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FACTORS THAT INFLUENCE LEARNING SATISFACTION DELIVERED BY VIDEO STREAMING TECHNOLOGY

by

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ABSTRACT

FACTORS THAT INFLUENCE LEARNING SATISFACTION DELIVERED BY VIDEO STREAMING TECHNOLOGY

Daniel S. Keenan
Old Dominion University, 2010
Director: Dr. John M. Ritz

In 2005, over 100,000 e-Learning courses were offered in over half of all U.S. postsecondary education institutions with nearly 90% of all community colleges and four year institutions offering online education. Streaming video is commonplace across the internet offering seamless video and sound anywhere connectivity is available effectively making any location a learning environment. The problem investigated in this study was to determine factors that affect the learning satisfaction of students that video streamed courses. This study is important to enable improvements in curriculum, delivery of content, designs of alternative study venues, and guide college administrators in making decisions on classroom and instructor utilization.

Information was gathered by analyzing quantitative data obtained from surveys issued to 1593 students from a coastal Virginia university engaged in e-Learning via video streaming technology with nearly 21% responding. Statistical analyses were used to determine relationships between independent variables, e.g., video stream quality, motivation, physical environment, climate, communication, interactions, location, and video streaming experience and learning satisfaction (dependent variable). The analyses were used to report characteristics and basic features, e.g., ages, sex, degree sought, to furnish details of the population studied.

The results of this study indicated that the physical environment had a moderate correlation as well as significance on student satisfaction. The multiple correlation coefficient from the stepwise linear regression analysis between the predictor (student environment) and outcome (student satisfaction) indicated that student environment accounted for most of the variation in student satisfaction. Social climate had the greatest influence on student satisfaction with communication with instructor and classmate interaction following second and respectively third. With regard to motivational factors professional development was rated first with course availability, prerequisite requirements, and availability of a degree being the top four reasons for taking a video streamed class. Availability of a course exerted the greatest influence in the variation of student satisfaction. A stepwise linear regression revealed significant influence between the physical environment, video streaming experience, social environment, and video streaming class quality to overall student satisfaction with video streaming experience having the greatest influence on student satisfaction.

Education institutions should consider the home as the location of choice of video streaming students; consider more accommodating schedules for the non-traditional student; and consider work load, class size, and training for instructors of video streaming classes.

DEDICATION

> After the cheers have died down and the stadium is empty, after the headlines have been written and after you are back in the quiet of your room and the championship ring has been placed on the dresser and all the pomp and fanfare has faded, the enduring things that are left are: the dedication to excellence, the dedication to victory, and the dedication to doing with our lives the very best we can to make the world a better place in which to live.
>
> ~Vince Lombardi

To those who fell short of living the prosperity of their lives by choosing to dedicate and cede it on the altar of valor so a free citizenship may enjoy the priceless liberty's so chivalrously paid, I dedicate this dissertation.

ACKNOWLEDGEMENTS

Do you want to know who you are? Don't ask. Act! Action will delineate and define you.
~Thomas Jefferson

This body of work would not be possible without the drive and determination on a personal nature; to augment and develop my strengths, discover my weaknesses and alleviate them, ascertain opportunity and seize them, and to cultivate my opinions to the truth keeping to the beliefs of Thomas Jefferson who said, "...he is less remote from the truth who believes nothing than he who believes what is wrong." It has to be said however, that my impetus has been developed from birth through the examples my parents have lived, teachers have modeled, coaches have inspired, and family and friends have supported. The credit for who I am has to be shared by my entire life experiences and the people who have inspired and impressed me at every turn. To every encouraging soul who has touched my life, thank you.

Daniel S. Keenan

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CHAPTER I

Introduction

E-Learning grew from a $6.5 billion dollar industry in 2003 to more than $27.1 billion dollar industry in 2009, with growth expecting to exceed $54 billion dollars by 2014 with educational institutions leading the way (Nagel, 2009). Britt (2004) predicted that e-Learning will increase 11% every year, involving over 80% of all universities and corporations in the United States. The National Center for Educational Statistics reported that enrollment at colleges will increase 16% by 2013 (Jones, 2003), resulting in a student population greater than current facilities can accommodate (Oblinger, Barone, & Hawkins, 2001). Since human resources and students are an investment in companies' and educational institutions' future, saving time, money, and material resources and effectively using facilities, are the primary driving factors behind migration from the traditional classroom to the e-Learning platform (Britt, 2004).

Face-to-face instruction is not necessary to accomplish a learning objective (Allen, Bourhis, & Mabry, 2002; Bernard et al., 2004; King & Boehlje, 2000; Lease, Davis, & Thievon, 2000; Navarro, & Shoemaker, 2000; Neuhauser, 2002; Reisetter, LaPointe, & Korcuska, 2007). King and Boehlje (2000) supported the evidence that, when possible, blended use of face-to-face and video streaming is a preferred method of delivery. Shephard (2003) suggested that the more seasoned lecturers were less apt to change their teaching methods and did not trust nor desired to try video streamed activities. However, Shephard (2003), Moore (2002), and Allen et al., (2002) contended that the video streaming method was enthusiastically welcomed by younger students.

This enthusiasm could be directly attributed to the electronic cultural environment that students, since the 1990's, have been raised utilizing (Shephard, 2003).

The video streaming industry is entering its second decade, celebrating the patent award for Real Networks' streaming media technology and applications (Markoff, 2006). Streaming video has impacted thousands of companies who rely on this technology to train employees, communicate to partners, executives, and vendors, and advertize to customers. Billion dollar companies have invested in this technology, not as a solitary product, but as an important strategy to train and educate their customer/employee base and conduct business (Rayburn, 2007).

Statement of the Problem

The problem of this study was to determine factors that affect the learning satisfaction of video streamed students. This study is important to enable improvements in curriculum, delivery of content, and designs of alternative study venues. Results of this study may aid student decisions to enroll and consider where to take video streamed classes. Information will be gathered by analyzing quantitative data obtained from surveys issued to students from a coastal Virginia university engaged in e-Learning via video streaming.

Research Questions

The researcher investigated the motivations of video streamed students as well as identified prominent factors that influence their learning satisfaction. The researcher believed that intrinsic motivations, personal comfort, social support, and freedom of choosing learning venue contributed to the e-learners academic success. The intent of this was to identify the challenges and advantages of physical and social learning

environments, as well as determine the motivation that empowered the acquisition of learned tasks and goals from learning objectives.

This study was guided by the following research questions:

RQ_1: Do the physical qualities of an environment including temperature, lighting, noise, and room design relate to the video streamed student's success and satisfaction?

RQ_2: Does the existence of sociability in an alternative learning venue that is at a location other than a face-to-face classroom relate to the video streamed student's success and satisfaction?

RQ_3: What motivational factors does a student possess that lead to academic success in a video streamed class?

RQ_4: Does the quality of the video streamed media relate to student satisfaction and success?

Background and Significance

In 2005, over 100,000 e-Learning courses were offered in over half of all U.S. postsecondary education institutions. Nearly 90% of all community colleges offered online courses and 89% of all four year institutions offered online education. Only 40% of private postsecondary institutions offered online education in 2000-2001 (Phipps, 2004). Of those institutions that offered online education, 53.6% of them had faculty and/or administrators who were critical of their traditional face-to-face planning strategy because of research that demonstrated that online education was just as effective as face-to-face instruction (Allen & Seaman, 2004).

Streaming video is common place across the internet; access to streaming video is inexpensive and easy. With a single click of a mouse a user can download players such as Window's Media Player, QuickTime, Flash, and Real Player (eStream, 2004; Wattanajantra, 2008). The quality of the seamless video and sound, as well as the younger generation's familiarity with technology, secures its future use in industry and education.

Some of the problems with video streaming are quickly becoming obsolete with modifications to the players and modern compressors/de-compressors (CODEC) by reducing the bandwidth requirement to operate. This modification allows the video streamed producer to generate fewer signals, thus saving money. This delivery can be improved by industry standardizing the bandwidth requirements for the players or standardizing the players specific for the end users. This issue is being debated primarily between the major players who claim they have the advantage of the market (Figure 1), which is a reflection of the customer's choice (Figure 2). An example of standardizing the bandwidth is the requirement for Old Dominion University video streamed students to download Adobe Flash 8. This allows the university to push just the bandwidth required for the Adobe player and not the continuous broad band required for all other players. This requirement allows for the quick encoding and decoding of signals of a single format allowing for a more seamless experience (Rayburn, 2007).

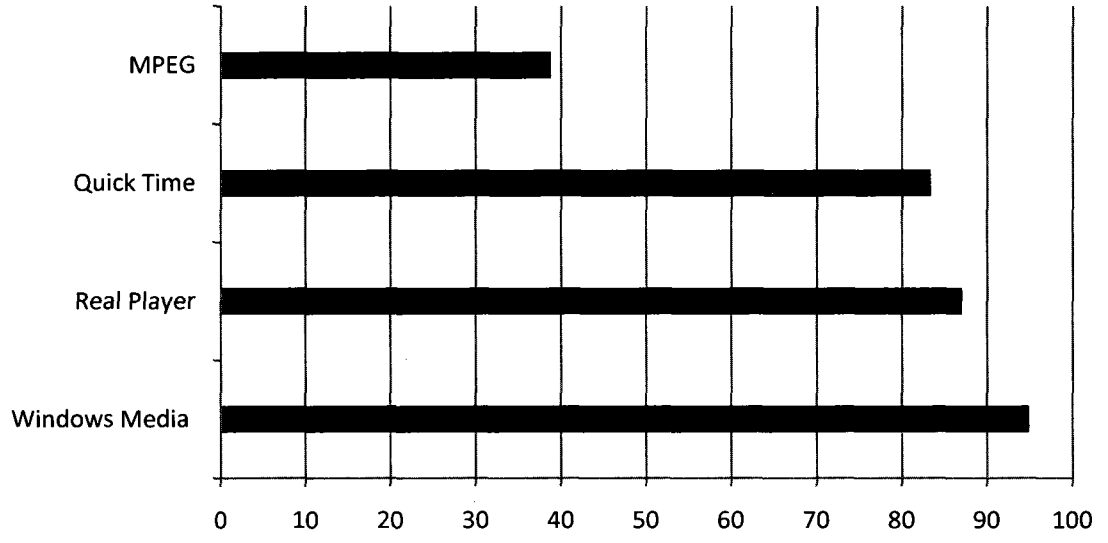


Figure 1. Percent of users possessing players.

Note. This is not indicative of the actual use of the player. Figure does not include statistics on Adobe Flash as Adobe did not have a player available at the time the data was collected.

From "Streaming and digital media" by D. Rayburn, 2007. Copyright 2007. Adapted with permission of the author.

The choice of the Content Delivery Network (CDN) is crucial especially as it pertains to reliability and global access. Some CDN's will advertize high definition, quick speeds, low bandwidth, and systems that facilitate multiple players. Technology has evolved offering qualities that the end user can not fully appreciate because of feature unavailability to the customer or its seamlessness. CDN's through webcasting, deliver instruction to classrooms around the world enabling tours and virtual trips. This ability through streaming media enlightens the educational experience and gives students an educational exposure they usually would not have otherwise (Bickel & Carrol, 2003;

Billings, Connors, & Skiba, 2001; Cooper, 2001; Navarro & Shoemaker, 2000; Perreault, Waldman, & Zhao, 2002; Rayburn, 2007; Reisetter et al., 2007).

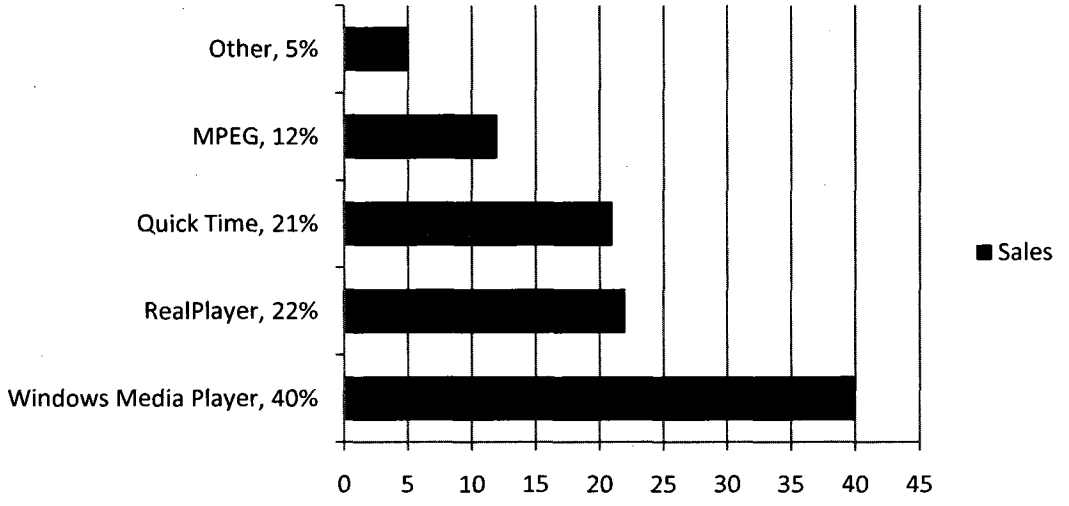


Figure 2. Player customer choice.

Note. Figure does not include statistics on Adobe Flash as Adobe did not have a player available at the time the data was collected.

From "Streaming and digital media" by D. Rayburn, 2007. Copyright 2007. Adapted with permission of the author.

As technology advances and web-based learning continues to show great advantages, business institutions and colleges are expanding training and education using e-Learning, while remaining cognizant of its challenges and limitations, especially as e-Learning pertains to the physical and social learning environment (Bibeau, 2001; Halverson & Collins, 2006; Merriam, Caffarella, & Baumgartner, 2007; Rotter, 1954; Zifferblatt, 1972). Technology is not the panacea of all educational problems, but it offers

alternatives when time, availability, comfort, learning styles or preference, and finances are a factor. Digital means of receiving wireless information have empowered students to bring digital devices everywhere they go, rendering essentially any venue with wireless reception a potential learning environment (Milne, 2007).

Technology is utilized best when it is augmented with interpersonal human flavor. Educational technology has to be placed into the hands of a trained facilitator (Leamnson, 2001; Reed, 2003). Neal Postman has said, "[t]echnological change is not additive; it is ecological. A new technology does not merely add something; it changes everything" (Postman, 1992, as cited in Leamnson, 2001, p. 77). Training instructors in how to teach using video streaming will be a necessity, but the return on the investment will far exceed expenditures and expectations.

When streaming audio via the internet became a viable alternative to purchasing music from a store and when it became possible to link streaming video with audio, streaming media became an educational reality. It was not long after the entertainment industry began using video streaming (VS) that a use for the technology was found in education. Curiously, the European Union, perhaps out of a deeper necessity, fully embraced this technology to teach students at a distance (eStream, 2004). The Europeans, Australians, and those countries that had distances and transportation issues to overcome envisioned video streaming (VS) as a means to educate their population that was cost effective and just as convincing as face-to-face (F2F) instruction (Arbaugh, 2000). One aspect of e-Learning that the Europeans have grasped more so than Americans is the need to train instructors in techniques of delivering a video streamed or distance learning (DL)

class. Such instruction is different and requires skills and competencies that complement the electronic format (Arbaugh, 2000; eStream, 2004).

King and Boehlje (2000) showed that face-to-face classroom teaching was no longer the norm, nor was it always the most desired agent of learning. The cost savings for educational institutions may be substantial, depending on the level of dedication the institution had committed to distance education, e.g., video streaming (Cecil & Feltes, 2002; Shephard, 2003).

Medical and dental schools were one of the first groups to educate their students and professionals via video streaming. Cornell University, for example, broadcast their lessons to students at the off site location at Qatar. Video streaming technology provides precision imagery that endorses the detailed instruction, giving medical and dental school instructors the flexibility to teach real time and through an archive (Van Etten, Pressley, McInerney, & Liem, 2008). Several factors that sell the video streaming experience are the cost, interactivity, knowledge transference, modification to curriculum, and the ability to archive classes (Kane, 2008). The medical profession has such confidence in the technology that it is used to consult doctors in other locations during operations (Kane, 2008).

Gandsas (2002) had broadcasted recorded surgeries and conferences to doctors and health care professionals around the world by using nothing more than desktop computers equipped with the standard streaming-enabled software, hardware, and operating systems.

He was able to broadcast with such clarity that students, faculty, and clients easily identified all anatomic structures in full color motion, clearly followed all steps of

> the surgical procedure, and successfully asked questions and made comments by using the e-mail/chat module while viewing the surgery. Minimal investment of finances have created an interactive virtual classroom with the potential to attract a global audience. (Gandsas, 2002, p. 377)

Nevertheless, with all of this success, few studies have been conducted to analyze the learning environment effect on a student's capability and motivation to learn academic material. Warger and Dobbin (2009) emphasized that elements of the environment exist that are beyond the control of the subject and thus make any study of the environment incomplete. This research study will add more information to the discussion by asking broad questions such as, 'What physical and social environments promote video streamed learning?', and 'Which motivational factors are dominant, intrinsic or extrinsic, or are they equally shared?' The researcher will not focus on grades as a measure of learning effectiveness, as suggested by Wise and Groom (1996), but rather on the students' desire to continue learning and acquiring a valuable experience in the process.

