Distance learning student is a person taking college or university courses, enrolled full-time or part-time, who takes courses at a distance using some form of technology. Synonyms are distance learner and distance student.

Interaction is actions and reactions that influence one another.

Interactivity is enabled by technology that provides the connections from one point to another point or multiple points in real time.

Need is a challenge faced by learning students. Examples include unfamiliarity with the institution, lack of information pertinent to the student's academic success, comfort, satisfaction with quality of education, and university support services.

Online course is a course taught in a Web-based learning environment.

Traditional classroom-based learning is educational experiences in a physical classroom environment with teacher led instruction.

Traditional student is a person taking college or university courses who is 18-24 years of age attending classes on-campus.

Transmission-based model is a learning environment that is a teacher-centered process of providing access to authoritative information.

Virtual university is an institution that uses technology to break the time and space barriers traditionally associated with learning.

Web-based learning is a learning process that utilizes technologies available on the Web (i.e. email, discussion forums, or chat rooms).

Web-based learning environment is a teaching format for university courses offered entirely via the World Wide Web. Synonym is Web-based or Web instruction, courses or programs.

Web student is a college or university student who is participating in Web-based learning environments.

World Wide Web is a "network of networks" that links computers around the world. Synonym is the Web.

Purpose of the Research

The purpose of this study has been to examine the concepts and practices of facilitating effective online adult learning as it applies to community college education practice. This research was necessary to discover whether Web-based education practice is consistent with the concepts and practices of providing meaningful learning experiences. This study explored the relationship between the concepts and practices of facilitating effective online adult learning as applied to college Web-based education practice.

At the center of this study is the major research question: Are sufficient instruction and resources available to provide meaningful learning experiences for the online adult learner? The research study focused on the following questions:

- How did the instruction/instructor facilitate an effective learning experience?

- How did the technology facilitate or impede the learning experience?
- How did the course/program administration provide quality and timely support to the learning experience?

The answers to these questions will hopefully provide direction as higher education takes a comprehensive look at what its future might entail.

This case study, utilizing qualitative and quantitative research methods, was conducted to examine the extent to which current practice at one institution, a community college in the Philadelphia suburbs of Pennsylvania, reflects the concepts that underlie effective online adult learning. The results of this study are presented as recommendations for improving Web-based program offerings. A case study was utilized in order to examine a variety of empirical data—analysis of course artifacts, institutional documents, and informal interviews (Denzin & Lincoln, 2000) as well as the quantitative analysis of a Web course evaluation questionnaire. The research study participants involved only adult learners participating in Web-based courses.

Significance of the Study

There are many factors that contribute to the changing landscape of higher education and the expansion of Web-based course offerings. The characteristics and expectations of the typical college student, the advancement of technology, and growing competition have all contributed to higher education's gravitation toward online education.

The global economy, exponentially advancing technology, regulatory requirements, and political considerations have forced colleges and universities to change continuously in order to achieve and maintain success. Additionally,

corporate entities and industry depend upon the continuous education and retooling of individual employees as a method of remaining competitive and progressive. There are increasing workplace demands for information, instruction, and training resources that are accessible when and where they are needed. These demands are driven by individuals' requirements for immediate and individualized learning and performance support tools, as these individuals perform their present jobs as well as prepare for new challenges.

The existence of an increasing online learning and performance support marketplace indicates a shift in the balance of power away from education providers and towards the individual learner (Wagner, 2001). However, there is often conflict between the expectations of corporate and industrial organizations and the traditional college's ability to meet those expectations. For higher education institutions that attempt to serve the needs of the business community, there are many challenges. Too often college representatives attempt, unsuccessfully, to relate seamlessly to the corporate student while managing academic activities within a traditional higher education institutional structure.

It is this traditional, pre-Web framework that prevents competitive response to the ever-evolving parameters of higher education. If traditional colleges and universities expect to remain fiscally sound, they will have to compete rigorously with institutions that are rapidly adapting to meet adult student and employer needs, such as the University of Phoenix or Capella University.

Advances in technology help educators address the need to employ a variety of teaching approaches to attract and accommodate students with diverse learning

needs (Como & Snow 1986; Sarasin 1998). As Como and Snow (1986) wrote, "The success of education depends on adapting teaching to individual differences among learners" (p.605). Furthermore, educators must create learning situations where students are actively engaged in the concepts they are learning and demonstrating their learning by communicating what was learned with peers (Alexander, 2000). This research shows that while the impact of Web-based technology is reshaping the organization of course delivery, the underlying issue is whether the college is understanding and meeting adult learner needs.

Delimitations of the Study

This case study confined itself to surveying, analyzing, and interviewing the adult online learners and the institutional and instructional artifacts and documents in a large southeastern Pennsylvania-suburban community college. The focused, sampling method decreases the generalizability of the findings (Creswell, 2003). This study cannot be generalized to all areas of education. The findings may be generalized only if the criteria of the setting are given considerable weight.

2. Literature Review

Web technology has significantly changed distance education opportunities in higher education, but uncertainty remains of the impact this new learning environment has on the learning process and the expectations between the college and the adult learner. The research suggests that Web technology will not replace traditional learning experiences but will provide additional virtual learning formats (Brown & Duguid 2000; Dunn 2000; Katz 1999). Additionally, Web technology used for student services is rapidly providing ease of access options for traditional admission, registration, financial aid, library, bursar and bookstore transactions. As technology enhances the student service area, students may look closer at course performance dimensions, their relationship with the learning environment and how the college is responding to their needs.

The conceptual framework for discussing adult student participation in Web-based learning environments begins with the scope of the problem. This discussion will include the evolving social and economic perceptions of learning, factors driving the rise of the adult/lifelong learner and an exploration of Web-based higher education market segments, competition, and demand. Next, the discussion illustrates how the Web is impacting the relationship between faculty and the College, considerations for designing effective Web learning environments, adult learner characteristics and needs, institutional support structures for Web-based learning environments, and the future relationship between the college and the online adult student. The literature review will close with a synthesis of the literature.

Scope of the Problem

Evolving Social and Economic Perceptions of Learning

According to Dolence and Norris (1995), "Higher education has encountered the leading edge of the world of Information Age learning. We are in the midst of a multitude of transitions to that new world" (p. 20). It appears that technology has irrevocably altered the landscape of the learning process. How has higher education been changing to adapt to this "new world"? The Information Age seems to have awakened higher education administrations to the necessity of technology integration into traditional academic learning environments.

Dolence and Norris (1995) further state that the transformation from the Industrial Age, where the focus was to view people/workers as interchangeable parts or pieces of machinery, to the Information Age that has mandated organizations to change from "rigid, formula-driven" entities to "fast, fluid, flexible" entities (p. 30). They hypothesize that the workers found in Information Age institutions will no longer be categorized into "tightly-defined positions" within the organization, but will rather be "knowledge workers who have the capacity to continually retool themselves with minimal direction from the organization" (p. 31). The "Information Age" focus drew away from people and instead towards process. People were viewed as interchangeable consumers and processors of information.

Since 1995 we have transcended into the "Knowledge Age" according to Brown and Duguid (2000). Technology has made an increasing amount of information relevant and accessible. The "knowledge age" represents a shift towards people, what they know, how they come to know it and how they differ in the

processing and evaluation of information through enterprise and networking. Web capabilities allow vast quantities of information to be swiftly delivered with a keystroke to any individual with access to the Web. As learning is promoted and nurtured, how do we defend against the exploitation of intellectual property? Learning cannot survive without intellectual capital. In addition, it is learning that allows intellectual assets to be usable, (Brown & Duguid 2000). Knowledge management must deal with this central challenge. Thriving in the "knowledge age" requires attention to the new pressures of this era.

Factors Driving the Rise of the Adult/Lifelong Learner

Societal Pressures

There are three major areas of pressure causing universities and colleges in the late 1990s to start changing quite rapidly (Brown & Duguid, 2000). First, characteristics of the typical college student are changing. Students are older. They are the ones paying their tuition, not Mom and Dad. In addition, it is taking students longer than four years with increased stopping and resuming from term to term until degree or certificate completion.

Second, corporate competition is attempting to capture a larger segment of the higher education market. Traditional colleges and universities are finding themselves in direct competition with global corporations and educational entities of all kinds, such as privately owned corporate universities and far reaching distance-learning collaborations. Instead of using traditional higher education institutions, corporations are discovering that Web-based applications are allowing for highly sophisticated and readily available in-house training programs. In addition, there is

significant revenue potential in the education market. The United States spends $600 billion on education of all types annually, making it the second largest industry after health care. There are estimates that the typical citizen will need the equivalent of 30 semester credits of coursework each 10 years to keep up with the changes that are coming, as a result, entrepreneurs see opportunities for large profits (Dunn, 2000).

Third, Web technologies create major pressure on colleges and universities to change (Brown & Duguid, 2000; Katz, 1999). Working adults have a finite amount of time and patience with a lecture styled instructional format. Corporate clients/students are accustomed to a higher standard of technology use and consider technological sophistication as a significant indicator when rating the quality of educational programs. These pressures are forcing the restructuring of colleges and universities, including how they relate to their primary customer, the student.

Higher Education Forces

In regards to forces promoting change in higher education, Katz and Assoc., (1999) state: "Today, the motivations are more complex. In addition to providing young people with a venue for growing up, colleges and universities are increasingly providing services to adult learners and corporations, creating additional factors driving the market for advanced education" (p. 52). As a result of these additional motivating factors, Katz et al list three goals that higher education now includes in its mission: (a) provide knowledge to the workforce, (b) retool people for new careers, (c) and cater to the need for mental stimulation. The philosophy that we are all lifelong learners has taken a foothold in American society and higher education must

respond to this reality. The new goals of education are also related to the advent of the following environmental trends.

Environmental Trends

There are significant environmental trends that are driving the changes in education, according to Katz et al, (1999). These trends include: (a) demographics, (b) technology, (c) the overcoming of time and space, (d) an "800 number, ATM" mentality, in a world of twenty-four hour markets, telecommuting, and instantaneous information, students are not always satisfied with sitting in a classroom for fifty minutes, three times a week, (e) blurring of industry boundaries, (f) proliferation of authority figures, and (g) the individual as the business unit. These are monumental changes within the fabric of our national community and these societal trends greatly impact higher education.

The Web has become a significant vehicle for conveying information about the College or University to prospective students. In addition, today's college-age generation attributes truthfulness to what they see on the Web. Students use the Web as a metaphor for the personality of the college or university. As a result, the Web has become one of the most powerful marketing tools any institution may have in its possession (Confessore, 1999).

Institution-wide Web strategic planning is just as important as any other operational planning. Developing, implementing, and living within a Web culture are critical for any traditional college or university campus. Increased Web activities should be part of continuous internal action plans. Web management must

encompass and consider the prospective student, employers, current students, the local and international community, and alumni (Confessore, 1999).

Katz et al, (1999) illustrate that all of the societal changes in learner's expectations and environmental trends are contributing to the new landscape of higher education. In the forefront is technology and it is challenging all aspects of the traditional academic structure. Corporations view the higher education market as an opportunity for growth and they are going head-to-head with traditional universities and colleges for the revenue dollars.

Web-based Higher Education Market Segments/Competition/Demand

"Whether Internet-based distance education is as good as traditional education is debatable. That students, particularly working adults, are flocking to such programs is undeniable", states Confessore (1999, p.26). Confessore believes the natural market for distance learning lies within the fastest-growing segment of the otherwise stagnant higher education industry: continuing and professional education or lifelong learning for working adults. Many schools, and, increasingly, prestigious business schools eager to tap the higher-end executive education market, have looked towards distance learning and virtual learning formats as a large growing market. The greater the accessibility to Web-based learning environments, the greater the student demand for using only those educational opportunities that meet desired expectations.

There are emerging themes depicting how the market is changing in higher education. It appears that these themes are a result of a changing, evolving global society that is embracing technology. As a result of the emerging themes, some of

the key issues to consider for a competitive advantage include e-delivery, flexibility, increasing global demand, strategic alliances, and the challenge of developing online culture.

Many futurists believe that workers will need to be certified in a technology system or software to succeed. Schrage (2000) thinks it is astonishing that so many truly legitimate academic degrees are so utterly meaningless. Schrage believes that a computer science degree is acceptable, but that being a Certified Novell Engineer, a Microsoft Certified Systems Engineer, or a Cisco Certified Internetwork Expert is more advantageous for boosting one's value. In fact, vendor-driven and vendor-defined certification programs have become both market and marketing mechanisms for building brand equity and a skilled talent pool. In markets where the half-life of useful knowledge shrinks and the importance of new knowledge accelerate, educational artifacts like university degrees may become anachronisms.

Increasing competition may promote the use of many institutions of higher education by a single student. Certifying colleges and universities are those that act as educational bankers for students. Students will earn credits from many places and have the credits or certifications of completion sent to the certifying university. Then that certifying university will award the degree when enough credits of the right type have been accumulated. Thomas Edison College of New Jersey is a public certifying institution that gives accredited degrees. Most traditional colleges and universities already could be classified as certifying institutions (Dunn, 2000). However, there is room for improving the assessment and acceptance of credits between institutions.

When students had to go to a particular location to access their educational programs, it made sense to talk about regional accreditation, tuition rates, service regions, and semesters. Now with Web-based possibilities, the new delivery systems are changing how higher education administrators are viewing these concepts. It appears that these changes in delivery are making it necessary to develop new ways of accrediting or approving courses and programs that students may receive from many parts of the world.

Web and Web-based applications are increasingly more prevalent in traditional university course delivery structures. According to Matthews (1999), information technology meets the need for a more flexible education system, fosters lifelong learning by allowing people to periodically update their knowledge, and keeps learners connected. Whether the Web is used for business transactions, entertainment services, informational research, or for educational experiences, it has become an integral part of our society.

Education is the core of the emerging global knowledge society and the virtual university will be intricately woven into that society. The virtual university is not a single institution, but a web of education providers that collectively distribute services to the client at the time, place, pace, and style desired by the client, with quality determined by the client and a variety of approving and accrediting bodies.

Web collaborations and partnerships are also important for educators and professionals. Moss (2000), argues that creating and sharing scholarship should be the goal, the point of contact, for professionals on the Web. Through theoretical analysis she describes effective online professional learning environments through

two perspectives: relevant theory operating in effective practice and online learning environments as environments that learn. She believes online learning environments have the potential to help educators create the future while reinventing the present.

The organizational changes that are necessary for traditional colleges and universities to be successful may be greatly enhanced through partnerships and collaborations. For the immediate future, it may be necessary for higher education institutions to collaborate and form strong business partnerships. According to Zerby (1998), virtual universities have been formed through coalitions to allow for rapid, effective response to the environmental changes and threats in the higher education market. Zerby (1998) conducted research that reflected the organizational behavior of three organizations of higher education that operate virtual universities: Purdue University, Western Governor's Association, and University of Phoenix. Zerby observed what he described as the "coalition" metaphor. Zerby continues his discussion by stating: "Coalitions are typically formed to allow a rapid, effective response to some environmental change or threat, and are fluid enough to allow the addition or removal of members as dictated by the changing scenario" (p. 114).

Coalitions are an option for traditional colleges and universities to respond faster to the changes in their environment. Conversely, mismanaged coalitions can create an environment where there are more bureaucratic issues than for a single organization. Still, coalitions offer a support system with enhanced resources and expertise that in most cases leads to an advantage over competitors.

Web Impact on the Relationship Between Faculty and the College

As the number of colleges and universities offering Web-based instruction increases so does the number of faculty facilitating within this learning environment. Research suggests the advent of Web-based instruction has had a significant impact on faculty. As described by Cook (2000), professors who find themselves as newcomers to Web-based instruction seeking advice about teaching courses online, quickly learn there are few comprehensive discussions about online instruction. With few models to emulate, faculty face a challenging task when trying to determine appropriate course goals, objectives, and effective technological delivery methods.

Research conducted to help faculty design effective online course material appears to be increasing. Discussions have focused on the differences and commonalities between Web-based and traditional classroom instruction and the successful teaching techniques for Web-based learning environments. However, material delivery, evaluation and assessment techniques are uniquely different than that of traditional classroom instruction.

Kearsley (1997) discusses important implications of teaching in a virtual classroom. These implications include students realizing improved communication skills in parallel to the subject matter by being forced into written communication, social dynamics change to place both students and professor on equal footing, the professor does not automatically command a presence in a Web-based environment, there is a minimizing of discrimination and prejudice, and lastly it is noted that people react and participate differently in a Web-based learning environment based upon their learning style and interests.

Ellin (2000) discusses the fear colleges and universities have concerning professors earning considerable money via Web courses and not sharing the profits with their institutions. Colleges and universities are currently serving as the middleperson between the professor and the student, by providing the bricks and mortar. The Web allows communication directly between the teacher and the learner. Stellar professors could become cyber superstars with no need for affiliation with a higher education institution.

