EXPLORING THE UTILIZATION OF WEBCAM VIDEOS TO ASSESS EXERCISE TRAINING AND FITNESS ASSESSMENT SKILLS OF STUDENTS IN AN ONLINE GRADUATE EXERCISE SCIENCE COURSE: A CASE STUDY

by

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Submitted to the Graduate Faculty of the

School of Education in partial fulfillment

of the requirements for the degree of

Doctor of Education

University of Pittsburgh

2008

UNIVERSITY OF PITTSBURGH

FACULTY OF EDUCATION

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ABSTRACT

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University of Pittsburgh, 2008

Online learning (web-based education) continues to have a significant impact on higher education. Increasingly, students seek fully online programs in a broad range of disciplines at the undergraduate and graduate levels. College faculty have produced increasingly more research focusing on how to teach online, including best practices and appropriate web-based course pedagogy. Faculty and college administrators regularly discuss what curricula is appropriate for online learning versus what curricula does not adapt well into online courses. This is especially true for course content in the psychomotor domain which is typically taught in live lab-based courses and traditional "hands-on" focused classroom presentations. A few of the significant challenges for instructors teaching psychomotor skills in the online course environment include: how to appropriately assess student learning of hands-on skills, how to confirm psychomotor skill acquisition, and how to verify the student can teach the skills to other individuals. This research provides a qualitative focus within a problem solving case study that introduces a possible solution for assessing fitness assessment and exercise training techniques learned in a

web-based course. This paper presents background information on the use of web-based learning in the general sphere of higher education and outlines the current range of online education courses in fitness, exercise science, health, and wellness education. This inquiry focuses on a case study analysis exploring the utilization of webcam videos as new assessment tools implemented in a fully web-based course, *PRF 711: An Integrated Approach to Fitness and Wellness*, offered in an Exercise Science and Health Promotion Graduate Program at California University of Pennsylvania. The web-based graduate program offers several psychomotor skill based courses, recently developed at the University. The research results are analyzed supported by survey data, mining data from assessment documents, online classroom observation, and interviews of several students, the instructor, and three subject matter professionals. One goal of this study was to identify the entry-level technology skills, professional experience, client accessibility, and confidence with technology of students enrolled in the PRF 711 course. Another goal was to analyze the experiences and feedback of five students, who used webcams to submit online video/audio course assignments focused on "hands-on" content in the psychomotor domain, more specifically, fitness assessment and exercise activities. The five students were asked to describe experiences, suggestions, and questions regarding the processes and protocols used during video set-up, video recording, project submission, and instructor feedback. An additional goal was to analyze the experiences of the instructor who implemented the video project protocols, evaluated student video projects, and faux-graded student performance. The study also analyzed interview data collected from a variety of stakeholders who made observations and suggestions regarding the video assessment protocol, the assessment instruments, as well provided feedback at the end of the course regarding summative evaluation of the video assessment intervention. The stakeholders interviewed included the Director of

Training and, the Director of Content Development for the National Academy of Sports Medicine (NASM), who were jointly responsible for designing much of the curriculum used in the *PRF 711: An Integrated Approach to Fitness and Wellness* course. Additionally, feedback and insight were analyzed from an instructional designer. Constant comparison of stakeholder feedback and analytic induction were used to organize and categorize the data. Study results show that the new webcam video assessment protocol is a viable solution for assessing hands-on skills in the PRF 711 online course. Several challenges, issues, and solutions are addressed. The study results will be used at California University of Pennsylvania to enhance assessment protocols using webcam videos in courses that require the learning of "hands-on" and psychomotor skills. The study results may also be used as a conceptual framework to examine how web-based courses in several disciplines, with a significant amount of psychomotor objectives, could include online video assessment techniques. The implications of this research for healthcare/fitness educators, students, college administrators, and instructional designers is reviewed in the discussion. Suggestions for areas of further research and future practice are included.

ACKNOWLEDGMENTS

The challenge of writing a dissertation and completing all prerequisites including course requirements, competency examinations, internships, and other tasks is daunting. Several people should be recognized as my support system during my doctoral studies experience. My committee was selected for their individual expertise and passion for innovative research in education. Dr. Diane Davis, an expert in distance education, Dr. Noreen Garman, an expert in qualitative research, and Dr. Elizabeth Nagle, an expert in exercise science education, provided unique contributions allowing me to complete a comprehensive study. I kindly thank each member for their time and invaluable insight. A special thank you to Dr. Lou Berry, my advisor and patient committee chair. Without your patience and ongoing support, I would not have achieved my goal.

Several colleagues have supported me along my journey, helping me stay on task, providing valuable feedback, and providing support during the demanding months writing the dissertation. These colleagues, and more importantly friends, include Prof. Jeff Hatton, Dr. Linda Meyer, Dr. Paula Sammarone Turocy, and Dr. William B. Biddington.

Lastly, I deeply thank from the bottom of my heart my family. My father, Robert E. McGlumphy, did not live to see me complete the degree, but is surely the most proud of my accomplishments. Earning my doctoral degree is a legacy in his honor and memory. My mother, Mary Jane McGlumphy, is equally as proud and content with the achievement. My supporting wife, Jami L. McGlumphy and my two children, Reilly and Cole, deserve great love and thanks for their understanding, motivation, and dedication to me reaching my long time goal.

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1. Introduction

The face of higher education has changed significantly over the past several years. Academe, while usually slow to change, has seen a metamorphosis to some extent with the inclusion of technology into classrooms and the incorporation of classrooms into technology, in the form of online education. "Web-based courses", "e-learning", "accelerated Internet-degree programs", and similar terms have become common "buzzwords" found in college board rooms and often marketed on regional radio and television commercial spots. The Sloan consortium (Sloan-C) has been a leader in tracking the growth of online education, as well as in providing best practices for administrators, faculty, instructional designers, and students. The mission of Sloan-C is described on their website as follows (Sloan-C website, 2007, p. 1):

> The purpose of the Sloan Consortium (Sloan-C) is to help learning organizations continually improve quality, scale, and breadth of their online programs, according to their own distinctive missions, so that education will become a part of everyday life, accessible and affordable for anyone, anywhere, at any time, in a wide variety of disciplines. Created with funding from the Alfred P. Sloan Foundation, Sloan-C encourages the collaborative sharing of knowledge and effective practices to improve online education in learning effectiveness, access, affordability for learners and providers, and student and faculty satisfaction.

According to a recent Sloan-C Report (Allen & Seaman, 2007, p. 5) focused on the 2002-07 academic years:

> Online education is penetrating institutions of higher education in both size and breadth of programs and courses. The number of students taking at least one online course in the fall, 2006 was over 3.5 million students with this number representing 20% of all students enrolled in higher education. This statistic is nearly a 10% increase over the number reported the previous year. Additionally, the 9.7% growth rate for online student enrollments far exceeds the 1.5% growth of the overall higher education student population. More than two-thirds of all higher education institutions now have some form of online offerings, with the majority of these providing programs that are fully online.

Increasingly, more and more people recognize the phrase "world's largest higher education institution" used to describe the University of Phoenix, a predominately distance education for-profit company. Other marketing campaigns also describe the online accelerated offerings at local, traditional colleges and universities, such as the California University of Pennsylvania online program offerings which will be discussed in this study. Companies such as eCollege, Blackboard, and Web-CT (now owned by Blackboard), have supported the growth of distance education by marketing user-friendly, faculty driven web-based courseware and learning management systems, often promoting companion websites for traditional "on-campus" course work as well as fully online courses. Faculty and students alike have become aware of the challenging, and often exciting, possibilities associated with teaching and learning via the Internet. Most colleges have begun, or are beginning to develop, a web-presence offering various forms of web-based courses and, more increasingly, comprehensive, fully online, web-based degree programs. The 2005 Sloan-C report states that "65% of schools offering graduate face-to-face courses also offer graduate courses online. Sixty-three percent of schools offering undergraduate face-to-face courses also offer undergraduate courses online" (Allen & Seaman, 2006). Even more interesting in the report summary, is that "among all schools offering face-to-face master's degrees, 44% also offer master's programs online" (Allen & Seaman, 2006).

According to slightly older data from the National Center for Education Statistics (NCES, 2003) "during the 12-month 2000–2001 academic year, 56% (2,320) of all 2-year and 4-year Title IV-eligible, degree-granting institutions offered distance education courses for any level or audience, (i.e., courses designed for all types of students, including elementary and secondary, college, adult education, continuing and professional education, etc.) Twelve percent of all institutions indicated that they planned to start offering distance education courses in the next

three years; only 31% did not offer distance education courses in 2000–2001, and did not plan to offer these types of courses in the next three years." The 2005 Sloan-C report found that "online enrollment growth rate is over ten times that projected by the NCES for the general postsecondary student population" (Allen & Seaman, 2006, p.8).

Some colleges have emerged as leaders in the race to build and grow distance education programs, while others have allowed the early adopters to find the solutions for the many mistakes made during the development and implementation of such programs. As defined by the National Center for Education Statistics (2003), distance education is "education or training courses delivered to remote (off-campus) sites via audio, video (live or prerecorded), or computer technologies, including both synchronous (i.e., simultaneous) and asynchronous (i.e., not simultaneous) instruction." Distance education is often further defined as being either partially or completely self-paced and self-directed in nature, with the student learning independently while being geographically isolated from instructors who are based at the degree granting institution (Chyung, Winiecki & Fenner, 1998; Eastmond, 1998; Holmberg, 1989; Kember, 1989; Klesius & Thompson, 1997). Distance education in and of itself is not a recent development, rather, technological advances allowing for easier implementation of distance education offerings are relatively new. Distance education as a model emerged as long ago as the 1840s in the form of correspondence courses (Abernathy, Black, Goldstein, & Lohman, 1998; Matthews, 1999). However, the most common form of distance education seen today is web-based courses.

This study is a result of the development and implementation of a distance education graduate degree program in Exercise Science and Health Promotion (ESHP) within the California University Global Online (CalUGO) initiative (see Appendix A). CalUGO, California

University of Pennsylvania's online education "division," is part of the Keystone University Network (KUN). KUN, as part of Pennsylvania State System of Higher Education university consortium, "draws upon the educational excellence of the System's universities and their partners to deliver online education and training services" (Keystone University Network, 2006). Furthermore, "the Keystone University Network draws upon the administrative, technological and instructional strengths of the State System and its universities to deliver affordable, convenient and high-quality online education meeting the diverse needs of individual learners and the business community" (Keystone University Network, 2006). The ESHP Master of Science program, created for working health care and fitness professionals, was developed and implemented in 2003 at California University of Pennsylvania, one of fourteen members of the Pennsylvania State System of Higher Education. The completely web-based, accelerated graduate program was California University's first contribution to the Keystone University Network.

Implementing the fully online Exercise Science and Health Promotion Program has created several challenges with regard to pedagogy. One of the most challenging issues was creating instructional design plans for the delivery of fitness and exercise learning material via the Internet. This was especially challenging since no other University had previously attempted to offer an online program based in exercise and fitness training. Another very challenging issue was designing a method for evaluating student's hands-on skills and verifying that motor skill acquisition occurred during the learning process. While cognitive and affective domain knowledge could be easily evaluated via online exams, threaded discussions, and written projects, motor skill assessment was not easily addressed during program creation. A significant need for a quality psychomotor skill assessment protocol was shaped over the first three years of

the program. One such protocol discussed by faculty within the Exercise Science & Health Promotion program was the use of webcams to evaluate student performance on hands-on motor activities such as fitness assessment and exercise training provided to a client.

This case study specifically explored the implementation of webcams as an assessment tool for evaluating psychomotor skills learning and application in one of the Exercise Science and Health Promotion Program online courses. The primary goal was to explore the many ramifications, as well as feedback from all stakeholders, regarding the use of webcam video assignments to assess psychomotor-related skills and hands-on activities. Additionally, a new protocol for assessing learning of fitness assessment and exercise activities presented in a particular web-based course, *PRF 711: An Integrated Approach to Fitness and Wellness*, (see Appendix B) was evaluated.

The evolution and growth of online degree programs, driven primarily by technological growth and social change, has created a shift in the way some institutions view learning, teaching, administration, marketing, strategic planning, and budgeting (Rogers, 2000). College constituents who have an investment in the success of their institution, such as faculty, staff, administration, and students, quickly understand that successful implementation of online education requires a thorough self-analysis and reassessment of how they do business on a daily basis (Chen, 1997; Garrison, 1989; Inglis, Ling, & Joosten, 1999; Moodie & Nation, 1993; Rumble, 2000). These constituents also realize the importance of having successful models to follow when implementing "best-practice" solutions during program development and implementation. Often, as was the case with this study, successful protocols are driven by student opinion and experiences, as well as faculty experiences and perceptions of what works and what does not. Additionally, subject matter experts in content creation, instructional design,

and content delivery provided insight and expertise in the development and evaluation of the new webcam video assessment protocol. Therefore, this case study offers some "best-practice," practical ideas for implementation of webcam video assessment protocols into online courses that require the learning of psychomotor or "hands-on" skills. The case study also addresses challenges, issues, problems, and solutions identified during the study. Lastly, the study discusses future implications related to research and application of the protocol.

1.1. The Problem

The growth of online education has resulted in various disciplines and related curricular content being transformed into educational offerings via web-based courses. As discipline-specific courses are being transformed to web-based offerings, the faculty and any ancillary staff, such as instructional designers, must evaluate the curricular content to determine if offering the course in a web-based environment is appropriate. While certain curricula represented in traditional "classroom" courses are obvious choices for creating web-based versions, many other courses are often denied transformation based on preconceived notions that the content cannot be presented adequately using online education. In particular, courses that require "hands-on" skill learning and psychomotor objectives often are labeled as inappropriate for web-based courses. The typical rationale given is that there is no recognized pedagogical strategy for delivering these techniques in a way where students can learn and apply the skills and techniques. Additionally, and of particular interest in this study, faculty and administrators often question how to evaluate and assess psychomotor skills via online courses. Many argue and speculate that traditional "face-to-face" observation of psychomotor skills cannot be replicated in the online environment or that any potential solution would not be as good as "face-to-face" live assessment. Regardless of the strong resistance, the skepticism related to delivery of psychomotor skills in online

education has not stopped program and course development in “hands-on” focused disciplines such as medicine, dentistry, exercise physiology, occupational therapy, physical therapy, and nursing (Schleyer & Johnson, 2003; Henrich & Pankey, 1998; Blair & Candler, 1998; Neame, Murphy, Stitt, & Rake, 1999; Wagner NL, Wagner PJ, & Jayachandran, P. 2005). While some of the instructors in the aforementioned disciplines have created resourceful online solutions for delivering psychomotor skill content–narrated lectures, streaming video with audio narration, and simulations, for example–very little practical research exists related to implementing innovative methods and tools for the assessment of psychomotor and hand-on skills in an online course.

The CalUGO initiative, which encompasses the *PRF 711: An Integrated Approach to Fitness and Wellness* course (PRF 711) described in this study, has evaluated each course offered through a variety of fully web-based programs and appraised the courses for pedagogical “soundness” in an online format. In other words, faculty, staff, and University administrators have carefully planned the development and implementation of web-based course offerings. PRF 711 is a psychomotor skill intensive course that has been implemented at California University of Pennsylvania after careful curricular design and planning. This course, along with all psychomotor skill intensive courses at the University, has been designated by the faculty and administration as a “course to watch”. The goal of tracking such courses is to determine whether the learning objectives translate into student success in the course and application of the learned material. While certain outcome measures, such as student evaluations of teaching, course presentation evaluation, and program enrollments, have already resulted in the Exercise Science and Health Promotion program courses being classified as “successes”, one indicator of success has not been evaluated; the pedagogical soundness and practical use of assessment techniques.

More specifically, the topic that has not been pursued prior to this study is the discovery, implementation, and evaluation of assessment techniques that determine whether the students have effectively learned psychomotor skills and hands-on techniques. This study focused on students, the instructor, and various professional colleagues who are involved in the *PRF 711: An Integrated Approach to Fitness and Wellness* course. The course is designed to not only deliver exercise science theory, but also to teach the student a wide variety of psychomotor skills and hand-on fitness assessment and exercise techniques. The participants were interviewed to determine descriptive experiences and perceptions related to the implementation of webcam videos as an assessment tool in the aforementioned course. Additionally, other data collection methods such as observation, survey data, and document analysis techniques were used. While faculty and administrators normally decide whether courses that are "heavy" in psychomotor pedagogy are appropriate for online delivery, the primary goal of this case study is to address the question of quality assessment of student learning in courses delivered in this manner.

1.2. The Purpose of the Study

In order to better describe the purpose, methods, results, and implications of this case study, I present and write with elements of a personal narrative. As summarized by Piantanida and Garman (1999, p.67) "the genre of narrative has attracted considerable interest among educational researchers in the past decade. In many ways, narrative–especially personal narrative–is ideally suited for professionals who want to examine their own practice." According to Piantanida and Garman (1999) "the discourses about qualitative research occur on multiple levels, ranging from highly philosophical and theoretical to very practical." This study leans dramatically towards the "very practical" end of the spectrum, with the goal of creating a "Plan

of Action" based on study results. Additionally, a far-reaching goal is for lessons learned from this study to be applied in a variety of disciplines and situations.

The goals of this study were four-fold. First, determine the backgrounds and experience of students enrolled in one section of the PRF 711 course. The second purpose was to develop a new webcam video assessment protocol to use in the PRF 711 course. Third, the study is designed to determine the perceptions, thoughts, and experiences of several students, the instructor, and three subject matter experts with regard to the new webcam assessment protocol. The last goal is to determine and analyze the outcomes resulting from implementation of the protocol and to examine implications for future applications of the protocol, as well as propose future research methodology. The study was framed by identifying six guiding questions which are listed below:

Question 1: What are the issues related to assessing psychomotor and hands-on skills learned in online courses?

Question 2: Who are the students (learners) studied in this case study including; background, credentials, years of professional experience, experience & confidence in using technology, and access to subjects to be used as clients in video assessment activities?

Question 3: What are the experiences of the instructor and students who are introduced to the new protocols for accessing psychomotor skill performance using webcam video/audio assessment?

Question 4: How does pre-course and post-course feedback from several stakeholders (instructional designer, faculty, leaders in the discipline) affect the formative and summative evaluation and development of the video assessment protocols and processes?

Question 5: What new assessment instruments can be developed during this study that will allow instructors to adequately evaluate student performance via online video projects?

Question 6: Based on the results in this study, what are the implications for online learning?

1.3. The Researcher's Perspective

Before proceeding, it is important to note my perspective as the researcher conducting this study. I believe that my background, experience, and current professional responsibilities appropriately position me as the keystone of this study. As summarized by Piantanida and Garman, (1999, p. 24), "the researcher is as much a part of the inquiry as the intent of the study and the inquiry process. In fact, the researchers thinking lies at the heart of the inquiry." Based on their summation, I will now describe my interest in the issues addressed, and my overall perspective when undertaking this inquiry.

I am the Program Coordinator and an Associate Professor for the Exercise Science and Health Promotion program at California University of Pennsylvania. I have a direct and vested interest in the program as I envisioned, developed, and implemented all facets of the program including curricular content, hiring of faculty, marketing, administration of students, student advisement, and faculty training. My viewpoint on pursuing this study is one of a problem solving and continuous improvement case study analysis. Problem solving, in that I, as Coordinator of the degree program, continually look for improvement, solutions to problems, and progressive evolution of the courses, course delivery, administrative processes, and programmatic policies. I have "lived" with the program for four years and approached this study with the same sense of "living" with the experience. As so eloquently stated by Piantanida and

Garman, (1999 p. 144), "qualitative researchers live with the phenomenon and context of the study, immersing themselves in it and striving to know it as deeply and intimately as possible." I, as the researcher is this study, should be viewed as an "instrument of inquiry." Piantanida and Garman, (1999, p. 144), describe the researchers experience as follows: "At the heart of the inquiry is the researcher's capacity for encountering, listening, understanding, and thus "experiencing" the phenomenon under investigation. Rather than assuming the traditional stance of a detached and neutral observer, an interpretive inquirer, much like a tuning fork, resonates with exquisite sensitivity to the subtle vibrations of encountered experiences." During this study, I truly became highly engaged in the research and became the center of the wheel with the process revolving around me.

As the Coordinator of the program since its inception, I have clearly identified the strengths and weaknesses of delivering a health and fitness degree program via online courses. Of the weaknesses identified, the most commonly discussed in regular discourse with faculty, administrators, prospective students, and others, is the question of assessing student performance and desired skill acquisition outcomes. This study addresses one of the most significant course pedagogical weaknesses identified to date: that is, the ability to visually evaluate whether students are learning, and more importantly, able to perform, applied fitness and exercise techniques learned via web-based courses.

1.4. Significance of the Study

This study is significant for it included the development, implementation, and evaluation of a new webcam video assessment protocol not previously discussed in the literature. Very little data has been collected in this area and, based on discourse among faculty teaching online courses at California University, there is a need for new assessment protocols to be developed

and analyzed in these types of online courses. This study is also significant in that it provides some baseline data and a protocol to be used by future researchers when assessing psychomotor skills learning via web-based coursework. The study has also identified best practices related to psychomotor skill assessment techniques in a web-based course. Lastly, this study is significant because it is a starting point for future research, by this researcher and others, which will cover a wide variety of methodologies assessing psychomotor skill instruction and learning in online education.

1.5. Definitions of Terms

The following terms are defined in this study in the following manor:

Distance education: education or training courses delivered to remote (off-campus) sites via audio, video (live or prerecorded), or computer technologies, including both synchronous (i.e., simultaneous) and asynchronous (i.e., not simultaneous) instruction (National Center for Education Statistics, 2003).

Psychomotor (motor) skill: skills found under the Psychomotor (doing) domain of or relating to motor action directly proceeding from mental activity ("Psychomotor Skill." Def. Merriam-Webster's Collegiate® Dictionary, Eleventh Edition, 2003).

Online education: Credit-granting courses or education training delivered primarily via the Internet to students at remote locations, including their homes. Online courses may be delivered synchronously or asynchronously. An online course may include a requirement that students and teachers meet once or periodically in a physical setting for lectures,

labs, or exams, so long as the time spent in the physical setting does not exceed 25 percent of the total course time (US News and World Report, 2007).

Web-based course: a course offered in a 100% online format via the Internet using such pedagogical tools as narrated lectures, threaded discussions, webliographys, streaming video, and various other tools. Education or training delivered over the Internet and accessible using a browser. WBT may incorporate the use of an instructor or facilitator (elearning glossary, 2007). In this document, "web-based courses" is used interchangeably with "online courses".

Exercise Science and Health Promotion Program: the thirty credit graduate education program offered fully online at California University of Pennsylvania.

1.6. Basic Conditions

The following were basic conditions associated with this study:

1.) Web-based Exercise Science and Health Promotion students, the PRF 711 course instructor, and the selected subject matter experts were the most qualified group to be interviewed regarding the new webcam assessment protocol introduced in this study.

2.) The population of participants was five students, one instructor, and three subject matter experts

3.) All subjects had adequate time to complete the activities, video recordings, and interviews.

4.) All the participants in this study had involvement, in some capacity, in the following course at California University of Pennsylvania: *PRF 711: An Integrated Approach to Fitness and Wellness*.

2. Review of Related Discourse

The following review of discourse includes a broad look at distance education and online learning. Subject areas include historical perspectives, policy issues, training issues, discipline-specific protocols and studies, and several other areas. This discourse review is a result of many years of personal study regarding distance education, an extensive review of related literature, and several insightful discussions with faculty colleagues over the past fifteen years. The review also includes insight and observations resulting from many hours of firsthand experience in policy meetings, strategic taskforce initiatives, and administration of online graduate programs and courses.

2.1. The Evolution of Online Education

"American higher education is in the midst of a virtual revolution" (Kriger, 2001, p. 3). The structure of higher education in America has been relatively unchanged since the first university opened in the 1600s (Farrington & Yoshida, 2000). This structure has been based on the age of mass-production, limited information, and vast sources for funding, and little technological change (Richart, 2002). As the ease of access to higher education allows institutions to come under greater scrutiny (Prestera & Moller, 2001), and as innovation and competition influence the learning environment (Farrington & Yoshida, 2000), society has had a more direct effect on higher education, and society's expectations of these institutions have increased (Carr-Chellman, 2000). According to Bates (1997) and Kriger (2001), institutions of higher education need to be ready for major challenges and possibly structural change Many colleges have found that the goals, and therefore the structure of the organization, have been realigned when incorporating web-based courses and online learning programs into their plans (Hanna, 1998; Prestera & Moller, 2001; Saba, 2002). This realignment of goals also has affected the short and long-term

strategies of institutions. As an example, at California University of Pennsylvania, the University Mission Statement and Vision Statement have been altered recently to address the idiosyncrasies related to distance education and online learning programs. According to the 2005 Sloan-C Report, "the overall percent of schools identifying online education as a critical long-term strategy grew from 49% in 2003 to 56% in 2005" (Allen & Seaman, 2006, p.14). More recently the 2007 Sloan-C Report stated:

> Slightly more than one-third (35 percent) of all higher education institutions (around 1,500 total) are fully engaged in online education. They believe that their online offerings are strategic for their institution and they have fully incorporated online into their formal long-term plan. Not surprisingly, they also have the most extensive online offerings. Fully 69 percent have at least one completely online program. These schools enroll 43 percent of all higher education students but represent nearly three quarters (73 percent) of all online students in fall 2006 (Allen & Seaman, 2007, p.14).

Marketplace demands have affected education in ways that they have not been affected in the past (Hanna, 1998; Thompson, 1999). Higher education has entered a global economy with intense competition and commercialism (Bates, 1997; Rumble, 2000; Taylor & Swannell, 2001; Turoff, 1998). The power distribution of higher education is being realigned in many institutions, with the individuals and organizations who are controlling higher education today not being the ones who will develop and control it in the future (Carr-Chellman, 2000; Hughes, 2001). Universities are dependent more on partnerships and outside vendors, such as agreements with technology companies, other schools, and professional organizations. Partnerships have been formed to make weaker institutions or departments stronger, combine resources, and save duplication of costs. Consortia have been formed so that those colleges who provide similar services for students can pool their resources and expertise for the online student (Farrington & Yoshida, 2000; Hanna, 1998). As a result of consortia offerings, students in many schools are able to put together their own individualized programs for what is known as a virtual degree.