Technology is rapidly evolving to accommodate streaming digital media in every location where connectivity to the internet is permitted, broadening the scope and environments that the students of the near future will be learning (Rayburn, 2007). Understanding the influences that affect learning satisfaction will enable educators to make decisions that are conducive to learning regardless of technology (Warger & Dobbin, 2009). This study will discover truths about environmental and social effects on student motivation and attitude to learn with video streaming technology (Bibeau, 2001; Shephard, 2003).

Limitations

The following limitations existed for this study:

1. A single coastal Virginia university video streamed student population was used as the model for video streaming methods, design, and technology. A coastal Virginia university was chosen for this study because the researcher was a student of their video streamed courses and familiar with the procedures and protocol of course delivery and assessment.

2. A coastal Virginia university e-Learning curriculum, teaching strategies, and assessment methods, along with the literature, were used as the e-Learning models from which the video streamed survey was developed.

3. The entire video streamed student population (N= 1593) from four semesters of the coastal Virginia university were sent the video streamed research survey.

Assumptions

Throughout the consecution of this research, the following assumptions were made and considered true:

1. All students had experienced a traditional formal classroom in either high school and/or college from which a comparison of the different teaching styles/methods, delivery, and assessment strategies associated with video streaming classes could be made.

2. All students had taken a video streamed class.

3. Reasons for taking a video streamed class were accurately captured in the survey.

Procedures

The purpose of this research was to determine the physical environment, social environment, and motivational effects on student satisfaction who use video streaming to receive instruction (e-Learners). For the purposes of this study, the physical environment was defined as tangible elements that are tasted, felt, heard, or smelled (Fielding, 2006). The social environment was limited to the student-teacher and student-student interactions (face-to-face contact, e-Learning communication such as discussion boards, e-mail, and chat rooms). This study focused on the conscious perception, preferences, and experiences of the student and the physical and social phenomena of their learning environment, and their effect on the students' ability to retain and/or apply the tasks learned, otherwise known as "learning effectiveness." Motivation and the influences it has on student attitude toward learning tasks were also studied since motivation influences engagement and may be unique in ways not yet discovered.

The research population consisted of over 1500 students at a coastal Virginia university (N=1593) who were enrolled in video streamed classes encompassing four semesters. Every student who was enrolled in video streamed classes was sent a research survey. The video streamed student list was obtained through the Registrar's Office of the university.

Identifying survey information was void of name. Statistical data necessary for research, e.g., gender, location, degree sought, university college attending, age, and survey responses were kept confidential and secured within the guidelines approved by the Human Subjects Review Board of the coastal Virginia university.

Quantitative data were tabulated and analyzed. Pearson *r* correlation, stepwise regression, ANOVA, *t*-tests, and descriptive statistics were used to determine significance between factors, e.g., video stream quality, motivation, physical environment, climate, communication, interactions, location, rigor (independent variables) and learning satisfaction (dependent variable). A tentative theory to explain the amassed data emerged. Answers to the research questions were formulated, validating the beliefs, thereby resulting in the concluding narrative.

Definition of Terms

The following list of terms and their definitions will aid the reader in understanding this exposition:

Asynchronous - operation without the use of fixed time intervals (opposed to synchronous).

Compressors/DECompressors (CODECS) - Mechanism that converts data between uncompressed and compressed electronic formats reducing the bandwidth requirement (Rayburn, 2007).

Content Delivery Network (CDN) - Providers of network services to broadcasting customers (Rayburn, 2007).

Distance Learning - The acquisition of knowledge and skills through electronic or digitized means encompassing all methods that technology can support from one site to another, e.g., school to home, home to home, school to alternative venue.

Efficacy - capacity for producing a desired result or effect; effectiveness.

e-world - the electronic dependent and technology driven world.

Synchronous - existing or occurring at the same time (opposed to asynchronous).

Video streaming - The animation of a video as it is being sent to a browser in real time (Darrel, 2001).

VOD (Video on Demand) - describes video content which may be viewed by the end user from beginning to end, at any time (Rayburn, 2007).

Summary and Overview

Video streaming usage is commonplace if the internet is being accessed. In 2007, over 38% of all internet users viewed video streamed content at least once a day (Rayburn, 2007). Even though there are few studies analyzing the effectiveness of video streamed lessons in student achievement in higher education, universities video streamed classes became a benefactor realizing an immediate return on investment due to increased student enrollments (Shephard, 2003). Video streaming reaches students who would not take classes otherwise because of time constraints or geographic location (Allen & Seaman, 2007). With technology making education, training, communication, and sales easier and cost-effective, it is safe to regard video streaming as the media that best represents the future of multimedia communication.

This research is focused on video streaming technologies and their application as an education and training tool. The research will specifically explore the effects of social and physical environment on video-streamed e-Learning, the role that intrinsic and extrinsic motivations have in concentration, and unique problems associated with video streaming classes.

Chapter II reviews the literature adopted to answer the research questions. The Review of the Literature is broad as it provides an extensive set of variables that affect the learning experience. The chapter reviews nine constructs related to the learning

experience: (a) biology and psychology of learning; (b) Maslow hierarchy of needs; (c) physical environment; (d) alternative venues; (e) social environment; (f) motivation; (g) self-efficacy; (h) support; and (i) barriers to motivation and learning satisfaction. Although it is not possible to evaluate all of these variables in this study, it is imperative to understand the scope of learning theory as well as the science of learning in order to appreciate the vast challenges this, or any, study has in determining learning effectiveness in video streaming.

Chapter III describes the methods used to collect and analyze the data. This chapter describes the population, selection criteria, independent and dependent variables, instruments used to gather data, procedures for gathering statistical data for analysis, and summary.

Chapter IV details the findings of the research formatted systemically to answer the research questions. This chapter describes the population response rate and all details necessary to establish fidelity of the research findings using tables and figures to support the narrative description.

Chapter V is the summary, conclusions, and recommendations formulated through the research and opinions emanating from the findings. The chapter begins with a summary of the first four chapters, answering research goals, and ends with the researcher making recommendations for future research.

CHAPTER II

Review of the Literature

The 21st century will expand the use of web-based learning, using all forms of technology-enhanced learning to include video streaming technology. Oblinger and Hawkins (2005) implied that even with all of the technology available to the digital generation, the students do not focus on technology; rather, their concern is accomplishment because they want to learn. How people acquire knowledge, the pedagogy and andragogy that determine the methods of instruction, and the digital technology that enables learning at a distance shapes education and training throughout the institutionalized educational system and corporate employee development.

This chapter will encapsulate the biology and theories of human learning with the intention to enlighten the reader as to why applied learning technology research supports online web-based learning and video streaming as a viable educational tool. The topics will include biology and psychology of learning, Maslow's hierarchy of needs, physical environment, alternative venues to learning, social environment, motivation, self-efficacy, support, and barriers to motivation and learning satisfaction. By evaluating these topics, the reader will gain an appreciation of the value of e-Learning and realize that video streaming technology is a possible future of synchronous online learning.

Allen and Seaman (2007) stated that nearly 3.5 million students were taking at least one online course during the 2006 fall term; this figure is an increase of 10% over 2005. This number also represents a 9.7% increase in online enrollments and an increase of 1.5% in enrollments above other forms of education delivery. Two-year associate's

degree granting institutions have the highest growth rates and account for over one-half of all online enrollments for the last five years.

With money savings being the primary motivator private industry is expanding its use of video streaming for several reasons (Figure 3). Education within the internet is here to stay as proven by its significant growth in enrollment (Boster, Meyer, Roberto, Inge, & Strom, 2006).

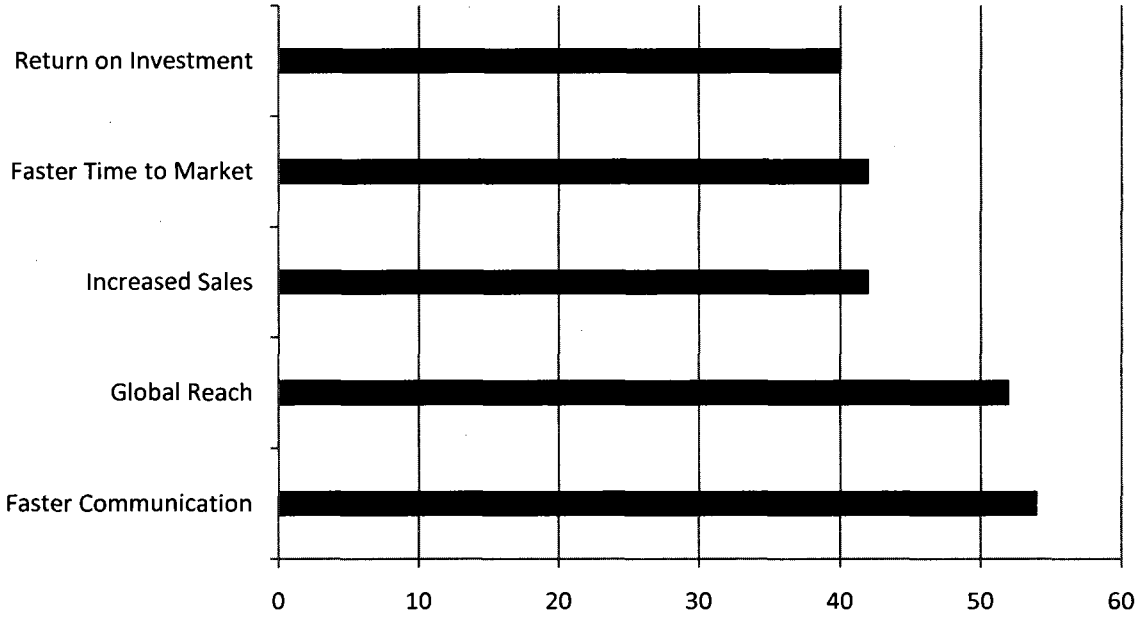


Figure 3. Private industry reasons for e-Learning per percent of responses. From "Streaming and digital media" by D. Rayburn, 2007. Copyright 2007. Adapted with permission of the author.

Video streaming technology has earned the trust of the medical profession. Huang, Qiu, Fu, Shimizu, and Okamura (2008) transmitted video streamed surgical procedures to four sites in China and Japan. The transmission could be switched on

demand between any combination of the four sites to facilitate questions and answers using a video streamed face-to-face technique. The remote sites heard the "voices synchronously transmitted with the images. Every participant could offer comments and raise questions at any time while the live surgery was continuously shown on the screen" (p. 483).

Video streaming came into existence because people needed to communicate effectively with sight and sound quickly, cheaply, and easily. Travel costs and the rapid pace of daily life have necessitated the creation of linkages to entertainment, business, and education. Rapid and stimulating dialogues through dependable sources have made participants feel co-located and part of the learning community. Video streaming with high definition quality currently available in the market allows communication and education with vivid detail. Such delivery closely resembles the warmth that exists in face-to-face communication. Video streaming technology is a major focus in the expanding e-Learning industry, gaining great exposure and notoriety with Fortune 500 companies reliant on video streaming to educate and professionally train their employees. Universities have converted classrooms that would normally seat 20-30 students to video streaming studios that can now serve the plurality, limited only by the instructor's ability to manage the numbers. Industry video streams education and training to increase profits. Video streaming has proven its worth and, because of its success, has secured a place in industry and education as standard business protocol.

Video streaming is not a vision of the future, but rather, it is today's reality. Businesses, hospitals, universities, and government agencies, e.g., Department of Defense, United States Agency for International Development, and United States Justice

Department, use video streaming to communicate, educate, and facilitate operations. Kane (2008) believed that video streaming may soon become one of the most popular internet technologies because of its video on demand (VOD) web accessibility, video archive library potential, virtual classrooms, and chat capability. Students who received instruction in a course with VOD showed dramatic improvement in the attainment of learning objectives goals (Boster et al., 2002, as cited in Reed, 2003).

Biology and Psychology of Learning

Wedge and Kearns (2005) postulated that "learning is a social construct that allows access to instruction, collaboration, informed research, relevant resources, critical analysis, and integrated results; learning manifests itself in knowledge and often in wisdom" (p. 32). Human beings are naturally curious and are adapted to learn. Charles Darwin linked human behavior to that of primates, inferring that behavior is driven by instincts and emotion (McDougall, 1998). Murray (1967) wrote that instinct theory faded away from science with support of homeostasis theories, regulating internal wellness with the external environment and psychological drives and desires. Murray continued to define "drive" as a bodily mechanism which seeks a balance with the environment, suggesting that learned social prestige could accomplish this balance.

Behavior theorists believe that behavior is learned and is best studied through observation of animals because of their inability to speak (pure observation). Skinner believed occasional reward was sufficient to modify behavior; Thorndike offered rewards to cats when they successfully navigated through a maze; and Pavlov tested aural stimuli, rewarding behavior consistently to affect a response with just a stimulus (Phillips & Soltis, 1998). Ahl (2006) suggested that since people are closely related to primates and

since primates are animals, then people can learn something new if they are exposed to a stimulus, concluding that, "If motivation is what causes behavior, then motivation is, in this case a stimuli or a reward" (p. 390). This concept is emerging in studies of motivation and its effects on human behavior. Studies, such as Pinder (1998), advanced the theory that behavior modification is designed by experimental psychology to effect specific behavior with the goal of solving personal and social problems and "enhancing human functioning" (p. 426).

The biology of learning, as presented by Leamnson (2001), was a matter of brain development rather than brain employment. Leamnson (2001) continued to suggest that "computers and technology, and the access they afford, constitute a new way of studying" (p. 78). "Teaching is a process of motivation, stimulation, and encouragement to help the learner focus on the change in behavior that is required after learning has taken place" (p. 78). Technology has a permanent place in education. The precept that "learning can never be improved by technology is certainly and demonstrably wrong" (Leamnson, 2001, p. 78).

The brain is ready for the video streamed method of delivering a lesson and is, in fact, systematically designed for it. The dopamine system activates the feeling of pleasure as a reward for survival. Most distance learning students enjoy and prefer the e-Learning process, thereby linking this endocrine system to emotion and increasing the learning potential that may accompany it.

> As we move from slower paced media messages such as those in print to faster media messages characterized by triple cutting on the moment, the dopamine system and enhanced emotional memory reinforce the pleasure of the new pace

> with immediate gratification and reward. The delayed gratification associated with abstract thinking and complex analysis works less dramatically, working through the cognitive pathway first, only later adding emotional satisfaction to the task. The mesolimbic dopamine system is part of our emotional learning system. (Barry, 2001, p. 113)

Robert Sylwester studied the cycles of attention. He notes that the human brain has a cycle that runs between 90-110 minutes (Sylwester as cited by Weiss, 2000; Leamnson, 2001). Consequently, trainers should recognize and appreciate this cycle and front load the bulk of course content to be learned and use practical exercises at the end. Video streamed classes, when managed properly, could obey the tenets presented by these researchers. This researcher's intent was to investigate how this cycle of attention was or was not implemented in video streamed courses and to recommend improvements to make it the more effective.

Hierarchy of Needs

Maslow's (1943) hierarchy of needs is the most cited authority pertaining to human behavior. This mention is necessary in order to understand the breadth of motivations and/or distractions that may exist in a learner. Humans will have a problem concentrating if they are distracted or have unsatisfied needs (Maslow, 1943). He postulated that human behavior is mostly motivated by intrinsic needs. Ranked from the lowest order of need to the highest, they are: psychological, security, belonging, recognition, cognitive, aesthetic, and self-realization. Maslow (1943) believed that personal needs must be reached at the lower levels before higher levels can be attained; however, very few people ever achieve self-realization. This point is pivotal in

understanding the needs of an e-Learning student when an instructor is not physically present or easily available. All basic educational needs, e.g., cooperation, communication, and flexibility of the learner must be satisfied at a lower level if motivation to attain a higher level of learning is to occur (Maslow, 1943).

McClelland (1961) built upon Maslow's hierarchy, believing that its application to every human being flawed the theory. McClelland (1961) added three fundamental needs for humans: affiliation, achievement, and power. Motivation or desire to engage in a learning activity must exist if constructive learning is to occur (Paldanius, 2002). This example should not be viewed, nor compared, to the low motivated student who chooses not to participate in an activity because the psychology and affects of the observed behavior on learning and the results of learning are different. Motivations are focused differently, as was verified in studies by Foucault (1995), who wrote that motivation is driven by discipline and power as seen in industry; he concluded that resistance to discipline is easier when power is easily seen than when power is internalized.

It is easy to compare the human body to an organization. For example, a body that feels pain cannot function properly because of the distraction or distress caused by the injury; the need to get well is paramount. A business behaves in the same manner and acts to keep employee motivation high; a business recognizes that motivation results in productivity or health. Herzberg's (1966) needs based theory was identified in two categories: avoidance of pain and a need to grow, e.g., achievement, recognition, work, responsibility, promotion, and growth. Attention to these needs as they pertain to employment and learning are paramount to future managers and educators. Deci and Ryan (1985) supported theories stressing the consequences intrinsic and extrinsic

motivations have on behavior. Motivation's affect on behavior and the rewards that Ahl (2006) suggested directly contribute to the intrinsic and extrinsic inspiration needed by learners to balance, and to receive, the most value or impact of the induced effect (Frey 1997; Frey & Osterloh, 2002). Husén (1958), Knowles (1980), and Wlodkowski (1999) determined that learning is intrinsically motivated, building on Hertzberg's theory for the human need to grow and on Maslow's theory of self-actualization. Learning theories influence the development of e-Learning technologies and the business of education and training. Motivation to learn without stress and the intrinsic personal desire to improve personal status is the primer of student need (Frey, 1997; Frey & Osterloh, 2002).