Considerations for Designing Effective Web Learning Environments

Interactivity and Interaction

Much of the research discussion focuses on how to use technology to create the same attributes as a traditional classroom. As a result, the center of attention appears to be on interactivity or interaction and why it is important to consider the inclusion of it when creating a Web-based learning environment. Wagner (1997) presents a discussion of how the two terms are frequently interchanged throughout distance education dialogue. She also illustrates the poignant differences between interactivity and interaction and the importance of recognizing the difference in terms when designing Web-based instruction.

Previously, Wagner (1994) defined interaction as two actions and two reactions, which influence one another. Conversely, interactivity appears to have emerged from characteristics of technology which enable connections from one point to another point or multiple points in real time. It is the availability of technology-based interactivity that allows real time interaction in almost every facet of our life. Web-based instruction can use technology to create interaction in almost every facet

of the learning process. However, to create an effective interaction design, it is suggested to first consider the goals and objectives of the course or program.

With interaction comes collaboration and collaborative learning. Borthick (2001) presents a process for designing technology-enabled learning experiences for collaborative discovery learning online. In discovery learning, learners are guided to recognize a problem, characterize what a solution would look like, search for relevant information, develop a solution strategy, and execute the chosen strategy. Borthick suggests situating learners in an electronically enabled community of practice that creates opportunities for learners to create their own understandings in the social framework.

Collaboration and participation contributes to student's success in Web-based learning environments. Watson (2001) conducted an experiment that explored foreign language learning online. Twenty adults (aged 19-86 years old) participated in an online French fluency course during two twenty-eight week semesters at Coastline Community College in Fountain Valley, California. Findings show that the students who participated most developed their fluency the most; moreover, these were also the students whose writing included the most diverse sentence styles and topic content. It was concluded that adults learning online must be encouraged to interact freely if their development is to be genuine and enduring.

Online Learner Characteristics and Needs

While considering the goals and objectives of the learning experience, there appears to be a heightened concern whether the learner/student is prepared to fully participate within a Web-based learning environment. In an attempt to capture what

information would be helpful to distance education students, many researchers are focusing their attention on learning styles and personality traits.

Many research studies have focused on what student profile criteria are necessary for successful learning online. Fox (2000) researched the relationship between student satisfaction in an online course and certain predetermined criteria. The research data were drawn from a participant pool of 1,129 undergraduate and graduate students at Marshall University. Fox (2000) discovered a new demographic profile for students taking online courses. The new profile illustrated that students are more likely to be older than traditional students, with a higher percentage of females, and higher retention rates. The data seem to indicate that student satisfaction is influenced by the quantity and nature of learner interaction and feedback, the reason why a student takes a course, faculty technical expertise, the pace of the course, and the type of instructional strategies used in the course.

According to other research studies involving distance education, the typical distance learner is between the ages of twenty-five and fifty, approximately two-thirds are female, most are married, and primarily working full-time while taking courses (Hardy & Boaz, 1997; Moore & Kearsley, 1996). There are personal attributes that adult Web learners need to possess to be successful. Recently, Caffarella (2002) highlighted major principles and practices of adult learning. These principles and practices include: (a) adults have a wealthy background of knowledge and experience and learn greatest when this experience is acknowledged and fresh information builds on their previous knowledge and experience; (b) adults are motivated to learn based on a mixture of multifaceted internal and external forces;

(c) all adults have favorite and diverse ways of processing information; (d) adults are not likely to willingly engage in learning unless the learning is meaningful to them; (e) adults want to apply their learning to current situations; (f) adults approach to a learning situation with their own personal goals and objectives; (g) adults prefer to be actively involved in the learning process rather than submissive recipients of knowledge; (h) adults learn in interdependent, related, and collaborative ways as well as independent, self-reliant methods; (i) adults are increasingly receptive to the learning process in situations that are both physically and psychologically comfortable; (j) and what, how, and where adults learn is affected by the numerous roles they take part in as adults and their own personal contexts as learners. Burge and Howard (1988) suggested that the adult learner typically meets the following criteria to be successful in distance learning environments: (a) the learner assumes full responsibility for her own learning, (b) the course content has relevance and meaning for the learner, (c) involvement and participation are necessary for learning, (d) the relationship between learners exhibits helping styles and learner self-responsibility, (e) the instructor is both a facilitator and resource person, (f) the learner views themselves differently as a result of the learning experience, (g) the learner experiences convergences. Whether or not adult learners possess the aforementioned characteristics therefore enabling them to excel in these Web environments, the demand for online learning continues to increase.

According to Ealy (1999), an unwelcome attribute for successful online learning is anxiety. The fact that employees in the business world are being asked to make use of an emergent list of communication technologies makes anxiety about

Web technologies of ever-increasing importance both during the formal education process as well as in training the workforce in the use of these new technologies. The Ealy (1999) research project focused on and was successful at improving Internet knowledge and the possibility to use the Internet, while diminishing Internet anxiety. It is critical for universities to provide the same level of orientation services to the new population of online students as those provided to traditional, on-campus students. It appears that student orientation and preparatory services reduce the student's anxiety levels.

Adult learners have many competing priorities in their busy lives. A strong support framework will significantly enhance an adult learner's ability to successfully complete their educational goals. Phillips and Kelly (2000) state there are five factors that create specific demands for focused and timely support for learners: competing life demands, physical separation, learning skill needs, open admission policy, and program-course choice flexibility. A learner service is not just initial information to get started nor is it only the responsibility of a few counseling staff. Phillips & Kelly (2000) believe that advice, guidance, and study support are developmental factors in the complete learning process and include activities such as selecting and planning a study program, organizing study, developing learning skills, monitoring progress, and managing college procedures, as needed.

Student needs are a critical issue to consider when designing and implementing a Web-based course or program. Visser and Visser (2000) examined the academic, affective, and administrative support expectations of distance education students. This study surveyed students and faculty online before beginning

the course. Their findings from this research indicate that distance-learning institutions will have to discover ways to assist learners learn the mode they learn best. This necessitates a dynamic student support system that is entrenched in a dynamic, reflective, and open learning environment.

Distance learners need a dynamic learning environment that keeps them actively engaged. McClean, et al (2001), conducted research using established educational virtual worlds. They describe experiments that explored whether graphical or text-based virtual worlds, designed to support authentic directions in cell biology and geology, can significantly advance the student's ability to solve authentic problems in these two disciplines. Students completed a pre-treatment scenario-based assessment exercise, and post-intervention scenario-based assessments approximately one month after actions were finished. A total 334 and 368 student volunteers participated, while non-volunteers were controls. Results point out that the use of virtual worlds designed as dynamic, authentic learning environments can positively influence student learning.

In addition to the learning environment, distance education students have many non-academic needs. A research study conducted by Bayless (2001) examined the non-academic needs of distance learners. Bayless surveyed both students and faculty at twelve universities within the United States. The research revealed student needs that had some or a great effect on students' success as distance learners. These needs include: (a) information about distance learning, the program, the institution, and the services available; (b) access to the systems that make courses function, such as registration, purchasing books, and admission; (c) the importance of a contact

person at the institution in addition to the instructor; (d) personal and prompt attention that provides accurate information and is convenient for the student; (e) assistance with technology issues; and (f) opportunities to apply the skills, knowledge, and values learned in a practical setting.

In summary, the typical online learner has the following characteristics: (a) more likely to be older than traditional students, (b) higher percentage of females, (c) higher retention rates, (d) and the majority are working full-time while taking courses. The following criteria influence online adult learner's satisfaction with their educational experience: (a) whether they are prepared to fully participate within a Web-based learning environment, (b) quantity and nature of learner interaction and feedback, (c) the reason why they are taking the course, (d) faculty expertise, (e) the pace of the course, (f) the type of instructional strategies used in the course, (g) and if there is a dynamic student support system.

Elements of Web-based Learning Environments

In addition to assessing the quality of student services, universities should be focused on the quality of the Web learning environment. Some research even suggests that Web-based learning environments are best when combined with classroom learning. For example, the 1998 study conducted by the American Association for History and Computing suggests the most effective use of instructional technology is to be integrated into small-class settings that also provide face-to-face interaction.

However, there is also research indicating that Web-based learning environments alone can be a stimulating and effective instructional delivery format.

Oliver and McLoughlin (2001) illustrated this when they explored the practice and incidental learning of generic skills (management of self, others, task, information) attained through the execution of a Web-based online learning system. The problem-based learning environment was implemented in a first year, ten week university course with ninety students working in small groups. The researchers discovered that the Web-based learning setting is a lively and engaging environment that encourages and supports student learning by providing genuine contexts and a range of learning frameworks and supports.

In addition, research has also shown that traditional instructional methods when applied online can be just as effective when used in a classroom on-campus. According to Smith (2000), there is little research that has focused on the effectiveness of traditional instructional methods when used in an online learning environment. Smith's study examined the effectiveness of traditional classroom teaching methods used in an online learning environment. Academic outcomes of pre-service education students who received online instruction were compared with pre-service education students who received traditional teacher-based instruction. The results of this study showed that student performance was the same whether instruction was delivered in a traditional classroom or through an online learning environment. Traditional instructional methods, such as those used in this study, can produce similar academic outcomes when delivered through online learning environments. But, are student experiences, while in these two different environments, the same? Additionally, does the student perceive one environment as better or higher quality than the other?

Again, research indicates that the online environment allows the student to enhance levels and styles of communication. Nummi, Ronka, and Sariola (1997) conducted a research and development project named LIVE (Learning In Virtual school Environment project) in a distance education classroom at the Media Education Centre of the Department of Teacher Education, University of Helsinki. The LIVE project incorporated three major concepts: (1) virtual school, (2) constructivism, and (3) cooperative learning. The goals of LIVE included the research and development of: (1) instructional networking models in a virtual school environment for teacher education and, (2) applicable methodology for cooperative learning in an open learning environment assisted by advanced technology. As described by the findings of Nummi, Ronka, and Sariola (1997), within a virtual learning environment, the learner's role is active information gathering, and responsible for working towards her/his own goals and those of the cooperative group. Learning within a virtual format gives the learner the opportunity to work on many different levels of communication.

User friendliness is an obvious necessity for an effective instructional delivery format. Ferreira (2001) presents the research of the EDUCAR project. This project involves the study of how to characterize and use user profiles to offer customized interface and to adapt content according to performance and interest of students. The key purpose of the EDUCAR project is to create a model for developing and managing Web-based courses. The project defines resources for course authoring and keeping track of student's advancement and assessment. The conclusion of the research introduces the idea that Web courses must provide an easy

interface and present content in a way that respects a student's pace and time available for studies. A course delivery model must not be an obstacle for the student. The chief intent of any Web-based course is not teaching how to use the system but to transmit the intended content. In essence, the learner must be able to navigate easily and at a pace that works for them.

Online learning environments can also be social learning communities. Barab (2001) examined the pathway of an online course in which thirty-four graduate students (aged 27-56 years old) collaboratively investigated and shared their personal experiences with respect to adult development. Naturalistic inquiry was used to get a holistic view of the semester-long course and to identify exact evolving issues that describe course dynamics. Three issues were selected for consideration: (1) flexibility of the course to accommodate participants; (2) co-construction of meaning through the sharing of personal experiences; and (3) expression of vulnerability and personal growth. Research indicated that benefits of online courses extend beyond the time and place independence they provide for participants, but also include the reflective and social environment they can cultivate.

Distance education students need to be adequately prepared before taking their online course. Hardy & Boaz (1997) present an outline for creating student development materials for distance education programs, specifically, student preparation for a distance learning experience that goes beyond technical aspects. The Hardy & Boaz (1997) study included the development and distribution of a survey instrument for distance education students across the country and as far away as Australia. The survey included the following sections: Student Profile,

Administrative Issues, Technical Issues, Access/Interaction, and Course Content/Interaction. Survey results appeared to indicate there are more learning challenges for a distance education student. Such as, distance students need to be more focused, better organizers of time, both team oriented as well as independent, possess strong motivation, self directed, and assertive.

Hardy & Boaz's (1997) study revealed the following negative comments on non-technical issues in regards to a lack of proper orientation for students participating in a distance-learning experience: course material distribution, general communication, financial concerns, and adequate preparedness on the university's policies and procedures. It appears that consideration needs to be given to the course design but also to how the university prepares students to participate in the virtual learning environment.

Illustrating the complexity of issues regarding distance education, Bunn (2001) provides a framework to categorize distance education issues into four distinct program stages and three decision areas. Bunn has classified program stages as: planning, development, implementation, and control. The decision areas include: student-related, instructional, and organizational. Since elements of this framework are interrelated, there is a need for education providers to administer a cross-sectional approach to create and maintain successful distance learning models.

Sub-systems within the institutional framework providing resources to online coursework are directly affected by a variety of factors. Carr-Chellman, Choi, & Hernandez-Serrano (2001) analyzed several specific major sub-systems (i.e., Students, Faculty, Curriculum, and Infrastructure) as starting points for the

development of potential impacts that World Campus at Penn State University may have on Penn State University. This model explored numerous factors (i.e., costs, student adoption, satisfaction, peer pressure, payoff, public opinion, perceived quality, perspective or current employer), which contribute and are interdependent on one another within the system. They found their research software could not anticipate all possible outcomes. However, the research simulation led them towards a deeper understanding of the overall system and those factors that are important in designing a new or existing online learning system at a university. It is believed by the researchers that deeper understanding will facilitate the process of projecting the impacts of these evolving systems.

The catalysts, emphases, and elements of virtual learning communities were examined by Schwier (2001). Schwier describes educators as being focused too often on products and hardware, and too seldom on learners. Schwier states that if educators choose to support the development of virtual learning communities, a number of issues are financial and logistical. Universities must discover how to bring together the technological and personal systems essential to construct and preserve a communication system. In addition, how do colleges and universities deal with questions regarding the design, implementation, pedagogy and effects of virtual learning communities, as well as, the socio-educational facets of learning through this means of communication?

The importance of a strong learning community should not be ignored when looking at effective asynchronous distance education models. Moller, Harvey, Downs, and Godshalk (2000) studied a population of twelve graduate students

enrolled in a course using Web-based conferencing software. Each student was assigned to work with one of three teams of four. Their specific research purpose was to explore the relationship between community and learning in asynchronous environments. Their conclusion indicated that more peer interaction resulted in heightened learning. In this study, most students reported gaining a sense of confidence from the act of learning about the subject and themselves. The need for collaborative research was greatest when students wanted to obtain feedback, and this assisted them to feel connected to their team members.

Research suggests the optimal education delivery model uses a combination of different learning formats. While universities are developing and offering new delivery models for Web-based courses and programs, it is the student/consumer who is choosing the most desired learning environment. From the perspective of implementing and managing Web technologies within education, Burge (2000) has pondered a handful of questions for the future: (1) How do I think about the concept of learning technologies? (2) Ethics: What does it mean to be an ethical user of learning technology? (3) Where are the difficulties in being harmonious? (4) What, in broad terms, does it take for an adult learner to proceed with proficiency and feel joined in a technologically mediated learning environment?

To some individuals, removal of direct interaction may be desirable. However, some students may have difficulty establishing a sense of presence online and do not thrive in this environment. Either way, the trend of distance education delivery has caught the attention of administrators, granting agencies, and business

people. As a result, educators and entrepreneurs are pursuing various ways to deliver quality courses via technology.

Adult Learner Characteristics and Learning Needs

There has been extensive research conducted exploring adult learner traits and what adults need to be successful. Hardy and Boaz (1997) describe the respondents of their 1996 research study. The results of the demographic information concurred with those cited by Moore and Kearsley (1996) as typical of distance learning students. The majority of the survey respondents were between the ages of twenty-five and fifty. Almost two-thirds are female; most are married and primarily working full-time while taking coursework. These results in combination with Knowles's (1978) principles of the adult learner are closely tied with the traits and principles of learner centeredness (listed below). The adult learner basically fits these conditions and frequently insists that they are followed in their educational experience.

- "The learner has full responsibility for her own learning.
- The subject matter has relevance and meaning for the learner.
- Involvement and participation are necessary for learning.
- The relationship between learners shows helping styles and learner self-responsibility.
- The teacher is a facilitator and resource person.
- The learner sees himself differently as a result of the learning experience.
- The learner experiences confluences (Burge & Howard, 1988, p. 2)."

Hardy and Boaz (1997) believe that if the majority of the respondents met the above criteria, the significant question in the survey is "Do you feel the administration at the 'sending' institution demonstrates an understanding of your needs as a distance student? The most common complaint made by the negative respondents relates to nontechnical issues such as instructional material distribution, general communication, financial matters, and information regarding the institution's policies and procedures.

Moreover, Verduin & Clark (1991) present an adult learning perspective as they illustrate the needs of the adult distance education learner. Those authors concentrate on recognizing and meeting the needs of adult learners through program planning, design, and delivery processes. They provide a comprehensive guide for building effective, creative, and nontraditional approaches to learning.