That is, they combine courses or programs from various institutions to make each student's online degree program unique (Garrison, 1989; Hawkins, 2000).

Curriculum and instruction have faced changes, as well. The role of the instructor has changed in the online environment (Young, 2002). Recent discussions with online course instructors at California University of Pennsylvania, as well as colleagues at various eLearning conferences, has revealed a common belief and perception that online courses are very time intensive for faculty. The amount of time required for providing adequate feedback to students, developing online course modules, being available 24/7 via email, and grading narrative projects and case studies, results in an increased number of labor hours for the instructor. In some institutions, different people do different parts of the work of a traditional instructor. Content specialists decide what material needs to go online. An instructional designer designs the presentation of the material, and a technical specialist actually creates the online course. Instructors most typically continue to directly communicate with and teach the students who are taking the online course (Grunert, 1997; Kriger, 2001; Taylor & Swannell, 2001; Young, 2002). A recent example of this was presented at California University of Pennsylvania's "Mission Day" activities in 2006. The Keynote Speaker, Dr. Alan Guskin, described a significant shift in course delivery and responsibilities, incorporating several professionals to deliver an online course versus the singular responsibility on the instructor (Guskin, 2006). He surmised that since the instructor will not be spending time writing lectures and creating course materials, more time will be spent interacting with online students to challenge them individually (Farrington & Yoshida, 2000; Guskin, 2006; Reigeluth & Avers, 1997).

Many student services are being provided by outside vendors. For example, virtual bookstores already exist for many colleges. In fact, students enrolled in the Exercise Science and

Health Promotion program obtain all text materials from Specialty Books, an online vendor. Technical specialists who put classes online do not have to be employees of the college. Short-term marketplace pressures have caused institutions to outsource more and more of their student services (Darnell & Rosenthal, 2000; Graves, 2000; Lloyd, 2000; Turoff, 1998). An example of this outsourcing would be the technical support system used by students and faculty involved in online courses at California University of Pennsylvania, which is provided by an outside vendor, eCollege, Inc. This interface between internal and external resources has created new administrative procedures and in some cases, new management structures and university policies (Hanna, 1998; Taylor & Swannell, 2001; Turoff, 1998). Administrators, especially in the highly competitive market of online education, have been forced to approach their institutions more as a business, than as a traditional institution of higher education (Green, 2001).

In order for online education to be successful, it must be integrated into the organizational structure and vision of the college (Bates, 1997; Bothel, 2001; Morrow, 1999; Rahman, 2001). The administration and faculty at California University have spearheaded the creation of CalU Global Online as an effort to incorporate online education courses and full programs into the organizational structure, vision, mission, and focus. The challenge to higher education is to design an organization that will continuously reform itself (Carr-Chellman, 2000). Traditional campuses will not go away (Hanna, 1998), but organizational change is likely to occur because of the changes and advances web-based programs have provided to teaching, learning, and meeting student needs. Faculty and administrators in many disciplines, including health and wellness disciplines, have started to seriously evaluate the long term potential for online education and the significant shift in course delivery and student assessment. One good example in health education is clearly described in the project title “Universities without walls:

evolving paradigms in medical education" (Neame, et. al, 1999). This work discusses the potential growth of online education in medical training and describes scenarios for delivery of these programs.

Many universities are beginning to realize that planning for a comprehensive online education program is necessary if they want to provide the same type of educational opportunities to the web-based student that they provide to the traditional on-campus student. This planning objective posses the challenge of replicating teaching and assessment techniques in the online course environment. This study will address only a few facets related to online education, specifically psychomotor skill assessment in online courses. However, I feel that it is necessary that this discourse review provide the reader with a variety of researched topics and other discourse addressing several topics in the evolution of online education. In addition to research articles, I also address educational reports, professional organization websites, statistics reported in various media, and personal observations as a professional educator. According to Piantanida and Garman (1999, p. 99):

> Scholarly literature is only one form of discourse that is likely to be occurring about important educational issues. Discourses may also be occurring among various stakeholder groups (e.g., practitioners, consumers, policymakers) and in the media. In crafting a proposal, it is often important to represent these multiple streams of discourse rather than focus only on the formal/theoretical literature. This is one reason why we find the concept of *reviewing discourses* to be more useful than *reviewing literature*.

The next section will provide a historical glimpse at the relatively new development of the Internet as an educational delivery method.

2.2. Online Education- A Historical Perspective

Distance education is an umbrella term that includes many different forms of educational delivery methods, including online education and web-based coursework. Online education has

its roots in the development of the Advanced Research Projects Agency Network (ARPNET) which was a Department of Defense project where four super computers were linked across the United States (Finkenberg, 1998). The goal was to create a network that could "survive" a nuclear war allowing military commands to communicate even if one part of the network was damaged or put out of service. Another primary focus was to develop a research network where scientists around the country could communicate and share data and data analysis information. ARPNET was the precursor that has evolved into today's Internet connecting countries and well over a billion people from around the world (Finkenberg, 1998,). While the infrastructure of the Internet has been in place for over 30 years, the coined term and definition did not arise until a little over a decade ago. On October 24, 1995, the Federal Networking Council (FNC) unanimously passed a resolution defining the term Internet. This definition was developed in consultation with members of the Internet and intellectual property rights communities (Roschelle, 2003). The Internet has grown rapidly since 1995 and as of January 2007 had over 433 million domain names (Internet Software Consortium, 2007). The World Wide Web (WWW), which is a set of standards allowing access to the Internet, was created using the Internet infrastructure. The WWW allows for the transfer of all kinds of data including text, audio, video, pictures, and also allows for high level communications in the form of desktop videoconferencing, web conferences, chat rooms, blogs, threaded discussion, instant messaging, and various other communications tools. In addition to allowing for communication and information retrieval and essentially being available at all times, the WWW has allowed access to information, and most importantly in this study, access to education, anytime, anywhere. The barriers to communication and education over time and place have been dismantled (Finkenberg, 1997).

The growth of the Internet has been rapid compared to other media such as radio which took 38 years to hit 50 million users, and television which took 13 years to hit the same milestone. In comparison, the Internet only took 4 years to hit the 50 million user milestone (Shotsberger, 2000). The WWW has created great opportunity for academia to reshape the way educational offerings are presented, the way students learn, and the way faculty teach. While not without its disadvantages, the WWW has created a rapid shift in education delivery options, not seen before in the history of higher education (Owston, 1997). The growth of the WWW has allowed education to evolve over the past twelve years to the present reality of web-based course offerings and enrollments flourishing across higher education. Hybrid or blended courses, where a traditional course has an online component, and fully online courses now are being offered at several Universities around the country resulting in steady increases of online enrollments (see Table 1.1, Allen & Seaman, 2007, p. 9). The offerings run the gamut from short four week online continuing education courses to fully online graduate programs such as the one described in this study.

Table 1.1: Growth of Online Enrollments 2002-2006

Term and Year	*Students Enrolled in Online Courses*	*Annual Growth Rate of Online Enrollments*
Fall 2002	1,602,970	Not Applicable
Fall 2003	1,971,397	23.0%
Fall 2004	2,329,783	18.2%
Fall 2005	3,180,050	36.5%
Fall 2006	3,488,381	9.7%

Adapted from Allen & Seaman, 2007, p.9.

2.3. The Demand for Exercise Science and Health Promotion Academic Programs

Along with the growth of the Internet and online education, the discipline of exercise science and health promotion has been expanding for several years. There is a primary need for professionals educated in these areas, specifically in the areas of preventative health care, fitness, wellness, and reconditioning from ill-health. Why is there such a need for educational programs in this area? An abundance of statistics is available to illustrate the magnitude, pervasiveness, and consequences of ill-health. For example, in 1998, the total healthcare expenditure for the United States was $1.1 trillion dollars and the yearly growth rate was 5.6%. Over the course of the past decade, the amount is expected to double to $2.2 trillion by the end of 2008. In America, for the year 1998 an average of $3,925 or 13.5% of our gross domestic product (GDP) was spent on each person on healthcare, the highest percentage in the world (Health Care Financing Agency, 2000). However, the Medicare Trustees' Report of 2000 projected that in 75 years the percentage will rise to 30% of the GDP (United States Department of Health and Human Services, 1998). Further, in 1998 there were over 100 million Americans with at least one chronic condition, and in 2000 the cost of chronic care was approximately $503 billion (Robert Wood Johnson Foundation, 2001). Taking a closer look at a specific chronic condition, obesity and being overweight, national medical costs attributed to these conditions accounted for 9.1% of total US medical expenditures in 1998 and reached as high as $96.2 billion in 2002 (Finkelstein, 2003).

Equally staggering estimates have been offered to describe the size of the potential market and the possible or projected savings that could accrue from information technology-related advancements in healthcare. For example, the creation of web-based education modules that focus on preventative healthcare and wellness programs could educate members of our society regarding preventative techniques such as physical activity programs and proper

nutrition. Another example would be widespread funding of online education in health and fitness related curricula. Some evidence exists that the healthcare consumer is increasingly using the Internet. As an example, the Forrester Research Group reported that the healthcare e-commerce market reached $370 billion in 2004 (Forrester Research Group, 2005).

A comprehensive record of the leading causes of death (heart disease, stroke, & cancer) and the incidence of chronic illness in the United States is available through the National Center for Health Statistics' morbidity and mortality statistical databases (National Center for Chronic Disease Prevention and Health Promotion, 2000). McGinnis pointed out that although over 50% of the real causes of death are preventable, less than 5% of the annual US government budget for healthcare costs is devoted to programs that are designed to reduce the burden that is caused by health-compromising lifestyle choices (McGinnis, Deering, & Patrick, 1995). One such program that could be financially supported is a higher education initiative to train more professionals in the areas of wellness and fitness, focusing on building expertise in modifying high risk health behaviors. In a report that was published in 2000, the Center for Advancement of Health estimates that 70% of the healthcare spending in the United States could be saved by modifying behavioral risk behaviors (Center for Advancement of Health, 2000).

Statistics related to specific health conditions and lifestyle choices such as physical activity, diet, and nutritional habits provide additional documentation of the health-compromising trends and behaviors of Americans. For example, Pate (1995) found that an estimated 250,000 deaths per year in the United States are attributable to a lack of regular physical activity, in 1998, it was estimated that 67% of the population was inactive, and between 27% and 31% were totally sedentary (United States Department of Health and Human Services, 1998). A recent report by the CDC on physical activity and good nutrition states that “despite the

proven benefits of physical activity, more than 50% of U.S. adults do not get enough physical activity to provide health benefits; 24% are not active at all in their leisure time. Activity decreases with age, and sufficient activity is less common among women than men and among those with lower incomes and less education." Insufficient physical activity is not limited to adults. More than a third of young people in grades 9–12 do not regularly engage in vigorous physical activity. Daily participation in high school physical education classes dropped from 42% in 1991 to 28% in 2003 (Centers for Disease Control and Prevention, 2006).

In addition to physical activity levels, a second very important area, diet and nutrition, has implications for an array of health conditions. For example, Americans spend $33 billion on the diet industry annually, yet over 50% of the US population is classified as obese, overweight, or susceptible to the co-morbidities that are associated with obesity (Bierut, 2000). More recent data shows that 23.9% of U.S. adults were obese in 2005, and the prevalence of obesity increased during 1995--2005 in all states. In 2005, among the total U.S. adult population surveyed, 60.5% were overweight, 23.9% were obese, and 3.0% were extremely obese (Centers for Disease Control, 2006).

The magnitude and impact of the health problem has implications for individuals as well as providers at multiple levels including organizations, communities, and governments. The motivating forces for addressing the health problems range from bottom-line business and economic factors to humanistic reasons. Strategies that individuals and agencies choose to address health problems, such as those listed below, have important implications throughout all healthcare disciplines, but especially so for those disciplines focused on fitness, wellness, and disease prevention.

The past few years have seen a significant shift towards wellness and fitness programs for members of the U.S. society. Organizations such as Healthy People 2010 have created a plan of action for reducing some of the aforementioned health problems facing our society. As described on the Healthy People 2010 website (Healthy People 2010, 2007):

> Healthy People 2010 is "a set of health objectives for the Nation to achieve over the first decade of the new century. It can be used by many different people, States, communities, professional organizations, and others to help them develop programs to improve health. Healthy People 2010 builds on initiatives pursued over the past two decades. The 1979 Surgeon General's Report, *Healthy People*, and *Healthy People 2000: National Health Promotion and Disease Prevention Objectives* both established national health objectives and served as the basis for the development of State and community plans. Like its predecessors, Healthy People 2010 was developed through a broad consultation process, built on the best scientific knowledge and designed to measure programs over time.

Another program developed to address the growing health concerns is "110 Million by 2010". This program lays out a plan for enrolling 110 million people in fitness programs in health clubs and fitness centers across the country. In its 2005 International Health, Racquet and Sportsclub Association (IHRSA) Global Report, which focuses on the state of the health club industry, IHRSA estimates that there are currently 85 million health club members worldwide – 25 million more than there were five years ago (IHRSA Global Report, 2005). Health club membership grew, on average, by more than seven per cent a year during that period. "Achieving 100 million members by 2010 seems a foregone conclusion," says Jay Ablondi, IHRSA's director of publishing, adding that it would require less than four per cent average annual growth for the industry to reach its goal. The IHRSA leadership is encouraging their association's members to add several more million members and increase the industry's goal to 110 million by 2010 (IHRSA Global Report, 2005, p. 3).

Based on the aforementioned dire situation of the health status in our Country and the growth in the fitness and wellness marketplace, the need for trained professionals who can educate others about fitness, exercise, nutrition and several other wellness areas is very clear. According to the U.S. Department of Labor Bureau of Labor Statistics (Bureau of Labor, 2006, p. 1):

> Opportunities are expected to be good for fitness workers because of rapid growth in the fitness industry. Many job openings also will stem from the need to replace the large numbers of workers who leave these occupations each year. Employment of fitness workers—who are concentrated in the rapidly growing arts, entertainment, and recreation industry—is expected to increase much faster than the average for all occupations through 2014. An increasing number of people spend more time and money on fitness, and more businesses are recognizing the benefits of health and fitness programs and other services such as wellness programs for their employees.

In order to educate and train the professionals needed to implement innovative health and fitness programs, educational institutions must be creative and open-minded about how to provide high quality degree and certificate programs. One such method of education delivery is via web-based courses and fully online degree programs in the fields of exercise, nutrition, fitness assessment, and wellness. The *PRF 711: An Integrated Approach to Wellness and Fitness* course described in this study is designed to teach students how to educate others regarding fitness activities, exercise training, fitness assessment, and overall wellness. The material provided to the students in this course also includes a national certification as a National Academy of Sports Medicine Certified Personal Trainer as part of the curriculum.

2.4. Partnering and Consortia in Distance Education

Partnering has become a common practice in web-based program offerings in higher education. One such example is the partnership created between California University of Pennsylvania and the National Academy of Sports Medicine (NASM). The Master of Science in Exercise Science and Health Promotion program with four distinct tracks: 1.) Wellness and

Fitness, 2.) Performance Enhancement and Injury Prevention, 3.) Rehabilitation Science, and 4.) Sport Psychology is offered by California University of Pennsylvania. The University has worked closely with the National Academy of Sports Medicine (NASM) to develop outstanding course content. The NASM was founded in 1987 by physicians, physical therapists and fitness professionals. Since its inception, the organization has expanded throughout the United States, Asia and Europe and has always focused on the development, refinement and implementation of superior educational programs for fitness, performance and sports medicine professionals.

As previously described, California University of Pennsylvania's online education programs are also part of a consortium, made up of all fourteen Pennsylvania State Universities, which is referred to as the Keystone-University Network (www.keystone-university.net). Described on the Keystone University web site, "as part of the Pennsylvania State System of Higher Education, Keystone University Network draws upon the educational excellence of the System's universities and their partners to deliver online education and training services for the diverse needs of Pennsylvanians" (www.keystone-university.net, 2006).

According to the National Center for Education Statistics, "among the institutions that offered distance education in 2000–2001, 60 percent participated in some type of distance education consortium (NCES, 2003). Of those institutions that participated in a distance education consortium, 75 percent indicated that they participated in a state consortium, 50 percent in a system consortium (a consortium within a single university system or community college district), 27 percent in a regional consortium, 14 percent in a national consortium, and 4 percent in an international consortium." Public 2-year institutions were more likely than either public or private 4-year institutions to participate in some type of distance education consortium. Eighty three percent of public 2-year institutions reported that they participated in a consortium,

compared with 68 percent of public 4-year institutions and 25 percent of private 4-year institutions (NCES, 2003).

2.5. Planning for Online Programs

The earlier description of the evolution and growth of online education does not mean that all colleges should adopt online education programs, nor does it suggest that all faculty should teach online courses. For those colleges that do choose to pursue online education as a delivery mechanism for existing or new academic courses, planning becomes an important requirement. Many authors have written about the necessity of having a vision and plan for the implementation of online education (Aoki & Pogroszewski, 1998; Hache, 2000; Miller, 1998; Moore, 1994; Richart, 2002; Saba, 2000). Hache (2000) made it clear that when college faculty, staff, and administration start with a vision, it is necessary for them to understand that this vision will result in a change in the organizational culture of the University. Online education cannot be molded into the image of existing campus-based programs (Miller, 1998; Saba, 1999) in which administrative and support systems were built for the traditional on-campus student (Aoki & Pogroszewski, 1998; Moore, 1994). The administration at California University of Pennsylvania recognized this when creating the concept of CalU Global Online, a branded branch of the University focusing on online education programs. Administrative support structures, student services, technology support, and faculty training and support needs are all areas that were analyzed and perhaps changed in order to successfully implement web-based programs and individualized web-based courses. By accepting a vision statement and its implications, those at the forefront of online education at the University acknowledge that physical, organizational, and programmatic changes will be occurring, with the inevitable shift of resources (Bloomfield, 1993).

Planning for online education and web-based degree programs traditionally has focused on budget and personnel planning, not on critical pedagogical issues (Bates, 2000; Berge & Smith, 2000; Bothel, 2001; Fryer Jr. & Lovas, 1991). Online education is more than a teaching mode or method; it is a distinct and coherent field of education (Keegan, 1986), focused on new delivery methods and pedagogical philosophy. Administrators have tended to put narrow limits on ways to make technology effective while expecting broad outcomes (Hawkes & Cambre, 2000). Technology is only a means of achieving a goal, not a goal in itself (Frances et al., 1999). There are some administrators that believe that if they supply the technology, the courses and students will come. Several researchers have suggested that technology infrastructure not be built without considering the academic and educational requirements of a web-based program or individual online courses (Bates, 2000; Bunn, 2001; Gibbons & Wentworth, 2001; Rockwell, Furgason, & Marx, 2000; Rumble, 2000; Saba, 1999). Daniel (1997) feared that by letting faculty create their own online courses without a plan, different delivery styles, course management techniques, and confusion for the students would ensue.

Berge and Mrozowski (2001), Care and Scanlan (2001), Chute et al. (1999), Robinson (2000), Verduin and Clark (1991), Walton (2001), and Willis (2000) stated that the planning phase is of major importance in online education, and Gellman-Danley and Fetzner (1998) agreed that advanced planning and policy development are the key to a well-run online education program. This planning allows money to be spent more efficiently such as buying one software package to serve multiple purposes, rather than several packages over several years. Planning also facilitates better use of existing resources and time, for example, developing technical training programs for all faculty rather than having faculty contacting technical support one at a time. For example, strategic planning was instituted by the administration at California

University of Pennsylvania when the University developed the Office of Web-Based Programs (OWBP) as the "one-stop shop" for all constituents of web-based courses. The goal was to consolidate resources into one office so faculty and students had a recognizable, consistent place to go for assistance.

Most plans for online education are incorporated into existing strategic planning documents at colleges and are not separate documents. Hache (2000) studied online education strategic planning and determined that it is a vital tool for growth that will integrate technology into teaching and learning without having to sacrifice the foundations of education. Stone et al. (2001) also found that an online education program will be more successful if it is strategically planned. A systematic approach to planning must be taken in order to provide a quality education for the diverse learning community of the 21st century (Frances, Pumerantz, & Caplan, 1999; Kemp, 2000).

Many authors have suggested that when creating a university's vision and plan for online education, the respect, value, and experience of all the stakeholders should be considered (Drucker, 1986; Hache, 2000; Morrow, 1999; Ohler & Warlick, 2001). Many online education programs are implemented based on a vision that is not universally shared and where the goals are not clearly stated (Bothel, 2001). By including administration, faculty, staff, and students in this process, it is easier to obtain a campus-wide consensus on the vision (Bloomfield, 1993; Hughes, 2001). Tosh, Miller, Rice, and Newman (2000) verified this in reporting that faculty should be involved in determining the priorities, policies, and procedures for implementing online education from the very beginning. Without the commitment of those involved in online education, many issues may not be resolved, and questions may remain unanswered, causing frustration, confusion, and discontentment (Collis, Veen, & De Vries, 1993). Based on the

aforementioned findings, this study focused on several stakeholders input in higher education online course delivery.

The Internet and web-based courses have caused the biggest change in education and learning since the advent of the printed book a little over 500 years ago (Draves, 2000). It is often difficult for people to adapt during times of rapid change. People tend to defend their methods, values, and beliefs and are not willing to take risks, so a solid resistance to the changes that may be created by implementing an online education program should be expected (James, 1996; Robinson, 2000). Draves (2000) declared that the rate of adopting online education and web-based courses would improve if revised policies and procedures and strategies to address significant issues existed. By involving all the stakeholders, determining the purpose or goal for an online education program (Kemp, 2000), and understanding the issues concerning online education from everyone involved, administrators can determine the priorities and constraints with web-based programs and courses that will lead to strategies to minimize the resistance to the changes being made. Yet, who should take the leadership role in developing a vision and plan for online education is disagreed upon within the literature. According to Care and Scanlan (2001) and Mills and Paul (1993), academic administrators should attempt to provide the guidance and leadership for developing a plan for online education. Strategic planning is proactive, dynamic, and directed toward a culture of change (Hache, 2000), so the processes involved in planning need to be led by administrators whose job it is to facilitate change. On the other hand, in order to move forward with online education, others believe that the plan is supported by a commitment of everyone involved. Schifter (2000), Kriger (2001), Myers and Ostash (2001), and Rockwell, Schauer, Fritz, and Marx (2000) argued that without faculty leadership, faculty would tend not to be supportive. Weigel (2000) believed that faculty leading

change would only work if the academic quality of the courses were improved. George and Camarata (1996) felt that leadership, and therefore ownership, of online education and web-based programs, should come from all areas of the college, and not rely simply on administration leadership or faculty leadership.

Husmann and Miller (2001) studied what academic administrators believed to be necessary for an effective online educational program. The administrators claimed that the program needed faculty support and a quality, customer orientation. What the administrators did not see was their role in making online education and web-based courses effective. Administrators have the potential to greatly impact the overall effectiveness and quality of any web-based education program (Husmann & Miller, 2001), yet they are often unaware of the opportunities afforded to their colleges through online education (Garrison, 1989; Moore & Kearsley, 1996). Busy administrators often do not take the time necessary to understand the new terminology, technology, and the issues facing instructors and students (Garrison, 1989; Wenzel, 1999). Husmann and Miller (2001) concluded that administrators see their role as administering the program, not owning the program. They are at times not aware of the impact they have on creating positive changes in online education (Dillon & Cintron, 1997; Dooley & Murphrey, 2000). Yet, administrators have the potential to greatly affect the effectiveness of such a program by securing resources, influencing potential participants (McAlister, Rivera, & Hallam, 2001), supporting the changes, and implementing processes that will overcome the barriers that affect instructors and students (Berge & Mrozowski, 2001). Administrators who have educated themselves about online education and web-based courses create a positive culture that will support others on their campus as they learn and adapt to the new technologies (Robinson, 2000).

With regard to the several hundred colleges offering online programs (Allen & Seaman, 2007), the challenge to these colleges is not to decide why they should have an online distance learning program, but to decide how to design, implement, and maintain online courses. Therefore, understanding how to plan a successful program and individual courses is essential to their success. Instruction is shifting from a model of individual use of technology to an integration of instruction and student services through technology. Yet, according to the California Community College Chancellor's Office, "the race among institutions to develop and offer new distance education courses and programs has surfaced issues which could overwhelm some of the colleges and derail their entire effort" (California Community Colleges, 1999). As Garrison (1989) acknowledged, "progress has been limited because few have the conceptual understanding to create a viable strategic plan for adopting distance learning methods congruent with their institutional values and goals". According to Bothel (2001) and McLendon and Cronk (1999), moving forward with a singular vision and the development of policies and procedures are the greatest challenges in planning for online education and web-based courses.

2.6. Goals of Distance Education Programs

As mentioned in the planning section of this document, quality planning is a key precursor to program achievement, and defining goals for distance education programs are a key component of success. The NCES report (2003) stated that, institutions that offered distance education were asked to report on the importance of various goals to their distance education program, and the extent to which the distance education program had met those goals it considered somewhat or very important. Goals included reducing the institution's per student costs, making educational opportunities more affordable for students, increasing institution enrollments, increasing student access by reducing time constraints for course taking, increasing

student access by making courses available at convenient locations, increasing the institution's access to new audiences, improving the quality of course offerings, and meeting the needs of local employers.

A majority of the institutions that offered distance education indicated that increasing student access in various ways was very important goals to their institution's distance education program. Sixty-nine percent of the institutions that offered distance education courses indicated that increasing student access by making courses available at convenient locations was very important, and 67 percent reported that increasing access by reducing time constraints for course taking was very important (NCES, 2003). In addition, 36 percent reported that making educational opportunities more affordable for students, another aspect of student access, was a very important goal for their distance education program (NCES, 2003).

On issues related to institutional enrollment and cost, 65% of institutions offering distance education indicated that increasing the institution's access to new audiences was very important, 60% reported that increasing the institution's enrollments was very important, and 15% reported that reducing the institution's per-student costs was very important. Additionally, improving the quality of course offerings was considered to be an important goal by 57% of the institutions, and meeting the needs of local employers was rated as very important by 37% of the institutions (NCES, 2003).