Motivation can affect behavior. Bandura (1997) briefed that a person's behavior and actions toward the world are caused by the interactions between the two; he defined this interaction as reciprocal determinism. Previously, it was believed the world affects behavior, but Bandura (1997) reshaped the theory by postulating that human behavior affects the environment; therefore, both share in the effect of change. Bandura (1997) studied personality and determined that it is the result of the cooperation between the environment, behavior, and the psychological process, i.e., mind imagery and language. Bandura's (1997) learning theory supposed that people learn from one another through observation, imitation, and modeling.

Learning theories become important when evaluating video streaming effectiveness. Brown (2005) developed a matrix displaying population, learning theories, learning space application, and technology in a way that categorizes the best technology and environment and matches it to population and learning qualities (see Table 1).

Traditional learning theories were applied to all learning aspects of e-Learning throughout this research in order to draw conclusions based on accepted learning beliefs.

Table 1.

Population to environment matrix

Population Trait	Learning Theory Principles	Learning Space Application	Technology Application
Group activity oriented	Collaborative, cooperative, supportive	Small-group work spaces	IM chat; virtual whiteboards; screen sharing
Goal and achievement oriented	Metacognition; formative assessment	Access to tutors, consultants, and faculty in the learning space	Online formative quizzes; e-portfolios
Multitaskers	Active	Table space for a variety of tools	Wireless
Experimental; trial-and-error learners	Multiple learning paths	Integrated lab facilities	Applications for analysis and research
Heavily reliant on network access	Multiple learning resources	IT highly integrated into all aspects of learning spaces	IT infrastructure that fully supports learning space functions
Pragmatic and inductive	Encouraging of discovery	Availability of labs, equipment, and access to primary resources	Availability of analysis and presentation applications
Ethnically diverse	Engagement of preconceptions	Accessible facilities	Accessible online resources
Visual	Environmental factors; importance of culture and group aspects of learners	Shared screens (either projector or LCD); availability of printing	Image databases; media editing programs
Interactive	Compelling and challenging material	Workgroup facilitation; access to experts	Variety of resources; no "one size fits all"

From "Learning spaces design theory and practice" by M. Brown, 2005, *EDUCAUSE Review, 40*(4), p. 30. Copyright 2005. Adapted with permission of the author.

Physical Environment

Environment was defined by Warger and Dobbin (2009) as being "the totality of the surroundings and conditions in which something or someone lives or functions" (p. 6). The physical environment is the tangible surroundings that can be felt, seen, tasted, heard, and smelled, e.g., light, design, temperature, humidity, ventilation, and sounds (Dunn & Dunn, 1978; Pines, 1995). It is the environment in which an organism exists, influencing its behavior (Lang, 1996; Pines, 1995). People can be affected by stress brought on by the physical environmental demands, e.g., artificial lighting, day lighting, noise, furniture, and floor plan (Dunn & Dunn, 1978; Lang, 1996; Vischer, 2007). With wireless laptop computers' small screens and small speakers, the physical and social environment may impact the e-Learning culture although studies from Milne (2007) indicated that greater resolution quality significantly reduces this impact. The motivational, environmental, and social support roles influence in learning will be explored in the places students engage in video streamed courses.

Formal Classroom Facilities

The formal classroom itself impacts student behavior and learning (Moos, 1973). Seating arrangements (Becker, Sommer, Bee, & Oxley, 1973; Dunn & Dunn, 1978), comfort, social interaction, air quality, daylight lighting capabilities (aesthetic) (Vischer, 2007), acoustical attributes, support from teacher and peers, and a facility that encourages safety, health, and security (Sustainable Design for Schools, 2004) influence the physical and social environment as it impacts behavior (Dunn & Dunn, 1978). Pastel colors have a calming effect on student behavior in the classrooms (Fielding, 2006). Darker colors

draw student attention, emphasizing mission of the institution and generating excitement (Fielding, 2006).

Although e-Learning does not have a traditional physical, meeting space, it does have a virtual space where learning takes place. This space includes virtual e-Learning environments facilitated through an interface, such as Blackboard, CISCO, Polycom, and Adobe Connect. A myriad of learning materials may be imbedded in these programs for viewing either synchronously or asynchronously.

Functionality of a learning environment, comfort, and aesthetics substantially affect learning (Wedge & Kearns, 2005). Wedge and Kearns (2005) presented a strong case that students are drawn to open spaces that invite and stimulate intellectual thought. Such open spaces will promote engaging conversation and motivate excitement in learning. Table 2 lists considerations in analyzing a learning space. Formal settings (classrooms), informal settings (student commons/centers), as well as alternative venues (coffee house, home, library, etc.) all share one or more qualities that enhances a learning opportunity (Wedge & Kearns, 2005).

Table 2.

Considerations in analyzing learning spaces

Consideration
1. What is the size of the learning space?
2. How any seats does the space have?
3. What is the pedagogical style for the space, e.g., lecture, mixed methods, seminar?
4. What is the layout and functionality of the space?
5. What technology will be available in the space?

Table 2. (continued)

Consideration
6. What is the aesthetic value of the space, e.g., lighting, temperature, acoustics, accessibility, and adaptability?
7. What is the current use or potential use of the space?
8. Who are the learners, and what is known about how they learn?
9. What supports the learning environment?

Many classrooms are being converted and some are being built to support the e-Learner (Johnson & Lomas, 2005; Long & Ehrmann, 2005; Sustainable Design for Schools, 2004; Warger & Dobbin, 2009). For designers to create environments that support teaching and e-Learning processes, they need access to research that describes and recommends the best designs to facilitate an efficient physical and social e-Learning environment.

Home

Home environments feature access to learning resources such as computer, printer, phone, paper, and other support equipment (Hsu & Huang, 2006). Home environments, e.g., comfort, familiarity, have their advantages if the climate supports learning or more importantly, does not hinder or distract the learner (Bandura, 1986). Because 21st century learners are digitally literate, turning nearly any environment outside the traditional classroom into an alternative learning space (Johnson & Lomas, 2005), they have begun to see home as a favorable educational venue. Home is a venue of choice for students who are obligated to spend time with family or who choose those

surroundings for other reasons. However, there are challenges with distractions that are found in an environment where children, television, and domestic responsibilities reside (Schugurensky, 2000). With high speed internet and access to World Wide Web available in most homes and with social climates and instructor presence felt within the visible working template of the media screen, the home becomes a valuable learning environment for the e-Learner (Cofield, 2002).

Alternative Venues

Illeris (2004) described alternative venues as being anywhere learning can take place during the normal course of everyday life. Access to a class, day or night, work or at play, either asynchronously or synchronously is possible with the use of alternative venues (Kinshuk & Yang, 2003). Schugurensky (2000) suggested that although informal learning can complement the learning process, it can also distract from it. Research must be conducted to determine what environmental factors hinder the e-Learning process, to what degree, and what can teachers or learners do to compensate for these factors.

Learning environments that are low stress such as home, libraries, Barnes & Noble, etc., favor reflection, and analytic thinking because the thalamus, hippocampus, and the cortex portions of the brain (memory and higher level thinking) are not used, enabling the electronic pathways that a high stress environment would inhibit. Because of this neurobiology, the brain is allowed to synthesize information on a higher level and exercise creativity (Barry, 2001; Weiss, 2000). These results indicate that low stress venues may provide a greater opportunity to learn more difficult objectives.

Social Environments

Milne (2007) supposed a large contributing factor of student academic success by suggesting that all learning has its basis in interaction with the social, physical, and information technology environment, either independently or in some combined form. Interaction comes in two varieties, human to human and human to information (Milne, 2007) with a direct correlation existing between interactions and learning effectiveness (Oblinger & Hawkins, 2005).

The art of teaching and the task of learning are socially oriented (Bibeau, 2001). Husén (1958) and Wlodkowski (1999) concluded that humans are socially oriented as seen in education activities such as study groups where support from peers are found to be influential and motivate the attainment of educational goals. Moore (1989) identified three social interactions in e-Learning: (1) student-student, (2) student-instructor, and (3) student-course. All three must be accessible and supported in order for a course to be productive (Perrault et al., 2002; Reisetter et al., 2007). Without social engagement the exchange of ideas will be difficult; real knowledge has little chance to evolve (Burdett, 2003; McDonald & Gibson, 1998).

Internet-based curriculum designers address social issues through the use of social environments; they create online courses that incorporate interactive devices such as discussion boards, chats, and blogs (Aragon, 2003; Bernard et al., 2004; King, 2001). Blackboard, Inc. (http://www.blackboard.com/us/index.bbb), recognizing the cognitive approaches outlined by Richardson and Newby (2006) and Deci and Ryan (1985), has integrated a social network into its web programming; this network encourages student-teacher and student-student communication by simulating face-to-face learning

communities (Bernard et al., 2004). Studies of this venue do not explore the amount of work involved to navigate through these social links, e.g., discussion boards, chats, and blogs, designed into web-based e-Learning systems. Merriam et al. (2007) acknowledged that the amount of time e-Learning students have to devote to e-Learning social activities is small and is one main reason students do not participate in them.

Uekawa, Borman, and Lee (2007) found that the level of student engagement in social activities may be attributed to cultural background. Hispanic students in Miami, Florida, and El Paso, Texas, were more engaged in activities and responded more to academic stimuli in problem-solving groups than their peers of other ethnic groups. Asians were more engaged in individual work and less involved in the cooperative environment.

Shin and Chan (2004) advocated that e-Learners who are strongly dedicated to the educational process and are engaged in the activities located in the online environments are more likely to be positive toward learning and the experiences of learning, while Peters (2003) believed social interactions in the e-Learning venue may not be valued as highly by students as by instructors. However, some students feel that being connected to their peers and sharing mutual respect were essential to a quality learning experience (Baumeister & Leary, 1995; Ryan & Deci, 2000). These students are more likely to stay involved in e-Learning programs and succeed than those who are not socially attached to the program or institution (Baumeister & Leary, 1995; Ryan & Deci, 2000; Shin, 2002; Student Research Centre I E T OU, 1986); additionally, involved students exhibit feelings of decreased isolation and increased satisfaction (Hawthornwaite, Kazmer, & Robins, 2000). Pawan, Paulus, Yalcin, and Chang (2003) argued strongly that social and

cognitive presence must exist in order for online learning to be effective; their argument reinforces the study of Cofield (2002) that there is a moderate to high relationship between social presence of the instructor and student satisfaction in the course. Cofield (2002) had found a positive relationship between video streaming media and the students' perception of instructor presence.

Computer-supportive collaborative learning, as suggested by Stahl (2002, 2003a, 2003b), accentuates the importance of group interactions, in that learning is not only a knowledge-transmission process but also a knowledge-creation process evolving from conversations with others, an activity which is critical in interpreting and understanding new knowledge. Increasing the frequency and quality of student-student interactions with improved communication technology will produce better information exchanges (Sanders & Morrison-Shetlar, 2001).

Data related to students' lack of time to engage in an e-Learning course needs to be explored since such a lack does impact student motivation, which is the leading contributor to the success of an e-Learner (Merriam et al., 2007; Shin & Chan, 2004). Mayo (1933) determined that humans are more motivated by social and emotional needs than by financial or physical environment needs. Research involving students forced engagement in the social aspect of an e-Learning environment (chat, discussion boards, wiki's, etc.) and the effect they have on student learning satisfaction and academic achievement needs to be investigated.

Motivation

Motivation is internal (Husén, 1958; Knowles, 1980; Wlodkowski, 1999). How it is linked to behavior is an ongoing debate. Ahl (2006) studied behavior and suggested

that "motivation could be better regarded as a disguised instrument for direction and control" (p. 402) rather than a means that affects action. Table 3 illustrates the general theories of motivation.

Table 3.

Classic Motivation Theories

Human as...	Motivated by...
1. Economical/rational	Rewards and punishment
2. Social	Social norms, groups
3. Psycho-biological	Instincts and drives
4. Learning	Stimuli and/or rewards
5. Need driven	Inner needs
6. Cognitive	Cognitive maps

Learner motivations can be categorized as: interest, relevance (Eccles, 1983), expectancy (Coffin & MacIntyre, 1999), and outcome (Schunk, 1996). Brophy (1987) and Sullivan and Wircenski (1988) believed that no motivation strategy will work unless six basic conditions have been provided by the instructor: (1) supportive environment, instructor must teach on the educational level of the student that challenges them through learning objectives that have higher performance standards; (2) learning objectives must be clearly written with measurable and observable behavior, performance, and condition standards and should reflect a performance expected beyond the class (Sullivan & Wircenski, 1988); (3) instructor linking learning to subjects already taught and will teach;

(4) use of simulation, technology, and gaming; (5) provide immediate feedback; and (6) institute assignments that require active participation and emulate enthusiasm (Sullivan & Wircenski, 1988; Wlodkowski, 1985).

Hsu and Huang (2006) recognized the importance of teacher confidence when using technology so that he/she may reduce student anxiety and raise student self-efficacy in using computers. Teacher training in instructional technology is paramount in order to motivate students. Sarkees-Wircenski and Scott (2003) wrote, "A key factor in learner motivation is teacher attitude" (p. 393). Once learners understand and believe that teachers are empathetic to their needs, recognizes their abilities, and are willing to adjust teaching strategies to aid their learning, student motivation will increase (Sarkees-Wircenski & Scott, 2003).

Intrinsic

The novelty of computers and computer-based learning is itself a motivator for some learners. Robert Aitken had found novelty played a role in learning, especially as an intrinsic motivator (Aitken as cited in Weiss, 2000). With intrinsic motivation being a key factor for e-Learning students (Dunn & Dunn, 1978; Merriam et al., 2007), it is why Courtney (1992) researched motivation for e-Learning students and why Merriam et al. (2007) suggested that more research in motivation for e-Learners be conducted. How the physical and social aspects of the learners' physical space and social academic interactions impact learning motivation must be answered so curriculum can be designed and teachers can be trained to address this issue. The result will be e-Learners who stay motivated and are successful.

Intrinsic motivators among college students include social class, expectations, and student beliefs, e.g., belief about control of learning and mastery of content. The extrinsic motivators, as they pertain to academics, include courses, evaluation, grade, and instructor feedback. Social motivators are instructors, co-workers, family, and student peers. The environment of the college, such as the physical environment, academic associations, internship/volunteer opportunities, and extracurricular activities, also influenced a student's motivation throughout his/her academic career (Husén, 1958; Knowles, 1980; Van Etten, Pressley, McInerney, & Liem, 2008; Wlodkowski, 1999).

Students older than 21 years old (non-traditional) exhibited higher levels of intrinsic motivation for learning than students between the ages of 17-21 (traditional). Non-traditional students showed a greater correlation to intrinsic motivation than the traditional student. Interest and age (maturity) surfaced as compelling determinants of intrinsic motivation to learn, with interest and intrinsic motivation predicting academic success (Bye, Pushkar, & Conway, 2007).

Self-efficacy

Dweck (2000) reported the way a person views him or herself has a direct correlation to the way the person perceives the world and how they can educationally succeed within it, especially as it pertains to past experiences, e.g., self-esteem correlates to success or failure in early grades. Subsequently, Heden and Svensson (1997) and Wlodkowski (1999) had found that when adolescents encounter good educational experiences their motivation remains high, regardless of educational challenges encountered later in life.

As computers gain a foothold in teaching methodology, the level of computer literacy and the student's ability to succeed using technology become inter-dependent, thereby becoming more important in educational procedures. Garland and Noyes (2004) asserted that the lack of computer experience did not make the learner any less capable. Experience depended on the user's exposure to technology and personal use, but with the ever increasing simplicity of point and click learning, speed and sequence became easier and quicker. In practical terms, computer experience was a poor predictor of a student's attitude and success (Dambrot, Watkins-Malek, Silling, Marshall, & Garver, 1985).

Hsu and Huang (2006) concluded that the use and familiarity of computers was the most significant factor in student self-efficacy. Improving the students' perception of the three learning motivations (interest, trend, and employment) and the home environment elevated their confidence. The researchers also determined that students, on average, were "dissatisfied with their school learning environments" (Hsu & Huang, 2006, p. 263). Learning environments do play a role in the learning process. It was a question that this researcher intended to investigate: to determine if the environment of the video streamed student authentically impacted learning satisfaction, and to what degree.

Support

Teachers should mentor their students, encourage their endeavors, and provide guidance in order for their students to, by a significant measure, reach their academic potential. Teacher support was listed as the first element necessary in making a learning environment effective (Brophy, 1987). The teacher could achieve this effectiveness by providing an environment that fosters learning and represents a place of casualness,

communication, and comfort (Evertt & Grubb, 1997). This end can be realized in the e-Learning environment by reducing the anxiety the e-Learner may have with using the technology present in the e-Learning class. Teacher and faculty familiarization with current technology and learning characteristics of the e-student will improve the e-Learners' success and is an area that needs improvement (Sullivan & Wircenski, 1988; Wlodkowski, 1985; Zhu, 2006).