The literature on adult education supplies groundwork in adult learner characteristics and best practice. Brookfield (1991, 2000), Cross (1992) and Knowles (1978) speak to understanding adult learning topics, while Merriam & Caffarella (1998) present the current state of adult learning theory, and Caffarella & Knowles (2001) and Cyrs (1997) focus on program planning that builds on the adult education base.

Brookfield (1991, 2000) presents an overview of adult learning studies. He approaches an emotional perspective that states adult learning seeks to empower self-directed learners with critical thinking models. He addresses emotional aspects of how to effectively work with adult learners appreciating they bring a wealth of knowledge and experience into the classroom and are task oriented. Cross (1992)

explores adult learner research and theory. She examines who participates in adult learning and why. Cross-discovered the major emphasis in adult learning was in the practical, obtaining skills, rather than on acquiring the knowledge.

Merriam & Caffarella (1998) synthesize the works of Cross and Knowles, and examine current adult learning theory. They discuss the context in which adult learning takes place, what is learned and the essence of the learning process. In contrast, Caffarella & Knowles (2001) explore the planning of adult educational programs. Cyrs (1997) also presents administrative or non-academic issues that are essential when providing a supportive framework for distance adult learners. Cyrs illustrates the specifics of administrative details critical for effective business practices. Exploring this background in relation to Web-based learning environments allows a perspective that can produce insight and suggestions for practice and research.

Institutional Support Structure for Web-based Learning Environments

Research has discovered that Web-based learning environments can be an effective and socially interactive instructional model. However, research has also shown that the administration significantly impacts the success of distance education programming. Havice (1999) conducted a research study that included a population of 115 lower, middle and upper level academic administrators from nine universities in the southeastern portion of the US during the 1998-99 academic year. Five significant conclusions surfaced from this research, (a) varying attitudes toward distance education among the three levels of administrators, lower level managers had much lower attitudinal scores than the upper and mid-level managers, (b) peers

and personal experiences influence administrator attitudes toward distance education, peer influence is reduced when administrators have personal experience with distance education, (c) attitude differences toward distance education are comprised of several interrelated factors: exposure to distance education; peer influence; deterrents; incentives; perception of need; and perceived support for distance education, (d) administrators, regardless of attitude, believe distance education training for faculty is both essential and insufficient, (e) there appears to be a strong, positive correlation between attitude toward distance education and willingness to support distance education in the future.

Strong leadership and support for online programming is critical for successful Web-based educational experiences. Amiri (2001) states that the most important component for a successful virtual university is the presence of a local hero with the vision, courage, and stamina to defy status quo. Growth with technology can be achieved via partnerships that bring together the federal government, state and local agencies, the private sector, and educational institutions.

Future Relationship between the University and the Online Adult Learner

An effective leader stays with and slightly ahead of their constituents and universities will have to do the same if they expect to be innovative and respected leaders in our society. Colleges and universities are servicing constituents that expect to utilize services in a virtual format that is easily navigable, highly functional, and aesthetically impressive. In order to attract the desirable student population, higher educational institutions must develop strategies to successfully integrate a Web-based learning environment into their traditional campus.

The student perceives the benefit of technology as having the potential to make student life much less complicated (Siedlecki, 2000). As an example, technology could eliminate lineups for student services and streamline the bureaucratic entanglements that students have to clamber through. Thus, the main student focus is still on the selected course of study and not the delivery method. However, Web-based support services and instructional delivery models will still be an increasingly integral part of a university student's experience.

For example, some research suggests how colleges can change their technology paradigm. Abrahamson (2000) presents ideas on how higher education can shift institutional culture from print-think to Web-think overnight. He believes that colleges and universities must accept the following web realities: (a) enhancing Web capacity and functionality is an emergency, (b) effective Web marketing requires consistent campus-wide strategies, (c) institution-wide Web planning is critical (d) research is mandatory; (e) Web management should be shared across campus, (f) an effective Web presence will fundamentally change 'business as usual', (g) Web users have a low pain threshold, (h) competition is near, (I) adequate funding for the Web is mandatory. Perhaps the preceding ideas can potentially serve as a blueprint for university administrators to follow in order to successfully manage the power of Web technology.

How organizations utilize technology also impacts their bottom line. Frand (2000) discusses the lesson learned by the commercial sector in the 1970s and 1980s. He examined an interesting paradox. Those companies who invested in information technology realized no positive return on the bottom line. However, there were a few

companies in the late 1980s that made major breakthroughs, namely, American Airlines' frequent flyer program and American Hospital Systems' customer-controlled inventory management system. Each of these organizations realized value-added from changing the nature of the relationship between the company and its customers, using technology to benefit the customer. The focus was external effectiveness rather than internal efficiency.

An institution's ability to be highly organized, yet fluid, can determine its success. According to Anastasiades (2001), through the use of a theoretical example, the development of a consistent system of evaluation, the standardization of curricula, and the establishment of open and understandable systems, will encourage students' mobility in the virtual university spaces that are being formed. These entering students will not be restricted to one university. They will choose subjects, faculties and studies that will be established through the selection of a certain number of courses which might be offered by different university departments, probably in different countries around the world. Faculty will be chosen by students because they trust her work and not just based on the reputation and authority of the university she is working in. The university will be expected to adjust their practice to innovative and shifting information. They will continue to be the genuine official regulatory structures that will see to the development of the appropriate educational setting.

The aforementioned examples confirm that organizations need to closely examine their relationship with their customer. Frand states: "… for any company to compete, it must be willing to challenge everything that has gone before and to

completely rethink the relationship between the company and its customers to reconsider its customer services, its organizational structure, and its business processes." The issue of student services becomes much more poignant when the student is experiencing a learning environment where they depend solely on the available technology. Monaghan (2000) believes the challenge is to find ways to expand the underlying aspect of the learning community, maintaining the relationship between the university and the learner.

Synthesis of Literature Review

As a result of Internet and Web technologies, the competitiveness and survivability of higher educational institutions will be dependent on their ability to respond to the rapidly changing environment that has been imposed on them by easily accessible virtual learning environments. Van Dusen (1997) states, "the transfer of these new technologies to the college campus is at the center of a reform movement designed, as the literature suggests, to transform, restructure, or reengineer higher education administration and instruction" (p. 4).

The evidence presented in this study would seem to suggest that the realignment of traditional colleges and universities in response to the advent of virtual learning environments may have a profound impact on the relationship between the university and its adult student population (Monaghan, 2000; Frand 2000). If the characteristics of higher education are indeed undergoing a metamorphosis, then continued research must be conducted in an effort to assess the dimensions of the virtual learning environment. Specifically, are sufficient instruction and resources available that provide meaningful learning experiences for

the online adult learner or are colleges and universities still primarily focusing on the needs of the traditional on-campus undergraduate student? Many studies (Alexander, 2000; Como & Snow 1986; Cook, 2000; Moore & Kearsley, 1997) are conducted from the perspective of the administrator or faculty and do not adequately represent the voice of the learner. The changing landscape of higher education includes significantly increasing numbers of older undergraduate students, adult distance learners, and predominantly adult learners taking online coursework. Traditional universities should know if they are meeting online adult learner needs.

We have experienced an evolution from the traditional-physical instructor-led classroom towards constructivism where: (a) learners construct their own meaning and understandings of instruction; (b) instructional goals will be discussed, not imposed; (c) task and content analysis would focus less on identifying and recommending a single best sequence for learning, but would instead identify several alternatives; (d) evaluation would be less criterion-referenced (for instance, might include portfolios). Furthermore constructivism is now evolving within Web learning environments. We are now seeing Web learning environments that encourage active learning, based on learners making decisions about task, content, navigation, presentation, and assessment (Campbell, 1999).

It appears that the higher education market is shifting from a process driven industry to a student driven industry. Wagner (1997) states the best approach when designing any kind of learning experience is to first consider the desired outcomes. The goals of the learning experience are learner-focused. Instead of the university process driving the activities of the educational experience, technology has afforded

the student and the university to focus on the primary objective, learning. Now, most Web-based transactions can satisfy many routine and bureaucratic student service issues. Customer service transactions for students on university campuses have, for the most part, been highly successful when intelligently implemented and sufficiently supported. What has yet to be adequately researched is whether college administrators are making decisions that directly contribute to the successful implementation, evaluation, and future development of e-Learning communities. It is also important to examine the perceptions held by online adult students to determine if the university is meeting learner expectations and needs.

As a means of exploring the perceptions held by online adult students, the adult online students at a Philadelphia-suburban community college were asked to rank twenty-eight essential dimensions of their Web course experience by completing a questionnaire; twelve of those online adult students were asked: (a) what is your sense of learning while participating in this environment?; (b) what is the speed and ease you are able to perform course tasks?; (c) what kinds of support and resources were available?; (d) describe the level of interactivity and interaction you experienced with the instructor and other members of their course? In addition, institutional artifacts and documents were examined along with the use of the six conceptual Frameworks for the Web: Design for Active Learning in order to analyze the course design. The six frameworks include: (a) provides multiple representations of reality, representing the natural complexity of the real world; (b) presents authentic tasks that conceptualize rather than abstract information; (c) fosters reflective practice; (d) enables context and content dependent knowledge

construction; (e) supports collaborative construction of knowledge through social negotiation, as opposed to competition among learners for recognition (Campbell, 1999). This framework allowed the researcher to comprehensively evaluate instructional materials.

As presented in this study, there are societal changes and environmental changes which are driving the changing needs of students. Specifically, how does higher education keep pace with the online needs of its largest growing population, adults? How can traditional academic structures change to keep pace with their constituents? Using the criteria illustrated in this study, the experiences of adult students and their perspectives were researched. Continued research will enable traditional colleges and universities to maintain and improve their ability to make available instruction and resources to provide a meaningful learning experience for adult online students.

3. Research Design and Methodology

Overall Strategy

This case study was designed to explore if a community college is providing sufficient instruction and resources that provide meaningful learning experiences for online adult learners. The study examined the factors contributing to a satisfying and effective learning experience. The mixed methods discussed were designed to explore student perceptions of their learning and whether the institution is providing a supportive organizational structure for effective Web-based learning environments.

As a means to explore the perceptions of online adult learners, this research study investigated questions in the following areas: instruction/instructor characteristics, technological characteristics, and course/management and coordination. In addition, students were informally interviewed in order to determine if the adult student feels comfortable and connected to the college, the instructor and fellow students, and if the adult student feels a sense of learning achievement online. It seems essential for researchers to examine and discover what adult students are experiencing while participating in Web-based learning environments and how well they perceive the college is meeting their needs and expectations.

Through a mixed methods case study design, questions were asked to determine:

- How did the instruction/instructor facilitate an effective learning experience?
- How did the technology facilitate or impede the learning experience?

- How did the course/program administration provide quality and timely support to the learning experience?

Design of the Case Study

A case study was chosen to explore the depth of adult students participating in a Web learning environment. The exploration focused on the experiences of students who had taken Web courses offered during the fall 2002 semester. This research study was designed as both a qualitative and quantitative case study. The mixed methods research was concerned with the learning processes within a Web-based learning environment and what the students are experiencing. Flick (1998) states that qualitative research has essential features: correctly choosing appropriate methods and theories, the acknowledgement and examination of diverse perspectives, the incorporation of the researcher's reflections of the study as part of their expanding knowledge, and the array of multiple approaches and methods in qualitative research. Creswell (2003) illustrates that the mixed methods approach incorporates the idea of triangulation, a way for seeking convergence across qualitative and quantitative methods, with the ability to elaborate on or develop the findings of one method with another method.

This case study converged a quantitative method with a large sample so that the research could generalize results to the selected population and qualitative methods for deeper exploratory purposes in order to provide a comprehensive analysis of the research problem: are sufficient instruction and necessary resources available that benefit and focus on the online adult learner? This research strategy addressed the critical components of a case study by the triangulation of

perspectives. Because the research questions involve the examination of the relationship between students and the college's Web learning environments, a case study design was determined as the most effective structure with which to frame this research.

The Web Course Evaluation Questionnaire was selected because it captured student beliefs about what they experienced by encompassing essential instruction/instructor, technological, and course management dimensions of a Web course. Hence, comprehensive student responses are quantifiable by essential dimensions. Institutional artifacts and course materials were analyzed to capture the essence of course design and support structures. Lastly, informal interviews were conducted to capture the student's sense of learning, ability to perform tasks, breadth of support and resources, and how they related with the instructor and fellow students.

Site and Population Selection

The research study was conducted at a Philadelphia-suburban community college. Adult students (twenty-five years and older) taking Web-based coursework were asked to participate. This community college is a thirty-one year old, well-established and progressive, comprehensive college serving the population of Delaware and Chester counties from a main campus in Media, PA and four off-campus locations in the two-county area. The college has made a significant commitment of resources to technology and wishes to continuously assess its impact on the college and its students. The college offers courses and programs that are

credit and non-credit, as well as students who are either full time or part time. The college enrollment data for fall 2001 and 2002 is shown in Table 1.

Table 1. Community College Enrollment Data

Unduplicated Credit Students	Total Student Headcount	Full Time Status	Part Time Status
Fall 2001	9,517	3,469	6,048
Fall 2002	10,511	3,892	6,619

The college's student profile consists of approximately fifty-four percent women, forty-six percent men, ninety-nine percent state residents, one percent international, forty-eight percent twenty-five years and older, one percent Native American, one percent Hispanic, nine percent black, three percent Asian or Pacific Islander. The most recently popular majors include: liberal arts/general studies, business administration/commerce/management, and nursing.

The potential participant population included more than 200 current adult students enrolled in approximately 30 different online courses delivered by the community college. The researcher's goal was to have as much participation as possible in responding to the Web Course Evaluation Questionnaire. The Web courses offered for fall 2002 and spring 2003 include the following disciplines: Accounting, Biology, Business, Data Processing, Economics, English, History, Hotel/Restaurant Management, Interactive Multimedia, Math, Office Management, Physical Science, Political Science, and Psychology. Online services available

include an online bookstore, library services, student records, college calendar, and learning center. There is currently a Director and two managers supporting the delivery and administration of these courses. In addition, the college created the Cyber College Project that currently houses three full-time professionals who provide professional development, technical expertise, and Web design support to faculty.

The online adult students were asked to participate in this study by way of a letter from the community college's Director of Distance Learning and the Primary Investigator of this study, Dr. Elizabeth Haslam. Students who completed and submitted the electronic Web Course Evaluation Questionnaire upon completion of their online course had anonymous identities due to the nature of how the questionnaire results were sent to the researcher. In addition to the questionnaire, the researcher recruited twelve students to participate in an informal interview. Students participating in the informal interview sessions signed and submitted an informed consent form. These participants were selected so there was an equal representation of background, ages, and academic discipline. Each informal interview required approximately thirty minutes with the researcher. The researcher indicated to volunteers that their participation in this research was being used for improving courses and programming support that will benefit future learners and others. The researcher also informed participants that she would arrange an opportunity to access research results to the participants of the study via the Web.

Data Collection Procedures

The research study was conducted during the fall 2002 and spring 2003 semesters. The request to participate letters from the college and primary investigator were mailed to the online adult students the middle of December 2002, at the end of the fall 2002 semester. Participant requests for informal interview sessions took place beginning December 17th 2002, throughout January, and ending February 14th 2003. In addition to the hard copy mailed with the request to participate letters, the Web course evaluation questionnaire was constructed online for participants to respond upon the completion of their course for the fall semester. This case study investigated the perceptions of adult learners regarding Web-based course instruction through the Web course evaluation questionnaire, the analysis of online course and college related artifacts and documents, and through informal interviews with the adult Web students. The research study relied on the participants' feedback, in various forms as the primary data sources for the study (Seidman, 1998): responses from the Web course evaluation questionnaire; informal interview notes; and written documents including professors' instructional material and assignments and university documents.

Web Course Evaluation Questionnaire

This instrument was used to determine student's perceptions of their learning experience online. The questionnaire asked students about the instruction/instructor, technology, and course management/coordination. The questionnaire was mailed to each fall 2002 Web student twenty-five years and older. Students were asked to complete the questionnaire as requested by the recruitment letter from the

community college's Director of Distance Learning and the Primary Investigator. The responses to the questionnaire were anonymous unless the participants chose to identify themselves. The questionnaire was designed and validated by Dr. Paul Biner at Ball State University.

In designing and validating this questionnaire, Dr. Biner's objective was to create a useful, yet psychometrically sound, technique of constructing an attitudinal assessment instrument that would accommodate their institutional information requirements. With this objective in mind, a series of four investigations was carried out to develop and test a systematic way of constructing a customized, empirically based instrument to evaluate the attitudes of distance education students. The explorations are reported as a series of steps, illustrated in Table 2. In Step 1, the chief concern was to generate an unrestricted list of possible items (i.e., factors that potentially could affect student's attitudes regarding technology-mediated courses). The goal of Step 2 was to identify the main dimensions underlying groupings of specific items. The results of this step would finally dictate the sections and section headings of the instrument. In Step 3, a content validity analysis was executed on each of the items to establish which should be included in the final version of the instrument. Finally, Step 4 involved writing as well as pre-testing the instrument using students currently enrolled in a technology-mediated course (Biner, 1993).