In general, institutions reported that most of the goals they considered to be important were being met to a moderate or major extent. Increasing student access by making courses available at convenient locations was reported to have been met to a major extent by 37% of institutions that considered it an important goal, and increasing student access by reducing time

constraints for course taking was reported to have been met to a major extent by 32% of institutions that considered it an important goal (NCES, 2003).

When looking at different categories of schools, the importance of various goals varied by institutional type. Public two-year institutions were more likely than either public or private four-year institutions to report that the following goals were very important to their distance education program: making educational opportunities more affordable for students (46% compared with 36 and 26%), increasing student access by reducing time constraints for course taking (73% compared with 66 and 61%), improving the quality of course offerings (66% vs. 53 and 53%), and meeting the needs of local employers (50% vs. 31 and 27%) (NCES, 2003). In addition, public two-year institutions were more likely than public 4-year institutions to report that increasing institution enrollments was a very important goal for their distance education program (64% vs. 58%) (NCES, 2003).

Institutions that reported that a particular goal was very important to their distance education program more often indicated that the goal had been met to a major extent compared with institutions that reported the goal was somewhat important, while institutions that reported a goal as somewhat important more frequently indicated that the goal had been met to a minor extent compared with institutions that rated the goal as very important. For example, of the institutions that indicated that increasing student access by reducing time constraints for course taking was a very important goal, 43% had met that goal to a major extent, compared with 8% of institutions that indicated the goal was somewhat important (NCES, 2003). In contrast, 44% of institutions reporting that this was a somewhat important goal met the goal to a minor extent, compared with 15% that indicated the goal was very important (NCES, 2003).

2.7. Web-Based Degree Program Offerings

The history of schools offering web-based courses or complete online education programs can be tracked via various reports. For example, trends can be tracked by looking at how common online degree and certificate programs have become over the past seven years starting in 2000. In 2000–2001, only 19% of all two- and four-year institutions had degree or certificate programs designed to be completed totally through distance education (NCES, 2003). Most schools in 2000-01 which offered online courses only offered non-program related individual online courses. Of the schools that offered degree or certificate programs, institutions were more likely to offer online degree programs than certificate programs (NCES, 2003). Among the institutions that offered online courses, 30% offered degree programs and 16 percent offered certificate programs designed to be completed totally through distance education. Among the institutions that had undergraduate programs of any type and offered online courses, 21 percent offered undergraduate degree programs, and 12 percent offered undergraduate certificate programs (NCES, 2003). Among the institutions that had any graduate programs and offered online courses, 35 percent offered graduate/first-professional degree programs, and 13 percent offered graduate/first-professional certificate programs. More recently, the 2006 Sloan-C report (Allen & Seaman, 2007, p. 5) states:

> More than two-thirds of all higher education institutions now have some form of online offerings, with the majority of these providing programs that are fully online. The distribution of institutions offering online programs and courses or only courses has not changed significantly over the past year. The percentage of institutions offering fully online programs grew from 31 percent to 35 percent, those with no online offerings dropped from 37 percent to 34 percent, while those offering online courses but no online programs remained constant at 31 percent. During the four year period from 2002 to 2006, graduate online degree programs increased by 19.6%, undergraduate online degree programs increased by 6.9%, and associates degree online programs increased by 24%.

Comparing public vs. private institutions is another way to assess the level of adoption of online education programs (NCES, 2003. Allen & Seaman, 2007). Among institutions that offered

distance education courses in 2000-01, public 4-year institutions were more likely to offer degree programs designed to be completed through distance education than private four year institutions, which in turn were more likely to offer these type of degree programs than public two year institutions (48 percent, 33 percent, and 20 percent, respectively) (NCES, 2003). With regard to certificate programs, 25 percent of public four-year institutions that offered distance education courses had certificate programs designed to be completed totally through distance education, compared with 15 percent of public two-year and 14 percent of private four-year institutions (NCES, 2003). More recent data confirms the trend regarding public institutions. According to the 2006 Sloan-C report, "public institutions have consistently led the way in online enrollments for every survey year. Each public institution with online offerings teaches, on average, close to 1,400 online students, a number which far outpaces that for private, for-profit and private, nonprofit institutions" (Allen & Seaman, 2007).

A final comparison can be done based on size of colleges. Among institutions offering distance education courses in 2000-01, large institutions were more likely to offer degree programs designed to be completed totally through distance education than were medium sized institutions, which in turn were more likely to offer them than were small institutions (47 percent, 34 percent, and 22 percent, respectively) (NCES, 2003). Further, large institutions offering distance education courses more often reported that they offered certificate programs designed to be completed totally through distance education than did either medium sized or small institutions (30 percent compared with 14 and 12 percent, respectively) (NCES, 2003). More recent data from the 2006 Sloan-C Report shows that "beginning in fall 2002, where nearly 600,000 of the 1.6 million online students were at the largest (over 15,000 total enrollment) colleges and universities, the pattern has been repeated each year. The most recent data shows no

exception; the largest institutions now have nearly 1.4 million online students, representing a compound annual growth rate of 24.1 percent for the four-year period" (Allen & Seaman, 2007, p. 6).

2.8. Faculty Training in Online Teaching

Not all faculty choose to teach in an online environment. In fact, many faculty prefer the traditional classroom and standard teaching methods over teaching in an online environment. While not all faculty choose to teach online, for those who do choose to "explore" online education, training in the methods and techniques of quality online teaching is a very important part of offering an online education program. However, many instructors who choose to teach in online courses do not want to change their style of instruction (Anderson & Middleton, 2002). Some feel that interactive lectures, small group activities, or closed labs are the only way that a subject can be taught. Other online faculty do not adapt their lectures to the advances provided by technology such as PowerPoint presentations, flash files, and multimedia demonstrations and do not want to change their teaching style. These deeply held beliefs and long-established practices are typically changed as courses are moved online, requiring new ways of thinking about teaching and learning (Bates, 2000; Burgess, 1994).

Though the principles of instructional design are not entirely different in online education than they are for the traditional classroom, instructors need training and support to be willing to adopt this new teaching approach. Instructors need to be cognizant of how the details of their course will be implemented in the new environment. McNaught (2002) stated that web-based courses be clearly planned and designed by the instructors. Replacing the current educational model in digital format is not sufficient (Weigel, 2000).

Training for faculty may be in several different areas. The development of web-based courses requires innovative development in curriculum, and faculty need to have greater flexibility as they teach their courses (Trindade, Carmo, & Bidarra, 2000). Effective web-based courses require the instructor to not only have knowledge of the content area, but also to have interpersonal skills to effectively communicate with their students online (White & Weight, 2000). Faculty may need basic or advanced training in these communication methods. Instructors teaching in online courses are assuming a broader role as planners, designers, guides, mentors, and facilitators and may no longer be seen as lecturers in the future (Gillespie, 1998; Young, 2002).

Despite the lack of adequate support at many institutions of higher education, online education instructors must have training to develop adequate technology skills. Faculty often upload their own files, deal with hardware and software problems, and help students overcome problems with the technology. In addition, instructors must be able to design their courses, making sure they are accessible to disabled students under the Americans with Disabilities Act (Senger, 2000). Instructors, who have the frontline contact with students, may be the ones who are required to solve problems as they arise. This requires technology training that may not be available to instructors at some institutions.

Although there are some obvious advantages of making courses easily accessible to students through the Internet, many instructors are reluctant to make the move to web-based courses. Therefore the instructors may need training in the benefits of delivering a course online. The instructors may be reluctant for many reasons, including what they perceive to be an increase in the time it takes to develop and deliver online courses (Clay, 1999; Georges, 2001), the lack of technical and administrative support available to them (Betts, 1998; Schifter, 2000),

concern about copyright and intellectual property issues (Berge & Mrozowski, 2001; Moore, 1994; Taylor, Parker III, & Tebeaux, 2001), concern about the quality of online courses (Betts, 1998), concern about incentives and obstacles to teaching online (Rockwell, Schauer et al., 2000; McKenzie et al., 2000), resistance to being told what to do by administrators (Noble, 2002), and inadequate training for the instructors who are being expected to write and teach these online courses (Schifter, 2000). Some faculty are concerned that when administrators try to compare the effectiveness and cost benefits of web-based courses to traditional on-campus courses, this places more pressure on instructors to teach more online courses (Armstrong, 2000). These are all areas that should be addressed in instructor training, especially for the novice web-based instructor who may not have a passion for online education, or even baseline knowledge of what web-based courses can become.

Instructor training is particularly important in a field that is rapidly changing (Crumpacker, 2001; Diaz, 2001; Rockwell, Furgason, & Marx, 2000; Torrisi-Steele & Davis, 2000). Bennett, Priest, and Macpherson (1999) supported this claim with a study that concluded that staff development for web-based courses is currently very limited. In addition, providing technical support for faculty is challenging for many colleges because of limited resources. Traditionally, instructors have received support from three different areas of the campus: libraries, computing centers, and faculty development centers. Some schools are now combining these into one faculty resource center (Long, 2001). Institutions need to "strive to provide access to technology and tools that help members of the campus community reach their goals" (Lawlor & Bradley, 2002, p. 26).

Training instructors about the new technology and ways to teach with it is essential to help them effectively deal with change (Lick, 2001). When an instructor's professional growth needs

are met, student learning can be enhanced (Lick, 2001). To gain the knowledge necessary to implement online curriculum effectively, instructors should have the necessary training, mentoring, and support, preferably on the equipment they will use. Faculty training is a core requirement of preparation when institutions plan for an online distance learning program.

2.9. Comparison of Online and Traditional Education

An investigation of the discourse on the subject of online education is not complete without discussing research comparing online education to traditional in-class education. This comparison of "new" educational delivery methods to the traditional classroom lecture is nothing new and has been happening over the past several decades. Carey and Gregory (2002) reported that comparisons have "gone through cycles of replication beginning with military training films in the 1940s, continuing with instructional television in the 1950s and 1960s, through multi-image presentations in the 1970s, and through computers and multimedia in the 1980s and 1990s." Opinions regarding online education versus traditional classroom education continue to differ depending on the audience polled. As an example, we can compare two different findings from the 2006 Sloan-C report. The report found that "chief academic officers of schools offering online education are very positive about a number of aspects of online education, including a belief that students are at least as satisfied with online instruction as they are with face-to-face classes, evaluating the quality of online instruction is no more difficult than for face-to-face, and an increasing majority view the quality of online education as the same or better than face-to-face instruction" (Allen & Seaman, 2007). Another view of online education was found in the same report. The report found that, "schools that state they have no interest in online education represent about 18 percent of all U.S. degree-granting postsecondary institutions (800). They do not have any online offerings and do not believe that online learning is important to their long-

term strategy. As a group, they have the most negative view towards online instruction, with only 3.7 percent saying that their faculty accept the value and legitimacy of online education and 44 percent disagreeing with the statement that online degrees have the same level of respect as face-to-face degrees" (Allen & Seaman, 2007).

Faculty acceptance of online instruction remains a key issue within many schools. Those institutions most engaged in online education do not believe it is a concern for their own campus, but do see it as a barrier to more wide-spread adoption of online education (Allen & Seaman, 2007). While there are many educators and policy makers who believe that online courses are of good quality, some believe that web-based courses are not the same as live lectures and that web-based education is a second class education (Mood, 1995). There are several studies that show no difference in meeting learning objectives whether presented via online education or traditional in-class education. One study examined the results of a comprehensive examination at the end of a course offered both online and in a traditional classroom environment. The web-based group (N=17) was compared to the traditional group (N=14) on a 100 point post course examination. The findings were clear that students from both groups produced similar scores on the examination (Wegner et. Al., 1999). In another study, "Project 25" was created to assess outcomes in several web-based courses vs. traditional courses at North Carolina State University. Twenty-five courses were converted into online offerings with twelve of the courses being compared to twelve "sister" courses offered in the traditional classroom method. Final examination scores were compared resulting in no significant differences being found between the two groups of students (Hoey et. Al, 1998). Some studies have even shown more impressive outcomes for students in a web-based course vs. the traditional course delivery method. East

Carolina University offered two courses which were similar in length, content, assessment, etc. The student final examination scores were higher for the web-based group (Danchak, 2002).

2.10. Student Related Research in Online Education

Research focused on student issues in online education has increased over the past several years. The student, as the consumer of online education, has a significant stake in the development and evolution of web-based curricula and the determination of best practices in web-based education as perceived by the student. As is true of traditional student research, research on students in web-based coursework has focused on such elements as motivation, time management, prior experience, and various other topic areas. Students in web-based classes who are motivated, have a high level of responsibility, who have self initiative, who can be self-disciplined, and who have a strong work ethic are more likely to succeed in the online environment (Sawyer, 2000, McLester, 2002). Adult learners, who make up a high percentage of students who are enrolled in online courses, tend to meet the aforementioned traits, and therefore tend to do well in online educational environments (St. Pierre, 1998). The ability of students to be successful is often very dependent on the students' ability to be self starters and great time managers. Students who cannot set aside time for online course work or who cannot set their own goals and work schedule, often drop-out from web-based courses or perform poorly when assessed, spend insufficient time on course activities, and have poor final grade outcomes. For these students, the lack of structure and lack of direct immediate feedback may be the reason these students perform poorly or fail (Alley & Jansak, 2001).

While several specific reasons can be listed for student failure, there are also several factors that affect student success. To determine where the student falls on the success - failure continuum, several factors play a part, including: prior learning in an online environment,

amount of course communication with other students and faculty, support of family, support of employers, career status, time availability, and course curriculum (MacDonald, 2001).

One of the most common reasons listed for taking web-based courses is the flexibility associated with course access, as the asynchronous model allows for varied login times based on each individual student (Morss, 1999). Students from around the world and across the country can all work together in a learning community, while each maintains a somewhat customized schedule.

2.11. Faculty Related Research in Online Education

As mentioned throughout this document, online education is growing rapidly in higher education. Of the stakeholders directly involved in this rapid evolution of online education, faculty are one of two primary players, with the other being students. While faculty are a primary player, findings show they may not be completely engaged with the notion of web-based courses and fully online programs. According to the Sloan-C 2005 Report, "only a minority of Chief Academic Officers agree that faculty at their institutions accept the value and legitimacy of online education." (Allen & Seaman, 2005) Additionally, the more recent 2006 Sloan-C report states "chief academic officers of schools offering online education have concerns with online education including concerns that teaching online takes more time and effort than teaching face-to-face courses, that students need more discipline to succeed in online courses, and that many of their faculty have yet to accept the value of online instruction." Engaging large numbers of faculty in the idea of course delivery via technology, specifically web-based delivery, is a significant test for administrators. In fact, while not singularly focusing on online courses, a previous survey study found that "the single most important information technology challenge facing colleges and universities in the United States over the next few years will be assisting

faculty to integrate technology into their instruction" (Reisman, Dear, & Edge, 2001). For online programs and individual web-based courses to be successful, faculty must be directly involved and support the notion or theoretical framework of web-based education (Reisman, et.al, 2001). Teaching courses online requires faculty to take a new approach to teaching and learning and to develop appropriate learning activities for students to meet course objectives. Ongoing research and evaluation are needed to identify competencies and resources needed by faculty in order to deliver quality web-based courses, to identify effective online teaching-learning strategies, and to compare outcomes of courses taught online versus conventional face-to-face settings (Hennig & Hassey, 2001).

The National Education Association (NEA) conducted a survey where 75% of respondents (educators) had positive feelings regarding web-based courses, while less than one quarter (14%) had feelings to the contrary (Reisman, et. Al., 2001). An ongoing University of Central Florida study shows that "more than 80% of UCF faculty indicate they are satisfied with their experience teaching web or web-enhanced courses. They also indicate that they would be likely to teach a web or web-enhanced course in the future" (RITE Website, 2006). While some studies show a positive view of web-based education, other studies show a different perception on the part of faculty. For example, a study of faculty perceptions of web-based education in social work showed that "that faculty perceived face-to-face instruction to be more effective than web-based instruction in all curriculum areas. However, the extent of perceived effectiveness of web-based instruction varied by curriculum area" (Moore, 2005).

"Eighty-seven percent of UCF faculty surveyed indicated they have changed their approach to teaching as a result of their online teaching experience. The changes reported included responding more to student needs, changing their course development and delivery,

incorporating technology into teaching, modifying their time management, and utilizing an increased amount of resources in their courses" (RITE Website, 2006).

While many faculty, and in particular faculty unions, may believe that web-based faculty are primarily adjunct and part-time hires, the Sloan-C 2004 Report found that "65% of higher education institutions report that they are using primarily fulltime faculty to teach their online courses compared to 62% that report they are using primarily fulltime faculty to teach their face-to-face courses". With regard to public institutions, such as California University of Pennsylvania, which is addressed in this study, the Sloan Report found that "74% of public colleges report that their online courses are taught by full time faculty, as opposed to only 61% for their face-to-face courses" (Allen & Seaman, 2005).

2.12. Advantages and Disadvantages of Online Education

The advantages and disadvantages of implementing web-based courses have been discussed for several years and many authors have completed summaries list. One such list, summarized by (Bodain & Robert, 2000, p. 1), is listed in table 2.1 and was constructed with a focus on four specific stakeholders, the student, the instructor, the administration, and society as a whole. The advantages and disadvantages listed in table 2.1 are not all inclusive, but include several of the most commonly cited advantages and disadvantages. The stakeholders included in this study included the student, the instructor, and to some extent administration, although the administrator who participated in this study would not be considered a high level decision-maker within the California University of Pennsylvania academic structure.

Table 2.1: Advantages and Disadvantages of Online Courses

Stakeholders	Advantages	Disadvantages
Student	✓ accessibility for those living away from the training center, in the far regions, or in other countries ✓ accessibility for those with restricted mobility (e.g., handicapped, injured, elderly) ✓ flexibility for those with irregular work schedule ✓ accessibility for those with family duties (e.g., parents with young children at home) ✓ self-paced learning ✓ just-in-time learning ✓ no waste of time in transport	✓ loss of direct interaction with the professor and the other students ✓ loss of direct, immediate feedback ✓ loss of motivation and high rate of failures and drop-outs ✓ difficulty to organize teamwork ✓ no access to the library ✓ the difficulty of personal work with no temporal constraints ✓ problem of isolation ✓ the quality of presentation depends on the student's system
Professor	✓ possibility of a larger audience ✓ no repetition in the classroom ✓ more time available to prepare and upgrade the course ✓ acquisition of a new experience	✓ loss of the dynamics of the class ✓ no visual contact and low feedback from the students ✓ difficult to evaluate the student's work ✓ workload increases at the beginning & ongoing labor intensity of grading, feedback, etc. ✓ redefinition of the professor's role and tasks ✓ complexity of the copyright and the author's rights for electronic documents
Institution	✓ no need of building ✓ easy access to an international clientele ✓ international visibility ✓ possibility of additional incomes ✓ measurable returns on investments	✓ high costs at the beginning ✓ scarcity of specialists on the Internet ✓ problems with credits evaluation ✓ necessity of redefining the professors' duties and roles ✓ difficult to define with precision the role of the institution concerning the rules and procedures with the Web
Society	✓ better access to education and increased competence of the workforce ✓ creation of new high-tech jobs ✓ opening of new markets ✓ no waste of time in transport and reduction of pollution	✓ risk of adopting the culture of the others when courses are taken from a foreign country ✓ potential migration of students with diplomas towards foreign countries

Bodain & Robert, 2000, p. 1

2.13. Online Education in Health, Wellness, and Fitness Programs

Web-based coursework in health, wellness, and fitness educational programs has become more and more common over the past few years and the Sloan-C Report found that 31.4% of web-based courses were in the health professions and related sciences (Allen & Seaman, 2005). The courses appear to cover the full spectrum of theory and focus on cognitive and affective domains. However, most health-related courses do not attempt to teach psychomotor skills or hands-on techniques. Web-based courses are often designed as "companion" courses for a live traditional class. In this model, theory can be covered online and hands-on skills can be covered in a live classroom or laboratory setting.

One example is at The University of Oklahoma College of Medicine where 150 first-year medical students were introduced to web-based instruction in a newly offered neurosciences course. The authors concluded that "clearly, the experience with the online Neurosciences course was successful, both in terms of objective outcomes and subjective feedback" (Blair & Candler, 1998). A hybrid model using two types of distance education was implemented at Emporia State University where a web-based companion course supplied theory and cognitive information, while two-way video/audio conferencing was used for psychomotor skill instruction and assessment (St. Pierre, 1998). While some medical and health care discipline organizations have been slow to accept technology in the form of web-based education, the American Academy of Orthopedic Surgeons (AAOS) wrote in an article describing how web-based courses can be an effective way to teach fellows and patients. With over 150 web-based course titles, the AAOS has course content in the psychomotor-related areas of "fitness and wellness, injury prevention, surgical procedures, and rehabilitation protocols" (Hirsch, 2000). Another health-related organization developed a white paper focused on web-based delivery of education. The

organization, the National Association of Emergency Management System Educators (NAEMSA, 2003, p.6-7), concluded that:

> The Internet has clearly become a major technology used in the education of health care professionals and is likely to become the most highly utilized distance learning platform for teaching and learning in healthcare and EMS. Additionally, the NAEMSA recognizes the benefits of face to face teaching for psychomotor skill mastery, and currently does not recommend using online learning for initial psychomotor training under most circumstances because the technology is very expensive, it is not widely available, and EMS educators have little experience with its use. These technologies currently are very useful for refreshing little-used skills after they have already been learned, particularly for EMS providers practicing in rural or remote locations. NAEMSE encourages innovation, experimentation and research with these and all training methods, and will reconsider its recommendations based on future outcomes.

The importance of teaching physical activity has been cited in this paper, but little research has focused specifically on web-based instruction related to physical activity. One study assessed the efficacy of web-assisted instruction for promoting the use of social cognitive theory (SCT) strategies related to physical activity (Suminski & Petosa, 2006). The researchers recruited college students attending health courses. The authors created three groups (web-assisted, comparison, and control) based on the course structure. The web-assisted group received information on exercise and fitness via an online program (treatment, N = 127); seven sections received the same exercise and fitness information as the treatment condition, but no web-based program (comparison, N = 118); and six sections received information in unrelated areas (control, N = 178). The web-based program consisted of nine web assignments (one per week) that targeted key SCT variables. Satisfaction with the web-based program was high. Use of self-regulation strategies was significantly higher at posttest in the treatment group than it was in the other groups. Knowledge concerning the skills taught by the web assignments was significantly greater in the treatment group than it was in the comparison group. The researchers concluded that the results demonstrated that a web-based instructional program has a positive

impact on knowledge and skills related to SCT strategies for changing physical activity behavior (Suminski & Petosa, 2006).

While the research in this area is lacking, there is some research in the disciplines of fitness, nursing, physical therapy, and occupational therapy. The primary reason for the lack of research is that some researchers state that course curricula focusing on psychomotor skills would be very difficult to teach in a web-based environment (Stanton, 2001). Even though this belief persists, this has not halted various health and wellness related curricula from being developed. For example, a fitness activity course was offered at Kutztown University of Pennsylvania where the students were required to complete theory and learn fitness activities and health information via the online course. At the beginning and end of the term, student's fitness levels were assessed. Even though the students learned all of the skills online, the students showed improvement in overall personal fitness levels by applying the information learned in the web-based course to their own "work-out" routines (Garman, Crider, & Teske, 1999). While health and fitness coursework which focus on psychomotor skills has been seen as questionable for online education, other courses focusing strictly on theory in the cognitive domain have been readily accepted (Stanton, 2001). At a Texas University, an online course offered in Exercise Physiology was compared to a live lecture-based Exercise Physiology course with student performance on final examination scores having no significant difference between the delivery methods. In the same study, 88% of the student participants in the web-based class would take another web-based course and 88% also felt that the online Exercise Physiology course was worthwhile (Henrich & Pankey, 1999). Another study focused on student satisfaction in an online degree for transitioning from a registered nurse to a bachelor of science in nursing. The study found that overall satisfaction with this course was high. Appropriateness of learning

methods was rated the most satisfactory, followed by appropriateness of content. Most of the students enjoyed the course and they wanted more nursing courses to be offered through the online format (Yom, 2004).

Various teaching methods have been suggested as more appropriate for teaching hands-on skills in web-based courses. Fenrich (2005) stated that "if you include simulations, active experimentation, discovery-learning techniques, numerous questions with detailed feedback, video, animations, and photographs, you can effectively teach practical hands-on skills through multimedia technology." He further stated that "the instructional challenge in these projects has been to ensure that the practical skills taught via the computer transfer to the real world" (Fenrich, 2005). In addition, preparation for students in health-related fields with regard to encounters with patients or clients may involve interactive simulations, models, and computer based simulators (Neame, Murphy, Stitt, & Rake, 1999.)

Studies of graduate nursing student's perception of online learning showed that using the Internet to deliver nursing courses via distance education can facilitate learning on demand and promote learner-centered instruction (Tilley, Boswell, & Cannon, 2006). The studies described the graduate nursing students' experiences with online learning as "learning through reflection, exploration, use of critical thinking, interacting with others, sharing of information, and using resources" (Ali, Hodson-Carlton, & Ryan, 2004). Furthermore, these studies describe the development of an effective learning community among web-based nursing students. The characteristics of the cohort leading to an effective learning community included "supportiveness, open sharing of oneself, and socialization". (Ali, et. Al., 2004; Tilley, Boswell, & Cannon, 2006).

Human anatomy instruction often includes hand-on dissection skills and is taught in many programs in fitness, wellness, and healthcare programs. As found with aforementioned fields and disciplines, little research has been done in the area of online education in human anatomy. However, Granger (2006) and colleagues have described an online course developed for medical students. An online interactive anatomy program was created to enhance the dissection experience, observational learning, and three-dimensional comprehension of human anatomy. An assessment was made of the utility of the program in preparing students for dissection laboratories and for examinations. The efficacy of the application was evaluated by first-year students and faculty with pre- and post-use surveys in anatomy courses at three medical schools. It was found that students felt better prepared if they utilized the website prior to their dissection laboratory, and faculty reported spending less time explaining basic concepts or techniques. It was concluded that a comprehensive online program significantly enhances the quality and efficiency of instruction in human anatomy in the dissection laboratory and could prove to be a useful tool at other institutions (Granger, 2006).