Vandenbroeck, Verschelden, and Boonaert (2008) determined that motivation and anxiety affect computer efficacy and have found that motivation to learn is higher when e-Learners have young children in the family. Children in the home provide a form of social support, e.g., maternal/paternal, which can result in an intrinsic motivation to succeed.

The planning and initiation of collaborative learning can be conducted in the same way by an instructor teaching a video streaming class as an instructor who is planning a face-to-face class. The result in the e-Learner's satisfaction of collaborative learning is comparable with those in the face-to-face instruction (Fill & Ottewill, 2006; Wiecha, Gramling, Joaachim, & Vanderschmidt, 2003). As with any other method of instruction, how collaborative learning exercises are facilitated, especially when blended learning is the method will determine learning success (Graham, 2002). Medical school instructors use collaborative learning strategies to prepare for class, knowing that students interacting with peers derive great satisfaction from the experience (Whitman, 1997). Lipman, Sade, Glotzbach, Lancaster, and Marshall (2001) suggested that a carefully planned delivery of a lesson can make a significant difference toward student success. Merriam et al. (2007) acknowledged research supporting that when a student is engaged

in the learning process, learning is more likely to occur and content is more likely to be retained. E-Learning encourages student interaction; instructors facilitate collaboration. Knowledge is the aggregate of who we are; it defines our identity as individuals (Gergen, 1991; Giddens, 1991).

Barriers to Motivation and Learning

According to Ahl (2006) and Miller (1967) three fundamental categories of variables are barriers to motivational learning: (a) dispositional, e.g., personality traits or qualities developed through adolescence; (b) situational, e.g., current life situation; and (c) institutional (see Table 4).

Table 4.

Motivational Variables

Dispositional - Situational - Institutional
Dispositional
Insufficient self-confidence
Insufficient self-confidence in ability in particular subject
Negative school experiences during adolescence
Identification with anti-education social group
Situational
Lack of time
Lack of interest*
Lack of learning objectives in course
Institutional
Lack of educational opportunities
Lack of educational information
No childcare
Lack of financing
Scheduling problems
Pedagogy not suited for adult learners
Social norms do not support for education
No career advancement with added education

Table 4. (continued)
Institutional
Lack of support for learning at work

**Note.* As Rubenson (1977) has postulated, people are presumed to be naturally interested as long as the education sought is relevant to the learner.

Once a barrier has been identified, it must be removed. For cases in which situational and institutional barriers exist, authorities can provide flexible opportunities with computer based training (e-Learning) to eliminate the barrier, thereby facilitating the motivation necessary to succeed (Selwin, Gorard, & Williams, 2001). Many education professionals recognize that this training will not solve all motivation issues, but it may aid in the achievement of academic goals by some students who are intrinsically motivated.

Selwin, Gorard, and Williams (2001) hypothesized that students would experience an academic motivational conflict when engaged in learning tasks when presented with an attractive alternative activity. This hypothesis was found to be correct; when students performed an academic activity, and they were aware that an attractive alternative activity was going to follow, they were less motivated to finish the academic task, resulting in a lower academic test score (Selwin, Gorard, & Williams, 2001). The academic activity became more challenging as the detractor became more available. This finding was readily admitted to by the participants in surveys and was supported by the quantitative academic testing data analysis. The findings showed that cognitive understanding of the academic tasks or deeper meaning of the lessons was not understood, but simple recall of some details was demonstrated by the participants.

Fries and Dietz (2007) assumed that attractive alternatives proved to interfere with academic performance if a student was still tempted by these activities. The researchers concluded that motivational interference cannot be overlooked in the educational setting which can extend into the students' personal life, e.g., athletics, home life, security, etc. Attractive activities compete for the attention of the student and whichever he/she feels a sense of missed rewards, anxiety can result and distract the student from the academic task. Knowing that the attractive alternative exists is enough of a temptation to lessen student focus and effort, such lack of interest influences the learning outcome.

In the digital age when access to more appealing activities exists at an instant and seems to be unavoidable, future research should incorporate a testing group that replicates this reality. Motivational interference exists; it affects academic success and it has to be studied in more detail. Knowledge of motivational power is paramount if educators are to overcome this barrier.

Summary

The research questions guiding this literature review can be summarized into one overarching theme, 'What factors influence video streaming students learning satisfaction and achievement?' The literature review shows a correlation between the e-Learning physical and social environments and motivation. What factors may be unique to the video streaming e-Learning students' learning climate? What is the impact on the video streaming students' ability to achieve mastery of personal and institutional objectives? E-Learner motivation is necessary in order for the student to accomplish difficult tasks. For this reason, studies investigating the correlation of the physical and social environment and motivation must use grounded and accepted educational theories as their conceptual

foundation; such a foundation is critical for reference to and comparison of traditional face-to-face learning to video streaming. The ability of the video streaming student to study within the physical and social environment afforded by the technology and how the e-Learning social system (chats and discussion boards) were used interested the researcher. Tremendous advancements have been made by e-Learning companies and institutions to accommodate a social network within the e-medium, with Blackboard Learning Systems and Adobe Connect making the social aspects of their programming a priority.

The basis of this study was to determine the factors that influence learning satisfaction using video streaming technology. This chapter began with an examination of the biology and psychology of learning, and then continued with an analysis of Bandura's learning theories and Maslow's hierarchy of needs. This introduction was important as it formed an understanding outlining why technology based learning is effective and supports research and why it is productive. A literary analysis was made to recognize the influence and possible affects of motivation, e.g., intrinsic and self-efficacy, study locations, e.g., home, work, alternative venues, environments, and barriers influencing the attainment of course objectives. Chapter III will provide a discourse on the population of students surveyed and the methods and procedures used to garner research data.

CHAPTER III

Methods and Procedures

This chapter provides an overview of the methods and procedures used to conduct this study. It includes a description of the population and sample, study design, and electronic survey used to gather demographic and attitudinal data regarding participant trends, beliefs, and attitudes concerning their ability to attain course objectives and personal goals through e-Learning techniques. This chapter will present a single stage sampling design concluding with a description of the collection procedures and the statistical analysis used to analyze study data.

Population

All video streaming students who attended the coastal Virginia university during the spring 2009, summer 2009, fall 2009, and spring 2010 semesters were invited to participate in this research study (N=1593). This population represented a heterogeneous demographic that included declared graduate (n=346), declared undergraduate (n=812), and undeclared/no degree students (n=280) students (male, n=878; female, n=986) ranging in age from 19 to 71 years (age groups, 19 to 25, n=416; 26 to 35, n=601; 36 to 45, n=375; >45, n=201), seeking 24 different degrees (see Table 5).

Table 5.

Degrees vs. number of students

Degree Being Sought	Number of Students (N=1593)
Bachelor of Arts	9
Bachelor of Science (BS)	196

Table 5. (continued)

Degree Being Sought	Number of Students (N=1593)
BS in Business Administration	115
BS in Civil Engineering	11
BS in Computer Engineering	3
BS in Computer Science	31
BS in Occupational and Technical Studies	27
BS in Dental Hygiene	2
BS in Electrical Engineering	3
BS in Engineering Technology	293
BS in Environmental Engineering	3
BS in Environmental Health	1
BS in Health Science	35
BS in Mechanical Engineering	1
BS in Medical Technology	2
BS in Nursing	39
Masters of Business Administration	10
Masters of Engineering	26
Masters of Engineering Management	44
Masters of Public Health	10
Masters of Science in Education	145
Masters of Science (MS)	23
MS in Occupational and Technical Education	26
MS in Nursing	1
Doctor of Engineering	3

Table 5. (continued)

Degree Being Sought	Number of Students (N=1593)
Doctor of Philosophy	36
Doctor of Philosophy in Occupational and Technical Education	20
Intended Degree - (undeclared)	163
Non-Degree	279

Research Variables

The research variables were identified and aligned to answer each research question. Independent variables were identified from the literature and included: video stream quality, i.e., encoded streaming video, compressed, and connected at speeds to players that will allow for seamless and synchronous video and audio reception; motivation (Ahl, 2006; Husén, 1958; Knowles, 1980; Wlodkowski, 1999), i.e., enthusiasm or interest that is the genesis of a specific action or behavior (Eccles, 1983); physical environment, i.e., external, tangible surroundings in which an organism exists and which can influence its behavior (Department of Education and Early Childhood Development, 2007); social environment, i.e., social relationships and cultural sphere within which defined groups of people function and interact (Barnett & Casper, 2001); climate, i.e., personality of a setting or environment (Moos, 2009); communication (Bernard et al., 2004; Maslow, 1943; Sanders & Morrison-Shetlar, 2001); interactions (Bandura, 1997; Oblinger & Hawkins, 2005); location (Allen & Seaman, 2007; Rayburn, 2007); and video streaming experience (Kane, 2007; Merriam et al., 2007).

Learning satisfaction, defined as feeling of achievement exhibited through changed behavior determined by elements in the environment (Merriam et al., 2007), was the dependent variable that was influenced by the independent factors.

Instrument Design

The purpose of this research was to determine the effects physical environment, social environments, and motivations have on students learning satisfaction who use video streaming to receive instruction (e-Learning). The researcher developed an eleven survey questions to gather data that determined the degree of influence an independent variable had on student learning satisfaction.

Survey research was the preferred method of collecting data for this research because of its rapid turnaround in data collection as well as the economy and ease of the design (Babbie, 1990). This study's survey approach focused on the conscious perceptions and experiences of the student interacting with the physical and social phenomena of their learning environment and their effect on the students' ability to retain and/or apply the tasks learned, otherwise known as learning effectiveness. The social environment was limited to the student-teacher, student-student, and student-people interactions (face-to-face contact, e-Learning communication such as discussion boards, e-mail, chat rooms, and interactions with family, friends, or others). Motivation and the influences it has on student attitude toward learning tasks were also studied as motivation does influence the engagement of learning tasks and may be unique in ways not yet discovered.

Data were collected by means of a survey containing 11 items. Survey questions were grouped by content to determine the factors that affect learning satisfaction of video streamed students as outlined below.

Research Question 1, Do the physical qualities of an environment including temperature, lighting, noise, and room design relate to the video streamed student's success and satisfaction?, was measured from Survey Questions 1, 3, 6, and 7. These included (1) "How would you rate your video streamed physical environment (home, work, alternative venue, etc.)?", (3) "How would you rate your video streamed social climate such as people interaction, children, and spouse, especially as it pertains to your ability to attain personal learning goals?", (6) "Which aspects of the physical environment influenced your answer the most to Survey Question 1?, and (7) "Where did you take your video streamed class most often?"

Research Question 2, Does the existence of sociability in an alternative learning venue that is at a location other than a face-to-face classroom relate to the video streamed student's success and satisfaction?, was measured through Survey Questions 3, 4, and 5. These included (3) "How would you rate your video streamed social climate such as people interaction, children, and spouse, especially as it pertains to your ability to attain personal learning goals?", (4) "How would you rate your ability to communicate with your instructor using the video streaming/e-Learning media?", and (5) "How would you rate the interactions with your classmates in the video streaming/e-Learning class?"

Research Question 3, What motivational factors does a student possess that lead to academic success in a video streamed class?, was measured through Survey Questions 9, 10, and 11. These included (9) "On a scale of 1 to 13 with 1 being the greatest

motivator and 13 being the least significant motivator, please rate your motivations for taking your video streamed class.", (10) "How would you rate your overall satisfaction of the video streamed class as it pertains to the social climate in your attainment of your academic and personal goals?", and (11) "How would you rate your overall satisfaction of the video streamed class as it pertains to the achievement of your academic and personal goals?"

Research Question 4, Does the quality of the video streamed media relate to student satisfaction and success?, was captured through Survey Questions 1, 2, 3, 8, and 11. These included (1) "How would you rate your video streamed physical environment (home, work, alternative venue, etc.)?", (2) "How would you rate your video streaming experience compared to Face-to-Face learning?", (3) "How would you rate your video streamed social climate such as people interaction, children, and spouse, especially as it pertains to your ability to attain personal learning goals?", (8) "How would you rate the video, sound, and connectivity quality for your video streamed class?", and (11) "How would you rate your overall satisfaction of the video streamed class as it pertains to the achievement of your academic and personal goals?"

Alignment of survey questions, recordable measures to research questions (concepts to be measured), and their association to the literature review which is the research base of this survey can be found in Table 6. See Appendix A for a copy of the complete survey.

Table 6.

Research question concept matrix

Concept Measured	Literature Review	Observable Measures/ Recordable	Survey Questions	Selection
Physical environment				
	Location	Home	SQ. 1, 7	Likert
		Work	SQ. 1, 7	Likert
		Library	SQ. 7,	Likert
		Alternative venue	SQ. 1, 7	Likert
	Physical aspects	Light	SQ. 6	Nominal
		Noise	SQ. 6	Nominal
		Temperature	SQ. 6	Nominal
		Furniture	SQ. 6	Nominal
Sociability climate				
	Classmate interaction	Satisfied/unsatisfied	SQ. 5	Likert
	Instructor interaction	Satisfied/unsatisfied	SQ. 4	Likert
	Grouped	People interaction	SQ. 3	Likert
		Children	SQ. 3	Likert
		Spouse	SQ. 3	Likert
Quality				
	Personal experience	Least preferred/Most preferred	SQ. 2	Likert
	Media quality	Video	SQ. 8	Likert
		Sound	SQ. 8	Likert
		Connectivity	SQ. 8	Likert
Motivation				
	Intrinsic	Interest in topic	SQ. 9	Ranking
		Removal of in-class anxiety	SQ. 9	Ranking
		Academic confidence	SQ. 9	Ranking

Table 6. (continued)

Concept Measured	Literature Review	Observable Measures/ Recordable	Survey Questions	Selection
Motivation				
	Extrinsic	Professional development	SQ. 9	Ranking
		Marketability	SQ. 9	Ranking
		Family	SQ. 9	Ranking
		Prerequisite for degree	SQ. 9	Ranking
		Reputation as lacking rigor	SQ. 9	Ranking
	Outcome	Unsatisfied/satisfied	SQ. 10, 11	Likert
Satisfaction				
	Physical qualities	Success	SQ. 1, 2	Likert
	Social qualities	Success	SQ. 3, 10	Likert

This survey was reviewed for content validity through an analysis by three subject matter experts in the field of video streaming media delivery; Executive Vice President of StreamingMedia.com; Director of Technology, Watson School of Education, University of North Carolina Wilmington; and Department Chair, Department of Instructional Technology, Watson School of Education, University of North Carolina Wilmington; three administrators from distance learning education and technology at Old Dominion University, a leader in distance education, including, Interim Associate Vice President of Distance Learning; Assistant Vice President for Site Operations/Military Distance Learning; and Director of Planning & Development; five video streaming education professors; and one technical writing technician. The survey was determined reliable after review and adjustment to the questions. This assured the alignment of the survey

questions to research questions.

Method of Data Collection

The survey was administered with the use of Inquisite Survey ™ through the College of Education and issued via e-mail to students through the Office of Computing and Communications Services at the coastal Virginia university in April 2010. This method of administering the survey online enabled the quick delivery and return of survey responses and eliminated survey costs. All students who enrolled in video streaming classes at the coastal Virginia university were sent invitations to participate in this study. Included in the invitation was an announcement of a drawing of e-mail addresses for four $50 gift cards as an incentive for all participants of this survey. All students were given assurances by the researcher that identities and personal information would be held in the strictest confidence and participation was strictly voluntary. Students who did not respond to the survey within two weeks of delivery were contacted by e-mail by the researcher, who encouraged their participation. All data were gathered and tabulated by the second week in May 2010. See Appendix B for the introductory e-mail to participate in the study.

Statistical Analysis

After the research population e-mail addresses were gathered from the Registrar's Office of the research university, the surveys were sent to all participants. The survey data were collected and tabulated in order to enable measurements of the scores. Measures are the units of analysis based on survey scores which could be empirically calculated. This was made possible because the opinions of the research populations' "emotion or concept" (Shuttleworth, 2008), or level of preference or satisfaction, had a

Likert score which could be quantitatively measured and applied to answer research questions.

Quantitative data were analyzed using SPSS®. Descriptive statistics, Pearson *r* correlation, ANOVA, R^2, *t*-tests, and stepwise regressions were used to determine significance between independent variables, e.g., video stream quality, motivation, physical environment, climate, communication, interactions, location, video streaming experience, and learning satisfaction (dependent variable).

Descriptive statistics, e.g., mean of responses, standard deviation, were calculated to report characteristics and basic features of a sample. Demographics, e.g., ages, sex, degree sought, were also reported to furnish details that would be missed through a descriptive summary. The researcher sought a minimum significance level of $p < .05$ to indicate influence and significance. Pearson *r*, ANOVA, R^2, and *t*-tests were used along with stepwise regression to offer support of the magnitude of influences of the independent variable by using a comparison between the inferential statistics. This enabled a confident determination of the researcher of which factors offered the most influence (allowing for the limitations of the study).

The purpose of the Pearson *r* correlation coefficient was to indicate a relationship between two measurement variables. Pearson *r* enabled an association of learning satisfaction based on correlational relationships of effectiveness, satisfaction, motivation, physical environment, and climate. The Pearson *r* also determined magnitude of an effect that independent variables had on the dependent variable, i.e., physical environment to learning; quality of the delivery media to learning satisfaction; motivation to take a video

streamed class to learning satisfaction; sociability climate to learning satisfaction; and overall satisfaction to learning.