Table 2. Questionnaire's Four-Step Validation Process

Step 1: Generating Items Related to Course Satisfaction
Step 2: Defining Dimensions Underlying Items
Step 3: Selecting Content Valid Items
Step 4: Writing and Pre-testing the Instrument

The instrument (See Appendix A) is comprehensive, consisting of three sections: instruction/instructor characteristics, technology characteristics, and course/program management and coordination. There were a total of twenty-eight dimensions asking the participants to rate each one as quickly and honestly as possible with the following choices; very poor, poor, average, good, or very good. Dr. Biner, the author, gave permission to use the questionnaire in this research study.

The questionnaire was mailed to two hundred and sixty four (264) community college students, twenty-five (25) years and older, who were taking one or more Web course(s) during the fall 2002 semester. The questionnaire was mailed with two (2) recruitment letters. The first letter was from the community college's Director of Distance Learning. The second letter was from the Primary Investigator of the research study. Both letters requested students to participate in an informal interview with the co-investigator and to complete and return the enclosed Web Course Evaluation Questionnaire or to complete and submit it via the Web at http://www.personal.psu.edu/staff/h/l/hlt1/Survey.htm. Electronic surveys offer efficiencies to the design and implementation of self-administered questionnaires such as elimination of paper, postage, data entry errors and costs (Dillman, 2000).

Questionnaires were completed and returned to the co-investigator beginning December 19, 2002 and ending February 27, 2003. There were a total of fifty-eight (58) questionnaires returned, representing a twenty-two percent (22%) return rate. Of the fifty-eight returned questionnaires, five, nine percent (9%), were submitted via the Web. The remaining fifty-three (53) completed questionnaires, ninety-one percent (91%), were submitted via the postal service. Dillman (2000) encourages a high rate of return in order to provide demographic data (e.g. age, sex, race) of the sample closely matching the demographic data of the population that the sample is intended to represent.

Analysis of Course and Institutional Artifacts/Written Documents

According to Vockell and Asher (1995), unobtrusive data collection techniques are recommended as a strategy to supplement other data collection strategies to establish triangulation—employing multiple operational definitions and multiple data collection strategies—will lead to the most valid conclusions about outcome variables. This research study provides data that incorporates feedback from various perspectives and sources. Course materials, the college catalogue and institutional artifacts and documents were examined and analyzed. Flick (1998) discusses the use of vital ideas to gain access to the significant processes, and the use of the triangulation of perspectives to unveil as many different aspects as possible increase the degree of closeness to the object in the way cases and fields are explored.

When students enroll in traditional face-to-face courses, they usually have access to numerous documents intended to prepare them for their learning

experience. In contrast, students who enroll in a distance-learning course may or may not be given the institution's course catalogue (Hardy & Boaz, 1997). This kind of inconsistency between information and support offered to traditional on-campus students and that offered to Web students provided the reason for this research method. Course materials and college documents were analyzed in order to ascertain whether the student is fully prepared and informed of what is expected of them by the college and the individual instructor and how clearly communicated are the learning objectives and program goals.

The six conceptual frameworks created for Web design for active learning were used as the criteria for analyzing course materials. As presented by Campbell (1999), the six frameworks include:

1. Various representations of reality—an environment or context is created
2. Authentic tasks—learners come across new information in the context that most resembles how it will be used in real life
3. Real-world, case-based contexts—problems, cases, or significant incidents present the anchor or impetus
4. Fostering reflective practice—has encouraged a great deal of interest in the concept for teaching and learning
5. Knowledge construction—based on the idea that learners already carry knowledge (schema), experience, and values to the undertaking
6. Collaborative learning—learners are positioned in collaborative workgroups to solve a problem collectively through conversation and negotiation.

Course material selected for analysis represents nine different academic discipline areas including Business, Data Processing, English, History, Hotel/Restaurant Management, Interactive Multimedia, Office Management, Physical Science, and Psychology offered via the Web.

Informal Interviews

While most of the sources of data involve various types of "managed communication", this is the data that provides contextual information for the survey response data. This method was selected to allow for the capture of rich, comprehensive and detailed data from the student's perspective. Seidman (1998) describes in detail recommended techniques an interviewer should follow to obtain the best results from interviewing a participant. The interviews conducted for this research study strongly considered these guidelines throughout the structure of the interview process. According to Creswell (1994), a protocol is useful in conducting interviews. Protocol components should include: (a) a heading, (b) opening statement, (c) the research questions, (d) and space for recording the interviewer's comments and reflective notes (see Appendix B for informal interview protocol).

The method of interviewing carries several major advantages for case studies. Interviewing is flexible and can capture a wide range of data. As a result, interviews are more appropriate if a wide range of in-depth thoughts and feelings is sought or if a limited range of possible responses is of interest; if the question cannot be easily asked and answered in an impersonal, printed format but must be accompanied by a personal explanation; or if the nature of a follow-up question can be determined only after the respondent has answered a prior question, (Vockell & Asher, 1995).

By informally interviewing the participants during the Web course activity, the researcher was able to gain valuable data regarding the growth and progress of their learning objectives, as well as their comfort and feeling of success. The interview questions asked the student's: (a) sense of learning while participating in this environment, (b) speed and ease in performing course tasks, (c) support and resources that were available, (d) level of interactivity and interaction experienced with the instructor and other members of their course.

Each participant signed an informed consent form. Each interview session was between fifteen and thirty minutes with each participant. To the extent possible, students were selected to equally represent ethnicity, gender, ages, and academic discipline. The informal interviews brought forth vital data as to whether the students are learning and relating successfully in the Web environment.

Table 3 depicts the elements of the research questions and the selected methodology:

Table 3. Elements of Research Questions and Methods

How did the instructor/instruction facilitate an effective learning experience?	Web Course Evaluation Questionnaire
How did the technology facilitate or impede the learning experience?	Web Course Evaluation Questionnaire
How did the course/program administration provide quality and timely support to the learning experience?	Web Course Evaluation Questionnaire

Table 3. Elements of Research Questions and Methods (Continued)

Were the learning objectives and program goals clearly communicated and is there sufficient support for Web learners?	Course and Institutional Artifacts/Written Documents
Were the six frameworks for the Web: design for active learning evident?	Course Materials
What is your sense of learning while participating in this environment?	Informal Interviews
What is the speed and ease you are able to perform course tasks?	Informal Interviews
What kinds of support and resources were available?	Informal Interviews
Describe the level of interactivity and interaction you experienced with the instructor and other members of the course?	Informal Interviews

Data Analysis Strategy

This research examined whether the instruction/instructor is providing a meaningful learning experience, whether the technology resources are sufficient, and if there is a strong support framework in place to manage the Web-based educational offerings. As a result, a strictly quantitative or qualitative research approach may not have been sufficient. Therefore, a mixed methods case study allowed this researcher to quantitatively analyze perceptual student feedback from the Web course

evaluation questionnaire and to incorporate qualitative informal interview feedback from the adult online students. In addition, the analysis of institutional course/instructional artifacts, including college documents and course materials are presented. These materials have been described and analyzed. A copy of the questionnaire and interview template is included in the appendix section of this research study.

The Web course evaluation questionnaire responses were transmitted anonymously to the researcher. The college did not know who responded and does not have access to their direct responses and the researcher has the actual responses without knowing the identity of the participant. The responses to the questionnaire were analyzed using SPSS software. The statistical analysis was based on a normal distribution using one sample and one known variable. A simple statistical mean was derived along with the standard deviation of each variable. Descriptive statistics and a One Sample t-test were run on the twenty-eight variables/dimensions. The statistical analysis of all responses to the twenty-eight dimensions are presented in Chapter 4, as well as, the aggregate means of each of the three sections; instruction/instructor characteristics, technology characteristics, and course/program management and coordination. Results will be made available to the college administration.

Feedback from the informal interviews appears as a narrative of the responses to the four open-ended questions. The narrative is organized into main themes that indicate the significant factors contributing to a satisfying and effective learning experience. Through analysis of this data, all recurring themes have become evident.

The study of material culture is of importance for case study researchers who wish to explore various and differing voices, differing and interacting interpretations (Denzin & Lincoln, 2000). Both the age of the participant as well as the delivery format of the course is non-traditional and a growing minority "on-campus". Artifact analysis and review of institutional documents enabled the researcher to determine critical cultural contexts of the adult online student population. The course materials were evaluated based upon the six frameworks for the Web: Design for active learning (Campbell, 1999), and institutional documents were examined to discover whether students were sufficiently oriented and prepared to learn in a Web environment, had access to critical student services, and whether program expectations were clearly presented.

Ethical Considerations

The researcher secured the written informed consent of each informal interview participant. The participants completing the questionnaire did so with anonymity and with knowledge that by completing the questionnaire they had agreed to participate in this research study. A participant is defined as any one who is involved in this study (Glatthorn, 1998). The participants were informed of what the researcher was studying, what methods were being used, why they had been selected, what were the benefits, what was the time commitment required, and why the study was being conducted.

Before the research study was conducted, the interview participants signed the Drexel University's Office of Research Compliance approved Consent to Participate form. Through the Research Participant Consent to Participate Form, the

researcher presented an assurance of anonymity for the interview participants. Anonymity is the assurance that the identity of participants will be preserved by the researcher (Glatthorn, 1998).

Validity

Maxwell (1996) refers to validity as being the correctness or credibility of a description, conclusion, explanation, or interpretation. By using a variety of data collection methods, including the Web Course Evaluation Questionnaire, an analysis of course/instructional artifacts and university documents, and informal interviews, this researcher based the validity of data through triangulation.

Triangulation has been usually considered a procedure of using various perceptions to elucidate meaning, verifying the repeatability of an observation or interpretation (Denzin & Lincoln, 2000). Triangulation serves also to clarify by identifying diverse ways the experience is being observed (Flick, 1998).

Role of Researcher

The researcher's professional and scholarly interests lie in the realm of improving how the college responds to online adult student-learner expectations and needs in the manner that Katz (1999) describes as the university understanding that outstanding personal education is its mission and responsibility to its students. This research involved the study of learner experiences by adult participants in a Philadelphia-suburban community college online courses. The researcher was the facilitator, analyzer, and interviewer. As interviewer, the researcher asked students open-ended questions regarding their educational experiences, recorded and analyzed feedback. As facilitator and analyzer, the researcher collected and reported data from

the Web course evaluation questionnaire and institutional documents and instructional materials. This included asking experiential questions, recording the feedback, categorizing, interpreting, and presenting themes on student perceptions of the instruction/instructor characteristics, technological characteristics, and course/program management and coordination. The researcher analyzed course/instructional documents including the course syllabi, supplementary instructional materials, and institutional documents.

Researcher Background

As a former administrator of program development and contracted training and a current administrator of enrollment management and institutional research serving non-traditional adult students within a traditional college and university, the researcher has seventeen years experience working towards meeting the educational needs and expectations of this unique population within higher education. The researcher designed this study to contribute to the learning achievement of online adult students attending traditional colleges. The research related to this study has extended my knowledge of the significant factors contributing to a satisfying and effective learning experience for adult students working online. These discoveries are discussed in detail in Chapter 5. The expectation is that participants in this study provided an opportunity for me to see what institutions of higher education need to provide to adult learners online.

4. Results

The purpose of this study was to examine the concepts and practices of facilitating effective online adult learning as applied to college Web-based education practice. This research was necessary to discover what it takes to thrive in a technologically mediated learning environment and whether Web-based education practice is consistent with the concepts and practices of providing meaningful learning experiences. Consumerism is a growing force in the future of educational institutions. Without geographical control, institutions of higher education will be far more susceptible to consumer pressures than they have been in the past (Turoff, 2000). This competition has contributed to the speed with which many traditional colleges have adopted online course offerings.

Learners expect distance education to be high in quality, convenient, individualized and interactive (Rogers, 2001). The problem, then, is the traditional college is competitively meeting online adult student expectations and individual learning needs. In addition, research has revealed that students enrolling in distance learning courses are primarily between the ages of twenty-five and fifty, which is significantly different from the age of traditional college students (Hardy & Boaz, 1997; Moore & Kearsley, 1996).

Higher education is shifting from a traditional physical worldview to one that incorporates Web technology and the Web into student learning and services. While distance education has been in existence for over one hundred years, the advent of Web-based instruction and service has provided learners with instantaneous

interaction, communication and information. However, it is often uncertain if and or how college and university decision-makers are providing a supportive organizational framework and resources for online adult students. From a critical perspective, Weigel (2002) stated that virtually all varieties of distance education have failed to bring depth and dimensionality to the experience of learning. This research study examined if and to what extent college decision-makers provided adequate resources and support to online programming and if and to what extent the instruction provided a meaningful learning experience for adult students.

This case study confined itself to surveying, analyzing, and interviewing the adult online learners and the institutional and instructional artifacts and documents in a southeastern Pennsylvania suburban community college. The focused, sampling method decreases the generalizability of the findings (Creswell, 2003). This study will not be generalizable to all areas of education. The key concepts explored in this study were Web learning environments, traditional colleges, and adult learners. For this reason, the population of the study was chosen from a Philadelphia-suburban community college's adult online students. The research study's data collection was conducted over a span of three months: beginning December 17th 2002, through January and ending February 14th 2003.

The methodology was designed to explore the major research question: are sufficient instruction and resources available to provide meaningful learning experiences for the online adult learner? As sub problems, the research study focused on the following questions:

1. How did the instruction/instructor facilitate an effective learning experience?

2. How did the technology facilitate or impede the learning experience?
3. How did the course/program administration provide quality and timely support to the learning experience?

The researcher hypothesizes whether these essential dimensions were evident in the online adult student's learning experiences.

The use of mixed methodology provided a comprehensive perspective of the learning experiences of the community college's adult online students. The methodology chosen for this research study converges a quantitative method, the Web Course Evaluation Questionnaire, that captures feedback for all three sub questions and two qualitative methods that focus on the depth of the main question and several of the sub questions. The use of these three methods provided a rich and comprehensive examination of the main question. Table 4 illustrates each research question and the corresponding methodology used to capture the relevant feedback.

Table 4. Research Questions and Method of Data Collection

RESEARCH QUESTION	DATA COLLECTION METHODOLOGY
Main: Are sufficient instruction and resources available that provide meaningful learning experiences for the online adult learner?	• Web Course Evaluation Questionnaire • Analysis of institutional artifacts and course materials • Informal Interviews
Sub: How did the instruction/instructor facilitate an effective learning experience?	• Web Course Evaluation Questionnaire • Analysis of institutional artifacts and course materials • Informal Interviews
Sub: How did the technology facilitate or impede the learning experience?	• Web Course Evaluation Questionnaire • Informal Interviews
Sub: How did the course/program administration provide quality and timely support to the learning experience?	• Web Course Evaluation Questionnaire • Informal Interviews

Results of the Web Course Evaluation Questionnaire Responses

The Web Course Evaluation Questionnaire was designed to assess student satisfaction on specific dimensions of Web courses. The Web Course Evaluation Questionnaire was chosen to provide comprehensive and quantitative data addressing each of the three sub research questions by indicating the participant's perceptions of the essential dimensions of a Web learning environment. The questionnaire includes a total of twenty-eight dimensions (See Appendix A). The dimensions were divided into three major sections: (1) Instruction/Instructor Characteristics (2) Technological Characteristics (3) Course/Program Management and Coordination. The questionnaire lists the dimensions, and students are asked to rate their level of satisfaction with each on a five-point, Likert-type scale on which 1 = Very Poor; 2 = Poor; 3 = Average; 4 = Good; and 5 = Very Good. There were a total of fifty-eight (58) participant responses. The responses were electronically compiled into a database using Perseus Survey software. The data was then imported as a database into SPSS software. Analysis of the twenty-eight variables (dimensions) was conducted by capturing descriptive statistics of each variable/dimension. Descriptive Statistics (Appendix F) and a One Sample t-test (Appendix G) were run for the twenty-eight (28) variables/dimensions.

The descriptive statistics were used to determine the mean value of each of the twenty-eight variables. For the One Sample t-test, it was determined that a 95% confidence level would be used to determine the credibility of the results. For this sample, the degrees of freedom ($df = N - 1$) were determined to be 57 ($df = 58 - 1$). Let μ denote the population mean satisfaction, for this five-point scale. The analysis

was performed to check how, if at all, the population mean departs from the "average" response of 3. The null hypothesis is $\mu = 3.0$ and the alternative hypothesis is $\mu \neq 3.0$. The null hypothesis states that, in general, the participant's satisfaction response is "average." The alternative hypothesis states that the mean falls in the "good" or "very good" direction ($\mu > 3$) or in the "poor" or "very poor" direction ($\mu < 3$).