2.14. Student Training in Online Learning

While the great importance of faculty training was previously stated in this document, the importance of student training for web-based courses should also be investigated. Students who are not prepared for the online environment can have a negative impact on other students and the instructor in the online classroom (Fink, 2002). Many instructors may not be able to tell students why a file is not downloading, or how to access online tutoring or library resources, or how to extend the time limit to take a test, making student access to orientation and support even more critical. Lynch (2001) concluded that student orientation to online courses and student socialization with other online students greatly affected their success in the course. As indicated

within the literature, students with support systems such as online tutoring, online counseling, and online study groups are more likely to succeed in their web-based classes (Mason & Weller, 2000; McLoughlin, 1999; Myers, 2001; Myers & Ostash, 2001; Savrock, 2001). Bennett et al. (1999) studied the social isolation of students and came to the same conclusion. A study on technical support for students showed that students who needed the most help did not ask for it (Ehrmann, 1999). Moore and Kearsley (1996) observed that most research in distance learning focused on the effectiveness of the computers, the software, and the Internet without looking at the human factors of training and orientation. Even though web-based courses have become much more commonplace, and there are over 3.5 million college students enrolled in online courses (Allen & Seaman, 2007), online course offerings have only been in existence for a brief time period so the majority of current college students are probably still not familiar with how to take a class online. This is why training and support for students is so essential.

2.15. Technology and Administrative Support for Students

Research in the area of student services and administrative support for web-based students has started to increase over the past few years. Though some say that technology should not be the impetus to drive organizational change (Brown & Jackson, 2001; Hughes, 2001), others state that technology cannot be introduced into teaching without changing the ways other things are done in the educational process (Moore & Kearsley, 1996). Therefore, more attention needs to be given to the organizational structures, especially as they pertain to servicing students (Bothel, 2001; Morrow, 1999; Wilson, 1998). One problem with online education planning is that much of the focus is on instruction, with typically little focus on student services. Care and Scanlan (2001) did a fairly comprehensive study that focused on the issues facing administration, faculty, and staff in planning and delivering web-based courses, but it did not look at student services and

technical support. Tinto (1993), Voorhees (1987), and others ("A Workplan," 2001) found that in order for students to be successful, they must have access to student services. Husmann and Miller (2001) agreed that a major problem is when the entire program is not being planned, and that most attention is paid to individual course offerings. Planning for online education must include fiscal, personal, academic, legal, technological, and support issues as a framework for future decision making (Fryer & Lovas, 1991; Gellman-Danley & Fetzner, 1998). Online education is not just about teaching and learning, it is about giving students who are not able or not willing to come to campus an experience equivalent to the on-campus student by providing the same types of student services online that an on-campus student has available (Berge, 1998).

A contributing factor to the fact that online education planning is limited to instruction is that faculty have been the major force behind the implementation of web-based courses and online programs on most campuses (Husmann & Miller, 2001). The problems with online education may become more significant if universities continue to let individual faculty members and departments put classes online without planning to implement the support structure involved with teaching and learning (Daniel, 1997). The 2001 Campus Computing Survey (Green, 2001) supported this by finding that not many colleges provide access to student services online. According to Brown and Jackson (2001), administrators should not be concerned with how to get faculty to develop and teach courses online, but on how to deal with the need to support online students in other areas of education such as counseling, library services, and financial aid.

Sally Johnstone (2002), the founding director of the Western Cooperative for Educational Telecommunications at the Western Interstate Commission for Higher Education, stated that there are three stages to providing online student support: The first is to create web pages that provide information. The second is to add forms and communication methods to the web pages.

The last stage is to offer services that can provide personal interaction, such as online counseling via chat rooms, or online access to student records. Many institutions are in a support service crisis because universities are not planning for, and therefore are not finding the resources, to provide adequate student support (Daniel, 1997; Milliron & Miles, 2000). If colleges want to succeed in online education, they must consider access, equity, and continued support and not treat web-based students as second-class citizens (Bothel, 2001; Buchanan, 2000; Hanna, 1998; Rumble, 2000; Schrum, 1999).

Aoki and Pogroszewski (1998) claimed that by integrating online courses and student services, costs would be cut and productivity would be improved, and hopefully, according to Matthews (1999), the enrollment would grow. Unfortunately, colleges face a dilemma in planning for online education because they are torn between wanting to serve students online and the need to continue to support their traditional student services (Collis et al., 1993). Yet, it is important for administrators to consider the student who will never come to campus, and to provide the essential student services for that student. Inglis et al. (1999) stated, "delivering courses online at a distance calls for a reorganization of the ways in which support services are provided. This is important to ensure that the highest standard of support is provided for the resources available as well as to avoid the possibility of costs escalating". (p. 118). Dennis Bancroft, Director of Oscail, the National Distance Education Centre in Dublin, Ireland, when interviewed by Savrock (2001), identified student support as one of three critical areas - the others being curriculum and technology - needed to maintain a successful online education program.

2.16. Teaching and Assessment Using Video Technologies

Research in the area of video recording has been primarily focused on the use of video as a teaching tool, or to create a videotaped record of a student's performance on a particular skill, or often an evaluation of some type of performance; e.g, a videotaped recording of student teaching (Davis, 1993). Although research regarding videotape has been occurring for several years, research regarding webcams as a teaching and assessment tool in online courses appears to be in its infancy stage with very few articles written regarding the topic. Although little research has been done focusing on webcams as an assessment tool, recent discourse on the Internet and in professional magazines has focused on the use of webcams to proctor online students taking exams, supervise student teachers at a distance, and teach surgical techniques to physicians. Examples of video technology research and discourse are described below.

Videotaping has been supported as an effective teaching, performance, and assessment technique that could be applied within curricula across several disciplines (Gray, 1990; Liu, Schneider, & Miyazaki, 1997; Riolo, 1997; Baum & Gray, 1992; Ignico, 1995). The performance may be a student teacher practicing a lecture, a music student playing a musical instrument, nursing student performing a clinical technique, or a wide variety of other scenarios. Videotaping as a teaching strategy has been used in the disciplines of medicine (Gray, 1990), physical therapy (Liu, et.al., 1997; Riolo, 1997), psychology (Baum & Gray, 1992), and physical education (Ignico, 1995).Within healthcare disciplines such as physical therapy and occupational therapy, videotapes allow faculty to conduct detailed assessments of students' ability to perform physical assessment, accomplish specific tasks, demonstrate communication techniques with a patient, and organize their thinking processes (Liu, et. Al, 1997). In other healthcare disciplines, emphasis has been on videotaping as a method for teaching psychomotor skills (Baldwin, 1991), as well as communication and interpersonal skills (Burnard, 1991; Minardi & Ritter, 1999).

Videotaping a healthcare skill in the laboratory requires repeated practice and direction by self and peers, with minimal faculty supervision. The use of videotaping provides student and instructor feedback for evaluation of the process and correcting performance (Valentine & Saito, 1980).

In addition to healthcare settings, videotaping has been used in many educational settings primarily as instructional guides to videotape lessons, trigger discussion, observe role models, or provide students with feedback on their performance from peers and instructors. In a study by Minardi and Ritter (1999), study participants reported that videotaping was helpful in learning interpersonal skills and provided a useful learning experience. A study by Ignico (1995) supported videotaping as a more effective instructional method than teacher-directed instruction in the development of performance and teaching skills. (Bandura, 1997) states that "the self-efficacy theoretical framework supports videotaping as a teaching/learning method." Videotaping offers a mechanism to promote self-awareness and self-evaluation of both positive and negative behaviors. Although videotaping has been documented as an effective teaching method, it has been underused and undervalued in fitness, healthcare, and wellness education (Fowler, 1993; Minardi & Ritter, 1999).

Video recording also allows for self-assessment and peer assessment of psychomotor skill performances. Students can increase their competence as they practice in a "safe" environment prior to performing the skills in clinical settings. The importance of feedback, from instructor to student, has also been addressed when video is implemented into teaching and assessment. In their review of teaching- learning theories of skill acquisition, Gomez and Gomez (1984) stated that, without feedback, learning will not occur. In addition, proficiency is improved with repeated practice of a skill. When skills learning and practice are based on intervening

feedback, there is also improved retention, allowing a skill to be performed safely at a later date (Gomez & Gomez, 1984; Oermann, 1990). According to Hamlin (2005), using video technology, students "step outside themselves to become actively involved in a process of making adjustments. Skill adjustments occur immediately during skill practice and again after viewing the videotape. Students use the video to better visualize and reflect on errors, strengths, and weaknesses."

While some research has been completed focusing on videotaping as a teaching and assessment tool, very little research has been completed with an analysis of using digital video or webcam recordings for teaching and assessment. As previously mentioned, research and discourse regarding video implementation in online courses is just starting to evolve from online initiatives around the world. Purdue University faculty have used digital video equipment to evaluate student teachers in a live classroom allowing for peer and instructor feedback after the teaching session (Holsapple, 2004). At the University of Southampton, streaming video over the Internet was used to support the learning of first year student nurses on a "Life Sciences" module. Based on the experience, instructors were supportive of the use of streaming video as a teaching tool in online and partially online courses (Shephard, 2001). Webcams are also being employed as distant tools for teaching medical students, especially in the area of laparoscopic surgery. (Chung, Landsittell, Chon, Ng, & Fuchs, 2005). Troy University has 11,000 online students and has implemented the use of webcams in online courses for distant proctoring (Pope, 2007). That is, the instructor monitors the student taking an online course examination using a webcam from one computer to another via the Internet. While anecdotal evidence supports the Troy University webcam proctoring model, no research has been undertaken to this point. The College of Education at Indiana University of Pennsylvania received a three year grant to

evaluate video, using videoconferencing technology as a tool for supervising student teachers during clinical experiences (Garrett & Dudt, 1998). The study concluded that the use of videoconferencing technology was an appropriate and useful method of supervising student teachers spread across a large geographical area. Another project involved using video Ipods as a teaching tool. The purpose of this project was to compare student performance between students who were taught nursing skills by faculty demonstration and those taught nursing skills delivered via video IPods. Assessment outcomes for the two groups of students were not significantly different, supporting Ipod video as an appropriate teaching method. (Snow, Schumann, Hillier, & Garee, 2007). In addition to the examples listed above, searching the Internet for examples of teaching using webcams also produced websites offering virtual Karate classes (Karate Lessons Online, 2007), teaching English as a second language (Webcamenglish.com, 2007), and online guitar lessons (Bob's Online Guitar Lessons, 2007).

3. Research Procedures

3.1. Introduction to Chapter

The case study research design for this study is descriptive and is focused on design and implementation of a new webcam assessment protocol and the collection of data collected from phone and/or email interviews. Researchers have used case study research methods for many years across a variety of disciplines. Social scientists, in particular, and increasingly more education researchers, have made wide use of this research method to examine contemporary real-life situations and provide the basis for the application of ideas and extension of methods.

Regarding research procedures, I employed a case study approach, insofar as I analyzed implementation of a new online course assessment protocol within a single course offered at a single institution, California University of Pennsylvania. The case study research design for this study is descriptive in nature, and is best described as a problem solving study in that I am attempting to discover a solution, or series of solutions, for a specifically defined problem, or set of problems. The purpose of this study was to develop a new protocol for assessing psychomotor skills in an online course, explore experiences of students and the instructor as it pertains to the new protocol, and determine beliefs and thoughts of subject matter experts regarding the new protocol. This case study focused on five students enrolled in an online course (*PRF 711: An Integrated Approach to Fitness and Wellness*), the instructor for the course, and three subject matter experts who have some connection to the course. I employed several methods of data collection: two instances of observations, several phone and email interviews, and content analysis related to course design and documents created for the new protocol. Immersion in the data to identify patterns and themes guided data analysis.

Data obtained in the interviews were organized into categories of beliefs and context factors. Practices were divided into subsets. This case study produced knowledge relevant to the

understanding of webcam technology integration as a solution for assessing hands-on activities in an online course. The purpose of this chapter is to describe the procedures and methods of my study. A timeline table representing each component of the study describes various study milestones (Table 3.1). Major topics addressed in this section include: the rationale for employing a qualitative approach, the researchers role, the research questions, the research participants, collection of data, data analysis techniques, trustworthiness features, and ethical considerations.

Table 3.1: Study Timeline

Key Tasks	**Date Accomplished**
Approval of Study by California University of Pennsylvania IRB	February 7, 2007
Approval of Study by University of Pittsburgh IRB	March 22, 2007
Recruitment letter sent to Subject Matter Experts (SME 1, SME 2, Instructional Designer) and Instructor	March, 2007
Recruitment letter sent to entire class of Students	March, 2007
Random Selection of Student Participants from Returned Notifications	March, 2007
Pre-Course Interviews with Subject Matter Experts and Instructor	March, 2007
Development of New Webcam Video Assessment Protocol by Researcher	March-April, 2007
Review of Protocol by Subject Matter Experts and Instructor	April, 2007
Course Survey Completed & Submitted by PRF 711 Students	March, 2007
Webcam Assessment Activities and Webcams Sent to Five Student Participants	April, 2007
Observation of Two Students Completing Webcam Video Activities	May, 2007
Student Participants Submission of Webcam Assessment Videos into PRF 711 Course	May, 2007
Post-Course Interviews with Selected Student	May, 2007

Participants	
Review of Videos and Completed Process by Subject Matter Experts and Instructor	May-June, 2007
Post-Course Interviews with Selected Subject Matter Experts and Instructor	June, 2007
Analysis of Interview and Observation Data by Researcher	May-August, 2007
Follow-up Interviews with Selected Participants	July, 2007
Analysis of All Data	June-November, 2007
Results, Implications, and Conclusions Added to Document	September-December, 2007
Final Review of Document	January, 2008

This research procedures used in this study drew upon the work of previous case study models and included six general steps that were used:

- Determine and define the research objectives
- Design the study while specifying data gathering and analysis techniques
- Prepare to collect the data
- Collect data from the defined population
- Evaluate and analyze the data
- Prepare the report

All phases have been completed, with this report providing a comprehensive description of the processes, techniques, results, and conclusions.

3.2. Rationale for Qualitative Approach

Since this study is qualitative in nature, I find it suitable to briefly define qualitative research and portray some of its chief characteristics. Merriam (1998 p. 5) describes qualitative research as “an umbrella concept covering several forms of inquiry that help us understand and explain

the meaning of social phenomena with as little disruption of the natural setting as possible". One key uniqueness of qualitative research is interpretation—namely, this approach goes beyond mere description and classification of events to an attempt at understanding the meaning underlying them. Often, qualitative researchers seek to recognize meaning from the participants' point-of- view, commonly known as the *emic* perspective (Merriam, 1998, p. 6). Distinctive from purely quantitative inquiry, which aims to test a pre-existing theory by testing hypotheses through the organization of a formal experimental design, qualitative research is more inductive in nature, in that the researcher often attempts to generate concepts or theory from the data (Merriam, 1998, p. 7). This is not to say that qualitative researchers begin a study without a formal research design, but rather they often do not have a specific theory in mind that they are trying to support or counter. In probing particular phenomena, which can include precise settings or environments (e.g. an online course) or less concrete items such as university or academic policies or guidelines, qualitative research uses a variety of data gathering techniques. These can include interviews, fieldwork focusing on participant observation, and document analysis/data mining. These techniques produce the necessary "raw materials" used in subsequent data analysis: audio recordings, field notations, and course-related documents (Huberman & Miles, 1994, pp. 429-431). As I will demonstrate, this study included all three aforementioned methods of data collection.

The basic methodologies of educational research are quantitative research and qualitative research. Quantitative research uses objective measurement and numerical analysis of data to try to explain the causes of changes in social phenomena (Ary, Jacobs, & Razavieh, 1996). Qualitative research is an inquiry process in a natural setting where the researcher is an instrument of data collection that explores a social or human problem (Creswell, 1998).

Quantitative research begins with hypotheses that will be supported or not supported in the data. Qualitative research does not usually begin with hypotheses, although the research may generate them as events occur (Ary et al., 1996). While hypotheses are not frequently found in qualitative research procedures, I have developed guiding research questions to help steer the inquiry.

Qualitative study lends itself to broad narrative description. It takes place on site, or in this case "online", in the group's natural environment, and endeavors to be nonmanipulative of the groups' behaviors. An initial phase of design is to consider whether a qualitative study is suitable for the study of a problem, and also to frame the study within the philosophical and theoretical perspectives (Creswell, 1998). Creswell identifies five assumptions that guide design and are central to all qualitative studies: "the multiple natures of reality, the close relationship of the researcher to that being researched, the value-laden aspect of inquiry, the personal approach to writing the narrative, and the emerging inductive methodology of the process of research". In qualitative studies, the researcher is the instrument. Whether the researcher's presence is constant and rigorous, as in long-term ethnographies, or whether relatively concise but personal, as in in-depth interview studies, the researcher enters into the lives of the participants (Marshall & Rossman, 1999). The researcher's role entails varying degrees of participation – from full participant to complete observer, and all possible combinations along the continuum. Because the researcher is the instrument, a qualitative report must include information about the researcher (Patton, 1990) as I have done earlier in this document. The traits that make a successful qualitative researcher are discovered through understanding of ethical issues. The competent researcher demonstrates awareness of ethical issues in qualitative research and shows that the research is both feasible and ethical (Marshall & Rossman, 1999). Strategies that speak to ethical issues include: "recruitment of respondents via informed consent; conduct fieldwork so

as to avoid harm to others; protection of confidentiality in reports; emphasize reciprocity with the researched; make reports just, fair, and honest; and be sensitive to the language and meanings of the culture being studied" (Huberman & Miles, 1994). "The qualitative researcher has an obligation to be methodical in reporting sufficient details of data collection and the processes of analysis to permit others to judge the quality of the resulting product" (Patton, 1990, p. 462). Qualitative analysis has been described as three concurrent flows of activity: data reduction, data display, and conclusion drawing (Huberman & Miles, 1994). Data reduction refers to the process of selecting, focusing, simplifying, abstracting, and transforming the data that appear in field notations or printed transcriptions of interview conversations. Data display is an organized, compressed assembly of information that permits conclusion drawing and action. Conclusion drawing is deciding what things mean, noting regularities, patterns, explanations, possible configurations, causal flows, and propositions (Huberman & Miles, 1994). Conclusions are verified as analysis proceeds.

A case study is chosen to study a case with clear boundaries, such as a course or introduction of a new protocol of assessment. The researcher needs to have a wide array of information about the case to provide an in-depth picture of it (Creswell, 1998). Case studies try to describe the participant's entire range of behaviors and the relationship of these behaviors to the participant's history and environment. The researcher tries to discover all the variables that are vital in the history or development of the topic under study. Content analysis is a research method applied to written or visual materials for the purpose of identifying specified characteristics of the material. An advantage of content analysis is that it is unobtrusive (Ary et al., 1996). In this study content analysis was applied to the exercise and fitness activities created

for the study, the course syllabi, and the grading rubric developed for the evaluation of video submissions.

3.2.1. Philosophical Paradigms

The previous section describes some core aspects of qualitative analysis. But to appreciate the scope of qualitative research, one must note the assortment of philosophical assumptions and methodological approaches under which qualitative researchers operate. Piantanida and Garman, 1999, (p. 30) describe philosophic assumptions as a "research worldview".

> Research worldview points to the philosophic orientation that each of us brings to his or her judgments, actions, and ways of knowing. The term orientation refers to the specific ways in which an individual looks at the world. On the surface, it includes the notions of point of view, perspective, and a person's outlook in relation to experience and ideas. On a deeper level, it encompasses one's beliefs about what constitutes legitimate knowledge.

Several authors have described various categories and notions of research (Guba & Lincoln, 1994; Maykut & Morehouse, 1994; Sipe & Constable, 1996). I focus on the description provided by Guba and Lincoln (1994) identifying four philosophically based paradigms that social science researchers identify with: positivism, postpositivism, critical theory, and constructivism. They also define paradigm as "a set of *basic beliefs* (or metaphysics) that deals with ultimates or first principles" (Guba & Lincoln, 1994, p. 107). Because they are essentially belief systems, paradigms "are not open to proof in any conventional sense; there is no way to elevate one over another on the basis of ultimate, foundational criteria" (p. 108). Each paradigm, in effect, offers a unique way of collecting data on, and interpreting, diverse phenomena. As the authors note, differences exist between the paradigms with respect to the interpretation of reality, the relationship between the observer and the observed, and the specific methods used to obtain data (p. 108).

A comparison of the four approaches will now be described. Positivism takes a very objective view of reality—according to Guba and Lincoln, within this paradigm "an apprehendable reality is assumed to exist, driven by immutable natural laws and mechanisms" (Guba & Lincoln, 1994, p. 109). Researchers using this approach, moreover, construct this 'reality' without reference to the specific context in which it resides. The observer (researcher) and observed (subjects) are considered independent of each other, and neither has the ability to influence the other. Regarding methodology, positivist researchers generally state their hypotheses prior to their investigations, and then rigorously collect data to verify these hypotheses. Contextual variables are highly controlled to prevent them from intervening in data collection and analysis. As such, this approach most often lends itself to quantitative research methodologies.

Although similar in many respects to positivism, post-positivism assumes a more critical view of reality, insofar as "reality is assumed to exist but to be only imperfectly apprehendable because of basically flawed human intellectual mechanisms and the fundamentally intractable nature of phenomena" (Guba & Lincoln, 1994, p. 110). Although an objective, independent relationship between the observer and observed is established as an ideal, this approach concedes that such a scenario is unlikely. With respect to methodology, postpositivism deviates from positivism in allowing for the possibility of context specific variables to intercede in data collection. Although still concerned with hypothesis testing, the emphasis is on "falsifying (rather than verifying) hypotheses" (Guba & Lincoln, 1994, p. 110). Postpositivist researchers employ multiple data collection techniques, including both quantitative and qualitative methods.

Diverging from the positivism/postpositivism frameworks is critical theory, which proposes a more contextually laden view of reality. Namely, critical theorists assume that a

reality exists, but one that has been shaped by numerous social, cultural, historical, political, and other factors. Regarding the observer/observed relationship, critical theorists assume the two to be "interactively linked," in so far that each influences the values of the other (Guba & Lincoln, 1994, p. 110). The methodology (generally qualitative) of critical theory is described as "dialogic," in that there is a need for sustained dialogue between the observer and observed (Guba & Lincoln, 1994, p. 110). The observer, in particular, must become informed of the various social, cultural, and historical factors affecting the observed, with the ultimate goal of helping the observed to overcome his/her condition. This approach is transformative in that critical theorists assume their participants are operating within repressive conditions, and through a process of discovering the various factors keeping them within their state, seek to enable them to overcome their struggle.

The final paradigm, which is relevant to this dissertation, is that of constructivism. Constructivism views reality in a situational context—that is, "realities are apprehendable in the form of multiple, intangible mental constructions, socially and experientially based, local and specific in nature ..." (Guba and Lincoln, 1994, p. 110). Similar to critical theory, the relationship between the observer and observed is one of reciprocal value sharing and influence. Through largely qualitative techniques, the researcher attempts to comprehend multiple realities and to develop concepts/generalizations based upon these analyses. Given the highly interactive nature of the researcher and his/her subjects, the constructivist researcher often attempts to obtain knowledge from subjects through vicarious experience (p. 112). In completing this dissertation, I operated under the tenets of the constructivism paradigm. Namely, I assumed that each of my participants, instructor, students, and subject matter experts alike, had differing perceptions of reality and their experiences in the PRF 711 course. As such, each constructed his/her own

'reality' of the webcam video assessment protocol experience. As the observer, I attempted to develop general concepts and conclusions within the context of multiple views. Moreover, as advocated by the constructivist paradigm, I attempted to be the "passionate participant," in that I tried to comprehend the online course experience from my participants' multiple points of view (Guba & Lincoln, 1994, p. 112). This was achieved through a combination of phone and/or email interviews and online course observations, where I could vicariously step into the students' environment and attempt to understand the process of using the new webcam video assessment protocol on their terms. In summary, my approach was interpretive "and was based on the presupposition that we live in a social world characterized by the possibilities of multiple interpretations" (Yanow, 2000, p. 5).

3.2.2. Qualitative Techniques

Now that I have established the philosophical paradigm that guided me in this study, I would like to discuss the specific qualitative methodologies that I used. Basic, or generic, qualitative analysis embodies much of what has been discussed in the previous section of this paper. According to Merriam (1998, p. 11), "researchers who conduct these studies, which are probably the most common form of qualitative research in education, simply seek to discover and understand a phenomenon, a process, or the perspectives and worldviews of the people involved."

3.2.3. Case Study Research

"Case studies help us to understand processes of events, projects, and programs and to discover context characteristics that will shed light on an issue of object" (Merriam, 1997, p. 33).

The case study approach provided me the methodological support necessary to do an in-depth study of a phenomenon in its context (Hamel, 1993; Merriam, 1997; Stake, 1994; Yin, 2003). The context of this study was the development and implementation of a new protocol of assessment in an online course. Once the protocol was developed with the input from various subject matter experts and the course instructor, student participants, as well as the instructor, experienced the new protocol. The experiences of all participants was examined after the requirements of the new protocol had been concluded in the course.

Yin (2003) stated that, in most cases, a multiple and disparate participant pool is the preferred design. This study focused on the perceptions and experiences of several disparate individuals, including the students, subject matter experts, the instructor, and myself. This study performed an in-depth analysis of the development of the new web assessment protocol, including creation of various related documents. Two advantages of having several participants were: "conclusions independently arising from two cases, as with two experiments, will be more powerful than those coming from a single case (or single experiment) and the contexts of the two cases are likely to vary" (Yin, 2003, p. 53). Although a very common approach in qualitative research, Merriam (1998) asserts that a case study lacks a common, agreed-upon definition. Some scholars, for instance, have attempted to define a case study by focusing on the process utilized in conducting a case study analysis, while others have defined a case study by its end product (Merriam, 1998, p. 27). Regardless of definition, according to Merriam, a ubiquitous feature of a case study is its clearly defined unit of analysis: the case. In order to qualify as a case, the phenomenon under investigation must be "intrinsically bounded," in that "there is a limit to the number of people involved who could be interviewed or a finite amount of time for observations" (Merriam, 1998, pp. 27-28). As Stake notes, "a case may be simple or complex"

(1994, p. 236). It can be a single individual (i.e. instructor), an academic department, or a particular program/policy—however, to qualify as a case, it must adhere to the "bounded" limitations described above. In this study, I classified the development of new webcam video assessment protocol and implementation of the protocol into the *PRF 711: An Integrated Approach to Fitness and Wellness* online course as the case. In line with Merriam's description of cases as being "intrinsically bounded," the course and assessment protocol creation "team" had a limited number of participants, and each participant interacted with the online course during a limited period (i.e. spring semester 2007). Within the case, I selected three subject matter expert participants for this study, as well as the course instructor. I additionally surveyed students enrolled in the PRF 711 course to obtain a better perspective on the background of typical students enrolled in the course. In his discussion of case studies, Stake (1994) identifies three approaches that researchers often use in carrying out their analyses. An intrinsic case study, according to Stake, only focuses on the specific case at hand, without attempting to generalize on a larger scale. The specific case in question, therefore, is of primary interest (1994, p. 237). An instrumental case study, conversely, attempts to build theories (or seeks to understand a case on a larger level) from data obtained through the analysis of a single case. Within the instrumental approach, "the case is of secondary interest; it plays a supportive role, facilitating our understanding of something else" (Stake, 1994, p. 237).