Linear relationships, as determined by the Pearson *r* analysis and the stepwise regression models and the strength of influence between two or more variables, were compared to ANOVA, R^2, and *t*-tests. Stepwise regression measured the degree of relationship between two or more quantitative variables, i.e., quality of media, physical, and social climate to satisfaction. The backward elimination approach of stepwise regression was used starting with all independent variables in the set removing those variables, one by one, which were not considered significant in the influence of affecting student learner satisfaction ($p > .05$).

Pearson *r* and stepwise regression data were used as predictors of dependent variable behavior, with stepwise regression affording information as to which group of independent variables had the greatest influence on learner satisfaction. See Table 7 for a summary of the statistical analysis to be used in this study.

Table 7.

Independent variable statistical application

Independent Variable	Survey Question	Statistical Analysis	Dependent Variable
Physical environment	SQ. 1, 6, 7	Pearson *r* Stepwise Regression ANOVA R^2	Learning satisfaction
	SQ. 1, 6, 7	Pearson *r*	Learning satisfaction
Sociability climate	SQ. 3, 4, 5	Pearson *r* Stepwise Regression *t*-test R^2	Learning satisfaction

Table 7 (continued)

Independent Variable	Survey Question	Statistical Analysis	Dependent Variable
Quality	SQ. 2, 8	Pearson *r* Stepwise Regression ANOVA *t*-test R^2 Descriptive	Learning satisfaction
Motivation	SQ. 9, 10, 11	Stepwise Regression Descriptive	Learning satisfaction
Satisfaction	SQ. 1, 2, 3, 10	Pearson *r* Stepwise Regression ANOVA *t*-test R^2 Descriptive	Learning satisfaction

Summary

Chapter III outlined the methods and procedures used to gather and analyze data for this quantitative study. Characteristics of the population, e.g., size, age groups, degrees sought, etc., for this study were described. A description of the independent variables, i.e., physical and social environments, video stream quality, motivation, and satisfaction were made and associated to the literature. A description of the Likert scale for the survey, question alignment to independent variables, and supporting characteristics of the survey questions to each other were made in order to enable the prediction and strength of effect on the dependent variable, i.e., learning satisfaction. The independent variables were further explained and aligned with research and survey questions. A matrix detailing the alignment of research questions to survey questions, data collection, and measures were presented to augment the narrative description. This chapter illustrated the instrument design explaining how the survey was validated and

administered through the research university. The method of data collection through Inquisite Survey™ was explained identifying the confidentiality of the participant and the participation incentive. Finally, this chapter described the statistical analysis, measures the researcher intended to use to describe the results, capturing the narrative in a table. The data collected in this study will be used to consummate findings in Chapter IV.

CHAPTER IV

Findings

The problem investigated by this study was to determine factors that affect learning satisfaction of video streamed students. This study was guided by the following research questions:

RQ_1: Do the physical qualities of an environment including temperature, lighting, noise, and room design relate to the video streamed student's success and satisfaction?

RQ_2: Does the existence of sociability in an alternative learning venue that is at a location other than a face-to-face classroom relate to the video streamed student's success and satisfaction?

RQ_3: What motivational factors does a student possess that lead to academic success in a video streamed class?

RQ_4: Does the quality of the video streamed media relate to student satisfaction and success?

An 11 question survey was developed to collect data necessary to answer the four research questions. This chapter provides the findings derived from that survey under the sub-headings Report of Findings, Physical Environment, Social Environment, Motivational Factors, and Video Stream Quality – Satisfaction and Success.

Report of Findings

On April 20, 2010, the survey and invitation was e-mailed to the research population of over 1500 video streamed students at a coastal Virginia university (N=1593) who were enrolled in video streamed classes encompassing four semesters. On

April 21, 2010, an announcement, mirroring the invitation in content, was sent to all video streaming instructors asking for their support in this research study. On May 3, 2010, a reminder, mirroring the invitation in content, was sent to all non-respondents of the research population, and on May 12, 2010, the survey was closed having attained the minimum number of responses necessary for a valid survey study, n=325 (>310) (Bartlett, Kotrlik & Higgins, 2001). On May 14 and May 15, 2010 phone calls were made to those respondents who had an incomplete survey (n=15).

The demographics of the response population were male/female, 136/189; age groups, 19-25 = 51; 26-35 = 104; 36-45 = 100; and > 45 = 70. The demographics and degrees sought by the respondents are displayed in Table 8.

Table 8

Demographics, n=325

Sex	Number of students
Male	136
Female	189
Ages	**Number of students**
19-25	51
26-35	104
36-45	100
>45	70
Degree Being Sought	**Number of Students**
Bachelor of Science (BS)	43
BS in Business Administration	22

Table 8 (Continued)

Degree Being Sought	Number of Students
BS in Civil Engineering	2
BS in Computer Engineering	2
BS in Computer Science	6
BS in Dental Hygiene	2
BS in Engineering Technology	55
BS in Health Science	7
BS in Nursing	3
Masters of Business Administration	6
Masters of Engineering	4
Masters of Engineering Management	8
Masters of Public Health	4
Masters of Science in Education	41
Masters of Science (MS)	17
Doctor of Philosophy	29
Intended Degree - (undeclared)	34

Physical Environment

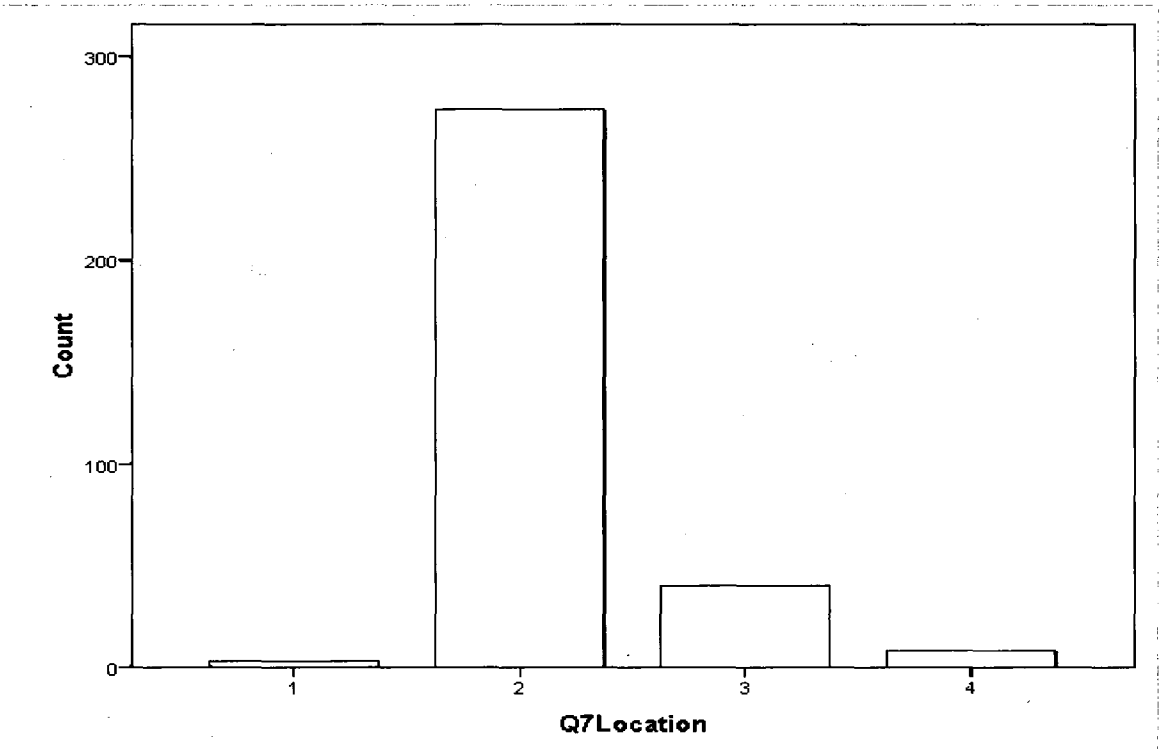
Research Question 1 was to determine if the physical qualities of an environment including temperature, lighting, noise, and room design related to the video streamed student's success and satisfaction. These measures were captured from Survey Questions (SQ) 1, 3, 6, and 7. These included (1) "How would you rate your video streamed

physical environment (home, work, alternative venue, etc.)?", (3) "How would you rate your video streamed social climate such as people interaction, children, and spouse, especially as it pertains to your ability to attain personal learning goals?", (6) "Which aspects of the physical environment influenced your answer the most to SQ 1?, and (7) "Where did you take your video streamed class most often?"

SQ 1 had a mean response of 4.54 out of a possible 5, indicating students took classes in a comfortable physical environment with SQ 3 having a mean response of 3.44 indicating a choice between no preference, 3, and preference, 5, to their video streaming environment. SQ 7 identified the locations that the video streamed students took their class with 84.6% (n=274) from home, 12.3% (n=40) from work, 2.4% (n=8) from a library/alternative venue, and .9% (n=3) taking classes from a dorm. See Figure 4.

Physical environment influences on student satisfaction had a moderate correlation at r =.455 as well as significance in ANOVA, $F(1,321) = 83.98$, $p<.01$. See Table 9. The value of the multiple correlation coefficient from the stepwise linear regression analysis between the predictor (student environment) and outcome (student satisfaction) being .455 yielded a $R^2 = .207$ signifying the measure of how much the variability in student satisfaction is influenced by environment, indicating that student environment accounted for 20.7% of the variation in student satisfaction. The adjusted R^2 (.205) yields to a confidence percentage of .2% in the event an entire population was tested. Student perceptions of their social environment had a moderate correlation to satisfaction at r =.532 and significance, $F(2,320) = 63.19$, $p<.01$. The R^2 value for the stepwise analysis was .283 yielding an extra 7.4% to the variance of student satisfaction.

The adjusted R^2 was .279 yielding a confidence percentage of .4% variance from a general population. See Table 10.



1=Dorm, 2=Home, 3=Work and 4=Library/AltVenue

Figure 4. VS student locations

Table 9

Physical environment influences on student satisfaction (R^2)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.455[a]	.207	.205	.774	.207	83.984	1	321	.000	1.877

a. Predictors: (Constant), 1PhyEnv

b. Dependent Variable: Q11OvallSatGoal

Table 10

Physical environment significance to student satisfaction

ANOVA[c]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	50.297	1	50.297	83.984	.000[a]
	Residual	192.242	321	.599		
	Total	242.539	322			
2	Regression	68.670	2	34.335	63.193	.000[b]
	Residual	173.869	320	.543		
	Total	242.539	322			

a. Predictors: (Constant), Q1PhyEnv

b. Predictors: (Constant), Q1PhyEnv, Q3Soc

c. Dependent Variable: Q11OvallSatGoal

SQ 6 had the students choose the aspects of the physical environment that affected their answer to rating the physical environment of their video streamed class. Room quality (R) was chosen most often at 52.3% (170) followed by noise (N), 44.3% (144); temperature (T), 28.6% (93); alternative activity (A), 26.5% (86); and light 20% (65). See Table 11.

Table 11

Physical environment qualities and response rates

	Physical Environment Qualities				
	Light (L)	Noise (N)	Temp (T)	Room Qual (R)	Alt Act (A)
Responses (Total)	65	144	93	170	86
	LNTRA	LNTR	LNT	NTRA	TRA
Responses (Combination)	14	41	8	1	4
	NRA	NTR	TR	NR	N
Responses (Combination)	3	4	7	8	58

Table 11 (continued)

	Light (L)	Noise (N)	Temp (T)	Room Qual (R)	Alt Act (A)
	LN	NT	A	R	T
Responses (Combination)	1	4	40	79	12
	NA	RA			
Responses (Combination)	11	8			

Social Environment

Research Question 2 was to determine if the existence of sociability in an alternative learning venue that is at a location other than a face-to-face classroom related to the video streamed student's success and satisfaction. These measures were captured through SQ 3, 4, and 5. These included: (3) "How would you rate your video streamed social climate such as people interaction, children, and spouse, especially as it pertains to your ability to attain personal learning goals?", (4) "How would you rate your ability to communicate with your instructor using the video streaming/e-Learning media?", and (5) "How would you rate the interactions with your classmates in the video streaming/e-Learning class?"

A stepwise multiple regression analysis was conducted with SQ 11, Overall Satisfaction-Goals as the dependent variable and SQ 3, Social Climate (family); SQ 4, Communication with Instructor; and SQ 5, Classmate Interaction as the predictors (independent variables). Social climate, expressed as interactions with people, e.g., family, had the greatest influence on student satisfaction with $R^2 = .153$, adjusted $R^2 = .151$; communication with instructor was second with $R^2 = .232$, adjusted $R^2 = .227$; and classmate interaction with $R^2 = .246$, adjusted $R^2 = .239$. This indicated social climate (family) accounted for 15.1% of the variance in student satisfaction, communication with

instructor had an additional 5.1%, and classmate interaction added an additional 1%. See Table 12.

Table 12

R^2 % influence of sociability to student satisfaction

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.392[a]	.153	.151	.800	.153	58.000	1	320	.000	
2	.481[b]	.232	.227	.763	.078	32.497	1	319	.000	
3	.496[c]	.246	.239	.757	.014	5.955	1	318	.015	1.922

a. Predictors: (Constant), Q3Soc

b. Predictors: (Constant), Q3Soc, Q4Comm

c. Predictors: (Constant), Q3Soc, Q4Comm, Q5ClassInter

d. Dependent Variable: 11OvallSatGoal

T-tests revealed significance to student satisfaction with social climate, $t(320) = 4.73$, $p<.01$; communications with instructor, $t(319) = 4.51$, $p<.01$; and classmate interaction, $t(318) = 2.44$, $p<.05$. The standardized coefficients (βeta) indicated the importance of the predictor with social climate as .254, communication with instructor as .250, and classmate interaction as .137, validating and supporting the results of the correlations. The Durbin-Watson value of 1.922 indicated residuals were uncorrelated (independent) and were not an influence on the Beta scores. See Table 13.

Table 13

Beta table and significance of sociability to student satisfaction

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	3.121	.139		22.388	.000	2.847	3.396			
	Q3Soc	.293	.039	.392	7.616	.000	.218	.369	.392	.392	.392
2	(Constant)	2.679	.154		17.397	.000	2.376	2.982			
	Q3Soc	.216	.039	.289	5.523	.000	.139	.293	.392	.295	.271
	Q4Comm	.218	.038	.298	5.701	.000	.142	.293	.398	.304	.280
3	(Constant)	2.521	.166		15.184	.000	2.194	2.847			
	Q3Soc	.191	.040	.254	4.731	.000	.111	.270	.392	.256	.230
	Q4Comm	.182	.040	.250	4.507	.000	.103	.262	.398	.245	.219
	Q5ClassInter	.108	.044	.137	2.440	.015	.021	.195	.341	.136	.119

a. Dependent Variable: 11OvallSatGoal

Motivational Factors

Research Question 3 was to determine what motivational factors does a student possess that lead to academic success in a video streamed class. These measures were captured through SQ 9, 10, and 11. These included (9) "On a scale of 1 to 13 with 1 being the greatest motivator and 13 being the least significant motivator, please rate your motivations for taking your video streamed class", (10) "How would you rate your overall satisfaction of the video streamed class as it pertains to the social climate in your attainment of your academic and personal goals?", and (11) "How would you rate your overall satisfaction of the video streamed class as it pertains to the achievement of your academic and personal goals?"

Question 9 was divided into 13 categories to rank from 1 through 13 with 1 being the most important motivator for taking the video streamed class and 13 being the least important. The categories were: Professional development within current job (ProDev); Marketability, career enhancement (Mark); Purely intrinsic, learning as a life-long learner (Intri); Interest in topic (Intere); Role model for family (RoleMod); Removal of Face-to-Face participation anxiety (F2FAnx); Confidence in achieving academic and personal goals, self efficacy (Confid); Video streamed class's reputation as being easier than Face-to-Face class (VSEasier); Video streamed class's reputation being just as challenging as Face-to-Face class (VSChalle); Prerequisite for degree (Prereq); Cost (Cost); Availability of Course (AvailCour); and Availability of degree (AvailDeg).

Descriptive analyses were conducted on the frequencies of student responses using 1 as the most important motivator and 13 as least important. Data were re-coded from the 13 survey responses in order to facilitate the descriptive means analysis. Likert responses 1-5 were re-coded as 1 (motivator), 6-8 as 2 (little motivation), and 9-13 as 3 (non-motivator). Table 14 represents the means of the descriptive analysis with values closest to 1 denoting a motivator and values closest to 3 illustrating a non-motivator.

Professional development was rated first (21.2% of the time) with course availability (20.1%), prerequisite (19.1%), and availability of a degree (13.8%) being the top four motivations for taking a video streamed class. Video streamed class reputation as being easier (0%), removal of face-to-face anxiety (1.2%), video streamed class's reputation being just as challenging as face-to-face (1.2%), role model (1.2%), cost (1.2%), intrinsic motivation/life-long learner (1.5%), and interest (2.5%) were the least of the considerations in taking a video streamed class. See Table 15.