The mean value for every variable was greater than 3.0, as illustrated in Appendix F. Each mean value indicated a satisfaction rating greater than "average" in varying degrees of "good" or "very good." The t-test determined the validation of each mean within a 95% confidence interval of the difference as seen in Appendix G. Table 5 displays each essential dimension and how the participants ranked it. The rank is illustrated by displaying, in descending order, the mean value of each dimension. The section or category of the dimension is also indicated in the table. The following table abbreviations are used for each section of the questionnaire: instruction/instructor characteristics = IC, technological characteristics = TC, and course/program management and coordination = CM. The level of satisfaction is ranked on a five-point. This Likert-type scale uses the rank as 1 = Very Poor; 2 = Poor; 3 = Average; 4 = Good; and 5 = Very Good.

Table 5. Dimensions Ranked by Participants

Dimension	**Section**	**Mean**
(Q3-8) The ease of class enrollment and registration procedures.	CM	4.54
(Q2-5) The degree of confidence you have classes will not be interrupted or canceled due to technical problems.	TC	4.44
(Q1-4) The timeliness with which papers, tests, and written assignments were graded and returned.	IC	4.36
(Q1-6) The extent to which the course management tool was free of distractions (e.g., clean interface, easy to follow instructions, etc.).	IC	4.30
(Q3-2) Your ability to access a library when, and if, needed.	CM	4.26
(Q2-3) The adequacy of the computer screen size for the class materials presented.	TC	4.25
(Q3-6) The promptness with which class materials were delivered/sent to either you or the site.	CM	4.22
(Q1-9) The instructor's organization and preparation for class.	IC	4.16
(Q3-5) The degree to which the helpdesk or someone was able to help you trouble shoot system problems.	CM	4.16
(Q2-4) The promptness with which the instructor recognizes and answers student email and bulletin board messages.	TC	4.12
(Q1-1) The clarity with which the class assignments were communicated.	IC	4.09

Table 5. Dimensions Ranked by Participants (Continued)

Dimension	**Section**	**Mean**
(Q2-1) The quality of the course content, graphics, and navigation.	TC	4.09
(Q3-7) Your ability to access help desk personnel when needed.	CM	4.07
(Q2-2) The quality of the streaming sounds and video when applicable.	TC	4.02
(Q3-4) The accessibility of the help desk or course coordinator.	CM	4.02
(Q1-3) The production quality of the pre-prepared graphics used for the class.	IC	4.00
(Q3-3) The general conscientiousness of the site/class coordinator, e.g., in delivering materials, solving technical problems.	CM	4.00
(Q1-10) The instructor's general level of enthusiasm.	IC	3.95
(Q1-14) The instructor's professional behavior.	IC	3.91
(Q1-11) The instructor's teaching ability.	IC	3.89
(Q1-15) Overall, this instructor was:	IC	3.89
(Q3-1) Your reaction to the present means of material exchange between you and the course instructor.	CM	3.89
(Q1-2) The degree to which the pre-prepared graphics helped you gain a better understanding of the course material.	IC	3.83
(Q1-8) The instructor's communication skills.	IC	3.81

Table 5. Dimensions Ranked by Participants (Continued)

Dimension	**Section**	**Mean**
(Q1-5) The degree to which the types of instructional techniques that were used to teach the class (e.g., lectures, demonstrations, online discussions, case studies, etc.) helped you gain a better understanding of the class material.	IC	3.70
(Q1-12) The extent to which the instructor encouraged class participation.	IC	3.70
(Q1-13) The in-person/telephone accessibility of the instructor outside of class.	IC	3.70
(Q1-7) The extent to which the instructor made the students feel they were part of the class and "belonged".	IC	3.65

It is interesting to note that Technological Characteristic dimensions were ranked with a mean value between 4.44 and 4.02 with no technology characteristics receiving a ranking less than "Good". This finding indicates that the technology piece is very important and evidently DCCC is sufficiently providing it for their online adult learners. Dimensions ranked with a mean between 3.00 and 3.99 only resided in the instruction/instructor characteristics and course/program management and coordination sections. The mean values indicate that the instruction/instructor dimensions were ranked lower than Technological Characteristics and Course Management/Coordination. It seems that technology and support structures provided

are meeting student expectations. However, there appears to be evidence that there is a need for course and faculty development. The areas indicating a need for improvement include: the instructor's level of enthusiasm, professional behavior, teaching ability, and communication skills; the means of material exchange between the student and the instructor; the assistance of pre-prepared graphics; the types of instructional techniques that were employed in the class; the encouragement of class participation; the in-person/telephone accessibility of the instructor outside of class; and the extent to which the instructor made students feel they were part of the class and "belonged". These weaker dimensions are substantiated by the mean averages of Instruction/instructor and material delivery dimensions ranked below 4.0.

Averages of the means for each section of the questionnaire were examined. Results of the section averages appear in Table 6. Both the technology characteristics and course/program management and coordination sections ranked above 4, 4 = Good and 5 = Very Good. In contrast, the instruction/instructor characteristics section ranked slightly below 4. Apparently, the technology and course/program management and coordination is not a barrier to a satisfying online learning experience and that in most instances, these two areas have been sufficiently supporting Web course activities.

Table 6. Dimensions Ranked by Section Averages of Means

Dimension Section	**Averaged Means**
Technological Characteristics	4.18
Course/Program Management and Coordination	4.15
Instruction/Instructor Characteristics	3.93

In addition to ranking the essential course dimensions, many participants included comments on the questionnaire about their online experiences. These comments and issues illuminate previous research stating that learners expect Web education to be high in quality and convenient (Rogers 2001). In addition, learners need and expect to receive interpersonal encouragement and assistance (Gunawardena, 1991; Moore & Kearsley, 1996). It was determined by the questionnaires containing comments from the participants that there are significant factors that contribute to a meaningful learning experience. It appears the participants who chose to write comments on the questionnaire felt both positively and negatively about their learning experience in the Web course. The following themes emerged from the questionnaires:

1. The Web courses are flexible and convenient for most learners.
2. For some students, the instruction and or an instructor did not employ learning strategies that helped students understand the material or provide sufficient communication, or interaction between the instructor and the students.

The Web courses are flexible and convenient for most learners. Three participants commented on the flexibility and convenience of Web courses. One participant believes the flexibility of the Web delivery format makes it is easier to finish a degree that the course afforded them the opportunity to learn at their pace and convenience. Another participant stated:

> I have taken four online courses over the past several years and hope to continue to do so. It is easy to take quizzes and submit work and the instructors have been wonderful.

Several participants stated that time is very valuable. Taking classes online saves traveling time allowing more time for studying. Some participants are looking into earning a bachelor's degree online. In general, students felt that the Web is an easy and comfortable environment to complete coursework.

Several students described their ability to continue their education online and still fulfill the responsibility of employment and parenting. One participant states:

> Web-based courses have given me the opportunity to finish (finally!) my degree. With a fulltime job, family, and other responsibilities, going back to College in the traditional setting would be impossible for me. I love these courses!

Another participant described being a single parent and how they are able to be in two places at one time, in their Web learning environment and at home with their children. Students with parental responsibilities can be available if their children need them, and in the meantime, do their schoolwork.

For some students, the instruction and or an instructor did not employ learning strategies that helped students understand the material or provide sufficient communication, or interaction between the instructor and the students. Several participants took the opportunity to discuss problems they had with individual course instruction and or instructors. In one course, the participant received no assignments, only tests. In addition, the course texts that were authored by the instructor were not satisfactory. The type of learning strategies employed in the course also impacted the student's experience online. A frustrating student experience in an online psychology course involved the sole learning activity as defining terms at the end of the chapter and the only interaction as posting questions to other students. There was only one lecture, and no other assignments. Unfortunately, this was the first and only online course this student has taken and as a result of his experience may not take another online course.

Another student stated that she experienced difficulty contacting her instructor and that the instructor was not timely in posting test grades on the Web. It appears these student's perceptions about their learning experience are closely connected to the instruction and or the instructor. A participant commented that his instructor had gone on vacation during the semester and did not respond to email or send an email to students saying when he would respond to emails. Another participant had taken five Web courses and had recorded five individual responses for each of the courses. The respondent had coded her responses by each of the five instructors. It is interesting to note that her responses for each of the courses were

significantly different depending upon who taught the course, but not necessarily the course content.

Analysis of College and Course Documents and Artifacts

This methodology enabled the researcher to deeply explore the sub question pertaining to the instruction and instructor dimensions. Historically, the community college's leadership has embraced and supported distance-learning programming. In the early 1990s, the college developed, promoted and supported televised courses via a local public broadcasting station. These course offerings have flourished over time and today are still a popular option for their students. Similarly, when Web technologies became integrated into the mainstream, it was natural for the college to develop and support Web course programming. Four years ago the college created the Cyber College Project that currently houses three full-time professionals who provide professional development, technical expertise, and Web design support to faculty.

There were thirty courses offered via the Web in fall 2002 semester and thirty-three in the spring 2003 semester. Of the thirty Web courses offered fall 2002, fourteen were chosen for content analysis. These instructional materials were evaluated based on Six Frameworks for The Web: Design for Active Learning (Campbell, 1999). In addition, accessible institutional artifacts and documents regarding Web courses and learners were examined.

Institutional Artifacts and Documents

The community college has an array of documents available to students via the Web. Those documents include: the course catalogue, course schedule, college

calendar, and two self-assessment quizzes. These quizzes, computer skills assessment and distance learning assessment, are designed to help students decide if distance learning is a viable option for them. Results are calculated instantly. If, after taking the self-assessment quizzes, the student still has questions they are asked to contact the distance learning office.

In addition to the aforementioned documents, the college also provides student services online. These services include: an online bookstore, library services, student records, and a learning center. There is also an extensive list of frequently asked questions for students considering a Web course.

The Distance Learning Department can provide support by phone or by email. The Library provides research assistance, online databases of books and journals, and access to reference materials. The Library's Web site is available from the Distance Learning Web site, www.dccc.edu/dl, under Online Student Services. The community college's Learning Center offers tutoring, study skills assistance, and testing services. The Learning Center's Web site is available from the Distance Learning Web site, www.dccc.edu/dl, under Online Student Services.

The college also offers on-campus orientation sessions. Participation is strongly recommended. Orientations may be optional or mandatory depending upon the course. The orientation sessions include: meeting the instructor and classmates, receiving additional information about policies, grading, and assignments, and learning more about distance learning and the course software or Web site.

Analysis of Course Materials and the Six Frameworks for the Web: Design for Active Learning

These frameworks were created to describe those elements necessary in developing learning environments that echo, to varying extents, constructivist tenets.

> Furthermore, there has been research indicating that adult learners benefit from learner control with guidance, in which effects of decisions (paths to take, order of instruction, complexity, etc.) are clearly described. These learners also prefer clearly defined learning outcomes, or tasks, and recommended sequencing, from which they can orient themselves at any time (Campbell, 1999).

In an attempt to discover and illustrate whether Web courses included components that contribute to an effective learning environment, instructional materials of fourteen courses were evaluated based on six frameworks for The Web: Design for Active Learning (Campbell, 1999). The six frameworks include:

1. Multiple representations of reality are present when an environment or context is created, the learning task is encountered and structured within the context, the environment may be viewed from many different perspectives or by peeling back layers, and learners enter the world and act from within it.
2. Authentic tasks are present when learners encounter new information in the context that most resembles how it will be used in real life, and anchored instruction is used as a strategy.

3. Real-world, case-based contexts are present when problems, cases, or critical incidents provide the anchor or impetus, cases must closely resemble real-life events, cases must reflect the needs and wants of the learners, and when learners either acquire new information as needed to solve the case, or learn a set of heuristics (rules first, then are presented with a problem that uses those principles).
4. Fostering reflective practice is present when the instruction has encouraged much interest in the concept for teaching and learning in general, seeks to include opportunities (built right into the instructional materials), for learners to ask questions about their new learning, encouraged learners to re-trace their steps to re-form new understandings or existing conclusions, and requires higher-order thinking skills.
5. Knowledge construction is the basis of all constructivist environments; based on the premise that learners already bring knowledge (schema), experience, and values to the task; the learner's schema are valued and provide the foundation on which new knowledge can be built; instruction is designed to 'tap in to' the existing knowledge base and to encourage the learner to overtly use the base as they progress through a task.
6. Collaborative learning is present when learners are placed in collaborative workgroups to solve a problem together through conversation and negotiation, and it involves sharing and valuing the perspectives of others (Campbell, 1999).

Courses were selected for analysis to represent a breadth of academic areas. The fourteen courses evaluated by the six frameworks include: ACC111 Financial Accounting ACC112 Managerial Accounting, DPR100 Introduction to Computers, ENG100 Composition I, HIS250 The Italian Renaissance, HRM100 Introduction to the Hospitality Industry, IMM100 Interface Design, IMM110 Introduction to Multimedia and Web Development, IMM120 Web Page Design and Development, IMM122 Programming for the Web, OFF100 Keyboarding/Document Processing, PHS124 Introduction to Astronomy, PHS140 Introduction to Geology, and PSY235 Educational Psychology.

The following table provides examples of course learning goals that represent the Six Frameworks for Web Course Design. If a framework dimension was present in a course learning activity it is listed as an example in the table. Not all learning activities for all the courses are listed in the table. Conversely, there are blanks in the table where the research did not discover a learning activity in the course that represented one of the six frameworks.

Table 7. Six Frameworks for the Web: Design for Active Learning

Web Course Title and Corresponding Framework	**(1) Multiple representation of reality**	**(2) Authentic tasks**	**(3) Real-world, case-based contexts**	**(4) Fostering reflective practice**	**(5)Knowledge construction**	**(6) Collaborative learning**
ACC111 Financial Accounting		Illustrate the accounting cycle.		Amounts of accounts receivable.	Income tax consequences resulting from methodologies.	Web forums. Fellow students and instructor email.
ACC112 Managerial Accounting		Analyze financial statements.		Operating and capital budgets. Performance evaluation reports.	Prepare reports and analysis utilizing systems and techniques.	Web forums. Fellow students and instructor email.
DPR100 Introduction to Computers		Software applications.		Word processing, database, and presentation skills.		Fellow students and instructor email.
ENG100 Composition I		Analyze prose. Critical and rhetorical terminology.		Narrow a general topic to a controlling idea.	Combine all competencies into an original essay.	Web site message board. Fellow students and instructor via email.

Table 7: Six Frameworks for the Web: Design for Active Learning (Continued)

HIS250 The Italian Renaissance		Illustrate the theme of humanism.		Describe the eminent Italian artists and their achievements.		Fellow students and instructor email.
HRM100 Introduction to the Hospitality Industry		Structure of the lodging/food service industry.		Hospitality industry and personal career development.		Web forum. Fellow students and instructor email.
IMM100 Interface Design	Interface development tools.	Computer-based training (CBT) and Web programs.	Contrast Web interfaces and PC interfaces.	Utilize screen design basics.	Design CBT and Web programs. Heuristic Evaluation.	Virtual teams. Fellow students and instructor email.
IMM110 Introduction to Multimedia and Web Development	Real world instructional design problems.	Multimedia / WWW hardware and software requirements.	Use the WWW to conduct academic and professional research.	Determine how and where multimedia and WWW technologies are used.	Evaluate and discuss interface design.	Online Conference Room Chat. Fellow students and instructor email.
IMM120 Web Page Design and Development		Hardware, software and network environment of a WWW site.	Use HTML tags to add multimedia elements to WWW pages.	Describe how CGI is used in the development of WWW pages.	Demonstrate a working knowledge of HTML, XML, and XHTML.	Online Conference Room Chat. Fellow students and instructor email.

Table 7: Six Frameworks for the Web: Design for Active Learning (Continued)

IMM122 Programming for the Web	Download and customize CGI scripts.	Integrate JavaScript and HTML.	Test and debug JavaScript and CGI scripts.	Use objects, properties, methods and events.	Incorporate if, if…else, while statements and loops into scripts.	Fellow students and instructor email.
OFF100 Keyboarding/ Document Processing		Format a diskette, store, and retrieve a document.		Proofread documents.	Produce business letters, reports, memos, and tables.	Fellow students and instructor email.
PHS124 Introduction to Astronomy		Describe the night sky		Types of measurements of the science.	Dynamics of the Milky Way and other galaxies	Interactive quizzes. Fellow students and instructor email.
PHS140 Introduction to Geology	Virtual field trips	Identify volcanism and igneous activity.		Summarize the theory of plate tectonics.	Apply the plate tectonic theory to mountain building.	Fellow students and instructor email.
PSY235 Educational Psychology		Identify key concepts in the behavioral theories of learning.	Write a brief summary and reaction to Educational Leadership journal articles.	Elements of observational learning and relate them to the teacher as a behavioral model.	Present personal teaching and learning philosophy.	Online message board. Fellow students and instructor email.