As Stake notes, a collective case study is an "instrumental study extended to several cases" (1994, p. 237). Though I did not attempt to generate a theory, my analysis tended more toward the intrinsic case study approach, insofar as I attempted to discuss the general utility of a new assessment protocol through the lens of a single course at a single institution, California University of Pennsylvania. Although realizing the inherent variability among different online

courses, with respect to academic discipline and pedagogy, I nonetheless attempted to draw some general conclusions on the efficacy of the new assessment protocol as a solution for assessment of psychomotor skills, across disciplines and various pedagogical approaches, in online courses. The next section will describe the research questions guiding the inquiry in this particular case study.

3.3. Research Questions

As previously mentioned, the focus of this case study is the development and implementation of a new assessment strategy and protocol using webcams and digitized video files. In Chapter 1, the specific goals of this case study have been stated as distinct and disparate research questions that relate to the various inquiries coupled with the assessment of psychomotor skills and hands-on technique learning presented in a web-based course. Piantanida and Garman (1999) purposely state that "generally no more than three to six guiding questions are needed to structure a study. Usually long lists of questions indicate that further deliberation of the intent of the study is needed." Therefore, six far-reaching, guiding questions were developed for this study. In order to better identify how each question was addressed in this study, the questions are listed in table 4.1 along with criterion regarding how each question was addressed during data collection and analysis.

Table 4.1: Research Question Criterion

Guiding Question	***How Question Was Addressed in Study***		
What are the issues related to assessing psychomotor and hands-on skills learned in online courses?	Interviews with subject matter experts associated with the PRF 711 course.	Review of various literature related to the topic.	Analysis of discourse among faculty teaching in online environments.
Who are the students (learners) studied in this case study including; background, credentials, years of professional experience, experience & confidence in using technology, and access to subjects to be used as clients in video assessment activities?	Primarily addressed using the results of the pre-course survey adopted for use in the PRF 711 course.		
What are the experiences of the instructor and students who are introduced to the new protocols for accessing psychomotor skill performance using webcam video/audio assessment?	Addressed via interviews with the instructor of the course.	Addressed via initial and follow-up interviews with selected students who experienced the new webcam assessment protocol.	Field observation of two students while they installed webcam software and recorded video assessment activities.
How does pre-course and post-course feedback from several stakeholders (instructional designer, faculty, leaders in the discipline) affect the formative and summative evaluation and development of the video assessment protocols and processes?	Addressed via interviews with the instructor of the course.	Addressed via interviews with an instructional designer familiar with the course.	Addressed via interviews with two subject matter experts who are leaders in the fitness discipline.
What new assessment instruments can be developed during this study that will allow instructors to adequately evaluate student performance via online video projects?	Addressed via interviews with the instructor of the course.	Addressed via interviews with two subject matter experts who are leaders in the fitness discipline.	Grading rubric development, implementation, and summative analysis also addressed this question.
Based on the results in this study, what are the implications for online learning?	Addressed by the researcher with knowledge relevant confirmation from the three subject matter experts.	Addressed by the researcher with knowledge relevant confirmation from the faculty instructor	

3.4. Research Participants

This section will focus on the selection and description of study participants. Non-probability sampling was employed as my method for selecting participants. Honigmann, (1982)

has stated that non-probability sampling methods "are logical as long they are used to solve qualitative problems, such as discovering what occurs, the implications of what occurs, and the relationships linking occurrences." In selecting participants involved in this study, I also employed a purposeful sampling strategy. Maxwell (1996) stated that purposeful sampling "encourages the researcher to choose cases that encourages comparisons to illuminate differences and similarities across themes". Creswell (1998) believed that a purposeful sample can help highlight different perspectives on a problem. Patton (1990) argues that "the logic and power of purposeful sampling lies in selecting information-rich cases for study in depth. Information-rich cases are those for which one can learn a great deal about issues of central importance to the purpose of the research, thus the term purposeful sampling." My goal was to identify the most relevant participants, with a variety of varying perspectives, who could bring "information-rich" contributions to my study. Therefore, I selected the following: a single course instructor from the PRF 711 course described below, five students enrolled in the PRF 711 course, two subject matter experts who have previously created content for the PRF 711 course and are nationally recognized experts in the content area, and a subject matter expert in instructional design. The next section below will describe the University course in which this study was housed.

The course integrated in the study was *PRF 711: An Integrated Approach to Fitness and Wellness*, which was offered as a 100% online course at California University of Pennsylvania in spring 2007. The course is regularly offered in the first semester of a 30 credit graduate program in Exercise Science and Health Promotion. The course is required for all students enrolled in the Wellness and Fitness track of the program and has a companion course, *PRF 751: Program Design in Fitness*, which is completed in the following semester and focuses on program design

in fitness training. The Wellness and Fitness track is described on the program website (www.cup.edu/go, 2007) as follows:

> Exercise Science & Health Promotion- Wellness and Fitness Track
> In response to great demand, this recently developed track is designed for the health / fitness professional, personal trainer, educator, military professional, coach, and others who want to learn about fitness training program design and wellness programs for the general population. Research and current issues in the fitness industry, as well as, wellness programs will be a focus of the courses. Students enrolled in this track are prepared to take the National Academy of Sports Medicine (NASM) Certified Personal Trainer (CPT) certification.

The next section below will expand on selection criteria, and specific selection methodology, for each participant.

Recruitment for this study occurred in two ways. First, the selection of the instructor and subject matter experts was based on purposeful sampling due to the relationship of the aforementioned with the course, course content, and University assignments. According to Trochim (2006), "expert sampling involves the assembling of a sample of persons with known or demonstrable experience and expertise in some area. Often, we convene such a sample under the auspices of a panel of experts." An expert sampling method was used in selecting the instructor and subject matter experts. These participants were logical additions to the study based on title, responsibilities, and potential for contributing to the richness of the study. Second, the selection of the students occurred by employing a random selection of students from the group of students who agreed to participate. A "typical" sample was drawn from the student participant pool. According to Patton (1990) a typical sample "is one that is selected because it reflects the average person" within the sample population, and that the sample selected "is specifically selected because it is not in any major way atypical, extreme, deviant, or intensely unusual." The selection criteria for each participant is listed below:

Course Instructor: The instructor must have taught the course at least two times prior to teaching the course in this study. In addition, the instructor was required to have earned the nationally recognized Certified Personal Trainer (NASM-CPT) certification offered by the National Academy of Sports Medicine (NASM). Lastly, the instructor had to agree to work closely with me to design and implement a new protocol of assessing student skills using webcams.

Students: The students eligible for participation had to be enrolled fulltime in the MS in Exercise Science and Health Promotion graduate program, Wellness and Fitness track, offered at California University of Pennsylvania. Additionally, they had to be registered in the spring 2007 PRF 711 course which was taught by the course instructor listed above. Lastly, the eligible students had to agree to fully participate in the requirements (installing a webcam, video recording, and video submission, etc.) associated with implementing a new protocol of assessing student skills using webcams.

Instructional Designer: The instructional designer must have had at least one year of experience working with faculty in online course development. In addition, the instructional designer must have had working experience with the inclusion of videos and video-based software in an online course. Lastly, the instructional designer had to agree to work closely with me to design, implement, and evaluate a new protocol of assessing student skills using webcams.

Subject Matter Expert 1 (SME 1): The first subject matter expert, the Director of Training and Development for NASM, was selected because of his knowledge of the course content to be focused on in this study. His background in creating fitness assessment and exercise training content for the national NASM-CPT certification and for the PRF 711 course qualified him as a key contributor to this study. The SME 1 also had experience in teaching online courses in the fitness discipline. Lastly, the SME 1 had to agree to work closely with me to design, implement, and evaluate a new protocol of assessing student skills using webcams.

Subject Matter Expert 2 (SME 2): The second subject matter expert, the Content Development Coordinator for NASM, was selected because of his knowledge of the course content to be focused on in this study. His background in creating fitness assessment and exercise training content for the national NASM-CPT certification and for the PRF 711 course qualified him as a key contributor to this study. Lastly, the SME 2 had to agree to work closely with me to design, implement, and evaluate a new protocol of assessing student skills using webcams.

Now I will describe how I contacted and/or selected potential participants in the study. Since I had selected the instructor and subject matter experts specifically for their background and experience related to the PRF 7711 course and the content presented, I contacted each via an introductory letter (see Appendix C & D) with an enclosed Informed Consent Form (see Appendix E & F). In order to be included in the study, these participants were required to complete the Informed Consent Form, sign it, and return the form in order to participate in the

study. These participants were also granted the opportunity to discuss the study time requirements and study objectives in greater detail via personal phone conversation with me. Recruitment of student subjects was more random than that of the instructors, insofar as I did not have any specific individuals in mind who I wanted to involve in the project. A group of 30 students, all enrolled in the spring 2007 PRF 711 course, were mailed an introductory letter (see Appendix G) with an enclosed Informed Consent Form requesting participation (see Appendix H). Twelve students responded that they would be available and interested in participating. Based on input from one of my Committee members, Dr. Noreen Garman, I randomly selected five students from the pool of students who agreed to participate as represented by submission of the signed Informed Consent Form. The random selection was completed by assigning each student a number and randomly selecting five numbers, then determining which students were assigned to the selected numbers. The five students selected were then contacted via email regarding specific procedures and it was confirmed that the students were willing and physically able to participate. The five student participants were also emailed a Webcam Video Release Form (see Appendix I) and a Facility Permission to Video Release Form (see Appendix J). The first form was required to be completed and signed by all student participants and selected clients. The later form was required to be completed by a manager, owner, or other supervisor working at the facility where the video was recorded. All forms were returned by the student participants. The next section will address data collection procedures.

3.5. Collection of Data

Data was collected using a variety of methods including interviews, document analysis, observation, and surveys. Each of these methods is described in greater detail below in this

section. Before providing detailed descriptions, I want to provide a couple general comments and descriptors regarding techniques used to collect data.

Interview Method: As a key component of probing for quality information during this study, I selected interviews as the primary method of collecting data. According to Dexter (1970), interviewing is the preferred tactic of data collection when "it will get better data, or more data, or data at less cost than other tactics." I interviewed all of the participants in this study in order to complete the picture of experiences from many angles and perspectives. General questions regarding the new video assessment protocol, as well as experiences related to implementation of the protocol, were asked. Questions that emerged from the development of the new protocol before the course began were added to the interview guide, or schedule, of all participants (see Appendices K, L, & M). A standardized open-ended interview via phone and/or email was conducted in each case, with a series of questions being pre-conceived by myself before conducting the interview. While several questions were developed before each interview, the open-ended nature of the questions allowed for participants to expand on descriptions of experiences and allowed me to ask "sub-questions" based on participant responses as the interview progressed. This format allowed for an easy pursuit of salient points, and it helped to reduce interviewer bias, while better facilitating the organization and analysis of data (Patton, 1987). The initial interviews were conducted via phone, face to face, or email with some follow-up interview questions being asked via email communication. All face-to-face interviews were recorded using a digital recorder and each interview was saved as MP3 files on my computer for archive purposes. In some cases, the interview was divided into three distinct audio files in order to reduce MP3 file size. Each recording was then transcribed using the speech-to-text software program, Dragon Naturally Speaking. The transcripts were then compared and cross-referenced with the audio MP3file recordings to verify correct and accurate transcription.

Observation Method: I acted as an observer during the study in two ways. First as a "Complete Observer" while viewing student activity in the course and accessing relevant data within the course related to submission and grading of video assessment projects. According to Merriam (1998), "a complete observer is either hidden from the group or is in a completely public setting." I functioned as a complete observer in this case since I was invisible to the student participants who did not have direct knowledge that I was logged into the course and viewing various data. Secondly, I acted as an "Observer as Participant" while watching two students install the software, set-up the webcam on their computer, record the videos, then upload the video assignments into the course Drop Box. Again according to Merriam (1998), the "Observer as Participant" is best defined when "the researcher's observer activities are known to the group or individual, but the researcher's participation is definitely secondary to the role of information gatherer." During all observations I collected field notes which included a description of activities, further questions to explore in interviews, and specific challenges or issues that needed further exploration.

Survey Method: The survey that was developed for implementation at the start of the course was a brief, to the point, survey which allowed for open ended responses, but primarily looked for Yes/No responses. The primary goal of the survey was to create a general picture of the students participating in the course. Survey data were collated and analyzed in descriptive form, primarily looking at data that could be used to "define" the typical student enrolled in the PRF 711 course.

Document Analysis Method: Several documents were analyzed for this study, with most documents being researcher-generated documents. Merriam (1998) defines researcher-generated documents as those "prepared by the researcher or for the researcher by the participants after the

study has begun." I worked closely with the course instructor and subject matter experts to create several documents associated with this study. Examples of documents created and analyzed in this study include the student activities, grading rubric, and a pre-course student survey.

One goal of the study was to analyze the experiences and feedback of five students, who used webcams to submit online video/audio assignments focused on "hands-on" content in the psychomotor domain, more specifically, fitness assessment and exercise activities. An additional goal was to analyze the experiences of the instructor who implemented the video project protocols into the course, evaluated the student video projects, and faux-graded student performance. I also analyzed question/answer data collected from a variety of stakeholders who provided input, feedback, and suggestions regarding video assessment protocols and assessment instruments. As mentioned earlier, the stakeholders, or subject matter experts, which were interviewed included the Director of Training, and the Director of Content Development, for the National Academy of Sports Medicine (NASM). In addition to their daily work at NASM, the two professionals were partly responsible for designing and refining much of the curriculum used in the PRF 711 course analyzed in this study. Additionally, feedback and insight was analyzed from the instructor teaching the course. Lastly, the five students submitted video/audio assignments and, via interviews, were asked to describe opinions, experiences, suggestions, and questions regarding the processes and protocols used during webcam set-up, video recording, and project submission.

Pre-Course Data Collection

The primary goal of this study was to create a new protocol of assessment implementing webcam video assignments in an online course. In order to develop the protocol, data was

collected initially by interviewing various stakeholders with firsthand knowledge of the content created for the course. The goal of initial data collection was to develop the protocol, determine the processes required to implement the protocol, and to identify existing documentation, or create new documentation, that would be integrated into the new protocol's processes. The development of the protocol required analysis of video software, the identification of hardware requirements, and mapping of the specific "routine" students would follow to prepare for the assessment, complete, the video assessment, and submit the video assessment. Processes included student recording of content, student uploading of videos, and instructor grading of video assignments. Documents included three exercise and fitness assessment activities (see Appendices N, O, & P) a pre-course student survey (see Appendix Q), and a grading rubric (see Appendix R). The results and results related to development of the new protocol will be further discussed in the next chapter.

During-Course Data Collection

During the PRF 711 course, over the 15 week semester, several data collection methods were used including a survey, observation, and student submission of video assessment activities. Prior to the course starting, I worked closely with the instructor and the instructional designer to create a student survey to be implemented in the very first week of the course. Students were asked by the instructor to complete the survey in the first week and submit the survey via email to the instructor. The goal of the survey was to identify the students' background regarding years of experience, fitness related certifications, experience in online courses, experience using webcams, confidence in using webcams for assignments, and ability to identify and recruit a "subject" (client, relative, friend, etc.) for recording of video assessment

activities. Observations were also performed during this phase of data collection. I observed two of the student participants as they installed the required software on their computers, set-up the hardware including webcam, completed the video recording of activities, and submitted the videos into the course. As mentioned previously, I acted in an "Observer as Participant" role. Data was also collected during the PRF 711 course by having the five student participants, selected for the study, complete the video assessment activities and upload videos into the "Drop Box" section of the online course. The results and results related to the student survey and student submission of video assessment activities will be discussed in the next chapter.

Post-Course Data Collection

Post-Course data collection came in a variety of forms including subject matter expert (SME) review of the actual webcam video recordings and answers/discussion data. Interview data and emailed questions with responses were collected with regard to "experiences" secondary to implementation of the new video assessment protocol. The post-course interviews included the following:

1.) Course Instructor Interview: I emailed the instructor who taught the *PRF 711: An Integrated Approach to Fitness and Wellness* course in spring 2007 with questions focusing on assessment results, methods used to evaluate and grade student submissions of the webcam video assessment activities, and analysis of student feedback directly submitted to the instructor during the course. Additionally, I asked the instructor to provide feedback regarding the processes and protocols for using webcam video as an assessment technique for evaluating psychomotor skills and hands-on fitness assessment

and exercise skills. I also asked the instructor to provide details regarding challenges and issues related to the process (see Appendix M).

2.) SME 1 Interview: I emailed the Director of Training and Development for NASM for the National Academy of Sports Medicine (NASM) with questions regarding the use of video assessment to evaluate psychomotor skills and hands-on fitness assessment and exercise skills. After granting access to the video assessment activities, I also asked the subject matter expert to provide feedback regarding the processes and protocols for using webcam video as an assessment technique for evaluating psychomotor skills and hands-on fitness assessment and exercise skills (see Appendix L).

3.) SME 2 Interview: I emailed questions to the Content Development Coordinator for the National Academy of Sports Medicine (NASM), who helped develop and directly supervises the Optimum Performance Training Method used in the Certified Personal Training certification, which is embedded and presented in the PRF 711 course. After granting access to the video assessment activities, I also asked the subject matter expert to provide feedback regarding the processes and protocols for using webcam video as an assessment technique for evaluating psychomotor skills and hands-on fitness assessment and exercise skills (see Appendix L).

4.) Instructional Designer Interview: I emailed the instructional designer, who is employed at California University of Pennsylvania, with primary responsibilities of assisting and educating faculty who are teaching in online courses. The instructional designer was also

familiar with various aspects the PRF 711 course. After granting access to the video assessment activities, I also asked the subject matter expert to provide feedback regarding the processes and protocols for using webcam video as an assessment technique for evaluating psychomotor skills and hands-on fitness assessment and exercise skills (see Appendix L).

5.) Student Interviews: I emailed the five students who participated in the video assessment activities during the PRF 711 course. I asked the students to provide feedback regarding the processes and protocols for using webcam video as an assessment technique for evaluating psychomotor skills and hands-on fitness assessment and exercise skills. I also asked the students to provide details regarding challenges and issues related to the process (see Appendix K).

3.6. Data Analysis

As described previously, this study presents background information on the use of web-based learning in the general sphere of higher education and outlines the current range of online education courses in fitness, exercise science, health, and wellness education. This qualitative study focused on a case study analysis exploring the utilization of webcam videos as new assessment tools implemented in a fully web-based course offered in an Exercise Science and Health Promotion Graduate Program at California University of Pennsylvania. The research results were analyzed supported by mining data from assessment documents, a pre-course student survey, my observation, and interviews of several students and professionals.

Evaluation of the data is in the form of a case study report describing common concerns and comments made by participants, a listing of advantages and disadvantages related to

implementing webcam video as an assessment tool in web-based classes, and suggestions for future implementation of webcam video recordings as an assessment tool in psychomotor skill based courses in an online environment. Constant comparison of stakeholder feedback and analytic induction were used to organize and categorize the data. The study results will be used to enhance assessment protocols using webcam videos in courses that require the learning of "hands-on" and psychomotor skills. The study results may also be used as a conceptual framework to examine how web-based courses in several disciplines, with a significant amount of psychomotor objectives, could include online video assessment techniques.

In describing my approach to data analysis, I have relied heavily upon Yin's (2003) and Merriam's (1998) treatments of case study research. Yin maintains that "data analysis consists of examining, categorizing, tabulating, or otherwise recombining the evidence to address the initial propositions of a study" (2003, p. 102). In this study, I have analyzed various strands of evidence obtained during my data collection. The result has been the creation of various themes, or conceptual categories, to guide my interpretation of the data. Below I discuss in detail the processes used in analyzing my data. Yin (2003, p. 103) asserts that researchers using a case study approach must develop an overall analytic strategy in organizing data. One strategy he proposes, which he terms the 'relying on theoretical propositions' approach, was particularly useful in my analysis. This strategy maintains that data analysis should derive from the researcher's own specific theoretical propositions, which in themselves should mirror "a set of research questions, reviews of the literature, and new insights" (Yin, 2003, p. 103). Indeed, based upon an extensive review of the discourse and initial data collection, I developed three primary theoretical propositions. Aside from guiding my data analysis, these theoretical propositions helped frame my research questions and overall study design.

Within the larger analytic strategy for data analysis, asserts Yin (2003), the researcher must select sub-strategies (i.e. specific techniques) to examine the data. Yin explains several of these strategies, of which the 'explanation building' technique proved most applicable in this study. Specifically, using this approach, I created baseline propositions (theoretical or otherwise) regarding the new webcam assessment protocol, the phenomenon I investigated. Through a progressive series of steps, during which I collected data on the case and then compared that data to the initial proposition, I eventually produced an explanation of the experiences, as well as outcomes, and conceived some relevance of the results (Yin, 1994, pp. 110-111). In developing explanations of my data, I additionally followed procedural guidelines established by Merriam (1998), who describes a range of "levels of analysis" that researchers proceed through to reach the "interpretive/explanation-building phase". The interpretive/explanation-building phase is achieved after the various levels of analysis. The first level is that of description; where I described the data in summary form for my own analysis, but I did not initially offer any of my own interpretation. As evident in chapter four of this document, I have sufficiently described my data, including various statements made by student, instructor and subject matter expert participants, as well as my own observations of the PRF 711 online course and observations of students applying the new webcam assessment protocol. In addition, as a second phase of data collection, I have gone past description to the next level of Merriam's hierarchy, that of category construction. Merriam explains that "devising categories is largely an intuitive process, but it is also systematic and informed by the study's purpose, the investigator's orientation and knowledge, and the meanings made explicit by the participants themselves" (1998, p. 179). As I coded interview transcripts and reviewed relevant documents and fieldwork notations, the important themes occurring within these data sets appeared, mostly in the form of issues,

challenges, and solutions. Particularly, I looked for similar themes occurring across data sets, with a particular focus on cross-referencing comments, observations, and suggestions made during emailed questions or interviews of all participants. Similar themes were then grouped together into distinct conceptual categories, which in turn formed the basis for explanation building. In developing my own conceptual categories, I followed the constant comparative method (Merriam, 1998, p. 159). Following each set of interviews or emailed answers, I looked at responses to search for meaningful themes—the identification of themes was principally guided by my research questions and theoretical propositions. Upon identifying a specific theme within a given comments, I analyzed other comments to determine if the same theme was present. In identifying and developing themes, I additionally used information contained within the PRF 711 course and from my observations to reinforce or dispel various results. This comparison of themes across multiple data sets, otherwise known as triangulation of data, served as the foundation in developing my conceptual categories. In particular, I selected "methodological triangulation", which involves using more than one method of data collection to decipher results. Thus far, I have explained two levels of Merriam's data analysis hierarchy, description and category construction. A third level described by Merriam, theory building, allows the researcher to move beyond category construction into formal theory development. In this final process, the researcher formally links together his/her categories into a broader conceptual scheme. The resulting theory, often called 'grounded theory' (as the theory itself derives from the data), thus provides a larger, more holistic explanatory framework of the phenomenon under study. In this study, I did not attempt to build theory from my conceptual categories. Since my case study was more exploratory and practical in nature, I felt that the

development of conceptual categories was sufficient for describing and interpreting facets of the new webcam video assessment protocol.

3.7. Trustworthiness

Lincoln and Guba (1985) identified four methodological issues that any research project needs to address in order to establish the scientific worth of a study: consistency, applicability, truth value, and neutrality. In quantitative studies the four issues are commonly addressed by establishing the study's generalizability, validity, and objectivity. In qualitative studies, such as the case study focus used in this study, the issues are addressed by establishing dependability, transferability, credibility, and confirmability. (Lincoln & Guba, 1985).

One key criterion used to assess research studies is validity. The issue of validity is usually posed in terms of what constitutes a credible claim to truth (Silverman, 2000). Two common ways to address validity are method and data triangulation and/or respondent validation. Triangulation is the use of multiple sources of data, multiple observers or interviewees, and multiple methods to enhance the probability that interpretations are credible (Miles & Huberman, 1994). Triangulation methods of field observation, interviewing, and document analysis were used in this study to provide a complete understanding of the beliefs, context factors, and practices of students, instructor, and subject matter experts. In addition, each participant was afforded opportunities to read, correct, and make comments on written descriptions, assertions, and interconnected components. None of the participants choose to make changes. To check for credibility of the data being gathered and to confirm developing themes and ideas, techniques of prolonged engagement and repeated confirmation were used. Lincoln & Guba, (1985) suggest that "the idea of dependability emphasizes the need for the researcher to account for the ever-changing context within which research occurs. The researcher is responsible for describing the

changes that occur in the setting and how these changes affected the way the researcher approached the study". To enhance the dependability of this study, I maintained an audit trail of materials that documents how the study was conducted: what was done, when, and why. Additionally, I maintained the raw data gathered in observations and interviews as paper documents and digitized files. According to Lincoln & Guba (1985), "transferability refers to the degree to which the results of qualitative research can be generalized or transferred to other contexts or settings. From a qualitative perspective transferability is primarily the responsibility of the one doing the generalizing." To establish transferability I provided sufficient information that allows the reader to establish the degree of "fit" with other similar situations regarding online course delivery and psychomotor assessment requirements in web-based courses. To do this, I provided a thick description that outlined as many salient and peripheral dimensions as possible regarding each participant in the study, and specifically addressed transferability in the conclusions and implications chapter of this document. According to Lincoln & Guba (1985), "the credibility criteria involves establishing that the results of qualitative research are credible or believable from the perspective of the participant in the research". To establish credibility, I needed to adequately represent the multiple realities of all research participants. As previously mentioned, this was done by triangulation, which calls for the use of multiple sources of data to maximize perspectives of the phenomenon. This was done by using many sources of data from each participant's interviews, various observations, and cross referencing with documents. The course syllabi, assessment activities, online course layout, grading rubric, and learning objectives were all examined. Finally, confirmability required that I established the "reasonableness" of the interpretative results. According to (Lincoln & Guba, 1985), "qualitative research tends to assume that each researcher brings a unique perspective to the study. Confirmability refers to the

degree to which the results could be confirmed or corroborated by others". This was done by submitting my study document to three faculty colleagues for evaluation in preparation for the defense meeting. The review by the faculty colleagues, all of whom teach online courses in the health and fitness disciplines, acts as a sort of confirmability audit. My colleagues provided a professional assessment as to whether the conclusions drawn from this study are supported by the data collected and analyzed.