Table 14

Question 9 mean responses

	Descriptive Statistics		
	Mean	Std. Deviation	N
Q11OvallSatGoal*	4.13*	.868	323
ProDev2	1.64	.816	323
Prereq2	1.52	.745	323
AvailCour2	1.32	.625	323
AvailDeg2	1.57	.779	323
Market2	1.57	.750	323
Confidence2	1.67	.760	323
Intrinsic2	2.30	.756	323
Interest2	1.89	.745	323
RoleModel2	2.35	.795	323
F2F2	2.67	.676	323
Easier2	2.77	.530	323
Challeng2	2.50	.745	323
Cost2	2.25	.842	323

* Q11OvallSatGoal was on a scale of 1-5 with 1 representing not satisfied and 5 being most satisfied

To determine the factors that influence student satisfaction and academic success, a stepwise linear regression analysis was conducted. Availability of Course (AvailCour) was the only factor considered a predictor and making a significant contribution to the model, $t(321) = 2.247$, $p<.05$. See Table 16.

Table 17 reveals that the availability of a course exerts an influence of 1.5% in the variation of student satisfaction. The Durbin-Watson value of 1.836 indicates that the assumption of independent variables is tenable.

Table 15

Survey response rates/ranking to motivation factors, total of (n)

M / Ran	Pro Dev	Mark	Intri	Intere	Role Mod	F2F Anx	Confi d	VS Easier	VS Challe	Prereq	Cost	Avail Cour	Avail Deg
1	69	27	5	8	4	4	26	0	4	62	4	67	45
2	41	55	3	11	9	6	16	5	4	51	8	78	38
3	26	32	13	26	13	15	30	4	11	37	21	47	50
4	32	31	19	24	17	6	51	4	18	32	20	33	38
5	21	47	19	41	22	7	42	4	13	23	32	25	28
6	27	34	33	53	28	9	36	7	14	25	17	17	26
7	23	25	39	47	22	13	35	8	24	20	36	14	20
8	16	22	38	41	31	8	32	24	28	26	23	15	21
9	17	22	32	30	46	23	24	16	30	15	48	9	13
10	11	8	45	18	59	36	20	24	46	7	31	7	13
11	14	12	31	10	32	46	10	51	77	4	24	3	11
12	9	9	22	12	20	64	3	102	31	17	23	8	4
13	19	1	26	4	22	88	0	76	25	6	38	2	18

Ran = Times ranked as "x", M = Motivator

Table 16

Availability of course significance and t score

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95% Confidence Interval for B Lower Bound	95% Confidence Interval for B Upper Bound	Correlations Zero-order	Correlations Partial	Correlations Part
1	(Constant)	3.903	.112		34.849	.000	3.682	4.123			
	AvailCour2	.173	.077	.124	2.247	.025	.022	.324	.124	.124	.124

a. Dependent Variable: Q11OvallSatGoal

Other survey variables or motivators were not included in the stepwise model because their significance was greater than .05, excluded variables, $p>.05$. This finding excludes all motivations except availability of course as having any significant impact on the models ability to predict student satisfaction. See Table 18.

Table 17

Availability of course variability influence on outcome (R^2)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.124[a]	.015	.012	.862	.015	5.050	1	321	.025	1.836

a. Predictors: (Constant), AvailCour2

b. Dependent Variable: Q11OvallSatGoal

Table 18

Excluded variables and significance to student satisfaction

Excluded Variables[b]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics: Tolerance
1	ProDev2	.041[a]	.727	.468	.041	.971
	Prereq2	.012[a]	.210	.834	.012	.911
	AvailDeg2	.020[a]	.326	.744	.018	.848
	Market2	.027[a]	.493	.622	.028	.997
	Confidence2	-.049[a]	-.876	.381	-.049	.967
	Intrinsic2	-.007[a]	-.124	.901	-.007	.902
	Interest2	-.044[a]	-.789	.431	-.044	.974
	RoleModel2	.054[a]	.931	.352	.052	.904
	F2F2	-.059[a]	-1.028	.305	-.057	.939
	Easier2	.072[a]	1.255	.211	.070	.941
	Challeng2	-.087[a]	-1.567	.118	-.087	.995
	Cost2	.032[a]	.568	.571	.032	.979

a. Predictors in the Model: (Constant), AvailCour2

b. Dependent Variable: Q11OvallSatGoal

Video Stream Quality – Satisfaction and Success

Research Question 4 was to determine if the quality of the video streamed media related to student satisfaction and success. These measures were captured through SQ 1, 2, 3, 8, and 11. These included (1) "How would you rate your video streamed physical environment (home, work, alternative venue, etc.)?", (2) "How would you rate your video streaming experience compared to Face-to-Face learning?", (3) "How would you rate your video streamed social climate such as people interaction, children, and spouse, especially as it pertains to your ability to attain personal learning goals?", (8) "How would you rate the video, sound, and connectivity quality for your video streamed class?", and (11) "How would you rate your overall satisfaction of the video streamed class as it pertains to the achievement of your academic and personal goals?"

A descriptive analysis was conducted to evaluate the mean scores of the respondents as they pertain to overall satisfaction with the quality of the video stream class. Scores ranged from 1 being least satisfied to 5 being most satisfied. Students were satisfied with their physical environment (PhyEnv) scoring M=4.56. Students scored toward the no preference mean with video streaming quality, M=3.48; social climate/family, M=3.43; and video streaming experience, M=3.38. See Table 19.

Table 19

Mean score – video stream quality to student overall satisfaction

Descriptive Statistics

	Mean	Std. Deviation	N
Q11OvallSatGoal	4.13	.868	322
Q1PhyEnv	4.56	.808	322

Table 19 (continued)

	Mean	Std. Deviation	N
Q2VSExp	3.38	1.195	322
Q3Soc	3.43	1.159	322
Q8VSQual	3.48	1.119	322

A stepwise linear regression was conducted to evaluate the relationship and influence the independent variables, i.e., physical environment (SQ1), video streaming experience (SQ2), social environment (SQ3), and video streaming class quality (SQ8) had on the dependent variable, overall student satisfaction (SQ11). The ANOVA was significant for all predictors in these models, VSExp, $F(1,320) = 103.21$, $p<.01$; VSExp, PhyEnv, $F(2,319) = 82.16$, $p<.01$; VSExp, PhyEnv, VSQuality, $F(3,318) = 68.62$, $p<.01$; and VSExp, PhyEnv, VSQuality, Soc, $F(4, 317) = 53.10$, $p<.01$ indicating that the overall satisfaction was not derived by chance and that the final model significantly improves our ability to predict the outcome, overall satisfaction. See Table 20.

To validate the ANOVA findings, the coefficients table was analyzed to draw comparisons to *t*-tests. T-tests were found to support the ANOVA with significant contributions made by all the variables in the models. The fourth model which incorporates all of the variables indicates Video Streamed Experience (VSExp), Physical Environment (PhyEnv), and Video Stream Quality (VSQuality) with a significance of $p<.01$ and social environment (Soc) as significant with $p<.05$. See Table 21.

An R^2 analysis was conducted to determine a measure of how much of the variability in the outcome was accounted for by the predictors (independent variables). Video stream experience was first, contributing 24.4% to the variance in overall student satisfaction with physical environment contributing an additional 9.6%, video streaming

quality 5.3%, and social climate .8% respectively. The Durbin-Watson value of 1.882 gives the researcher confidence that the assumption of independent errors have been met. See Table 22.

Table 20

ANOVA overall satisfaction to experience, social climate and video stream quality

ANOVA[e]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	58.966	1	58.966	103.214	.000[a]
	Residual	182.814	320	.571		
	Total	241.780	321			
2	Regression	82.201	2	41.100	82.160	.000[b]
	Residual	159.579	319	.500		
	Total	241.780	321			
3	Regression	95.015	3	31.672	68.624	.000[c]
	Residual	146.764	318	.462		
	Total	241.780	321			
4	Regression	97.008	4	24.252	53.103	.000[d]
	Residual	144.772	317	.457		
	Total	241.780	321			

a. Predictors: (Constant), Q2VSExp

b. Predictors: (Constant), Q2VSExp, Q1PhyEnv

c. Predictors: (Constant), Q2VSExp, Q1PhyEnv, Q8VSQual

d. Predictors: (Constant), Q2VSExp, Q1PhyEnv, Q8VSQual, Q3Soc

e. Dependent Variable: Q11OvallSatGoal

Table 21

T-tests overall satisfaction to experience, social climate and video stream quality

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Correlations		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	2.914	.127		23.007	.000	2.665	3.163			
	Q2VSExp	.359	.035	.494	10.159	.000	.289	.428	.494	.494	.494
2	(Constant)	1.575	.229		6.866	.000	1.124	2.027			
	Q2VSExp	.278	.035	.383	7.917	.000	.209	.347	.494	.405	.360
	Q1PhyEnv	.354	.052	.329	6.815	.000	.252	.456	.459	.357	.310
3	(Constant)	1.241	.229		5.412	.000	.790	1.692			
	Q2VSExp	.230	.035	.317	6.583	.000	.161	.299	.494	.346	.288
	Q1PhyEnv	.318	.050	.296	6.320	.000	.219	.417	.459	.334	.276
	Q8VSQual	.190	.036	.245	5.269	.000	.119	.261	.412	.283	.230
4	(Constant)	1.169	.231		5.070	.000	.716	1.623			
	Q2VSExp	.192	.039	.264	4.895	.000	.115	.269	.494	.265	.213
	Q1PhyEnv	.305	.050	.284	6.038	.000	.205	.404	.459	.321	.262
	Q8VSQual	.184	.036	.238	5.126	.000	.114	.255	.412	.277	.223
	Q3Soc	.082	.039	.109	2.089	.038	.005	.159	.392	.117	.091

a. Dependent Variable: Q11OvallSatGoal

Table 22

R^2 ranking of predictors for overall student satisfaction

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.494[a]	.244	.242	.756	.244	103.214	1	320	.000	

Table 22 (continued)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	Df1	Df2	Sig. F Change	
2	.583[b]	.340	.336	.707	.096	46.448	1	319	.000	
3	.627[c]	.393	.387	.679	.053	27.765	1	318	.000	
4	.633[d]	.401	.394	.676	.008	4.363	1	317	.038	1.882

a. Predictors: (Constant), Q2VSExp
b. Predictors: (Constant), Q2VSExp, Q1PhyEnv
c. Predictors: (Constant), Q2VSExp, Q1PhyEnv, Q8VSQual
d. Predictors: (Constant), Q2VSExp, Q1PhyEnv, Q8VSQual, Q3Soc
e. Dependent Variable: Q11OvallSatGoal

Summary

This chapter provided the analysis of data received from the sample of students surveyed as related to each of the four research questions contained within this study. The instrument and coding of data were presented in order to facilitate an understanding of the development of the analysis in order to illustrate the importance of the analysis. Analysis results were provided for the instrument used.

The demographics of the survey population (n=325) were collected through Inquisite Survey™ and reported as a valid cross section of the research population (N=1593) with a response rate of 20.4%. Research question findings were discussed. The grouping of the data into four areas provided focus to each of the research questions independently.

Research Question 1 was to determine if the physical qualities of an environment including temperature, lighting, noise, and room design relate to the video streamed student's success and satisfaction. SQ 1 had a mean response of 4.54 out of a possible 5 demonstrating that students took classes in a comfortable physical environment. SQ 3

having a mean response of 3.44 indicated an undetermined choice between no preference and preference to their video streaming environment. SQ 7 identified the locations that the video streamed students took their class with 84.6% taking their classes from home. Physical environment influences on student satisfaction were moderate and had significance, $p<.01$ and a R^2 of .207 accounting for 20.7% of the variance on student satisfaction. Social environment also was significant, $p<.01$, accounting for 7.4% of variance to student satisfaction.

Research Question 2 was to determine if the existence of sociability in an alternative learning venue that is at a location other than a face-to-face classroom related to the video streamed student's success and satisfaction. A stepwise multiple regression analysis was conducted with SQ 11 Overall Satisfaction-Goals as the dependent variable and SQ 3 Social Climate (family), SQ 4 Communication with Instructor, and SQ 5 Classmate Interaction as the predictors (independent variables). Social climate had the greatest influence on student satisfaction with $R^2 = .153$; communication with instructor was second with $R^2 = .232$; and classmate interaction with $R^2 = .246$ accounting for 15.1% of the variance in student satisfaction, communication with instructor adding an additional 5.1%, and classmate interaction adding 1% to the total variance. Student satisfaction with social climate and communications with instructor were significant, $p<.01$ with classmate interaction being significant at $p<.05$.

Research Question 3 was to determine what motivational factors does a video streamed student possess that lead to academic success in a video streamed class. Descriptive analyses were conducted on the frequencies attained from SQ 9 responses using 1 as most important motivator and 13 as least important. Professional development

was rated first at 21.2% with course availability (20.1%), prerequisite (19.1%), and availability of a degree (13.8%) being the top four motivations for taking a video streamed class. Video streamed class reputation as being easier (0%), removal of face-to-face anxiety (1.2%), video streamed classes reputation being just as challenging as face-to-face (1.2%), role model (1.2%), cost (1.2%), intrinsic motivation/life-long learner (1.5%), and interest (2.5%) were the least of the considerations in taking a video streamed class.

A descriptive means analysis was conducted on SQ 9 after being recoded. A stepwise linear regression was conducted revealing availability of course was the only factor considered a predictor, $p<.05$ contributing an influence of 1.5% in the variation of student satisfaction. All other variables (predictors) were not considered and excluded from the stepwise linear regression model as they were $p>.05$.

Research Question 4 was to determine if the quality of the video streamed media related to student satisfaction and success. A descriptive analysis was conducted to evaluate the mean scores of the respondents to SQ 1, 2, 3, 8 as they pertain to overall satisfaction with the quality of the video stream class, SQ 11. Scores ranged from 1 being least satisfied to 5 being most satisfied. Students were satisfied with their physical environment (PhyEnv) scoring M=4.56. Students scored toward the no preference mean with video streaming quality, M=3.48; social climate/family, M=3.43; and video streaming experience, M=3.38.

A stepwise linear regression was conducted to evaluate the relationship and influence physical environment (SQ 1), video streaming experience (SQ 2), social environment (SQ 3), and video streaming class quality (SQ 8) had on the dependent

variable, overall student satisfaction. The correlations were significant for all predictors, $p<.01$ and was supported by *t*-tests showing contributions made by all variables in the models. An R^2 analysis was conducted revealing that the video stream experience contributed 24.4% to the variance in overall student satisfaction with physical environment adding 9.6%, video streaming quality 5.3%, and social climate .8% to the total.

Chapter V provides a summary of the findings presented in Chapter 4. The consequence of the analyses of this research will be established deriving conclusions from the analysis of this research. Conclusions will affirm the summary of the data analysis supporting the research questions. Recommendations for the implementation of the research and for future studies will be offered.

CHAPTER V

Summary, Conclusions, and Recommendations

This chapter begins with a restatement of the problem, presentation of the research questions, research instrument, population, limitations, and assumptions. Synopses of the literatures' significant points regarding this study are followed by a brief review of the methodology, sample, findings, and the results of the analysis. Conclusions were drawn regarding each of the research questions discussing each outcome. The chapter concluded with recommendations for implementing the results found through this research study and future research relevant to environments and motivation of video steaming students.

Summary

The problem of this study was to determine factors that affect the learning satisfaction of video streamed students. This study was guided by four research questions:

RQ_1: Do the physical qualities of an environment including temperature, lighting, noise, and room design relate to the video streamed student's success and satisfaction?

RQ_2: Does the existence of sociability in an alternative learning venue that is at a location other than a face-to-face classroom relate to the video streamed student's success and satisfaction?

RQ_3: What motivational factors does a video streamed student possess that lead to academic success in a video streamed class?

RQ_4: Does the quality of the video streamed media relate to student satisfaction and success?

An 11 question survey was developed and delivered through Inquisite Survey™ to collect data necessary to answer the four research questions. The student population was obtained from the registrar's office of the research university with the College of Education at the research university administering the survey and issued via e-mail to students in April 2010.

All video streaming students who attended the coastal Virginia university during the spring 2009, summer 2009, fall 2009, and spring 2010 semesters were invited to participate in this research study (N=1593) with 20.4 % responding (n=325). The population that responded represented a heterogeneous demographic that included declared graduates (n=151), declared undergraduates (n=140), and undeclared/no degree students (n=34), students of both genders (male, n=136; female, n=189) ranging in age from 20 to 59 years (age groups, 19 to 25, n=51; 26 to 35, n=104; 36 to 45, n=100; >45, n=70) with the >45 age group having the highest response rating of 34.8%, 36-45 at 26.7%, 26-35 at 17.3%, and 19-25 at 12.2%, seeking 17 different degrees. In accordance with the research universities human subject's policy all students were given assurances by the researcher that identities and personal information would be held in the strictest confidence and participation was strictly voluntary.

Limitations of the study were: 1. A single coastal Virginia university student population who used video streaming methods, design, and technology to take a course; a coastal Virginia university that was familiar to the researcher as a student of their video streamed courses and accustomed with their procedures and protocol of course delivery and assessment, 2. A coastal Virginia university e-Learning curriculum, teaching strategies, and assessment methods, along with the literature, being used as the e-

Learning models from which the video streamed survey was developed, and 3. The entire video streamed student population (N= 1593) from four semesters of the coastal Virginia university were sent the video streamed research survey.