Table 8. Summary of Frameworks Within the Fourteen Course Designs

Course #	(1) Mult. rep. of reality	(2) Authentic tasks	(3) Real-world contexts	(4) Foster reflective practice	(5) Knowledge construction	(6) Collab. learning
ACC111		•		•	•	•
ACC112		•		•	•	•
DPR100		•		•		•
ENG100		•		•	•	•
HIS250		•		•		•
HRM100		•		•		•
IMM100	•	•	•	•	•	•
IMM110	•	•	•	•	•	•
IMM120		•	•	•	•	•
IMM122	•	•	•	•	•	•
OFF100		•		•	•	•
PHS124		•		•	•	•
PHS140	•	•		•	•	•
PSY235		•	•	•	•	•

The Web courses possess three or more frameworks as part of the learning activities. This is evidenced by the courses including (2) Authentic Tasks, (4) Fostering Reflective Practice and (6) Collaborative Learning. For example, course structures included learning opportunities that enabled learners to work through the task to a resolution choosing information as needed to complete the task, encouraged learners to re-trace their steps to re-form new understandings or existing conclusions and provided tools for learners to share and value the perspectives of others (Campbell, 1999). Most of the Collaborative Learning was not structured course activity but having the means in which to collaborate through email, Web forums or virtual team projects. As cited by students through the questionnaire and interview feedback, this collaborative learning opportunity was a vital component for student's sense of achievement and connection to other learners, the instructor and the college. The students knew they could always email someone for feedback to a question.

The fifth framework, Knowledge Construction was evident in eleven of the fourteen examined courses. Knowledge Construction was present in these eleven courses through tasks that used learner's existing knowledge base and encouraged the learner to openly use this base as they advanced through the task (Campbell, 1999). The most significant weakness involved (1) Multiple Representations of Reality and (3) Real-World, Case-based Contexts. This indicates a need to develop course learning strategies that include an environment where the learning task is encountered and structured within the context and may be viewed from many different perspectives and that problems, cases, or critical incidents closely resemble real-life events and reflect the needs and wants of the learners (Campbell, 1999).

This deficiency was most evident in the traditional academic courses. The (1) Multiple Representations of Reality appears in only the online courses with instructors possessing significant Web experience or if the instructor is able to use external environments to support the curriculum.

Informal Interviews

The third method utilized to collect data for this research study was conducting informal interviews. While most of the sources of data involve various types of "managed communication", this is the data that provides contextual information for the survey response data. This method was selected to allow for the capture of rich, comprehensive and detailed data from the student's perspective in regards to the main research question:

- Are sufficient instruction and resources available to provide meaningful learning experiences for the adult learners online?

And each of the three research sub questions:

- How did the instruction/instructor facilitate an effective learning experience?
- How did the technology facilitate or impede the learning experience?
- How did the course/program administration provide quality and timely support to the learning experience?

The students varied in their experience in taking Web courses. Their experience ranged from only one course to haven taken more than six. The researcher individually asked each of the participants the following questions:

1. What is your sense of learning while participating in this environment?
2. What is the speed and ease you are able to perform course tasks?

3. What kinds of support and resources were available?
4. Describe the level of interactivity and interaction experienced with the instructor and other members of their course?

Each participant signed Institutional Review Board approved consent to participate form. Each interview session lasted approximately thirty minutes. To the extent possible, students were selected to proportionately represent ethnicity, gender, ages, and academic discipline. There is approximately a three to one ratio between female and male Web students at Delaware County Community College. This may have contributed to only one male participant contacting the researcher to participate in this study. A total of twelve (12) students participated in an informal interview.

Table 9. Interview Participant's Description

Participant	**Ethnicity**	**Gender**	**Age**	**Web Course(s) Taken/Academic Discipline**
KA	White	Female	42	Psychology
DC	White	Female	42	Astronomy, Geology, DPR111, Advanced MS Office, Marketing
MC	White	Female	46	Informational Technology, Organizational Development (Academic Disciplines)
MEA	White	Female	33	English Composition I and II
BG	White	Female	40	Interactive Multimedia (Academic Discipline)
TH	Black/African American	Female	41	Geology
RL	White	Male	34	Psychology
DM	White	Female	38	Geology
JR	Black/African American	Female	38	Earth Science, Accounting, Business Math
MS	White	Female	28	Psychology, Biology, Astronomy
CU	White	Female	29	Marketing, Interactive Multimedia
KV	White	Female	53	Psychology (Academic Discipline)

Illuminated by the participants, there were four distinct factors that emerged as contributing to a meaningful learning experience. The participants made many comparisons of the Web environment to a traditional classroom/course, as well as discussed their personal responsibilities and how that impacts their education. For these reasons, this research study was created for this unique adult population of students.

As described by the adult students online who participated in an informal interview, the following are significant factors that contributed to a meaningful learning experience:

1. The Web courses were flexible and convenient for most learners.
2. For most students, the instruction and instructor employed learning strategies that facilitated understanding the material, provided sufficient communication, encouraged participation between students, and provided sufficient interaction between the instructor and the students.
3. Most participants believed it was necessary to be self-motivated, and self-directed.
4. In most instances students had a high level of administrative support, access to essential instructional resources and reliable technology that sufficiently facilitated their learning activities.

The Web courses were flexible and convenient for most learners. In many cases, participants did not believe they would have been able to accomplish their educational goals without the flexibility and convenience the Web courses provided. There were a variety of reasons for this. Parental and employment responsibilities

were among the most frequently cited barriers to a traditional, on-campus education. (BG) stated she can find quiet time and study at home. She is not in commuter traffic and worried about getting her kids at a certain time. She can put the kids to bed, do her course work, and be absorbed in it. The time she saved not having to commute can now be spent on homework, which is more important. She states:

> I have taken a test at midnight, which is when I have time. It is very beneficial. I get the kids into bed. After nine o'clock I can log on, get my homework done, take my test, do whatever I need to do, and log off. It is so simple, I am all for it. Everything should be this easy.

Another participant (DC), explained when her children are home sick from school, she does not miss class. Instead, she is able to do her course work later that evening. The Web courses allow her a great deal of freedom.

Participant (MC) believes online learning is easier because she loves being a mom. When she is home, she wants to be with her kids. She does not want to come home and throw dinner on the table and go back out again and leave her children with a sitter. She states:

> Moms like me, single moms would have to figure out a way to handle career and family and education. This is much more simplified. I put the kids to bed at eight-thirty, I open up my laptop and I can study. It is wonderful. I could not be doing it if it was not for this. There is just no way.

It is difficult for many of the adult students to carve out time in their busy schedule to do schoolwork. Study time competes with hectic schedules, which includes taking care of children, work, grocery shopping, and cleaning. Being able to swiftly and

easily navigate through assignments via the Web are critically important. Participant (DM) shares the only reason she is taking a Web course is because of time. She has two children and is a single mom. She has no additional time to go to a class on-campus. However, she prefers a traditional classroom setting with a teacher, classmates, and the interaction with the other students. (MS) also iterated the Web courses help moms like her. They are able to get a degree and still be a mom at the same time.

If the Web courses were not available, adult students may not have the opportunity to pursue a college degree. (JR) had strong feelings about the benefits of Web courses. She shared if it were not for Web courses; she would not have been able to receive an education. She has four children. If she had to be in a traditional classroom setting it would require time that she does not have. This non-traditional environment allows her to pursue an educational goal while she is at home being a mom. She believes distance-learning increases the accessibility of an education.

There were many aspects of flexibility and convenience discussed regarding the Web learning format in contrast to a traditional classroom environment. (DC) thinks it is nice to be independent; she can work at her own pace. (MC) touted she is a major fan of it (online learning) and that it is a wonderful enhancement to learning. (MEA) shared she is learning a great deal in the Web environment. She finds it very student-focused. She gets out of it only what she puts into it. Possessing extensive teaching experiencing and long ago acquiring a master's degree, (KV) feels for this stage in her life, and for her objectives, it was absolutely tremendous.

The Web learning environment provides collaborative and robust educational activities. (BG) found it was very convenient talking to the instructor and other students from the comfort of her home. Saving time not having a commute, for her, is more valuable than money. (JR) discovered the Web courses encouraged her to do more research, more than she would have done in a traditional classroom. One particular Web course enabled her to explore a lot of things. She believes she had more options, more than an instructional handout describing the chapters. If she kept up with the assignments, adhered to the syllabus, and did exactly as she was supposed to do, she did not become bombarded with work.

Students found Web courses to be accommodating in speed and pace of individual schedules. (MS) felt her speed in performing course tasks is faster on the Web than it would be in a classroom. If she has six hours to do homework one day, she can get two or three weeks ahead of class. However, if she had to go to class each week, her time is not being used to complete assignments. Similarly, (CU) tends to work ahead based on her upcoming schedule. She really enjoys that freedom. The ability to work ahead or get a week behind the suggested schedule and still finish the class within the semester is extremely convenient. Another advantage is sending a project or a paper to her instructor for early feedback. This is usually not an option in a classroom setting. Most classroom professors will not evaluate her work until the day it is due. In contrast, she has discovered her Web instructors are more willing to look at her work and provide early feedback.

Overall, most participants believed the Web learning environment provided many benefits. Adult learners have the ability to study from home, where their

family is located. They can use the Web as a research tool to explore infinite topic areas. Lastly, they have control over the pace of the learning process by determining when course tasks are performed.

For most students, the instruction and instructor employed learning strategies that facilitated understanding the material, provided sufficient communication, encouraged participation between students, and provided adequate interaction between the instructor and the students. However, there were vast differences in feelings of accomplishment depending upon learning strategies and course design. As an example, (KA) conveyed that her professor was available to answer questions at any time but thought there was too much busy work. In (DC)'s geology course, the instruction flowed smoothly as she answered assigned questions online and got immediate feedback as to which ones she got right or wrong. In contrast, one of her data processing courses proved to be far more challenging. If her assignments did not work out she had to figure it out on her own. There was no one to ask. She knows how that feels to a student because she teaches computer classes. If one of her students is stuck in class, she can immediately walk over and explain it to them, and they can work through it. She believes anyone setting up Web courses needs to know and understand the instructor and their instructional technique, more so than in a classroom setting. In addition, administration needs to find instructors that are sensitive to the students needs. She states:

> You do not even have a face to put with the student, and so that one bad experience really was terrible, even though I have had so many positive ones.

Similarly, (MC) experienced the quality of the course depended on the teacher's instructional style, in the classroom or through the Web. She would adapt to whatever the instructor wanted from her. (BG) thought her instructors have been wonderful. When she submitted work or had a question, they got right back to her immediately or within twenty-four hours.

Conversely, (RL) thought his Web course was not productive due to the structure of the class. There were no papers due, there were no discussions, and there was only one lecture posted by the instructor. It was tremendously easy, because the course assignments consisted of defining the terms at the end of each chapter. He does not know if he got a really bad instructor or if this is a typical online course.

When students experienced a conscientious instructor in a well-designed course, the results were extremely positive. (CU) has learned more in an online distance learning capacity than she has in the classroom. The project-oriented work and the class discussions online force her to participate more so than in the classroom settings. She does not think participation is encouraged as much in the classroom. There is an extra focus on participation in an online learning class. The increased participation has really helped her to get other student's perspectives, which has enhanced group project work and her attainment of course learning goals. She particularly enjoys the immediate feedback. For example, when the test can be graded automatically and she receives her grade immediately. For her online tests, the right answer is always noted so it helps her future studying, and to know what went wrong. She believes the highlight of the Web courses are working at her own pace, and getting immediate feedback.

A dictatorial teaching approach does not translate well in a Web learning environment. As an example, (KV) thinks course quality depends on the flexibility of the instructor. She had one instructor who was very strict. She felt there might have been some miscommunication because there are no actual face-to-face conversations. This makes it harder to communicate her point of view, and her aspect of whatever the topic might be. Her other instructor was more flexible and encouraged creativity and encouraged different ways of answering questions, that there was not one right answer. But in terms of having an outline, doing the outline at her own pace, emailing, she never talked to instructors or students over the phone and she liked that. She believes the whole purpose of distance learning is that she should not have to talk with anybody, she should never have to go anyplace, and that she should be able to do everything electronically.

The type of interaction is quite different online than in a classroom. For instance, (KA) found online learning a little chaotic. When she is in that (online) environment she sometimes tends to focus on things other than her studies. In addition, (DC) thought compared to the classroom setting, it (online) is a little bit isolated. Because in a classroom setting, numerous students are asking questions; they might ask questions that she did not think of. When she has a question, she must type it up and email it, and then wait for a response, which is very different than being with the instructor and other students.

In most cases, students found the Web course structure to be more intense. Not having an instructor standing in front of the classroom, students have to study harder, and they must read the text and other instructional material in more detail.

What one participant (MC) learned is when she takes an online course, she knows a whole lot more about that particular subject than she would have in the classroom environment. It is much more difficult because she has to be so focused and so committed to what she is doing, because if she misses a week, she has lost a lot of time.

In most instances, students wanted course activities to reflect authentic tasks. In addition, immediate feedback appeared as a significant feature of a well-designed Web course. Students sought the instructors who were sensitive to their individual needs and encouraged creativity. Lastly, students wanted learning activities to include interactive course projects.

How information is delivered, response rates, and a sense of being connected to the instructor and other students were considered very important to the participants. The type of communication, interactivity, and interaction varied greatly from course to course. As explained by (DC), it really depends on the instructor. If she has an instructor that does not get back to her, it does not work, plain and simple. In general, she has had a high level of interactivity with the instructors. One instructor has a chat every Wednesday night online, live chat, where all the students can talk with him and with each other. She was able to get questions answered regarding what to expect of the test and pointers as to what to study. Interaction with other students was available to all of the students. There is an area on the college's Web site for Web study students to introduce themselves. She has witnessed students creating friendships online through that Web site.

In general, participants were very satisfied with the level of communication they had with most instructors. (MC) felt the accessibility to communicate with her instructors was wonderful. However, she chose to have no interaction with her classmates. If she had a question, she emailed the instructor and would get an email back right away. She never had to wait. She was able to more heavily focus and with much more commitment only dealing with her instructor and not other students. She was not in need of the social aspect of college. She stated:

> My social life comes at a different place and a different time, I do not need it during the school day, so not having interaction with my classmates is perfect. It works out great.

Similarly, (MEA) said the interaction with other students was minimal. With most of her classes, the professors answered her multiple emails on a daily basis, met with her, and spoke with her on the phone whenever she requested. However, one of the major downfalls of one of her classes was that she and the other students had too little interaction and support of each other when there was a problem with the professor not adequately communicating.

Students enjoyed having the option of taking advantage of live chats, and electronic communications with other classmates. (BG) had one class with online chats she could attend. She would have a conversation with other students and the instructor, all at the same time. She learned from others and they learned from each other. She found the collaboration beneficial. (RL) felt the instructor was good at emailing back to him, seemingly available by responding to emails on grades and other items very quickly.

There were a few glitches with instructors not promptly responding to student questions. (TH) had an instructor who made himself available by email, but did not promptly respond. However, she did have access to all of her classmates. She could email them individually, or she could speak with them as a group by requesting an open forum. She could also chat with the teacher during certain days and times.

Most of the adult online students enjoyed collaborating with other classmates. (DM) has a study partner she meets with on Saturday mornings. They do much of their schoolwork together. She also speaks to other classmates online. She can pick anybody in her course by clicking on his or her name. (JR) Experienced a lot of interaction with other students in her Web courses. In her accounting class, they would meet to review for tests on a Friday evening, or whenever they all would agree. Through their online group talks, they would agree on a date, a time, and a place to meet for a review of the class. If she was having difficulties understanding anything or not clear on something, the meetings were great. In her business math course, the instructor makes herself available. In addition, there are links to the other students if she wanted to chat or if she had questions or wanted to have a study session. In her earth science course, she had group sessions on some evenings when the teacher was available, and all who were available could enter the discussion to help understand the current subject. (MS) was able to contact the professors by email or phone as needed. She never felt they did not want to talk to her. It varies from course to course, but overall, communication has been good. She particularly enjoyed the courses with a high level of interaction with her classmates on the Web.