3.8. Ethical Considerations

My many years of experience as a university professor, at both Duquesne University and California University of Pennsylvania, helped define my role as both direct observer, interviewer, and participant observer in my study. With over fifteen years of teaching and curriculum development experience, I have worked in a variety of allied health and fitness academic programs, with an extensive background in melding technology innovations with the delivery of health and fitness curricula. Having first-hand knowledge of online course development and delivery, helped me focus on important interview and document analysis data, while observing online course activities.

Extremely important in this study were individual rights to privacy and confidentiality. Before beginning observations and interviews, informed consent was discussed and signed by all participants. In addition, all IRB review requirements were filed and approved by both IRBs at the University of Pittsburgh (see Appendix S) and California University of Pennsylvania (see Appendix T). There were many ethical considerations to consider when preparing for and subsequently conducting this case study. Creswell (1998) suggested that the following are some ethical issues that the researcher should consider: 1) protecting the anonymity of informants, 2) disclosing the purpose and nature of the study, 3) how to use information shared "off the record",

4) whether or not to share personal experiences in interview situations (p.132). The students selected to participate in this study were kept anonymous with regard to names. Students were assigned a letter (Student A, Student B, Student C, etc.) for identification purposes. The instructor and subject matter experts were also not named specifically. While titles for the SMEs were used, no specific mention of names have been employed. Since this research focused on the implementation of a new assessment protocol in an existing online course, this study did not pose any potential risks of harm for the participants.

Another ethical consideration relates to the very nature of case studies requiring that the researcher become deeply embedded with the study and its participants. According to Piantanida and Garman (1999, p. 153):

> Living with the study can create a climate of intimacy, breaking down the traditional separation between researcher and subject. In forsaking the ontological stance of "detached, objective observer," interpretive researchers typically enter into relationships that are far from anonymous or impersonal. Indeed, skillful researchers-those with a highly honed sense of self as instrument-are likely to succeed in establishing a bond of trust that invites confidence from participants and thus increases their vulnerability.

The purpose of this study was outlined for all participants at the beginning of the study via informed consent documents and descriptive cover letters. All participants were given the opportunity to drop out of the study if it was deemed necessary at any particular point. While no participants choose to do so, all participants were afforded the ability to designate information that was provided as "off the record". While no information was designated as such, any information that would have been considered threatening or too controversial would have been removed during the formative or summative phases of the study. Finally, all collected data was protected under lock and key, and has not been made available to anyone not involved in the study.

In conclusion, the procedures I employed in this dissertation incorporated guiding principles from both general qualitative and, more specifically, case study research. Namely, I selected the implementation of a new video assessment protocol in the *PRF 711: An Integrated Approach to Fitness and Wellness* course as the case. Within this case, I sent a list of emailed questions to the instructor participating in the course, as well as three subject matter experts, each contributing in various ways to the study under investigation. I also conducted email interviews with five students, who were required to record and submit digitized video assignments created with webcams, enrolled in the PRF 711 course. As an adjunct to the interviews, I observed two of the students as they installed the software and recorded the required activities. I also observed the course as an external participant being able to login and view various aspects of the course related to the study. I performed document analysis and data mining from a variety of documents created for the new assessment protocol including the video recording activities, the grading rubric, and the pre-course survey required of all students enrolled. The survey, in particular, allowed me to determine several key descriptors of the students who typically enroll in the PRF 711 course. The data I obtained through interviews, observations and document analysis were coded to identify common themes. The themes I identified were an outgrowth of my research questions and theoretical propositions. The conceptual categories developed out of these themes served as the foundation for further analysis, interpretation, and explanation building. The following chapter will discuss the results of this process.

4. Presentation and Analysis of Descriptive Data and Content Synthesis

4.1. Development of a New Assessment Protocol

The development of the new webcam assessment protocol was a primary goal of this study. As such, several aspects of the development process will be described in this section. I will first provide a portrayal of the *PRF 711: An Integrated Approach to Fitness and Wellness* course to provide a clear picture of the course involved in this study. I will then discuss the current teaching and evaluation protocol that has been incorporated into the pedagogy of the PRF 711 course over the past two years. The instructional design review process of the new assessment protocol will then be discussed, and lastly, the application of the protocol during the spring 2007 term in the PRF 711 course will be highlighted.

The following information will offer a snapshot of the PRF 711 course as it exists within the larger picture of the University and Exercise Science and Health Promotion (ESHP) Program, as well as provide a look at the goals and objectives of the course. The course is required of all students in the Wellness and Fitness track within the ESHP program at California University of Pennsylvania. The course is one of four required for the specific track, in addition to six core courses required of the degree program. The core and track course titles are listed below:

Exercise Science and Health Promotion Core Courses:

PRF 720 Essentials of Human Movement Science
PRF 705 Industrial, Clinical & Corporate Wellness
PRF 715 Business & Entrepreneurship in the Fitness Industry
PRF 760 Leadership & Professional Development
PRF 765 Nutrition for Peak Performance
PRF 770 Exercise Physiology: Assessment & Exercise Prescription

Wellness and Fitness Track Courses:

PRF 800 Research in Fitness and Wellness
PRF 711 An Integrated Approach to Fit. & Well.

PRF 751 Program Design in Fitness & Wellness
PRF 781 Current Topics in Fitness & Wellness

The course, and guiding syllabus (see Appendix B), was approved in the 2004-05 academic year by several committees made up of faculty at the University. These committees include the Health Science and Sports Studies Faculty, University Wide Curriculum Committee, and the University Graduate Council. The course was first offered in the spring 2005 term. The course consists of fifteen modules offered over the time period of a fifteen week semester. Since students can begin the program in either the fall or spring term, the course is offered every fall and spring semester. Based on the high number of enrollments over the past two years in the Wellness and Fitness degree track, two or three sections of the PRF 711 course have been offered each fall and spring term. The course is offered as part of a cohort model where 30 students take all courses together as a group with the goal of creating a learning community of peers across the length of the program. The course description and primary learning objectives of the PRF 711 course are listed below:

> Course Description: This course will introduce the revolutionary exercise programming strategies of the Optimum Performance Training™ model. The student will receive a detailed insight into designing exercise programs for any personal training client. They will be shown how this systematic approach to program design uniquely blends the science of acute variables with the concepts of flexibility, core stabilization, balance, reactive training, speed, agility and quickness and strength training to develop safe and effective exercise programs for all individuals.
>
> Learning Objectives:

- Explain the history of personal training.
- Understand today's typical client.
- Rationalize the need for integrated program design.
- Describe the Optimum Performance Training (OPT™) model.
- Explain the structure and function of the nervous, skeletal, muscular, and the cardiorespiratory systems
- Analyze the concepts and theories of motor behavior.

- Explain the components and function of an integrated fitness assessment.
- Provide a scientific rationale for the use of an integrated flexibility-training program and differentiate between the types of flexibility techniques.
- Define integrated cardiorespiratory training.
- Analyze the importance of core training.
- Analyze the importance of balance training.
- Analyze the importance of integrated reactive training.
- Analyze the importance of speed, agility and quickness training.
- Describe the stages of the General Adaptation Syndrome and the Principle of Specificity.
- List and define the various stages of strength and training systems and alter program design for clients with various conditions.
- Define and describe conditions, dysfunctions or pathologies common in the special populations of clients.

In addition to the meeting the learning objectives listed above, students are also prepared during this course to "sit" for the NASM-Certified Personal Trainer (NASM-CPT) Examination. The NASM-CPT is a national certification presented as the primary fitness certification offered by the National Academy of Sports Medicine. The examination is recognized by an accrediting body to assess entry-level knowledge in the areas of exercise training, fitness assessment, and fitness program design development. As described by the NASM website (www.nasm.org, 2007), the NASM-CPT is:

Accredited by the National Commission for Certifying Agencies (NCCA). The NASM-CPT certification is the preferred choice for hire and career advancement by leading health clubs, such as: 24 Hour Fitness, Bally Total Fitness, Gold's Gym, Lifetime Fitness, and Town Sports International. National Academy of Sports Medicine certification means the most to sports professionals, club owners and fitness department managers because it requires comprehensive knowledge of human movement science, functional anatomy, physiology and kinesiology, as well as functional assessment and program design.

Upon completion of the PRF 711 course, students are highly encouraged to take the NASM-CPT certification examination at one of several hundred proctored sites around the United States. Proctors at the sites do not evaluate psychomotor skills, but the student is evaluated on cognitive

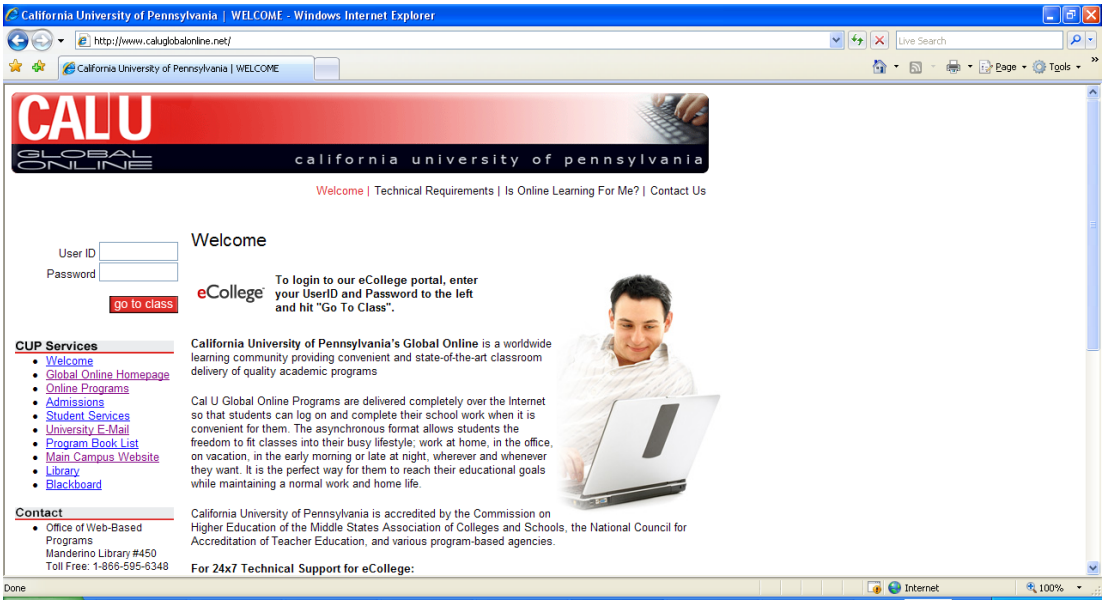
and affective domain knowledge via a computer-based examination. The next section will describe more specific details regarding existing pedagogy and instructional design within the PRF 711 course.

4.1.1. Existing Teaching and Assessment Protocol

This section will describe how content is organized, presented, delivered and assessed in the existing version of the PRF 711 course. I use the term "existing" to describe the course prior to addition of the webcam video assessment protocol. While the existing course does present exercise training and fitness assessment content to the students via streaming video, the course does not include any version of video assessment techniques intended to evaluate student learning.

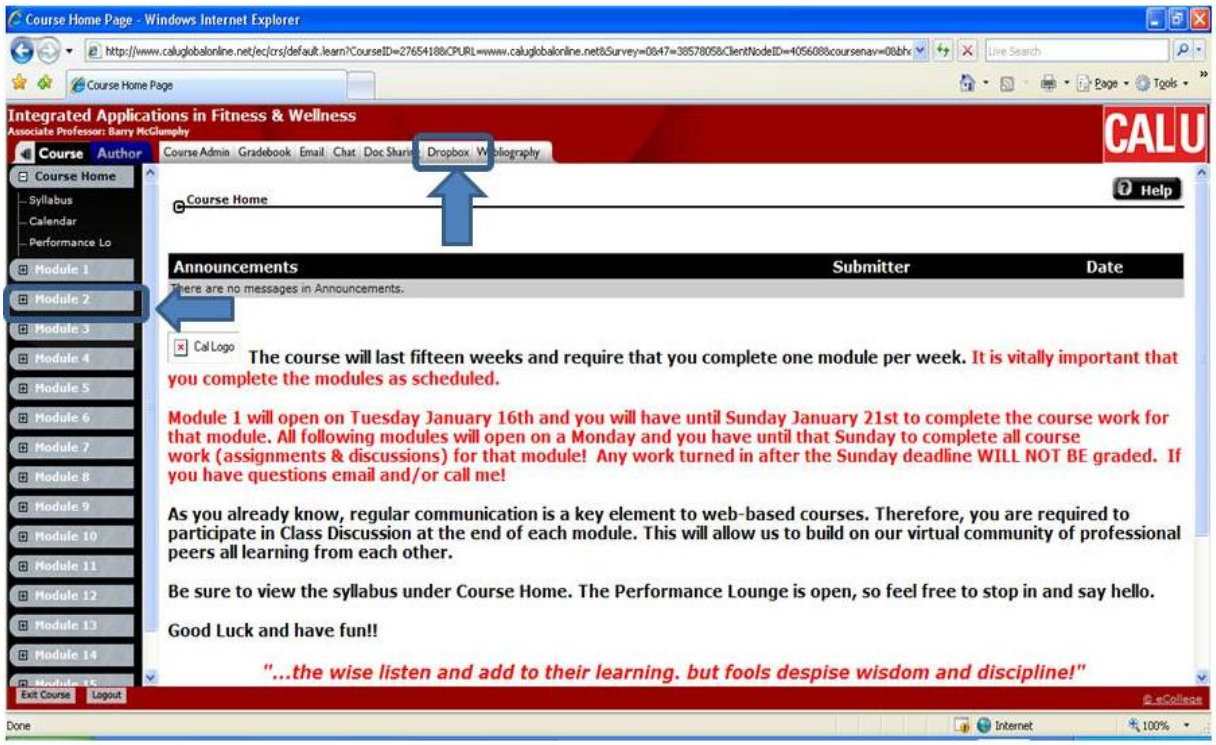
The current course is 100% online with no lab requirement and no need for students to attend any session on the California University of Pennsylvania campus. Students access the course via the CalU Global Online web-portal where students login to their courses (Figure. 4.1).

Figure 4.1: Login Portal for CalU Global Online Courses



The student is required to complete one module each week during the fifteen week term, with each module having the following common elements: an introduction, narrated presentations in Flash format or streaming video presentation readings (textbook and PDF files), an assignment/project, a threaded discussion, and a quiz. The required modules are listed on the left side of the course in order of progression with each module covering a distinct topic area in fitness assessment and exercise training. For example, Module 8 will cover topics related to core exercise training including several sample exercises, proper techniques, and progression strategies for moving the client from one fitness level to the next. (Figure. 4.2)

Figure 4.2: PRF 711 Online Course Module Layout and Drop Box



During a typical week the students read the introduction, then view the narrated Flash files. After viewing the presentations, the students read the required documents, which often include a chapter in the NASM textbook focused on the Optimum Performance Training Model. Out of class assignments or projects are posted for the student to complete and usually involve working by themselves or with a selected "client" to perform the exercise or fitness assessment exercises covered in the module. I often refer to these projects as the student applying the course material in their "working laboratory". The "working laboratory" could be their place of work or could simply be applying the techniques with a family member, friend, or themselves. After submitting a written narrative of their project experience and client-related results in the course Drop Box (Figure 4.2), the student then typically accesses the threaded discussion to respond to three or four questions posed by the instructor. The student is also required to "converse", via threads, with other students in the class. The student then would complete the required quiz which assesses the student learning of the content presented in the module. The instructor for the course typically grades each module ten days after the module opens to the student. Grading consists of reading and evaluating the written assignments related to the project, assigning points to the discussion posts, and automated results on the module quiz. Feedback from the instructor is usually limited to written feedback within the course grade book or via email responses. Very rarely is feedback provided to the student via the telephone or via any other synchronous methods. To provide a clearer picture of the working laboratory assignments required to be completed by students, below is a summary of one such project found in the PRF 711 course.

> You should practice the following techniques learned this week in class with a patient, client, family member, or yourself. Please focus on how you would describe the activity to the subject and pay close attention to your instructions to the subject when performing the activities. The techniques for this week are: Shark Skill Test, 40-Yard Dash Assessment, and the Vertical Leap Test. After performing the activities with your subject,

please write a one page narrative and submit in the Module 5 Drop Box in the course. This assignment is worth 20 points towards your final grade.

The existing course does not include a grading rubric for assessment of the working laboratory activities. The next section will describe the instructional design analysis of the protocol implemented during this study.

4.1.2. Instructional Design Review of New Protocol

In order to develop and implement an appropriate assessment protocol using webcam videos into the PRF 711 course, I selected an Instructional Design System to help guide the process. The ADDIE model of instructional design was selected because of its simplicity and universal recognition as a functional instructional design model (Gustafson & Branch, 2002). The ADDIE system is summarized as "a generic process traditionally used by instructional designers and training developers. The five phases—Analysis, Design, Development, Implementation, and Evaluation—represent a dynamic, flexible guideline for building effective training and performance support tools"(Wikipedia-ADDIE Model, 2007). While I will provide detailed descriptions of the instructional design and implementation of the webcam assessment model in a later section of this chapter, the following summarizes each step of the process and what was accomplished by me and the participants of this study with regard to instructional design analysis of the new assessment protocol.

Analysis: In the analysis phase, I clarified the instructional problem, and carefully considered the instructional goals and objectives as already established and approved as part of the course syllabus. I also reexamined the online learning environment and, via the pre-course survey, analyzed some of the learner's existing knowledge and skills. I also revisited several

questions which have already been addressed when the course was created. The goal was to verify that the PRF 711 course, in practice, was meeting previously stipulated instructional design guidelines created for the course. Below are some of the questions that were formerly addressed when we initially created the course in 2004.

- Who is the audience and their characteristics?
- Identify the new behavioral outcome?
- What types of learning constraints exist?
- What are the delivery options?
- What are the online pedagogical considerations?
- What is the timeline for project completion?

It was verified via observation of the course and discussions with the instructor that all previous guidelines were still being implemented.

Design Phase: During the design phase, I again analyzed already existing learning objectives, assessment instruments used in the course (quizzes, small group projects, etc.), out of class activities, module content, lesson planning, module sequencing, and streaming media and flash file selection. The design phase, which was conducted originally for the course, was very systematic and specific matching learning objectives with assessment strategies. My revisit of the design phase during this study primarily focused on the development of the new webcam video assessment component of the course, with a specific focus on the requirements and sequencing required to add the assessment to the course.

Development and Implementation Phases: These phases were the most time intensive and challenging during the initial creation of the PRF 711 course with several tasks taking months to complete before the course could be formally offered to students. Course text, illustrative

graphics, and streaming video needed to be designed and implemented as learning tools in the course. The development and implementation phases as they relate to this study, required that I implement the pedagogical requirements of the new assessment protocol. Again, the specifics of design, development, and implementation phases of the assessment protocol will be discussed in the next section of this chapter.

Evaluation Phase: The evaluation phase of this study focused on formative evaluation methods, which were ongoing during the development and implementation of the new webcam assessment protocol. Formative evaluation methods included assessment of the new protocol by subject matter experts and the instructor of the course. Additionally, a summative evaluation of the protocol was performed in several ways. First, the students were debriefed after the course to determine perceptions, opinions, and experiences related to exposure to the new assessment protocol. Secondly, the instructor was asked to respond to emailed questions to collect thoughts and opinions related to the protocol. Lastly, subject matter experts experimented with the applied working protocol and evaluated the video assessments as a final evaluation. The data and feedback from these participants allowed for a summative evaluation which will be discussed in the final chapter of this document.

4.1.3. Application of the New Protocol

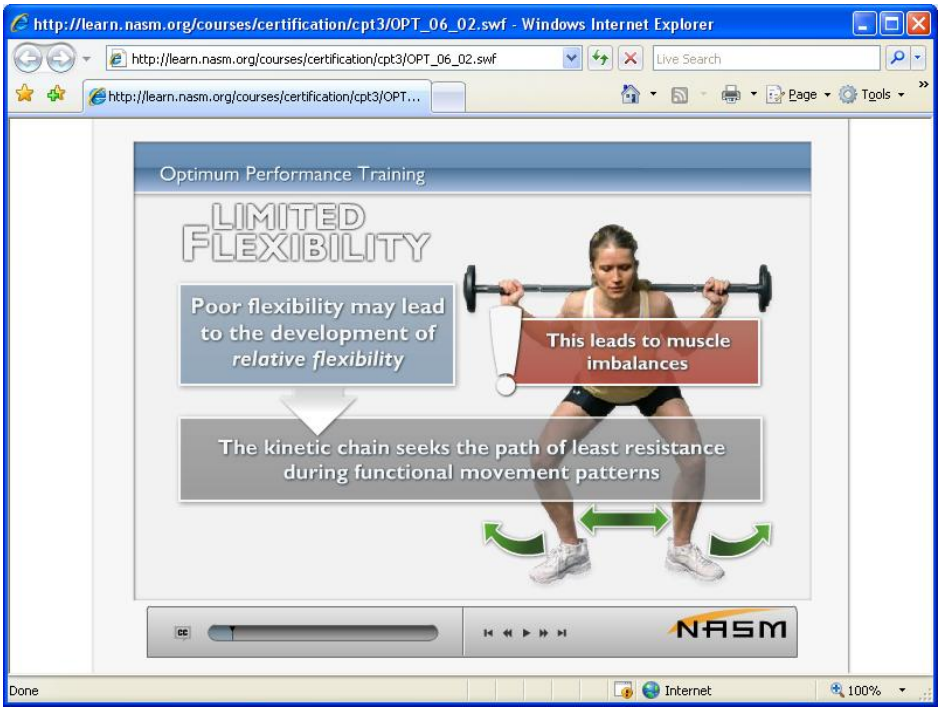
The following will describe the new assessment protocol developed and implemented in this case study. Based on the conclusions of the instructor and myself that current pedagogy and course delivery of PRF 711 course information was effective, the existing course structure was changed as little as possible. The course outline, learning objectives, and module sequencing

stayed the same. The only aspect of the course that was revised was the addition of three activities which were required to be completed by the five students participating in the study.

The five student participants were required to complete the PRF 711 course modules in sequence with their classmates during the fifteen week term. The five student participants were sent an email explaining the activities and were instructed that they would be receiving a webcam and related software in the US Mail for use in this study. Students were instructed to follow the installation instructions included with the webcam to set-up the camera and install the software. They were also requested to complete, sign, and return the Video Release Form (see Appendix I) and Facility Video Release Form (see Appendix J). The three modules described in this study required the students to read background theory, applied techniques, and suggested exercise progression related to core exercise, balance exercise training, and the overhead squat assessment. Students also viewed narrated flash files which include video examples of the exercises and progressions (Figures 4.3 and 4.4).

Figure 4.3: Narrated Presentation Screen Shot –Core Training

Figure 4.4: Narrated Presentation Screen Shot – Squat Assessment



After completing a module associated with this study, the student participants were required to complete a video assessment activity as an evaluation of applied learning and psychomotor skill acquisition. The selected video assessment activities are representative of the types of material presented during the course of the semester. The activities are also representative of key learning goals and criteria for passing the NASM-CPT certification examination. The activities selected were three of the most common techniques presented over the past three years at NASM workshops around the country. The activities were developed by the instructor and myself, and then were submitted to the three subject matter experts for comments, improvements, and final approval. The three activities selected were Core Exercise Training- Activity 1 (see Appendix N), Balance Exercise Training - Activity 2 (see Appendix O), and Overhead Squat Functional Assessment- Activity 3 (see Appendix P). The core and balance

exercise activities required that the student instruct and observe their client during six sub-activities selected by the student. These sub-activities included two strength exercises, two stabilization exercises, and two power exercises. Therefore, the student had the client perform six distinct exercises for both activity 1 and activity 2. Activity 3, the overhead squat functional assessment, required the student to instruct the client on performing an overhead squat, then observe the client as the squat was performed to determine if the client showed any biomechanical abnormalities, muscle tightness, or muscle weakness. Students could use any equipment they had available, but had to provide quality examples of exercises taught in the PRF 711 course. During all three activities, students were required to verbally explain what they were doing, what they observed, and justify why they selected specific exercises.