Throughout this research the following assumptions were made: 1. All students had experienced a traditional formal classroom in either high school and/or college from which a comparison of the different teaching styles/methods, delivery, and assessment strategies associated with video streaming classes could be made, 2. All students had taken a video streamed class, and 3. Reasons for taking a video streamed class were accurately captured in the survey.

The literature review began with a brief history of video streaming technology and its value to the 21st century as a viable means to train and educate a student population (Allen & Seaman, 2007). Video streaming technology won the trust of the medical profession because of student success (Huang, Qiu, Fu, Shimizu, & Okamura, 2008). This was accomplished by students not focusing on technology but rather on the task of learning (Oblinger & Hawkins, 2005). The review of literature continued with the biology and psychology of learning, i.e., Maslow's hierarchy of needs, physical environment, alternative venues, social environment, motivation, self-efficacy, support, and barriers to motivation and learning satisfaction.

The rapidly changing demographics of society and their need to communicate with friends, instructors and family; work; and desire to receive an education directed a change of the learning paradigm and were enabled by video streaming technology. Video streaming technology, content sent in a compressed format over the internet and viewed in real time by the user, has gained great exposure with Fortune 500 company's video

streaming courses to employees for development purposes. Universities have converted classrooms to e-Learning platforms increasing profits to the institution (Johnson & Lomas, 2005; Long & Ehrmann, 2005; Sustainable Design for Schools, 2004; Warger & Dobbin, 2009).

The biology and psychology of learning is social - integrating instruction, collaboration, research, resources, analysis, and results (Wedge & Kearns, 2005). Ahl (2006) and Pinder (1998) suggested that motivation is what causes behavior, and it could alone be the reward for behavior and improving the human condition. Most distance learning students enjoy the novelty of the e-Learning experience and the use of computers, linking dopamine from the endocrine system to emotion and increasing motivation and learning potential (Barry, 2001). Learning environments that are low stress favor reflection and analytic thinking because portions of the brain are not used, enabling the electronic pathways that a high stress environment would inhibit. This empowers the brain to synthesize information more effectively and efficiently (Barry, 2001; Weiss, 2000). These results indicate that low stress venues may provide a greater opportunity to learn more difficult objectives. Leamnson (2001) suggested that learning develops the brain and that computers and technology aids the process.

Maslow's (1943) hierarchy of needs concluded that humans will have a problem concentrating if they are distracted or have unsatisfied needs. People are motivated by intrinsic needs; believing that personal needs must be reached at the lower levels before higher levels can be attained. This point was critical in understanding the needs of a video streaming student when an instructor was not physically present or easily available. Herzberg's (1966) needs based theory identified achievement, recognition, work,

responsibility, promotion, and growth as needs in order to achieve objectives. Husén (1958), Knowles (1980), and Wlodkowski (1999) determined that learning is intrinsically motivated, building on Hertzberg's theory for the human need to grow and on Maslow's theory of self-actualization. Frey and Osterloh (2002) suggested that the first step in student intrinsic motivation is the need to learn without stress.

Warger and Dobbin (2009) defined environment as being "the totality of the surroundings and conditions in which something or someone lives or functions" (p. 6). Dunn and Dunn (1978) defined the physical environment as the tangible surroundings that can be felt, seen, tasted, heard, and smelled. Dunn and Dunn (1978), Lang (1996), and Vischer (2007) determined that people can be affected by stress through the demands of the physical environment influencing their performance in academic studies. The small screens on laptop computers and small speakers may be impacted by the physical environment to a greater degree because of their size. Milne (2007) indicated that greater resolution quality significantly reduced this impact.

The formal classroom impacts student behavior and learning (Moos, 1973). Seating arrangements (Becker, Sommer, Bee, & Oxley, 1973; Dunn & Dunn, 1978), comfort, social interaction, air quality, daylight lighting capabilities (aesthetic) (Vischer, 2007), acoustical attributes, support from teacher and peers, and a facility that encourages safety, health, and security (Sustainable Design for Schools, 2004) influenced the physical and social environment by impacting behavior (Dunn & Dunn, 1978). Functionality of a learning environment, comfort, and aesthetics substantially affect learning (Wedge & Kearns, 2005).

Home environments have advantages if the climate supports and does not distract the learner from the learning process (Bandura, 1986). Home is a venue of choice for students who are obligated to spend time with family. There are challenges with distractions that are found in an environment where children, television, and domestic responsibilities reside (Schugurensky, 2000). With high speed internet and access to World Wide Web available in most homes, it becomes a valuable learning environment for the e-Learner (Cofield, 2002).

Illeris (2004) described alternative venues as being anywhere learning can take place during the normal course of everyday life. Schugurensky (2000) suggested that informal learning can both complement and distract from the learning process suggesting that research be conducted to explore what environmental factors affect the e-Learning process, to what degree, and what teachers or learners can do to compensate for these factors (Schugurensky, 2000).

Milne (2007) suggested that all learning has its basis in interaction with the social, physical, and information technology environment, either independently or in some combined form. Interaction comes in two varieties, human to human and human to information (Milne, 2007) with a direct correlation existing between interactions and learning effectiveness (Oblinger & Hawkins, 2005).

The art of teaching and the task of learning are socially oriented (Bibeau, 2001). Husén (1958) and Wlodkowski (1999) concluded that humans are socially oriented where supports from peers are found to be influential and motivate the attainment of educational goals. Moore (1989) identified three social interactions in e-Learning: (1) student-student, (2) student-instructor, and (3) student-course, recommending that all three be accessible

and supported in order for a course to be productive (Perrault et al., 2002; Reisetter et al., 2007). Without social engagement the exchange of ideas will be difficult; real knowledge has little chance to evolve (Burdett, 2003; McDonald & Gibson, 1998). Mayo (1933) determined that humans are more motivated by social and emotional needs than those offered by physical environment.

Internet-based curriculum designers, e.g., Blackboard, Inc., Accordent Technologies, Inc., etc., address social issues and design a social network into their programming such as discussion boards, chats, and blogs (Aragon, 2003; Bernard et al., 2004; Deci & Ryan,1985; King, 2001; Richardson & Newby, 2006). These developments encourage student-teacher and student-student communication by simulating face-to-face learning communities necessary to attain the full measure of educational experience (Bernard et al., 2004). This supports the findings of Stahl (2002, 2003a, 2003b) who suggested that computer collaborative learning accentuates the importance of group interactions as a knowledge-creation process evolving from conversations with others. Sanders and Morrison-Shetlar (2001) determined that increasing the frequency and quality of student-student interactions with improved communication technology will produce better information exchanges sanctioning the acquisition of learning objectives.

Shin and Chan (2004) advocated that e-Learners who are strongly dedicated to the educational process and are engaged in the activities located in the online environments are more likely to be favorable toward learning, while Peters (2003) believed social interactions in the e-Learning venue may not be valued as highly by students as by instructors. Pawan, Paulus, Yalcin, and Chang (2003) reinforced Cofield (2002) that

social and cognitive presence must exist in order for online learning to be effective recognizing a moderate to high relationship between social presence of the instructor and student satisfaction in the course.

Motivation is internal (Husén, 1958; Knowles, 1980; Wlodkowski, 1999) and must exist if constructive learning is to occur (Paldanius, 2002). Ahl (2006), Frey (1997), and Frey and Osterloh (2002) suggested that motivations directly contribute to the intrinsic and extrinsic inspiration needed by learners to receive the most value or impact of the outcome. Learner motivations can be categorized as: interest, relevance (Eccles, 1983), expectancy (Coffin & MacIntyre, 1999), and outcome (Schunk, 1996). Brophy (1987) and Sullivan and Wircenski (1988) believed that no motivation strategy will work unless six basic conditions have been provided by the instructor: (1) supportive environment, instructor must teach on the educational level that challenges the student; (2) learning objectives must be clearly written with measurable and observable performance behavior that can be applied beyond the class (Sullivan & Wircenski, 1988); (3) instructor linking learning to subjects already taught and those that will be taught; (4) use of simulation, technology, and gaming; (5) provide immediate feedback; and (6) institute assignments that require active participation and emulate enthusiasm (Sullivan & Wircenski, 1988; Wlodkowski, 1985). Robert Aitken had found novelty played a role in learning, especially as an intrinsic motivator (Aitken as cited in Weiss, 2000). The novelty of computers and computer-based learning is itself a motivator for some learners.

Intrinsic motivators among college students include social class, expectations, and student beliefs. Extrinsic motivators include courses, evaluation, grade, and instructor feedback. Social motivators are instructors, co-workers, family, and student peers. The

environment of the college, such as the physical environment, academic associations, internship/volunteer opportunities, and extracurricular activities also influence a student's motivation throughout his/her academic career (Husén, 1958; Knowles, 1980; Van Etten, Pressley, McInerney, & Liem, 2008; Wlodkowski, 1999).

Students older than 21 years old (non-traditional) exhibited higher levels of intrinsic motivation for learning than students between the ages of 17-21 (traditional). Non-traditional students showed a greater correlation to intrinsic motivation than the traditional student. Interest and age (maturity) surfaced as compelling determinants of intrinsic motivation to learn, with interest and intrinsic motivation predicting academic success (Bye, Pushkar, & Conway, 2007).

Heden and Svensson (1997) and Wlodkowski (1999) found that when adolescents encounter good educational experiences their motivation remains high, regardless of challenges later in life. Dweck (2000) reported the way a person views him or herself has a direct correlation with their perception of the world and how they can succeed within it.

As computers gain a foothold in teaching methodology, the level of computer literacy and the student's ability to succeed using technology become inter-dependent, thereby becoming more important in educational procedures. Garland and Noyes (2004) asserted that the lack of computer experience did not make the learner any less capable but it did depend on the user's exposure to technology and personal use while acknowledging that computer experience was a poor predictor of a student's attitude and success (Dambrot, Watkins-Malek, Silling, Marshall, & Garver, 1985). Hsu and Huang (2006) concluded that the use and familiarity of computers was the most significant factor in student self-efficacy.

Teacher support was listed as the first element necessary in making a learning environment effective (Brophy, 1987). The teacher can achieve this effectiveness by providing an environment that fosters learning (Evertt & Grubb, 1997). Teacher and faculty familiarization with technology and learning of the e-student will improve the e-Learners' success (Sullivan & Wircenski, 1988; Wlodkowski, 1985; Zhu, 2006). Vandenbroeck, Verschelden, and Boonaert (2008) determined that motivation and anxiety affect computer efficacy and have found that motivation to learn is higher when e-Learners have young children in the family. Children in the home provide a form of social support, e.g., maternal/paternal, which can result in an intrinsic motivation to succeed.

As with any other method of instruction, how collaborative learning exercises are facilitated, especially when blended learning is the method, will determine learning success (Fill & Ottewill, 2006; Graham, 2002; Wiecha, Gramling, Joaachim, & Vanderschmidt, 2003). When a student is engaged in the learning process, with instructors facilitating collaboration, learning is more likely to occur and content is more likely to be retained (Lipman, Sade, Glotzbach, Lancaster, & Marshall, 2001; Merriam et al., 2007).

The review of the literature concluded with an examination of learning barriers. Three fundamental categories of variables are barriers to motivational learning: (a) dispositional, e.g., personality traits or qualities developed through adolescence; (b) situational, e.g., current life situation; and (c) institutional (Ahl, 2006; Miller, 1967). In cases where situational and institutional barriers exist, authorities can provide flexible opportunities with computer based training (e-Learning) to eliminate the barrier, thereby

facilitating the motivation necessary to succeed (Selwin, Gorard, & Williams, 2001). Fries and Dietz (2007) and Selwin, Gorard, and Williams (2001) hypothesized when students are involved in a learning task and confronted with an attractive alternative activity, a motivational conflict will develop and less motivated to finish the academic task, resulting in a lower academic test score. The academic activity became more challenging when the detractor became more available. Attractive activities compete for the attention of the student and whichever he/she feels a sense of missed rewards, anxiety can result, distracting the student from learning (Fries & Dietz, 2007).

This research examined factors that the physical environment, social environment, and motivational effects had on student satisfaction who used video streaming to receive instruction (e-Learners). The research population consisted of over 1500 students at a coastal Virginia university (N=1593, n=325) who were enrolled in video streamed classes encompassing four semesters. Survey information was void of name. Statistical data necessary for research, e.g., gender, location, degree sought, university college attending, age, and survey responses were kept confidential, secured within the guidelines approved by the Human Subjects Review Board of the coastal Virginia university.

For the purposes of this study, the physical environment was defined as tangible elements that are tasted, felt, heard, or smelled (Fielding, 2006). The social environment was limited to the student-teacher and student-student interactions (face-to-face contact, e-Learning communication such as discussion boards, e-mail, and chat rooms). This study focused on the conscious perception, preferences, and experiences of the student and the physical and social phenomena of their learning environment, and their effect on the students' ability to retain and/or apply the tasks learned (learner satisfaction).

The research variables were identified and aligned to answer each research question. Independent variables were identified from the literature and included: video stream quality, motivation, physical environment, social environment, climate, communication, interactions, location, and video streaming experience. Learning satisfaction, defined as feeling of achievement exhibited through changed behavior determined by elements in the environment, was the dependent variable that was influenced by the independent variables (predictors).

A pilot study provided validity and reliability of the survey as it was unique to this study. Eleven participants comprised the pilot study. Elements of the original survey were changed to aid the understanding of the student as to what the question is asking and to gather the information required by the research question. Demographic gathering programming was also added to Inquisite Survey™.

Conclusions

The exploration of student satisfaction as affected by the physical and social environment, motivation, and video stream quality at the coastal Virginia university resulted in the confirmation of research questions which were developed from the review of the literature. The discovery of physical and social environment qualities as well as student motivation to take a video streamed class may influence student enrollment and student satisfaction. Quantitative data reflective of students' satisfaction were analyzed using SPSS®. Descriptive statistics, Pearson *r* correlation, ANOVA, *t*-tests, and stepwise linear regressions were analyzed to determine significance between predictors (independent variables), e.g., video stream quality, motivation, physical environment, climate, communication, interactions, location, video streaming experience, and learning

satisfaction as an outcome (dependent variable). These data were analyzed to answer each of the study's research questions.

Research Question 1 was, "Do the physical qualities of an environment including temperature, lighting, noise, and room design relate to the video streamed student's success and satisfaction?" Study findings indicate that students took classes in a comfortable environment with a mean score of 4.54 out of 5. This is indicative of the respondents who 85% took their classes from home. This was a conscious decision. A choice that the students intuitively knew was their best location to take a course. Students scored their social climate (family and people interaction) at 3.44 indicating a mean choice of no preference (no influence). Eighty-five percent of video streamed students took their classes from home (n=274) with an average age of 36.5 years revealing a possible non-traditional population. This demographic can begin to infer the lifestyles and needs of this unique population as being professional and greater in age than the traditional college student.

A moderate correlation exhibiting a relationship existed between the physical environment and student satisfaction with r =.455 being supported by ANOVA, $p<.01$. This is a valuable analysis as it shows that the physical environment has an undeniable influence on student satisfaction with it accounting for 20.7% of the variation in student satisfaction. Student perceptions of their social environment had a moderate correlation to satisfaction at r =.532 and significance, $p<.01$ accounting for an additional 7.4% of the variance to student satisfaction. The aspects of the physical environment that affected their rating of their video streamed class had room quality (R) as the most influence at 52.3% (170); following with noise (N), 44.3% (144); temperature (T), 28.6% (93);

alternative activity (A), 26.5% (86); and light 20% (65). Those combinations that stand out has having the most influence are light, noise, temperature, and room quality at n=41; and light, noise, temperature, room quality, and alternative activity at n=14. It becomes evident from this analysis that as independent variables of room quality and noise having the most influence on student preference in satisfaction, but as a combination of factors light, noise, temperature, and room quality was the most common predictor supporting the research of Dunn and Dunn (1978). Room quality and social acceptance of their video streamed environment was not a surprise as the choice of home for the majority of the respondents may place the student in a location they prefer, or perhaps is more convenient, and possibly more comfortable. Being cognizant of the physical qualities of the environment and with noise as having the second greatest influence as predicting satisfaction, the researcher can make an assumption that the noise that was present was generally expected and prepared for, e.g., spouse, children, phone rings, TV, etc.

Research Question 2 was," Does the existence of sociability in an alternative learning venue that is at a location other than a face-to-face classroom relate to the video streamed student's success and satisfaction?" A stepwise multiple regression analysis was conducted with Overall Satisfaction-Goals as the dependent variable and Social Climate (family), Communication with Instructor, and Classmate Interaction as the predictors (independent variables). Social climate had the greatest influence on student satisfaction accounting for 15.1% of the variance in student satisfaction. Communication with instructor added 5.1%, and classroom interaction added 1% to the total influence. There were moderate positive Pearson *r* correlations to student satisfaction with social climate, $p<.01$; communications with instructor, $p<.01$; and classmate interaction, $p<.05$. The

standardized coefficients (βeta) indicated the importance of the predictor with social climate ranking first with .254, communication with instructor, .250, and classmate interaction, .137, validating and supporting the results of the correlations and studies conducted by Milne (2007). The Durbin-Watson value of 1.922 was a strong indicator that other predictors are independent and are not influencing the Beta scores. Social climate as it related to personal interactions with family, support the claim by Vandenbroeck, Verschelden, and Boonaert (2008). This is supported by statements made by the respondents from the survey suggesting that their children and spouse help to motivate them. This social climate correlation is suspected to be influenced by an intrinsic motivation to succeed as well as having a social support. Cofield (2002) could have predicted the significance between communications with the instructor and classmate interactions to student satisfaction as both were significant and valuable predictors of the outcome.