Many of the adult students thrive in the Web learning environment. (CU) experienced more collaboration through emailing her work back and forth and editing and working together with other students in comparison to her courses in a classroom setting. Her instructors have all been available as a resource and she typically experiences a very quick turnaround time in response to her questions. In a classroom setting, there is a week between classes and receiving feedback, but in her Web courses she usually has a response within twenty-four hours. Overall, the instructor availability and interaction has been great. Two of the three Web courses she has taken had chat sessions, or instructor led chat sessions that were a significant portion of the interactivity of the class. However, she took one course where the instructor was completely unresponsive. The course had a Web site not through the college but with a publisher, the book publisher's Web site. She got the distinct impression the instructor was not monitoring the chat room postings on the message board. She sent a couple emails to the instructor and did not get a response. Since she has an extensive background in the college's distance-learning program, she knows it was a fluke, a one-time thing. She thinks students, who had this course for their first online experience, may never take another online course. For her, she will take more classes. On the upside, she finds a lot of excitement taking online courses. It is convenient, she likes to go online, check the postings, and see what is going on. There is a lot of interaction with the other students, even when they are not engaged in-group projects. (CU) states:

> There is a lot of "do you understand this", or "when's this due?" that type of thing, a lot of interaction between the students. And the instructors, when

they have weekly chat sessions; there is flexibility there. That is great interaction, and great feedback. But there have been some instructors who are not responsive. They let the Web run the course, and that creates problems.

From a different viewpoint, (KV) provides the perspective of a seasoned educator who is taking Web courses as personal enrichment. She observed several students in one particular course asking the body of students who were taking the course, to meet on campus, and discuss the exercises, and go over the assignments, which the instructor encouraged. But that was not her goal, so she did not respond to those emails. She also noticed people who were possibly new to this type of educational environment, having a huge amount of uncertainty of expectations. Students helped other students through email, and support the same way the instructor encouraged the timid students that everything is going to be okay. She believes this is a great way of delivering instruction. What made it successful was that everybody supported the more timid people.

Communication and interactivity between the students and the instructor is a critical component of an effective Web course. The fact that every student could email their instructor or another student and get an answer anytime they needed was a key benefit that participants enjoyed. Participants cited reliable communication with the instructor, interactivity with other students, and the availability of live chat rooms and discussion forums as all being essential components of an effective Web course.

Most participants believed it was necessary to be self-motivated, and self-directed. Many of the interviewed participants discussed individual personality traits

and skills they thought were necessary to possess in order to have a satisfying and effective learning experience online. Such as, (MC) learned that she must carve out a particular day or a particular hour everyday, in order to keep herself on task. She learned she has to be self-motivated and cannot allow distraction.

Similarly, (MEA) believes a student has to be incredibly self-motivated to get through these classes. Similarly, (BG) thinks online learning is all up to the person. To have a successful experience, she knows what she has to do, and she commits herself. She gets the material read, and she remains motivated. She knows that it is impossible to wait until the last minute to do something. She has always read the material, outlined what is important, gone to resources, gone to a bookstore or library, and/or gotten additional material. She has really enjoyed working online. On any given week, she knows she has 'x' amount of work and she gets it done, and it is done on time, if not early.

The students who tend to excel and enjoy working online are excellent time organizers and self-directed. (TH) enjoys the Web and learning online. She recommends Web courses for the type of student who is motivated and disciplined. She enjoys learning online because it is convenient and she does not have to go to the classroom. She also enjoys the challenge of having to do time management on her own without the help of the teacher.

Not all the participants felt they were adept at learning online. (DM) thinks Web courses are set up for adults because students have to be disciplined. Unfortunately, she does not feel she is disciplined. She needs to be in a classroom and have a teacher give incremental assignments with strict deadlines. She likes to be

with other students and hear what they say in class, it helps her. Conversely, (MS) likes doing more reading online than she would in class. She is a visual learner, so reading is a better avenue for her than audio. She is also an independent worker, self-disciplined and enjoys moving at her own pace. If she is interested in a particular topic, she does not have to wait until the next class meeting, she can just keep moving. If she is having a good time, she will just keep going.

Overall, students recognized behavioral characteristics they believed are necessary to achieve learning goals in an online course. Students discussed traits they saw in themselves and fellow students that enable them to excel in a Web learning environment. These traits include the ability to stay on task, self-motivation, commitment to the learning process, good time organization, and self-direction..

In most instances, students had a high level of administrative support, access to essential instructional resources and reliable technology that sufficiently facilitated their learning activities. In most instances, the participants found the college had provided instructional resources and technology that facilitated a meaningful learning experience. In some cases, the available resources and reliable technology was able to assist students to get past other weaker instructional components. For instance, (KA) described how she had support from students in the class online. If she was really having a lot of difficulty, she could also go to the school and speak with someone. In essence, there were multiple resources for support.

Most participants' perceptions indicate that the college has a supportive structure for distance learning and its learners. The administrative staff is accessible

and proactive in meeting student expectations. For example, the Distance Learning Department holds a Web study class to teach students how to effectively work online. This course is available to every student who takes an online course. The Web study course is available on-campus with an instructor and it is also available online.

Many participants took advantage of the many resources available to them online and on-campus, which many thought were very helpful. Participant (MEA) experienced with the vast majority of her online classes, wonderful support, and resources that provided everything on-campus and on the Web. Similarly, (BG) described how she could always go into the college, and have the library and learning center available, including tapes and books. She also felt there are plenty of online resources. She could get information and access information from the school's library, and from local libraries online. If she had a question, most of her instructors would tell her where she could go and find the answer. She states:

> The instructors tell students on the syllabus, this is what you need, this is where you can find these things, and these are extra books for reference. They've been great. I do not have anything bad to say.

The Web provides vast resources of information at the student's fingertips. (JR) conveyed they were given a lot of links to other materials pertaining to topics they were working on. Referencing her earth science class, they were given a lot of helpful Websites and periodicals to go to. Many of the Web sites would provide a video presentation explaining different topics. It was a lot of information but it was

not an overload because all of it pertained to what they were learning. It made it easier since they we were not in the traditional classroom setting.

Conversely, (TH) feels the Web courses for her are a trade-off. The convenience and the ability to stay home if she really needs to be home, to get her coursework done is a plus, but then she has the stress of wondering if the Websites are going to be up or worrying about whether her computer is going to act up. (DM) also finds working online to be frustrating, and finds the speed is slow.

The first online course (CU) took; she had a dial-up connection, which posed a speed problem. Since then she has gotten a DSL high-speed connection and it has made a huge difference. But from a functionality standpoint, the technical aspects of online courses have been great. As a parting remark, she commented that if a resource cannot be obtained online, it is not all distance learning, to her, that is not a convenience.

For the most part, students found the Web course sites easily navigated and reliable. They found the Web study class helpful. In addition, students found Web access to the library and learning center to be useful. Lastly, Web site references given to students were found to be helpful in the attainment of learning goals.

The flexibility and convenience of the Web appear to make Web courses very attractive to adult learners with many responsibilities and too little time for higher education. As this study shows, adult students are academically successful if the instruction and instructor utilizes learning strategies that promote the attainment of learning goals, if students are willing to be personally committed to the learning

process, and if the college provides those resources and technology the student needs to perform course tasks.

As illustrated in the questionnaire mean value rankings of the essential Web course dimensions, evidence of Web design frameworks for active learning within course material, and feedback from the interview sessions, it appears that in most instances, the community college is providing sufficient instruction and resources in order for adult students to realize meaningful learning experiences while participating in Web courses. In general, they are benefiting from a flexible and convenient instructional delivery format, experiencing effective communication, and sufficient interaction with both the instructor and fellow classmates. Most adult students are receiving effective instruction from an instructor utilizing learning strategies that enable them to achieve learning goals. In addition, many participants believe that self-motivation and self-direction contribute to a meaningful learning experience. Lastly, it appears the college is providing accessible and supportive instructional resources using effective and reliable technology. In fact, the questionnaires mean scores of the technological factors supercede learning factors.

The research also indicates that some of the course structures would benefit from incorporating more constructivist oriented learning strategies that support learning goals. Specifically, the findings of the interviews and analysis of course materials indicate a deficit of learning activities involving multiple representations of reality and real-life, case-based contexts. Similarly, the feedback from the questionnaire indicates the Web courses may be more effectively delivered and supported if the instructors continue to develop their skills and technical expertise in

following areas: level of enthusiasm, professional behavior, pedagogical ability, communication skills; means of material exchange; pre-prepared graphics; types of learning strategies employed in the class; encouragement of class participation; in-person/telephone accessibility outside of class; and the extent to which students feel they were part of the class and “belonged”.

5. Summary and Discussion

In this chapter, the researcher imparts a brief overview of the research and research methodology followed by a synopsis of the results of the study. Closing this chapter is a discussion of the results and implications of this study.

There are many factors that contribute to the changing landscape of the higher education market and the reasons universities are expanding their Web-based course offerings. The characteristics and expectations of the typical college student, the advancement of technology, and growing competition have all contributed to higher education embracing online education. As a result, this case study was designed to provide academic and administrative college officers, interested in meeting adult learner needs, with data depicting the perceptions of the adult learner's online experiences. An additional goal of this study was to produce recommendations for enhancing Web-based programming effectiveness for the adult learner.

The examination of previous research demonstrated a significant need to determine whether higher education institutions were providing their adult students with a meaningful learning experience. As a result, the purpose of this case study was created to ascertain an understanding of the presence of instruction and resources necessary to provide meaningful learning experiences for adult learners online. It was determined that a case study design was best suited to accomplish this. Through this case study the following primary research question was addressed as well as asking questions in the subsequent areas:

- Are sufficient instruction and resources available to provide meaningful learning experiences for adult learners online? Specifically, the research study explored the following questions.
    - How did the instruction/instructor facilitate an effective learning experience?
    - How did the technology facilitate or impede the learning experience?
    - How did the course/program administration provide quality and timely support to the learning experience?

To determine the answers to these questions, I designed a research plan by carrying out the following procedures:

- Determining the study through the review of literature
- Designing the research methodology
- Identifying a research site and adult online student population
- Data collection
- Data organization and analysis
- Formulation and description of results
- Summary and discussion of results with suggestions for future research

The examination of existing literature shows there is a need for research on adult learner's perceptions of Web learning environments and whether the students are receiving a meaningful learning experience. The literature review provided a description of the changing landscape of higher education, the definition of adult learner's needs, and successful Web design for learning. These descriptions and

definitions molded the structure of the study. Once it was determined that the research would study adult learners online, the next step was to find an accessible and suitable population of learners.

The community college was chosen because of its dedication to serving adult student needs and its flexibility and responsiveness to the changing expectations of its community. The college already had a substantive adult population with a growing number of students opting to take the new Web courses. By fall 2002, the college offered thirty courses online, growing to thirty-three in spring 2003. Access was granted for the research.

After the completion of the fall 2002 semester, adult students were recruited to participate in the research study. The data collection methods included: completing the Web course evaluation questionnaire, conducting informal interviews, and evaluating course materials and institutional documents. These data gathering methods were selected because of their collective ability to supply the most comprehensive feedback regarding all the essential components of the study, at the same time ensuring the triangulation of data to make certain the correctness of the results.

Data collection yielded fifty-eight questionnaires, a twenty-two percent return, twelve informal interviews, and institutional documents including the materials of fourteen courses. All the data was compiled, organized, categorized and coded to ensure participant anonymity. The questionnaire data was compiled into a SPSS electronic database and statistically analyzed, the course and institutional artifacts were evaluated according to the Six Frameworks for the Web: Design for

Active Learning (Campbell, 1999), and the interview transcripts were categorized into emerging themes. The process of organizing and categorizing feedback proved to be a multi-level endeavor, to determine emerging themes and significant contributing factors of the student's learning experiences.

Summary of Results

1. The data collected from the questionnaire was statistically analyzed through a One Sample t-test and descriptive statistics. The descriptive statistics determined the mean value for each of the twenty-eight dimensions. The results of this instrument revealed how the students felt about the instruction/instructor characteristics, technology characteristics, and the course/program coordination within their Web learning environment. The mean value of each essential dimension was between 3.65 and 4.54, with 3 = average, 4 = good, and 5 = very good. The majority of dimensions were ranked between Good and Very Good. The technology dimensions received the highest ranking with all mean values above 4. Thus, the technological factors supercede the learning factors. However, there appears to be evidence of a need for course and faculty development due to the number of mean values below 4.0 (good) that fall into this category. These deficit areas include: the instructor's behavior and abilities including communication and access; the means of material exchange; instructional techniques; the student feeling connected or belonging; and whether participation was encouraged. In addition, the following themes emerged from comments students wrote on the questionnaires:
    a. The Web courses are flexible and convenient for most learners.

b. For some students, the instruction and or an instructor did not employ learning strategies that helped students understand the material or provide sufficient communication, or interaction between the instructor and the students.

2. The evaluation of institutional and instructional artifacts indicates that the college provides sufficient information about general institutional information and course expectations. In addition, the college provides most student services online as well as on campus. Evidence of the Six Frameworks for the Web: Design for Active Learning (Campbell, 1999) was examined. The course materials evaluated indicate that all courses include authentic tasks, foster reflective practice, and collaborative learning. Similarly, all interviewed participants cited the importance of being able to email the instructor or another student and get feedback to a problem. This type of collaborative learning was key to their attainment of learning goals. The majority of courses also included knowledge construction tasks. However, the most significant weakness involved the frameworks: (1) Multiple Representations of Reality and (3) Real-World, Case-based Contexts. This indicates a need to develop course learning strategies that include an environment where the learning task is encountered and structured within the context and may be viewed from many different perspectives and that problems, cases, or critical incidents closely resemble real-life events and reflect the needs and wants of the learners (Campbell, 1999). As a result, it appears the instructors and students would benefit from increased support in developing these types of learning activities.

3. The informal interview research data revealed there are four themes that students indicated as contributing to a meaningful learning experience within a Web environment. The following are the significant themes:
    a. The Web courses were flexible and convenient for most learners.
    b. For most students, the instruction and instructor employed learning strategies that facilitated understanding the material, provided sufficient communication, encouraged participation between students, and provided sufficient interaction between the instructor and the students.
    c. Most participants believed it was necessary to be self-motivated, and self-directed.
    d. In most instances, students had a high level of administrative support, access to essential instructional resources and reliable technology that sufficiently facilitated their learning activities.

Discussion

The first conclusion is that within the context of this research study *in most instances, adult students are realizing a meaningful learning experience in the Web environment*. It appears that most adult learners are able to achieve learning goals, are informed of course expectations, can sufficiently perform course tasks, do not have significant technical difficulties, and are receiving necessary support from the college. As mentioned above, the feedback produced very specific factors that contribute to an effective and satisfying learning experience. If these factors are present, the adult learner's needs are being met.

However, this research study shows that not all students had an effective learning experience. Specifically, not all courses employed effective learning strategies, or had instructors who facilitated sufficient communication and interaction within the course. Borthick (2001) suggests situating learners in an electronically enabled community of practice that creates opportunities for learners to create their own understandings in the social framework. Even so, students who were self-professed non-initiators, who struggled with self-direction, sought help and guidance successfully from the provided resources or from others in the course by choosing to participate in study groups or by participating in Web forums. Correspondingly, Neuhauser (2002) stated learning preference and type had little or no impact as a good predictor of success in an online course. Similarly, collaboration and participation contributes to student's success in Web-based learning environments (Watson 2001).

In addition, learners in other research studies have described "good beginnings" in online courses by addressing instructional roles, the organization of the course, and the social ambience of the environment (Conrad, 2002). As an experienced program development administrator, it was observable from the informal interviews that the students did not believe their online education was inferior to on-campus courses. Admittedly, students recognize the academic demands are consistent with those in a traditional classroom. However, many experienced more options in how to approach their tasks.

The second conclusion is that at this college *there is a robust technology platform that supports learning technologies and is a critical factor in whether*

students learn well. The mean score on the questionnaire shows technology factors supercede learning factors. Therefore, the technology characteristics in comparison to the learning components may be as or more important factors as viewed in the context of this research study. The participants of this study have indicated the technology component as very important and evidently the college is providing this essential factor that contributes to a meaningful learning experience.

It appears the adult students are capitalizing on the robust technology platform. Many students taking the Web courses are doing so to take full advantage of the cyber structure these courses provide. Most students are taking the Web courses because they cannot or will not come to the campus. It is the intention of many of the participants to take only Web courses versus on-campus courses. Additionally, most participants indicated an expectation to have all academic activities and services accessible online. This includes orientation sessions, reference materials, tests, etc. However, in order to attain learning goals, adult students, by nature of the online program design, must exhibit a high degree of self-direction (Stein & Glazer, 2003). Nonetheless, it appears that students want the choice whether or not to participate in an on-campus activity.

The third conclusion is that within the context of this research study *the course design and the instructor significantly contribute to student achievement and satisfaction within a Web learning environment*. The instructional dimensions consistently recurred, positively and negatively, throughout all data as having a significant impact on the student's learning experience. The evidence proved that most students were satisfied with the majority of course structures and instructors.

Similarly, if the course structure is properly designed, the student is able to progress independently. As described by Campbell (1999), constructivism is now evolving within Web learning environments by encouraging active learning based upon learners making decisions about task, content, navigation, presentation, and assessment.