Figure 4.5: Video Assessment Example of Balance Training Exercise

Figure 4.6: Video Assessment Example of Lateral Squat Assessment

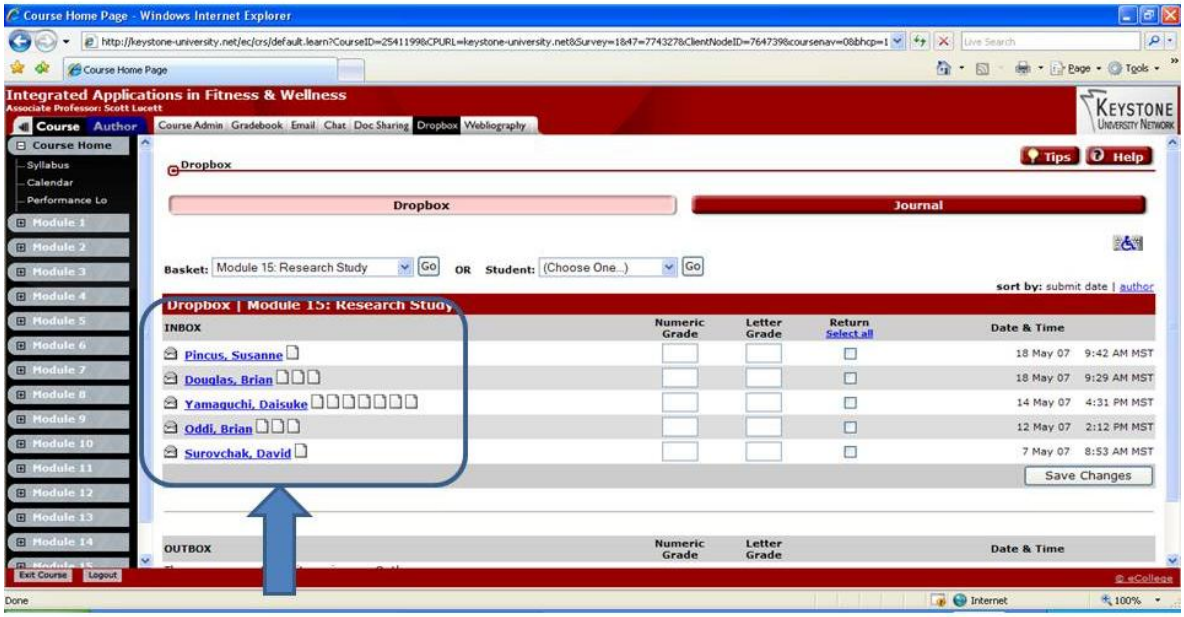
Figure 4.7: Video Assessment Example of Core Training Exercise

Figure 4.8: Video Assessment Example of Overhead Squat Assessment

Each activity required the student participants to download the written description of the activity from the course Doc Sharing section, and then complete the activities by recording videos of each activity via webcams. Each activity typically resulted in 10-12 minutes of digitized video. Screen shots of the assessment videos are seen in (Figures 4.5, 4.6, 4.7, and 4.8).

After completing the activities, the students were required to upload the videos directly into the Drop Box which was labeled "Research Study". In an actual course where the new video assessment protocol is applied, the Drop Box would correspond with the module the students are completing. For Example, the Core Training video activity would be uploaded by the student into the Module 8 Drop Box. An example of the Drop Box page with video assessment assignments uploaded into the box is seen in Figure 4.9.

Figure 4.9: Video Project Drop Box in PRF 711 Online Course



After the five student participants uploaded the videos into the Drop Box, the instructor viewed each video and, using the grading rubric (see Appendix R) created in this study, assessed the student's performance and assigned a faux grade. The grading rubric was developed by the instructor and myself, and then was submitted to the three subject matter experts for comments, improvements, and final approval. All three SMEs approved the rubric as developed without changes. The faux grade was not used in the calculation of the student's final course grade, but was only used for experimental purposes as it related to this study. After completing the rubric and assigning a faux grade, the completed rubric for each student was then sent to the student via the PRF 711 course outbox. The goal was to provide students with the breakdown of their grade and an opportunity to learn from the feedback provided by the instructor in the comment section of the rubric. The next section will describe the typical profile of students enrolled in the PRF 711 course.

4.2. Descriptors of the PRF 711 Course Student

The following section answers questions related to research question 2: Who are the students (learners) studied in this case study including; background, credentials, years of professional experience, experience & confidence in using technology, and access to subjects to be used as clients in video assessment activities?

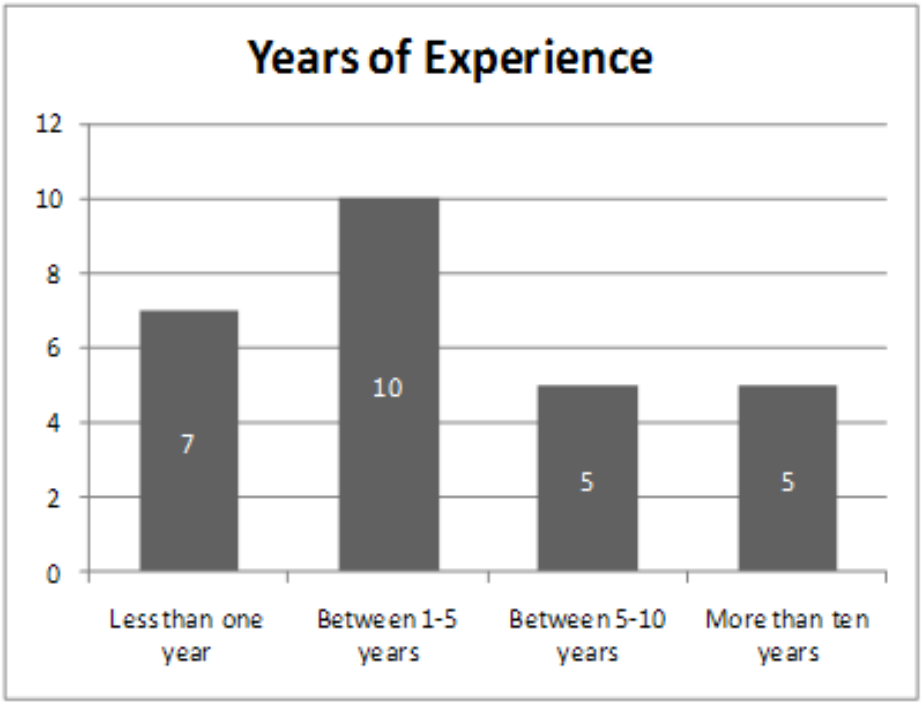
I created a survey for this purpose, which I then had evaluated by the course instructor and instructional designer to corroborate my belief that the survey questions were appropriate for addressing the needed descriptors of each student enrolled. The survey developed for this study is designed to be used in any course that would involve the use of webcams to record video. The survey provides background data regarding the student and helps the instructor identify students who may have problems, logistical or otherwise, related to use of the webcams for assessment. Each of the following sections describes the findings associated with a particular question on the survey. In order to better visualize the results, the tabulation of responses from students are represented in graph or chart format.

4.2.1. Years of Experience and Certifications

This section of the survey was designed to identify who the students, enrolled in the Spring 2007 PRF 711 course, were with regard to years of experience and fitness certifications. I believed that a snapshot description of the students regarding experience and knowledge would provide significant input into the study. I also suspected that a student group that already possessed significant experience in the certified personal training methodologies, used as assessment activities in this study, would provide less than desired data with regard to the outcomes of implementing the new video assessment protocol into the PRF 711 course. The students not having previous certifications related to the content area taught and assessed was

essential to the success of this study, as I wanted to introduce newly learned material to the student that could be applied by the student and evaluated as video assessments. Therefore, the goal was to determine what certifications, if any, the students previously acquired related to the NASM CPT protocols.

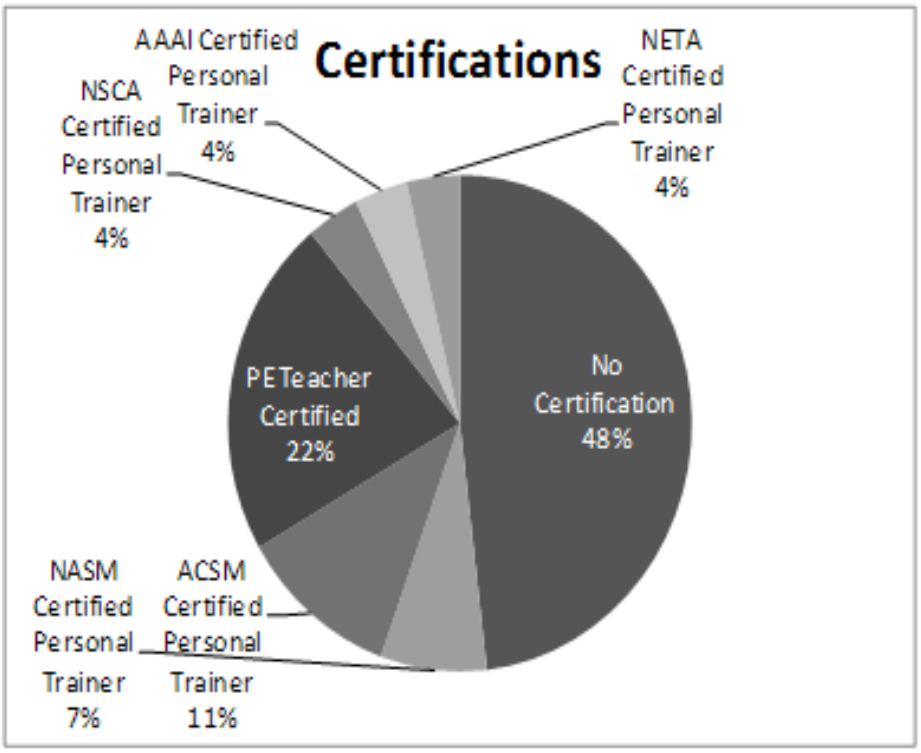
Figure 4.10: PRF 711 Course Student Profile- Years of Experience.



With regard to the question "How many years of experience do you have in the field of fitness?", the results showed that five students had greater than ten years experience in the fitness industry and that a majority of students were basically novices with regard to years of experience (Figure

4.10). Several students had less than one year experience, but the largest group of students had experience between one and five years.

Figure 4.11: PRF 711 Course Student Profile- Certifications.

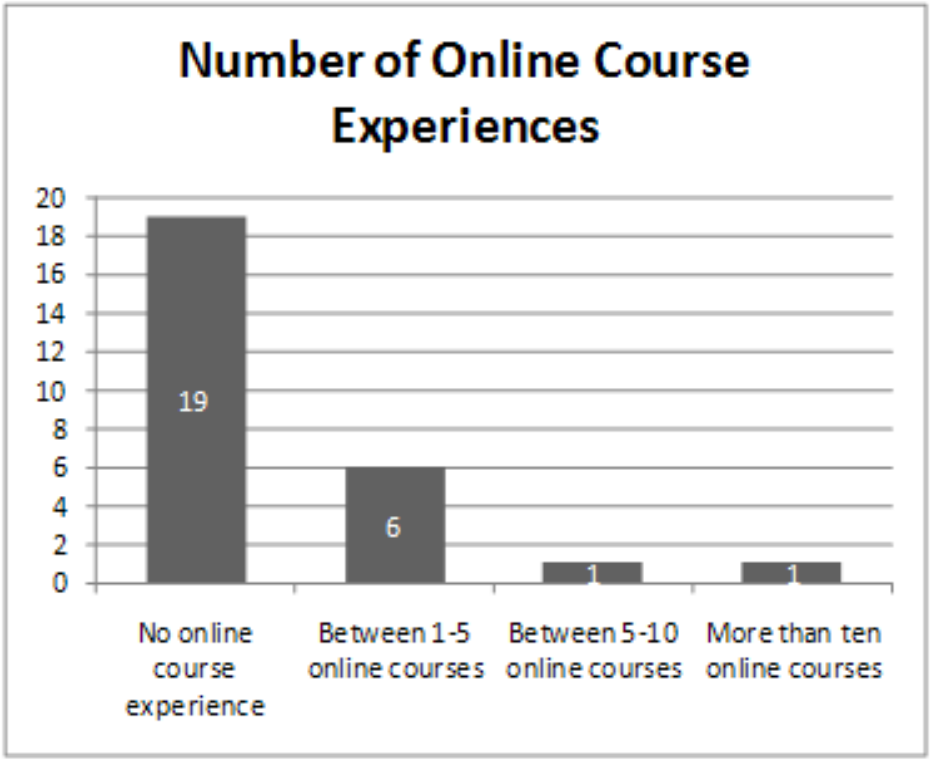


With regard to the question "What fitness and/or health profession certifications do you presently hold?", the results showed that approximately half of the students had no previous certified personal trainer or fitness certification coming into the course (Figure 4.11). While several students did report a national Certified Personal Trainer certification, only one reported being certified in the Optimum Performance Training methodology offered in the NASM-Certified Personal Trainer certification. This finding was important due to my concern that students would

already possess training and education in the specific activities tested in this study. In fact, the five student participants selected for the submission of video assessment activities, none had previous certifications in any fitness related area. Six respondents (22%) did report that they were certified as Health & Physical Education teachers, but this did not have any effect on the study.

4.2.2. Online Course Experience and Comfort with Technology

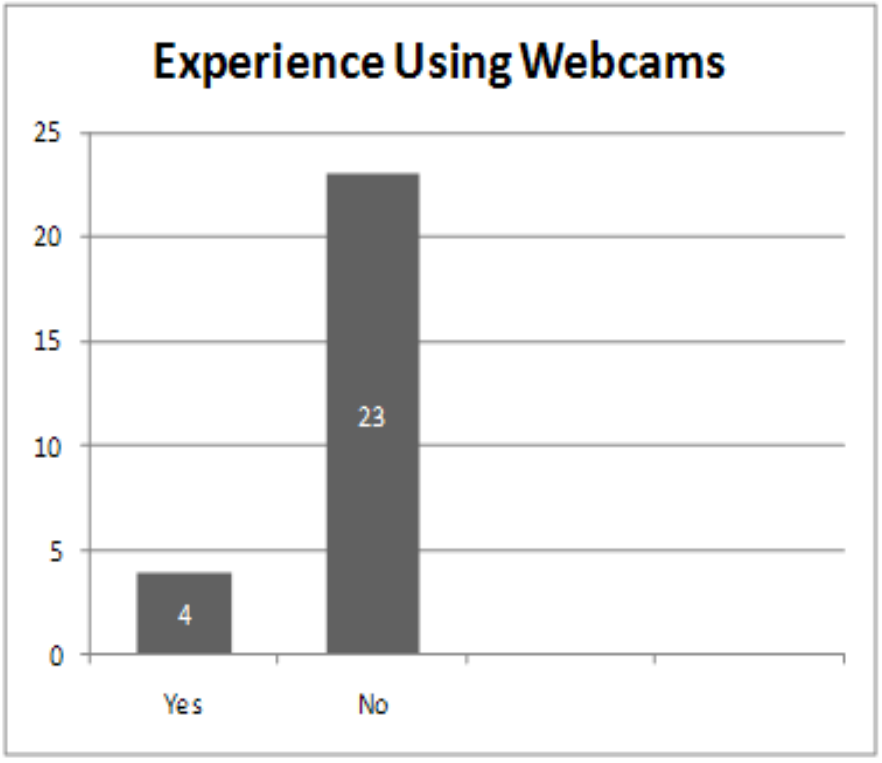
Figure 4.12: PRF 711 Course Student Profile- Online Course Experience



With regard to the question "Have you enrolled in online courses before taking online courses at CalU? If yes, how many?" the results showed that a majority of respondents have never enrolled in an online course prior to starting the PRF 711 course offered in the Spring 2007 term at

California University of Pennsylvania (Figure 4.12). While eight respondents did report previous experience, all but two had previously enrolled in only one or two online courses. My initial thought when asking this question was whether students with no online course experience would be intimidated by the prospect of using technology such as webcam videos in an online course. Based on the overall lack of experience in online courses, but the overwhelming confidence in the ability to use webcams (see Figure 4.13), I conclude that students with little to no online experience are not intimidated by the use of webcams. This point will be addressed again in the section below regarding confidence in using webcam technology.

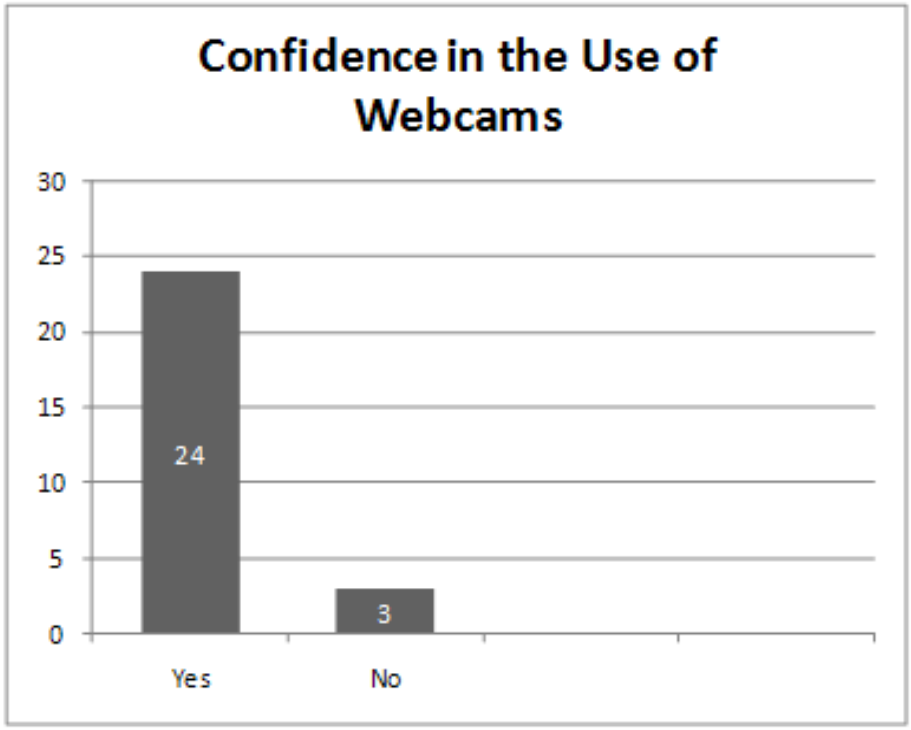
Figure 4.13: PRF 711 Course Student Profile- Webcam Experience



With regard to the question "Have you used webcameras (webcams) hooked up to a computer in the past? If yes, explain the amount of experience you have with webcams?" the results showed that a vast majority of the respondents have never used a webcam for any purpose (Figure 4.13).

This would signify the potential for a steep learning curve with regard to employing webcams in the PRF 711 course. However, the process for training students to use webcams has been refined during this study and appears to have resulted in minimal issues regarding the five students who submitted video activity assessments during the course. Of the students who did signify that they have used webcams previously, one regularly uses webcams to communicate with her husband when he is deployed in the military and another uses webcams with MSN Messenger to "chat" with family and friends.

Figure 4.14: PRF 711 Course Student Profile-Confidence in Using Webcams



With regard to the question "Do you feel confident enough in your technology ability to set-up a webcam on your computer?", the results showed that all but three of the respondents feel confident enough in their technology ability to set-up a webcam (Figure 4.14). It should be noted that this self-report of great confidence is in light of the fact that no information was shared with

the respondents regarding the hardware /software requirements and technological savvy needed to set-up and use a webcam. I feel very "good" regarding the confidence level displayed by the respondents and was especially impressed by two respondents who stated "yes, with help from my husband". It is clear, based on the findings in this survey, that former experience in online courses and/or previous experience with webcams is not a prerequisite for the student to display outright confidence in their ability to use webcam technology in n online course.

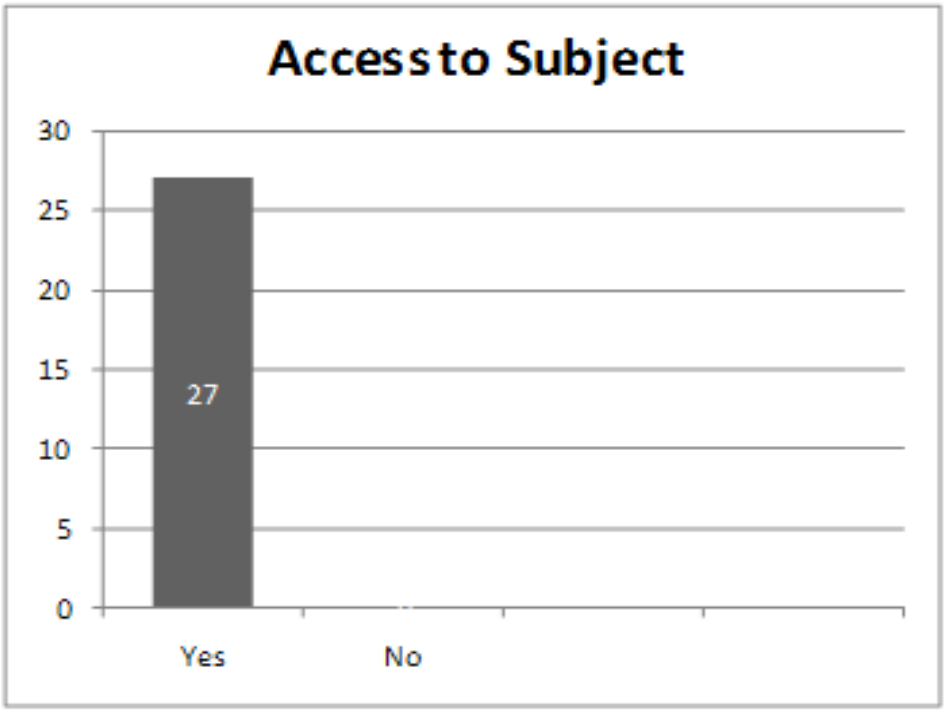
4.2.3. Client Accessibility

One of the important requirements of the new video assessment protocol is that each student have access to a subject (client or pseudo-client) for purposes of demonstrating the various activities during the video recording. In other words, the student must be able to explain the activity to a client and have the client perform the activity. In addition, the assessment activity required that the student evaluate the client and have the client perform various actions such as an overhead squat which allows for identification of muscle weakness, muscle tightness, and biomechanical distortions.

Prior to implementing the video assessment protocol in this course, students were required to go out into their "working laboratory" and practice the activities learned in the online course. The assessment of student learning performed by the instructor was in the form of reading and grading a written self-report from the student regarding activities performed in the "working laboratory". This previous method was not fully dependent on the student having access to a client, as the student could use themselves as their client. In contrast, the new protocol of using video assessment techniques absolutely requires that the student identify and recruit a subject for the assessment activities. After all, the instructor wants to specifically confirm or refute that the student can apply the activities learned in the online class in the real

world with a real client. Without access to a subject, the video assessment would be rendered useless for the particular student who does not have access.

Figure 4.15: PRF 711 Course Student Profile-Access to Subject



With regard to the question "If your courses required that you submit webcam videos of you performing course activities (a fitness assessment, for example) would you have access to a client to use as your subject (the client could also include a spouse, friend, colleague, patient, etc.)?", the results showed that all respondents would have access to a subject to use during recording of the video assessments (Figure 4.15). This finding is especially significant due to my concern regarding a student's ability to find and recruit someone else who must spend time

helping the student complete assessment activities for a college course. None of the students stated any qualifiers to the yes response.

4.3. Five Students and Their Experiences

The previous section included survey results from several students in the course. This section will include feedback from five students who were randomly selected to participate in the recording and submission of fitness assessment and exercise training activities using webcam video recordings. The following section describes the various experiences and contributions from the five student participants. Insight into a variety of areas was collected after the students completed the submission of the video assessment activities into the course. Students have been randomly assigned a letter (A, B, C, D, or E) for identification purposes. In order to cross reference findings with SME and instructor experiences, the student input is summarized focusing on students perceptions of the following: advantages of using webcams for assessment in the online course, disadvantages of using webcams for assessment in the online course, experiences setting up the webcam and submitting the video assignments, suggestions for implementing the webcam assessment protocol and protocols in future courses.

4.3.1. Student A

Student A Description: This student is a 28-year-old physical education teacher with five years experience teaching at the high school level. The student had no prior fitness certifications and was not familiar with the NASM-CPT certification prior to enrolling in the course. The student had no prior experience using webcams and had never experienced an online course before enrolling in PRF 711. The student was able to recruit a teacher colleague as the subject for the video assessment activities.

Advantages: While not directly implemented in this study, Student A commented that webcams could be a great advantage with regard to "real-time" interaction with the instructor, whether for instruction purposes or for assessment applications. This insight led me to investigate further the idea of synchronous vs. asynchronous video assessment discussed later in this document. The student also stressed the importance of visual content presented in the course. Specifically the student focused on personal learning styles especially as it relates to hands-on skills. As summarized by Student A, "there are many advantages to implementing the webcams as an assessment tool. Student's can interact with the instructor and peers just like in a classroom setting. I am more of a visual learner; therefore find the implementation of webcams a viable tool for online students."

Disadvantages: While Student A did not have many problems setting up the software and hardware configuration, the student did identify potential disadvantages to using webcams in the course. These included the increased potential for technology "breakdown" when using webcams. In other words, adding more technology to the course increases the chance for "something to go wrong" when submitting video assignments. Student A also highlighted a potential issue related to instructor-required "real-time" or "live" communication. As I have heard from several students in this course, real-time communication would be most difficult, based on the very busy schedules faced by most students. However, as mentioned previously, this issue is addressed later in this document.

Lastly, Student A suggested an idea that I had not thought about previously. That is the prospect that some students may not feel comfortable "performing" for the video camera.

Another way to look at this idea is a sort of "stage fright" that the student experiences in front of the webcam, that the student would not normally experience presenting in front of a live instructor. Student A summarized potential disadvantages as "technical difficulties, time issues if there is to be a group web-casts, no access to a computer with webcam hook-ups, and that not all students may feel comfortable with being on camera."

Experience with Webcam Set-Up and Video Submission: Student A stated that set-up time was minimal and mentioned that "in order to prepare for the set-up, I had to ensure that my computer had the capability to connect with the webcam. Installation of the software and camera took approximately 15 minutes from start to finish, which included time to become familiar with the software." In addition, the student added that "the process of submitting the webcam assignment was similar to attaching a word document and/or uploading pictures to an email. Due to the size of the file, uploading and submitting the final document took a little more time." The time issue related to file size was confirmed several times over during the study, therefore I address the issue in greater detail later in this document. This student's experience makes it appear that the learning curve for set-up and submitting the videos into the course was not steep, and in fact was an easy process to learn and follow.

Thoughts Regarding Future Use of Webcam Assessments: Student A stated several times that the webcam video assessment protocol is "a great assessment tool as it provides the students with feedback from both the teacher, and potentially peers, on proper exercising techniques." Student A was a clear proponent of using webcams as an assessment tool, and several times described potential for using webcams in a variety of ways in the course. One particular thought was as a

"peer review" tool that would allow each student to perform video activities, then submit them into the Doc Sharing section of the course so that other students could review. After some thought, I suggested to the student that peer review of the videos would be as important as the instructor review, especially since the students are primarily practicing professionals that could provide great feedback and insight to each other. This idea of a "learning community" where all students become teachers already occurs in the threaded discussion portion of the course where students interact and provide feedback on a weekly basis with different students becoming the group leader depending on the topic presented. Student A proposed that "webcam assignments become accessible to the entire class, in order to receive greater feedback. In addition to having assignments completed via webcam, perhaps threaded discussions could be implemented as well. For example, in the beginning of the course, when we are asked to introduce ourselves, it would be nice to have the classroom setting and have the ability to apply a face to the name." The idea of implementing the webcam early on, in the very first week of the course, would allow the students to become comfortable with the technology and that using the webcam as a tool to introduce the cohort participants to each other would reduce some of the "fears" related to use of the new technology.