Research Question 3 was, "What motivational factors does a student possess that lead to academic success in a video streamed class?" The analysis began with a re-coding of the responses of SQ 9 which was divided into 13 categories: Professional development within current job (ProDev); Marketability, Career enhancement (Mark); Purely intrinsic, Learning as a life-long learner (Intri); Interest in topic (Intere); Role model for family (RoleMod); Removal of Face-to-Face participation anxiety (F2FAnx); Confidence in achieving academic and personal goals, self efficacy (Confid); Video streamed classes reputation as being easier than Face-to-Face classes (VSEasier); Video streamed classes reputation being just as challenging as Face-to-Face class (VSChalle); Prerequisite for degree (Prereq); Cost (Cost); Availability of Course (AvailCour); and Availability of

degree (AvailDeg).

As motivators professional development was rated first 21.2% of the time with course availability (20.1%), prerequisite (19.1%), availability of a degree (13.8%), marketability (8.3%), and confidence (8%) being the top six motivations for taking a video streamed class. Video streamed class reputation as being easier (0%), removal of face-to-face anxiety (1.2%), video streamed classes reputation being just as challenging as face-to-face (1.2%), role model (1.2%), cost (1.2%), intrinsic motivation/life-long learner (1.5%), and interest (2.5%) were the least of the considerations in taking a video streamed class. Stepwise linear regression analysis was conducted to determine which predictor had the greatest influence on the outcome, student satisfaction. Availability of course (AvailCour) was the only factor considered a predictor and making a significant contribution to the model, $p<.05$ exerting an influence on student satisfaction of 1.5%. All other predictors were removed from the model with $p>.05$.

Research Question 4, "Does the quality of the video streamed media relate to student satisfaction and success?" A descriptive analysis revealed that students were satisfied with their physical environment scoring a mean (M) of 4.56, between no preference and preference with video streaming quality, M=3.48; social climate/family, M=3.43; and video streaming experience, M=3.38. Stepwise linear regression measured the relationships that the physical environment, video streaming experience, social environment, and video streaming class quality had on the dependent variable, overall student satisfaction. The ANOVA indicated significance for all predictors with $p<.01$. The *t*-tests in the coefficients table were evaluated and found to support the ANOVA with significant contributions at the .01 level. Social climate was significant with $p<.05$. This

affirms that the physical and social environment, the quality of the video stream, video streaming class, and overall experience with video streaming has a significant influence on student satisfaction. R^2 analysis indicated the video stream experience contributed 24.4% to the variance in overall student satisfaction with physical environment contributing 9.6%, video streaming quality 5.3%, and social climate .8%. This analysis supports the findings of Oblinger and Hawkins (2005) in which they found a direct correlation between interactions with environment and others to learning effectiveness.

Recommendations

These research findings and conclusions support recommendations for further research. The results of the first research question dealing with physical qualities of an environment, e.g., temperature, lighting, noise, and room design, to academic success and satisfaction support the claims of Dunn and Dunn (1978), Lang (1996), Vischer (2007), and Wedge and Kearns (2005). The physical and social learning environments chosen by the students supported their needs, i.e., comfort and aesthetics (Bandura, 1986), removing learning barriers resulting in the significant influence in student satisfaction (Selwin, Gorard, & Williams, 2001). The home is a valuable learning environment (Cofield, 2002) as seen with the significance scores and with 85% of the respondents taking classes from home.

It is recommended that education communities that teach via video streaming recognize that the home is the location of choice by its video streaming population. Educational communities, e.g., universities, community colleges, and employee development institutions, provide a schedule that supports and accommodates the learner from this learning venue, e.g., classes offered off the times of the normal work day,

courses 90 minutes in length (Sylwester as cited by Weiss, 2000; Leamnson, 2001). It is understood and appreciated that accommodating a schedule may place an added burden on the educational staff and faculty; however an evaluation of the mission statement of the institution will reveal where the focus is to be placed. An accommodating schedule may remove stress barriers from many students who have to take classes from a location or at a time that conflicts with an obligation (Ahl, 2006; Miller,1967). Accommodating students in this direction may increase student satisfaction (Selwin, Gorard, & Williams, 2001).

It is recommended that school administrators who are considering video streaming as a means to teach at a distance consider removing classes from satellite/off campus locations, allowing students to take courses from any location they choose, turning nearly any environment outside the traditional classroom into an alternative learning space (Johnson & Lomas, 2005). This will save universities thousands of dollars each semester in leasing agreements. Increasing the number of video streaming classes and the population within each class will conserve campus resources such as buildings and energy costs. Converting existing classrooms to video streaming platforms will increase university profits and decrease expenditures which is a trend around the country and the world (Johnson & Lomas, 2005; Long & Ehrmann, 2005; Sustainable Design for Schools, 2004; Warger & Dobbin, 2009).

The results of the second research question as it pertains to sociability in an alternative learning venue and the students success and satisfaction validated the claims by Moore (1989), Perrault et al., (2002), and Reisetter et al., (2007) that sociability

between student-student, student-instructor, and student-course are all important for student satisfaction.

It is recommended that universities offer teacher training on video streaming technologies and, in fact, require it before any teacher is placed in front of a camera. Computers and technology are a wave to the future of education and training (Leamnson, 2001). This educational strategy requires instructors to be trained in the technology, so they can effectively apply teaching strategies that will affect learning and goal satisfaction from the video streamed student population (Sarkees-Wircenski & Scott, 2003). Because of the video and sound capabilities of this medium the teacher will have to learn the mechanics and procedures of the equipment as well as design of peripheral educational materials, e.g., video, PowerPoint, overhead camera, etc. Any sign of inadequacies on the part of the instructor can have an adverse effect on the confidence the student has on the instructor which can affect learning (Hsu & Huang, 2006).

It is recommended that class size for video streaming classes remain conventional between 20 – 30 students as it will promote individual student attention with feedback as well as increase teacher level of happiness, morale and enthusiasm towards teaching (McGiverin, Gilman & Tillitski, 1989). Orellana (2006) suggests that class size is optimum between 18 and 23 students for online courses. Class sizes greater than 30 need to be properly compensated as being more than one 3 hour course of instruction.

It is recommended that an effective social program be embedded in all video streaming technology applications where teaching a formal education and training curriculum is required. Richardson and Newby (2006) and Deci and Ryan (1985) have researched the needs and successes of a social network in distance learning programming

media and would support the findings and recommendations of this research requiring that video streaming programming be quicker, more reliable, and accredit efficient communication with the instructor and fellow classmates.

The results of the third research question as it pertains to motivational factors of a video streamed student that enable academic success showed that professional development was the choice chosen most often as first at 21%, second at 12.6%, and third at 8% but yet shown as being insignificant as a predictor of student satisfaction, $p>.05$. This statistic being rated so high as a motivator cannot be ignored and in the opinion of this researcher supports the studies conducted by Frey (1997), Frey and Osterloh (2002), Husén (1958), Knowles (1980), and Wlodkowski (1999) who suggests that learning is intrinsically motivated. Professional development is important as competition for jobs and promotion is becoming more intense and as competition between businesses is determined and aggressive. Universities can market this strategy to increase enrollment.

Availability of course was the only significant predictor to student satisfaction which was contrary to the study done by Bye, Pushkar, and Conway (2007) who suggested that interest combined with intrinsic motivation to learn are predictors of academic success. This study showed that intrinsic motivation (1.5%) and interest (2.5%) were insignificant, $p>.05$ to this video streaming population. This is a tremendously valuable statistic to any university as it supports the scheduling recommendation made in Research Question 1. Video streaming students are a unique population who are comprised of non-traditional students with over 88% from this study being between the ages of 26-59. Most are employed and have commitments beyond the normal 8-5 work

day and need to be accommodated. Courses needed for professional development, marketability, and satisfaction of prerequisite requirements need to be made available.

The results of the fourth research question as it pertains to the quality of the video streamed media and student satisfaction supported this researcher's belief that the quality of the video and the overall social experience has to be high in order to gain satisfaction of the class. This supports the findings of the prior research questions as the quality of the video stream, the programming and connectivity of the media and the sociability it provides enables success and satisfaction of the experience. The actual video stream as experienced by the respondents contributed to the variance as a predictor of student satisfaction. This is a reasonable conclusion as if the video and sound connectivity is disjointed the experience will be null or at the least frustrating, placing learning barriers in the way of overall satisfaction. Since the quality of the video stream is shown to be a contributing factor to student satisfaction a large effort has to be made by video streaming universities and providers such as Accordent Technologies, Inc. to assure the stream is as close to synchronous as possible. The quality of this product reflects directly on the professionalism and reputation of the university and the technology provider so it cannot be compromised. Universities and the technology provider need to make the delivery system seamless and easy to use, enabling social communication with students and instructor virtually immediate with high definition quality. Video stream providers need to accommodate users with information and discounts to acquire computer equipment or HD screens to make their experience as fulfilling as possible.

For further research it is recommended that a qualitative study on factors that influence student satisfaction in an educational venue be conducted. A qualitative

analysis of social and physical environments in video streamed learning venues will give the research community insight to qualities not collected in this quantitative study and give a better understanding of the data reported here. Student narratives and explanations to research questions focused on motivation and sociability will fill gaps in the quantitative analysis by a rationalization of reasons not anticipated or accounted for through numbers. Qualitative analysis will allow for the interpretation of feeling, ideas, reasons, and emotions which will permit a more complete investigation into the factors that influence student satisfaction.

In conclusion, any provision that can improve the video streaming experience to the student will increase the excitement of the course, thereby enhancing the dopamine in the body and allowing neurobiology to access pathways obstructed by stress (Barry, 2001; Weiss, 2000). This endocrine accessibility will commission the body to a level of internal satisfaction not permitted otherwise (Barry, 2001). Developing an academic schedule that allows students to take courses at their leisure, without the requirement of being at a satellite classroom, being in class, or having to adjust their personal obligations will also increase student satisfaction with their overall video streaming class. A person's ability to grow professionally, to increase their chances of promotion within a job, or get hired at another location will allow for greater responsibility. Knowledge and skills attained through video streamed classes (Herzberg, 1966) will be acknowledged by peers and supervisors and will in itself be a motivator for the student to continue the behavior of learning (Foucault, 1995; Pinder, 1998). Video streaming technology can accommodate the factors that influence student satisfaction discovered in this research

study and is an objective that the technology and educational establishment should embrace.

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Appendix A

Survey

Project Title: Factors that Influence Learner Satisfaction Delivered by Video Streaming Technology.

You are asked to participate in a research study designed to determine the factors that influence learner satisfaction delivered through video streaming technology compared to the traditional face-to-face (F2F) method of instruction. This study is being conducted in partial fulfillment of the requirements in the attainment of a doctorate degree at Old Dominion University.

All participants who complete the survey will be **eligible for a drawing of a $50 gift card from the university book store**. Four cards of $50 each will be given away. The drawing will take place in September 2010 and winners will be contacted via e-mail.

Your identity will remain confidential in all aspects throughout the study and thereafter. Your participation in this study is completely voluntary. Taking this survey is your consent for the researcher to use the information you provide for this research study. You can choose not to participate in this survey. Your identity will be protected and kept in guarantee by the researcher.

Please use the rating scale below each question to express your degree of preference or satisfaction using the video streaming/e-Learning method of learning. Please explain your response in the dialogue box below each question. When you have finished a question and ready to move to the next one please scroll to the next question and click FINISH when the survey is completed.

1. How would you rate your video streamed physical environment (home, work, alternative venue, etc.)?
(Choose only one)

( ) Uncomfortable
( ) Somewhat uncomfortable
( ) Neutral
( ) Somewhat comfortable
( ) Comfortable

Please explain how your environment may have aided or hindered your ability to attain educational goals.

[ ]

2. How would you rate your video streaming experience compared to Face-to-Face learning?
(Choose only one)
( ) Least preferred
( ) Less preferred
( ) No preference
( ) Preferred
( ) Most preferred

Please explain details that influenced your response.
[ ]

3. How would you rate your video streamed social climate such as people interaction, children, and spouse, especially as it pertains to your ability to attain personal learning goals?
(Choose only one)
( ) Least preferred
( ) Somewhat preferred
( ) No preference
( ) Preferred
( ) Most preferred

Please explain details of the social climate that influenced your response.
[ ]

4. How would you rate your ability to communicate with your instructor using the video streaming/e-Learning media?
(Choose only one)
( ) Least satisfied
( ) Less satisfied
( ) No preference
( ) Satisfied
( ) Most satisfied

Please explain how communication with your instructor through the video streaming/e-Learning interface helped or hindered your learning experience.
[ ]

5. How would you rate the interactions with your classmates in the video streaming/e/Learning class?
(Choose only one)

( ) Least satisfied
( ) Less satisfied
( ) No preference
( ) Satisfied
( ) Most satisfied

Please explain how interactions with your classmates in the video streaming/e-learning environment affected your learning.
[ ]

6. Which aspects of the physical environment influenced your answer the most to Survey Question 1?
(Select all that apply)

( ) Light
( ) Noise
( ) Temperature
( ) Room arrangement/Furniture
( ) Presence of attractive alternative activity (e.g., video games, coffee shop, TV, etc.)

Please explain details of the physical environment that influenced your response.
[ ]

7. From where did you take your video streamed class most often?
(Choose only one)

( ) Dorm room
( ) Home
( ) Work
( ) Library

Please list any other learning venue you have take a video streaming class that does not qualify as "most often."
[ ]

8. How would you rate the video, sound, and connectivity quality for your video streamed class?
(Choose only one)
( ) Least satisfied
( ) Less satisfied
( ) Neutral
( ) Satisfied
( ) Very satisfied

Please explain elements of the video, sound, or connectivity that influenced your response.
[ ]

9. On a scale of 1 to 13 with 1 being the greatest motivator and 13 being the least significant motivator, please rate your motivations for taking your video streamed class. {Rank the following from 1 to 13}

[ ] Professional development within current job
[ ] Marketability, Career enhancement
[ ] Purely intrinsic, learning as a life-long learner
[ ] Interest in topic
[ ] Role model for family
[ ] Removal of Face-to-Face participation anxiety
[ ] Confidence in achieving academic and personal goals, self efficacy
[ ] Video streamed classes reputation as being easier than Face-to-Face classes
[ ] Video streamed classes reputation being just as challenging as Face-to-Face class
[ ] Prerequisite for degree
[ ] Cost
[ ] Availability of course
[ ] Availability of degree

Please explain your answer.
[ ]

10. How would you rate your overall satisfaction of the video streamed class as it pertains to the social climate in your attainment of your academic and personal goals?
(Choose only one)
( ) Least satisfied
( ) Less satisfied
( ) No preference
( ) Satisfied
( ) Most satisfied

Please explain your answer.
[ ]

11. How would you rate your overall satisfaction of the video streamed class as it pertains to the achievement of your academic and personal goals?
(Choose only one)

( ) Least satisfied
( ) Less satisfied
( ) No preference
( ) Satisfied
( ) Most satisfied

Please explain your answer especially if there are any environmental, social, or motivational influences that lead you to your satisfaction rating above.
[ ]

Appendix B

Invitation

Project Title: Factors that Influence Learner Satisfaction Delivered by Video Streaming Technology.

You are asked to participate in a research study designed to determine the factors that influence learner satisfaction delivered through video streaming technology compared to the traditional face-to-face (F2F) method of instruction. This study is being conducted in partial fulfillment of the requirements in the attainment of a doctorate degree at Old Dominion University.

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Education

BA, Biology, 1978, University of Richmond, VA
ASO, Aviation Safety, 1989, Naval Postgraduate School, Monterey, CA
Ed. Certification, 1995, Alvernia College, Reading, PA
M.Ed., Curriculum and Instruction, Kutztown University, PA
Ph.D., Occupational and Technical Education, 2010, Old Dominion University, Norfolk, VA

Professional Experience

United States Marine Corps, Academics Officer 11/01 to Present

Reading School District - Reading, PA, Senior Chemistry Teacher 8/96-9/01
Senior Chemistry Teacher for academic-college bound students, Senior Class Advisor (00-01).

United States Marine Corps, Squadron Pilot, Aviation Safety Officer 8/78-10/98
Squadron pilot, Aviation Safety Officer, and Operations Officer with HMH-772, Willow Grove, PA.

Pan Am/Trans World Express, Airline Captain 5/86-4/95
Possesses and exercises the privileges afforded by a Commercial Instrument, Airline Transport Pilot license. Possess ratings in Fixed Wing, Rotary Wing. Typed in DHC-7 and SK-65 (CH-53A, D, E, and RH-53)

A Presidential Classroom for Young Americans, Instructor 2004-2009

Publications and Presentations

Keenan, D.S. (2007) *Lucia: Where You Are*. Fredrick, MD: PublishAmerica

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Research Interests

My research interests involve the implementation of video streaming technologies throughout the Marine Corps training and education continuum. I am also researching the use of VTC to expand student experiences at Presidential Classroom, American Scholars, and other 501 (c) 3 organizations.

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