However, if students were participating in a course that did not provide multi-dimensional learning or was taught by an instructor who was non-responsive, did not give attention to their individual needs, and did not engage them or if the course activities did not promote the attainment of the learning goals, it quickly became a frustrating and discouraging experience. The instructional dimensions in the research study indicate the most need for improvement. This is substantiated by the lower mean value rankings on the questionnaire, the deficit of course design frameworks addressing multiple representations of reality and real-world, case-based contexts, as well as interview feedback discussing specific courses or instructors that did not facilitate a meaningful learning experience for the student.

The research indicated that if there was a problem with the course design or the instructor, the Web environment accentuated the difficulty. Fortunately, through the Cyber College Project office the college faculty have access to technical support and Web course development training and assistance. Although technological factors powerfully influence the online learning environment, their effects must be mediated by the human contact facilitated by the online teacher. It is the quality of these relationships that is essential (White & Weight, 2000). Similarly, instructors and administrators should emphasize the significance of teamwork and collaboration

skills in policy and staff/faculty development activities, highlighting the importance of teamwork in the development of courses and in the implementation of technology (Williams, 2003).

The evolution of Web-based education appears to be moving towards increased integration into programming areas. This concept has surpassed Web courses being merely a delivery model. Richards (2002) believes the traditional "transmission" models of learning technologies have evolved towards student-centered or constructivist formats. Hence, Web learning environments have presented possibilities for enhancing the integration of distance learning/online learning with on-campus courses. As institutions of higher education continue to expand their educational offerings via the Web, they should continue to seek feedback from their students. As a result, these institutions will be able to continue to meet the ever-changing needs and expectations of their constituents.

Limitations of the Study

It needs to be noted that there were several distinct limitations to this study. The first limitation was that this study only included community college students taking courses as part of an associate's degree. I attempted to include participants who have also acquired advanced degrees in hopes of providing a variety of perspectives of learning experiences.

The second limitation was the extent to which I was able to have a gender-balanced population of interviewed students. There was approximately a three-to-one ratio of females to males who were twenty-five years and older taking Web courses

in fall 2002. Of twelve students interviewed, I was only able to recruit one male for this portion of the study.

Further Research

The execution and investigation of the data from the study of the community college adult learners online characterizes one setting in which student satisfaction can be examined and measured. Comparable studies in different institutions of higher education may provide intriguing outcomes that could further help improve how Web courses are designed and supported. In addition, the same study conducted with students in a bachelor's or master's degree program may generate interesting data results. These suggested populations may provide results very different from this study. In addition, a study involving multiple semesters may produce interesting data.

Another possibility, which could lead to interesting results, is to focus the study on students eighteen to twenty-four years old. These students are considered to be the traditional student population. Implementing a study focusing on this population may unveil a completely different set of student expectations. In addition, a study like this would offer a comparison between the original study's population and other types of student populations.

Finally, a data wealthy area of future research that should be explored is the perceptions of professors teaching in a Web learning environment. Since college professors have a critical role in the delivery of meaningful and effective learning, a study of their perceptions teaching in this format could yield detailed data on the

instructional viewpoint. This could provide a foundation for further enhancement of the design of Web courses to meet the specific needs of professors.

In conclusion, it is hoped that this research has added to the literature in the area of Web-based instruction in higher education. This explanatory study will establish itself to be a valuable tool to those responsible for managing Web courses in administration, professors, and other educational professionals.

Personal Biography

July 2003 will complete the researcher's seventeenth year working in higher education. She is currently employed at Penn State Great Valley, Malvern, PA as Registrar and Director of Institutional Research and has been in this position since March 2000. Previous to working at Penn State, she was a Program Manager for Drexel University's College of Evening and Professional Studies, Philadelphia, PA from 1997 until 2000. Between 1986 and 1997 she was an academic Program Administrator and Contracted Training Data Analyst for Delaware County Community College, Media, PA.

Her undergraduate degree, a Bachelor of Science in Business Administration, is from East Carolina University, Greenville, NC, 1986. She entered into graduate school in 1990 and subsequently completed her MBA at West Chester University, West Chester, PA in 1993.

In June 1998, she enrolled at Drexel University as part of the second cohort in the Educational Leadership and Learning Technologies PhD program. Over the last several years, she has been completing her dissertation with the guidance and

support from her dissertation advisor and dissertation chairperson, Dr. Elizabeth Haslam, and her entire dissertation committee.

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Appendix A. Web Course Evaluation Questionnaire

A Case Study of Community College Adult Learners Online

The information will be used in a research study to guide future improvements in the responsiveness to the needs of adult students participating in Web courses. Your individual responses will remain anonymous. Please proceed from here by filling out this questionnaire that constitutes your consent for the purposes of participating in this study. If completing online, it is possible that your responses could be reviewed by a third party, if intercepted electronically or the security of the Website breached.

Please rate the following characteristics of this course as quickly and honestly as possible. For each item, simply choose the number that best represents your attitude or opinion.

Instruction/Instructor Characteristics					
	Very Poor	**Poor**	**Avg**	**Good**	**Very Good**
1. The clarity with which the class assignments were communicated.	1	2	3	4	5
2 The degree to which the pre-prepared graphics helped you gain a better understanding of the course material.	1	2	3	4	5
3. The production quality of the pre-prepared graphics used for the class.	1	2	3	4	5
4. The timeliness with which papers, tests, and written assignments were graded and returned.	1	2	3	4	5
5. The degree to which the types of instructional techniques that were used to teach the class (e.g., lectures, demonstrations, online discussions, case studies, etc.) helped you gain a better understanding of the class material.	1	2	3	4	5
8. The extent to which the course management tool was free of distractions (e.g., clean interface, easy to follow directions, etc.)	1	2	3	4	5
7. The extent to which the instructor made the students feel they were part of the class and “belonged”.	1	2	3	4	5
8. The instructor’s communication skills.	1	2	3	4	5
9. The instructor’s organization and preparation for class.	1	2	3	4	5
10. The instructor’s general level of enthusiasm.	1	2	3	4	5
12. The extent to which the instructor encouraged class participation.	1	2	3	4	5

Appendix A. Web Course Evaluation Questionnaire (Continued)

Instruction/Instructor Characteristics					
	Very Poor	**Poor**	**Avg**	**Good**	**Very Good**
13. The in-person/telephone accessibility of the instructor outside of class.	1	2	3	4	5
14. The instructor's professional behavior.	1	2	3	4	5
15. Overall, this instructor was:	1	2	3	4	5

Technological Characteristics					
	Very Poor	**Poor**	**Avg**	**Good**	**Very Good**
16. The quality of the course content, graphics, and navigation.	1	2	3	4	5
17. The quality of the streaming sound and video when applicable.	1	2	3	4	5
18. The adequacy of the computer screen size for the class materials presented.	1	2	3	4	5
19. The promptness with which the instructor recognizes and answers student email and bulletin board questions.	1	2	3	4	5
20. The degree of confidence you have that classes will not be temporarily interrupted or canceled due to technical problems.	1	2	3	4	5

Course/Program Management Characteristics					
	Very Poor	**Poor**	**Avg**	**Good**	**Very Good**
21. Your reaction to the present means of material exchange between you and the course instructor.	1	2	3	4	5
22. Your ability to access a library when, and if, needed.	1	2	3	4	5
23. The general conscientiousness of the site/class coordinator, e.g., in delivering materials, solving technical problems.	1	2	3	4	5
24. The accessibility of the help desk or course coordinator.	1	2	3	4	5

Appendix A. Web Course Evaluation Questionnaire (Continued)

Course/Program Management Characteristics					
	Very Poor	**Poor**	**Avg**	**Good**	**Very Good**
25. The degree to which the helpdesk or someone was able to help you troubleshoot system problems.	1	2	3	4	5
26. The promptness with which class materials were delivered/sent to either you or the site.	1	2	3	4	5
27. Your ability to access help desk personnel when needed.	1	2	3	4	5
28. The ease of class enrollment and registration procedures.	1	2	3	4	5

This evaluation form is designed and validated by Dr. Paul Biner at Ball State University, and presented here with permission.

Appendix B. A Case Study of Community College Adult Learners Online

Informal Interview Notes

Interview with "student" course "Date" is "Time"	Description of what and program the student participating
Setting:	*Comments and observations:*

Introduction: (researcher)

Open-ended questions:

What is your sense of learning in this environment?

What is the speed and ease you are able to perform course tasks?

What kinds of support and resources were available?

Describe the level of interactivity and interaction you experienced with the instructor and other members of the course?

Appendix C. DCCC Access Letter

May 10, 2002

Drexel University
3141 Chestnut Street
Philadelphia, P A 19104

To Whom It May Concern

Please accept this letter as confirmation that Ms. Heather Tilson, a doctoral candidate in your Educational Leadership Development & Learning Technologies Program, will be granted access to our Web students for research purposes.

Ms. Tilson met with our director of distance learning, Mr. Eric Wellington, and me on Apri110, 2002, to discuss the nature and purpose of the research she intends to conduct. We have agreed upon the methodology to be used to administer the survey instrument, and I am confident that Ms. Tilson will gain full access to our Web students meeting her parameters in such manner that falls within FERPA regulations. Furthermore, Mr. Wellington and I are pleased at the prospect of reviewing the outcome of Ms. Tilson's research, with the expectation that we can use the data to improve service delivery to our distance-learning students.

Should you have any questions, please feel free to contact me.

Sincerely,

Fran Cubberley

Fran Cubberley
Dean for Enrollment Services

Office of Enrollment Services.

901 *South Media Line Road, Media, PA* 19063-1094 Voice 610-359-5141 *Fax 610*-359-5343

www.dccc.edu

cc:
Ms. Heather Tilson
Mr. Eric Wellington

Appendix D. Recruitment Letter DCCC – Director of Distance Learning

DCCC
DELAWARE COUNTY COMMUNITY COLLEGE

901 South Media Line Road
Media, Pennsylvania 19063-1094
610-359-5000

Dear Online Student:

We are asking your participation in a research study designed to help us determine the extent to which your Web-based education has contributed to the attainment of your educational goals. This research project is designed to explore adult student experiences in Web-based learning environments. The feedback you provide will help Delaware County Community College and other like institutions to make future improvements in their responsiveness to the needs of the students who follow you. The researcher is conducting this study as partial fulfillment of a doctorate degree from the School of Education at Drexel University. The purpose of this study is to examine the concepts and practices of facilitating effective online adult learning as applied to college Web-based education practice.

We are asking you to complete and return the enclosed Web Course Evaluation Questionnaire in the enclosed envelope or you may respond to the questionnaire at http://www.personal.psu.edu/staff/h/l/hlt1/Survey.htm. The survey should only take approximately ten minutes to complete. You may also participate in a thirty-minute informal interview session consisting of four open-ended questions. Attached please consider the request to participate.

Thank you for your assistance,

Eric R. Wellington
Director of Distance Learning

Appendix E. Recruitment Letter Drexel University, Primary Investigator

Dear Online Student:

I would like to invite you to participate in a research project designed to explore adult student experiences in Web-based learning environments. My co-investigator, Heather Tilson, and I are interested in examining the perceptions of adult students participating in online courses at Delaware County Community College.

This study will be shared with appropriate members of the Drexel University and Delaware County Community College community. The dissertation that results from this work will be published in hard copy and microfiche, which will be housed at the Hagerty Library on campus. The feedback you provide will help Delaware County Community College and other like institutions to make future improvements in their responsiveness to the needs of the students who follow you. Please consider participating by providing your feedback in completing the enclosed Web Course Evaluation Questionnaire or online at: http://www.personal.psu.edu/staff/h/l/hlt1/Survey.htm.

You may also participate in the research study by engaging in an informal interview, which consists of one thirty-minute session. The interview session will consist of four open-ended questions. Your name will not appear in this study and your feedback shall be kept and remain anonymous. I appreciate your giving time to this study, which will help me learn more about adult student experiences in Web-based learning environments. **If you would like to participate in an interview session or if you have any questions, please call Heather Tilson at 610.725.5291 or email her at hlt24@drexel.edu.**

Thank you and Best Regards,

Dr. Elizabeth Haslam
Primary Investigator
School of Education
Drexel University

Appendix F. Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Q1-1	58	1	5	4.09	.978	.957
Q1-2	52	1	5	3.83	1.004	1.009
Q1-3	49	2	5	4.00	.890	.792
Q1-4	58	1	5	4.36	.831	.691
Q1-5	57	1	5	3.70	1.117	1.249
Q1-6	57	2	5	4.30	.680	.463
Q1-7	57	1	5	3.65	1.395	1.946
Q1-8	58	1	5	3.81	1.317	1.735
Q1-9	57	1	5	4.16	1.031	1.064
Q1-10	57	1	5	3.95	1.394	1.944
Q1-11	56	1	5	3.89	1.289	1.661
Q1-12	54	1	5	3.70	1.341	1.797
Q1-13	54	1	5	3.70	1.327	1.760
Q1-14	55	1	5	3.91	1.175	1.380
Q1-15	57	1	5	3.89	1.305	1.703
Q2-1	57	2	5	4.09	.739	.546
Q2-2	40	2	5	4.02	.800	.640
Q2-3	56	2	5	4.25	.745	.555
Q2-4	57	1	5	4.12	1.036	1.074
Q2-5	55	3	5	4.44	.631	.399
Q3-1	57	1	5	3.89	1.129	1.274
Q3-2	54	3	5	4.26	.678	.460
Q3-3	54	1	5	4.00	.991	.981
Q3-4	44	1	5	4.02	.976	.953
Q3-5	38	1	5	4.16	.973	.947
Q3-6	55	1	5	4.22	.937	.877
Q3-7	40	1	5	4.07	.997	.994
Q3-8	56	1	5	4.54	.738	.544
Valid N (listwise)	27					

Appendix G. One-Sample t-test

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q1-1	31.805	57	.000	4.09	3.83	4.34
Q1-2	27.477	51	.000	3.83	3.55	4.11
Q1-3	31.469	48	.000	4.00	3.74	4.26
Q1-4	39.959	57	.000	4.36	4.14	4.58
Q1-5	25.010	56	.000	3.70	3.41	4.00
Q1-6	47.690	56	.000	4.30	4.12	4.48
Q1-7	19.749	56	.000	3.65	3.28	4.02
Q1-8	22.029	57	.000	3.81	3.46	4.16
Q1-9	30.434	56	.000	4.16	3.88	4.43
Q1-10	21.377	56	.000	3.95	3.58	4.32
Q1-11	22.603	55	.000	3.89	3.55	4.24
Q1-12	20.301	53	.000	3.70	3.34	4.07
Q1-13	20.518	53	.000	3.70	3.34	4.07
Q1-14	24.674	54	.000	3.91	3.59	4.23
Q1-15	22.532	56	.000	3.89	3.55	4.24
Q2-1	41.776	56	.000	4.09	3.89	4.28
Q2-2	31.811	39	.000	4.03	3.77	4.28
Q2-3	42.709	55	.000	4.25	4.05	4.45
Q2-4	30.036	56	.000	4.12	3.85	4.40
Q2-5	52.109	54	.000	4.44	4.27	4.61
Q3-1	26.047	56	.000	3.89	3.60	4.19
Q3-2	46.157	53	.000	4.26	4.07	4.44
Q3-3	29.675	53	.000	4.00	3.73	4.27
Q3-4	27.334	43	.000	4.02	3.73	4.32
Q3-5	26.333	37	.000	4.16	3.84	4.48
Q3-6	33.396	54	.000	4.22	3.96	4.47
Q3-7	25.847	39	.000	4.08	3.76	4.39
Q3-8	46.013	55	.000	4.54	4.34	4.73

Vita

HEATHER LYN BECKER TILSON

Jeffersonville, PA 19403
htilson1@comcast.net

Education

PhD Educational Leadership and Learning Technologies, June 2003
Drexel University, Philadelphia, PA

Dissertation: ***A Case Study of Community College Adult Learners Online***

MBA Business Administration: Management, 1993
West Chester University, West Chester, PA

BSBA Business Administration: Marketing Management, 1986
East Carolina University, Greenville, NC

Professional Experience

Director of Institutional Research/Registrar, March 2000-Present
Penn State Great Valley, Malvern, PA

Program Manager, Division of Lifelong Learning, 1997-2000
College of Evening and Professional Studies
Drexel University, Philadelphia, PA

Business Analyst, Office of Workforce Education & Training, 1996-1997
Center for Business and Community Services
Delaware County Community College, Media, PA

Administrator, Program Development, 1990-1996
Center for Business and Community Services
Delaware County Community College, Media, PA

International Academic Activity, 1994 (Summer Semester)
International Studies, via Delaware County Community College
Faculty Member: English as a Second Language (EFL), at Tallinn Technical University (TTU) in Tallinn, Estonia. Taught two sections to TTU's faculty and two sections delivered to TTU's graduate students.

Coordinator, Job Skills, 1986-1990
Applied Sciences Division
Delaware County Community College