Student A also pointed out that students who might otherwise try to "cheat the system" by not performing out of class activities, cannot falsify the video assessment activities since a visual record is required. Student A summarized this thought: "With the webcam video, there leaves little room for assumption on if the one completing the assignment truly understands what is asked of him/her and the student cannot pretend to complete the out of class assignment without doing so."

4.3.2. Student B

Student B Description: This student is a 25-year-old with 2 years experience working as the Director of Sport Performance Training at a medium sized University. The student had two prior fitness certifications and was somewhat familiar with the NASM-CPT certification prior to enrolling in the course. The student had no prior experience using webcams and had previously completed five online courses before enrolling in PRF 711. The student was able to recruit a Strength and Conditioning Coach as the subject for the video assessment activities.

Advantages: Student B was also very direct regarding support of elearning and the experience of being a student in the PRF 711 online course. The student summarized thoughts by saying "I am a huge supporter of online education. This type of learning comes with both pros and cons. One of the cons is the assessment tools for classes that incorporate hands on activities such as the PRF-711 class. It is difficult to show the professor that you really know what you are talking about just through discussions with no visual component. Having a webcam as an assessment tool is a fantastic idea."

Student B also stressed the idea of feedback causing me to analyze another issue addressed later in this document. That is the issue of "feedback and cueing" not being addressed in the original protocol of webcam assessment activities. In a live laboratory setting, instructors can provide immediate feedback and cueing to correct student mistakes and praise proper technique. This idea of providing feedback allowed me to discuss other solutions for replicating the "laboratory experience", within the new webcam video assessment protocol. Again, I address this in a later section of this document. Student B's focus on feedback is best expressed by the following "Using the webcam will allow you to show physically what you are learning and then allow the professor to view and give the appropriate feedback. As an online student I am always

looking for feedback, and now with this visual aid for both the professor and student it will enhance my level of education. It is advantageous for the professor to implement the use of a webcam in a course, giving them a visual of the student and a great way to assess how the student is grasping the appropriate material."

Student B also proposed "asking questions with the webcam, then submitting to the professor for some feedback. You cannot always get all your questions answered without showing the exercises or going over a technique, you need a visual, this is a great tool to have as it not only enhances the learning process but brings more quality to the course." This proposal was discussed with the SMEs and the instructor and all thought it would be a good way to increase interaction with the student.

Disadvantages: Student B, as a strong advocate for using webcams as an assessment tool, did not see many disadvantages to implementing the protocol. The one area stressed by the student was the question of cost to the student. Student B asked "Are students going to be able to afford this type of hardware? Although this is a disadvantage I feel that there would be ways around this by supplementing the cost with another class or fee for the University."

Experience with Webcam Set-Up and Video Submission: Student B started with a rather gloomy picture of the suggestion that webcams would be used in the course, but quickly agreed that the set-up and submission process was quite straightforward. Student B submitted that "when I first heard that we, as students had to set up and install the webcam I thought that it was going to be an extremely long process and rather difficult. The process for setting up the webcam was very easy and quick. I simply put in the disc followed the very detailed step by step directions and in

a matter of minutes I was all set and ready to go. This is an excellent tool to have in this course and the setup is so minimal. There was no technical problems and very easy to follow."

In agreement with Student A, Student B likened the video submission process to that of other tasks the student was already familiar with, "the submission of an assignment was very easy. It was just as easy as sending an attachment. It was a quick process and effective. Being that I do most of my work online this process seemed like just another walk in the park. I think someone who is not too familiar with online learning would not run into any problems since submitting the videos from the webcams has a level of difficulty that is so low, it is self explanatory."

Thoughts Regarding Future Use of Webcam Assessments: Student B concluded that the use of webcams was a positive addition to an already "very good" course. Student B displayed the strong desire to learn that many of the students in the PRF 711 course typically exhibit. The student felt that any positive addition to the course would have a direct result on enhanced learning for all students. The student stated passionately, that "I would recommend that the PRF-711 course have this assessment tool included. As a student who is eager to learn and know what exactly I did right or wrong, I am all for it. I feel that this assessment tool enhances the quality of learning creating a great experience for the student." The student added later that "I feel that the course that is offered right now is very good. We are always looking for new ideas to better our courses and create very high quality when it comes to learning. I would like to say that I do, however, feel that this is a great idea and will only enhance the quality of education in an online environment which makes learning for working professionals and others possible."

Student B proposed what others also supported, and that is, implementation of the webcam video assessment protocol slowly, allowing students the option initially to use the camera, before making the protocol a requirement in various courses. The student suggested using the webcam for social communication in one of the first courses offered in the program, then implementing the assessment protocol into subsequent courses. Student B also suggested the expansion of the webcam video assessment protocol into other required courses in the Exercise Science and Health Promotion program. As stated by the student, "one suggestion may be a trial run, making the cam (webcam) optional for students? The protocol looks great! I have enjoyed this experience and look forward to using this technology in future classes. One suggestion would be the implementation of this technology in other classes that involve hands on activities."

4.3.3. Student C

Student C Description: This student is a 30-year-old Certified Athletic Trainer with one year experience working with a semi-professional basketball team. The student had no prior fitness certifications and was not familiar with the NASM-CPT certification prior to enrolling in the course. The student had no prior experience using webcams and had never experienced an online course before enrolling in PRF 711. The student was able to recruit a graduate student as the subject for the video assessment activities.

Advantages: Student C was the least vocal regarding feedback about the webcam assessment protocol. I observed that the student practiced English as a second language and may have not felt confident in expounding on the details of the experience. While the student did not provide

in-depth feedback, several key observations contributed to the wealth of this study. In agreement with statements by other students, Student C stated that "using webcams will make the course more hands-on. Webcam also let us learn a variety of things by watching other people's ways." Once again, the student suggests a peer review of video assignments, and more importantly, points out the learning of varying techniques and approaches associated with viewing other students' submissions. So while peer review is a good feedback approach, it also allows students to learn from several other classmates as they critique the videos submitted.

Disadvantages: Based on comments and suggestions for future "testing" of the protocol, student C appeared to be the most technological savvy of the group. The student stated that "some computers do not work well with webcam," which brings to light the issue of compatibility between various hardware, as well as software interfaces. I believe a thorough analysis is needed of a variety of hardware set-ups before the webcam video assessment protocol is implemented fully. Student C stated that as a proactive approach, "several cameras should be connected to a variety of software packages (Windows Operating system, Apple Operating system, etc.)." Another approach I suggested, and discussed with the SMEs, would be to mandate that all students have access to a specific hardware and software configuration. In other words, the hardware and software would be "prescribed" for the students in the course syllabus, or even as a program-wide policy. This is already done regarding basic needs to access the online courses, but the specific provisions and specifications required by the use of webcams are not in place.

Experience with Webcam Set-Up and Video Submission: Student C did have technological compatibility issues with the webcam provided and his personal computer. Therefore the student used a friend's computer to complete the activities. Although this student appeared to be the

most technological capable of the student participants, the student reported “it took a while to set up webcam and also I had to re-record the video since the sound system was not working well.” When probed further regarding the failure of the sound system, the student could not provide a reason for the problem, only to say that the camera started working OK after a few tries. When asked to try and replicate the audio problem, the student could not.

Thoughts Regarding Future Use of Webcam Assessments: Even though this student had a variety of technical issues when setting up the webcam and software, he summarized ‘although there are disadvantages as mentioned above, it is a great tool for learning if you are taking a web-course. But students should know what to expect, or disadvantage of the program before registering the class.” Student C points out the need for an FAQ component of the program related specifically to the use of webcams. I foresee taking this suggestion one step further with the development of a troubleshooting module which is actually a series of video clips, and/or narrated flash files that address all pre-identified potential problems that might arise when using webcams. Student C made a specific differentiation between information provided to the student after enrolling in the course itself, and the importance of information provided to the student before registering in the course. Essentially the concern is to make sure all students are aware of “what they are getting themselves into.” As stated by Student C, “it’s important to make sure everybody entering the program has tools necessary for the class work before registration. I do not know if everybody taking the web class has balls, steps, computers, and so on.” Student C makes an interesting observation that in addition to the technology requirements needed by the student, access to fitness equipment should also be spelled out for all students.

4.3.4. Student D

Student D Description: This student is a 52-year-old registered dietician with 25 years experience working at a large university with primary responsibilities counseling undergraduate students in proper diet and nutrition. The student had no prior fitness certifications and was not familiar with the NASM-CPT certification prior to enrolling in the course. The student had no prior experience using webcams and had never experienced an online course before enrolling in PRF 711. The student was able to recruit a staff member of the university's computer services center as the subject for the video assessment activities.

Advantages: Student D provided quality feedback and described the use of webcams very eloquently. Student D stressed that "the advantage would be that a picture is worth a thousand words. Having someone watch your work could provide additional feedback in a more practical way. When we actually have to leave the textbook and apply our knowledge in a training session, all kinds of questions can come up. Having a professor evaluate our work by watching how we teach could bring meaningful feedback." In addition, Student D suggested that a "stronger" bond would be created between instructor and student allowing the instructor to gain a better sense of who the student is as a person, and as a professional. The student observed that "a webcam could also add voice and a visual of a student. This could help the professor get to know the students by more than just their on-line personality." This begs the question, is the existing protocol (no webcam video assignments required) a better protocol due to the anonymous nature of the assessment and the inability of the instructor to have preconceived notions based on student personality, general demeanor, and overall likeability. While Student D was not fully convinced the webcam assessment protocol was a fully suitable replacement for instructor led laboratory

work, the student shared the following: “I felt that one limitation to the PRF 711 course with the required NASM content was not actually working in a lab setting. The webcam would provide some of the benefits of a lab. The teacher could see what was working and not working while the student worked with a client and give feedback.” The student still did not feel that all aspects of the one-on-one lab interaction with the instructor could be replicated using webcams. As I thought about the missing elements of the webcam assessment protocol, the one are that is lacking the most is the ability of the instructor to provide cueing and feedback, which was previously identified. I expand on this thought in greater detail in a later section of this document.

Disadvantages: Student D also observed the potential for frustration with regard to technology issues. “There could be frustrations with the technology. Not understanding how to use a piece of equipment can be frustrating and time consuming. This program requires a lot of time management to get the work done. Extra time spent on setting up equipment, returning faulty equipment or figuring out how to make the webcam work could take up time that a student does not have to give.” Time management is a key aspect of the program that students must master and any addition to the student’s already frantic schedules would be a negative on student morale and motivation. Student D also mentioned the idea of being “camera shy”. As stated by the student, “another disadvantage is that it can make you feel uncomfortable or self-conscious being on a video. If someone is self conscious about their body or their looks, this could be problematic. However, if we are going to train others, we need honest and reliable feedback so that we leave the program at a higher education level then where we started.”

Experience with Webcam Set-Up and Video Submission: Student D voiced to me several times before starting the recordings that she was a complete neophyte when it comes to technology. In a recent discussion, the student disclosed that without the help of a colleague, the student would not have completed the task of setting up the webcam and recording video. As described by the student "the microphone on my webcam did not work so I sought out the support of the tech support department where I work. They figured out the problem and provided me with a new microphone. The woman who appeared with me in the video (the student I was teaching) is a computer programmer. I had her set up the webcam. It took her about 10 minutes." Student D also made a comment that was reinforced by my observations of students. The student felt that non-technical set-up was also time demanding with regard to "getting the video just right." Student D shared that "it did take us awhile to figure out exactly where to stand and how much room we could take up to do the exercises and still be seen by the camera. We had to do practice shots before the real video on every exercise. Using the webcam for exercise requires the right space and some practice to get the video so that the whole body can be seen."

This student as a clear novice would have avoided completing the project if not for having help from a computer programmer. I identified this same feeling with two other students' responses in the pre-course survey. These students tend to be more mature students with years of professional experience, but a lack of technology experience. The students appear to depend on others to perform any technology related activities. As stated in some of the survey responses, students had confidence completing the video assessment activities with the help of others (daughter and husband were identified by two different students). Student D described the experience by saying "I gave the tapes to my computer support department and had them submit the tapes. I realize now that this was a limitation, that I should have done the work so that I could

provide feedback. I am very busy with work, school and kids and took advantage of working with people who could provide me with support. I would not have helped out in the project if it were not for being able to get help. I feel too insecure in my skills to take on a new technology. The directions would have to have been clearer for me to understand exactly what I would have to do to set up and submit the tapes." Interestingly enough, the student even referred to the digitized video as "tapes" which shows lack of familiarity regarding the technology.

Thoughts Regarding Future Use of Webcam Assessments: Student D summarized the experience and potential for using webcams in future courses by stating, "I think there needs to be a choice, if a student wants to use the webcam as an assessment or if they would rather use an alternative. If I were to be very time crunched to get in an assignment and run into any technical difficulties or just not able to use the technology, I would want an alternative way to submit an assignment. PRF 711 had us view tapes of exercises in the lab, this was a very helpful tool to learn. I believe it would also be helpful to have an instructor watch our work and give feedback. The instructions would need to be very clear and extra time allotted for the set-up and the submitting of the video."

The student also maintained the "social" role and personalization potential of the webcam. Student D stated "if using webcam in class was given as a way to give and receive feedback, it would be very helpful. How fun it would have been to actually see my fellow students who are in my cohort. However, anybody self conscious would probably pass on this opportunity. Again, having a choice as to whether or not to use the technology would be important." Student D clearly supported the webcam as an option, versus being a required activity in the course.

The student emphasized the need for training and 24/7 help regarding webcam setup and video recording. Presently there is no training or help desk support with expertise in this area. Training will be addressed in greater detail in this document. Student summed up the thought process by saying "if this new protocol is used, please make sure that there is time for practice runs so that mistakes and problems can be worked out. For instance, my microphone did not work. This could have delayed turning in an assignment on time. A separate chat room or tech support would need to be set up to handle any questions."

4.3.5. Student E

Student E Description: This student is a 23-year-old Certified Athletic Trainer with one year experience working with athletes at a private academy. The student had no prior fitness certifications and was not familiar with the NASM-CPT certification prior to enrolling in the course. The student had no prior experience using webcams and had never experienced an online course before enrolling in PRF 711. The student was able to recruit a college student as the subject for the video assessment activities.

Advantages: Student E was "very comfortable" with the webcam video set-up and recording process with regard to the technical aspect. The student also pointed out the usefulness of sharing the videos with the client as an educational tool in its own right. Student E stated "by using a webcam, this allowed me to review my client in a much slower and more precise fashion. I was also able to save their video clip on my computer which permitted me to share this document with others via email, as long as the client signed informed consent. The webcam could also be an advantage when sharing the video clip with the client pre- and post- testing. The client will have the advantage to actually monitor themselves and be able to visually identify where their

imbalances and weaknesses are. I highly recommend using the webcam, in fact I have used it about 6 or 7 times since receiving it for this project in assessing my clients." The student provided insight that was shared and discussed with the SMEs and the instructor and was included as a discussion point later in this document.

Disadvantages: Student E did point out potential issues and disadvantages to using the webcam assessment protocol, most of which have been discussed with other students. Student E observed that "one disadvantage would be the preparation and learning the operations. This may be a daunting task for individuals who are not very computer literate. Another disadvantage would be cost of the webcam to the consumer, unless funding was available through the significant program." This student, while seemingly very confident in setting up the technology, seemed to experience to some extent the "camera complex" phenomena described later in this chapter. During observation of the student, I noticed that the student was very "concerned" with the camera, which may or may not been a result of performance anxiety.

Experience with Webcam Set-Up and Video Submission: Student E describes the video recording experience; "my experience in preparation of the set-up for the webcam was quite easy. It is merely just a simple plug-in to the computer and download the software. The total process probably took approx. 10-15 minutes. The most difficult task in preparation was situating the computer in order to be able to view the client clearly." The student added "the submission aspect of the conclusion of the webcam was extremely easy. It was just about 2 clicks on the mouse; one to save, the other to submit it via Dropbox or email. Again, the webcam was a great tool to utilize in the course as well as simple for preparation and use."

Thoughts Regarding Future Use of Webcam Assessments: When asked to provide an opinion of future implementation of the webcam assessment protocol into the PRF 711 course, the student shared that "I would highly recommend the use of the webcam for the PRF 711 course. This would be a valuable tool to use and gain information from. My suggestions would be to definitely incorporate the use of webcam in the online courses, but especially PRF 711. The webcam would help expand the conversations in the discussions by visually being able to recognize significant problems and corrections. It would also help to visually identify individuals in the classroom instead of just through the discussion readings. I find it easier to paint a picture of the individual on the other end writing when I can identify them thru a video or picture." The student, like other students, points out the variety of uses for the webcam in addition to the function discussed here as an assessment tool.

4.4. The Instructor Experience

Instructor Description: The instructor is a 32-year-old faculty member with ten years experience as a fitness professional and two years experience teaching online courses in wellness and fitness. The instructor is nationally certified as an NASM Certified Personal Trainer and a NASM Corrective Exercise Specialist. The instructor has conducted several live workshops focusing on the Optimum Performance Training Model created by NASM. The instructor had no prior experience using webcams, personally, or as tool in an online course. The instructor also had no prior experience viewing and grading video assessment activities submitted by students. The instructor taught the PRF 711 course several times over the past two years and was part of the faculty design team that created content for the course.

The following section describes the various experiences and contributions from the instructor of the PRF 711 course. This contribution from the instructor was in addition to the insight and ideas submitted before the course, while the new protocol was being created. Insight into a variety of areas was collected after the instructor completed the faux-grading of the video assessment activities submitted by students in the course. In order to cross reference results with student and SME experiences, the instructor input is summarized focusing on perceptions of the following: advantages of using webcams for assessment in the online course, disadvantages of using webcams for assessment in the online course, discussions with students regarding setting up the webcam and submitting the video assignments, suggestions for implementing the webcam assessment protocol and protocols in future courses.

Upon first meeting with the instructor after the course was completed, the instructor described the assessment experience as "very refreshing" and "exciting". The instructor also described some aspects of the process as "challenging" and "daunting at times." When asked to expand on the comments, the instructor stated that "the refreshing part was that the additional visual component (seeing how to implement principles and concepts) added a better learning experience, and allowed me to better assess one's knowledge of the information. The video assessments also made the course more personable for me with the five student participants. This was the exciting part. I also think the video assessment activity added a "cool" factor that students will like. It certainly helps distinguish our course from any other online course that is similar." As we discussed this line of focus, I asked the instructor if the video assessment protocol also distinguishes our course from live courses. The instructor agreed that it does in a couple ways. We clarified our thoughts by observing that a live workshop or class typically does not employ video recordings of the students. Therefore, the archival nature of the webcam videos

allows the student and instructor to view the student's performance on an activity several times, thus resulting in a better understanding of proper techniques and a clear visualization of poor techniques. Additionally, we agreed that students seemed to be "better prepared" for the assessment when recording using the webcams. We speculated that students possibly study harder and practice more since they know there performance will be archived, potentially forever. Students in a live classroom or lab may not have the same "stress" placed upon them as that caused by the video assessment activities. In speaking with other colleagues, we all agreed that this phenomenon is very similar to what we see in a threaded discussion in the online course. Similar, in that, the students read the question posed by the instructor, then may take several minutes before responding with an answer or post. Often what results is a very high quality contribution by the student. We see the video assessment activities as the same type of scenario. Students are intensively practicing and determining what they need to do, with a goal of perfecting the technique before the activity is recorded by the webcam video. Several students confirmed that their focus seemed to be more intense in preparing for the webcam assessment activities.

Regarding disadvantages, the instructor did not identify many problems with the students requirements to submit the videos, but mentioned that his communication with a couple students unveiled that "one's ability to set-up and use webcams, especially for the technologically challenged could be an issue." The instructor also clarified the earlier statement regarding the process being "daunting at times" by saying "the video quality on a couple of the submissions was poor and made it more difficult to see details related to the students performance. The more daunting aspect was the file upload/download time when viewing the videos. Most of the videos were greater than 30 Megabytes each which resulted in very slow downloads. This became a

little annoying after awhile and would be especially cumbersome with all thirty students submitting video activities." This idea of bandwidth issues was confirmed by several student participants, as well as the SMEs, therefore, I will address it in greater detail in a later section.

Upon final analysis of the new webcam assessment protocol, the instructor was asked if it should be used as a functioning assessment activity in future offerings of PRF 711. The instructor stated "I would make it part of the course and also add the protocol to other courses in the program, assuming it is easy and time efficient to use." When asked to clarify "easy and time efficient", the instructor simply stated that the "kinks" should be worked out and students need to have great training on how to use the webcams and submit the activities so that the instructor did not become a "glorified" technical assistant, always answering webcam questions during the online course. The instructor was given a chance to add any final thoughts, then shared "I think it is a great tool that students and I can use to introduce themselves at the beginning of the class, also to submit assignments that require them to demonstrate competency on how to implement assessment/exercises. I also think it could be used for more personal one-on-one attention between students and me. I thought of another way to provide feedback with the webcams is realtime instructor office hours where the scheduled student uses the webcam with instructor to go over questions." As with the students, the instructor identified several other ways that the webcams could enhance the course in future iterations.

4.5. Subject Matter Expert Analysis of Protocol

The following section describes the various experiences and contributions from the three subject matter experts who participated in this study, including the NASM Director of Content Development, the NASM Coordinator of Training Development, and the university instructional designer. Insight into a variety of areas was collected after the SMEs completed a final review of

the video assessment activities protocol and processes after students completed the course. The SMEs were granted access to the course after the course was completed allowing them to view the videos and analyze the outcomes. In order to cross reference results with student and instructor experiences, the SME input is summarized focusing on perceptions of the following: advantages of using webcams for assessment in the online course, disadvantages of using webcams for assessment in the online course, experiences setting up the webcam and submitting the video assignments, suggestions for implementing the webcam assessment protocol and protocols in future courses.

SME 1 Description: The subject matter expert 1 (SME 1) is a 34-year-old fitness professional with twelve years experience as a fitness professional and three years experience teaching online courses in wellness and fitness. The SME is nationally certified as an NASM Certified Personal Trainer and a Performance Enhancement Specialist. The SME has organized and developed content for several live workshops focusing on the Optimum Performance Training Model created by NASM. Additionally, the SME is responsible for overseeing all training and development across all National Academy of Sports Medicine education programs. Since 1987, the National Academy of Sports Medicine (NASM) has been a leader in certification, continuing education, solutions and tools for health, fitness, sports performance and sports medicine professionals. Today, NASM serves more than 100,000 members in 80 countries. The SME had no prior experience using webcams, personally, or as tool in an online course.

The SME1 was asked to provide a final analysis of the new webcam video assessment protocol after viewing the submissions by the students. The SME described typical online courses in a unique way and cited the webcam assessments as a positive addition. The SME

stated “a long-time drawback to web-based learning is the sterile environment of class-to-class and class-to-instructor interactions. Implementing webcam assessments appear to help to bring students ‘closer’ to traditional campus feel.” The SME added several reasons for the enhancements provided by webcam assessments including the following: 1.) “the ability to assess analytical skills and integration of technique, client positioning, student explanations of their findings, and video and audio descriptions of the clients progressions,” 2.) “the ability to assess appropriate skill demonstrations more effectively than in written-only and audio-only”, 3.) “an increased flexibility for the instructor to develop assignments more conducive to real-life situations and assess their competence appropriately,” and 4.) “the length of time spent on assessments could be shortened through the use of webcams, and more specific, and more frequent, assignments.” I then focused on the insight regarding assignments that are “more conducive to real-life situations.” The SME and I agreed that any “real-life” scenario presently used as problem-solving activities in a laboratory section of a fitness course could now be easily implemented into the online course. This thought was also supported later by the other SMEs and the instructor. The SME also stated that student responses regarding their “findings” when evaluating a client, such as in the Overhead Squat Assessment, seemed much more “genuine and authentic” in the video assessment versus the written reports of findings used over the past two years in the PRF 711 course. When asked to explain further, the SME volunteered that seeing the student on video made it seem much more “real” that the student knew the material and could apply the techniques learned in the course.

With regard to disadvantages and potential problems with the webcam assessment protocol, the SME 1 stated several potential issues. The issues identified are summarized here: 1) “download times for video sharing based on connection speed could be a real issue, especially

for those who do not have access to high speed broadband connections. This could also increase assessment times for instructors with slower connection speeds", 2) "the short duration of video capture due to download time restrictions, related to file size, may present some assignment limitations and/or video production constraints, especially if longer recordings are required to capture the full assignment", 3) "video player compatibility issues – I experienced difficulties opening the ".wmv" file types on two of the students and I am not sure why," 4) "cost to student may be a limitation if not wrapped into semester fees", and 5) "training time and cost for faculty who'd be using this option may present some challenges. With several sections of the PRF 711 course offered each semester, you'd want to maintain consistency so that students taking different section numbers received a similar educational experience."

SME 1 produced several very meaningful observations which are discussed by me in greater detail later in this document. These include access issues such as bandwidth restrictions often seen with active military students deployed in far off places such as Iraq or Afghanistan, students living in rural areas, or those students who are late-adopters of technology; therefore they still function on a 56K modem to access the Internet. Another issue discussed later is the compatibility issue with Codecs that are found in video viewing software. Lastly, I discuss training issues related to faculty and student preparation for including the new webcam assessment protocol.

The SME was asked to identify any limitations regarding the student use of the webcam protocol. The SME shared that we need to investigate "possible compatibility issues with PC vs Mac users and possible quality assurance issues with students using different models/vendors of camera." The SME also added this interesting synopsis, concerned that there is "possible advantage given to those students who have more experience with video capture & sharing. The

working student which most of the students are may not have this background or experience. Therefore, there could be a scoring bias to those students who can 'produce' a better product than someone with equal knowledge and apparent skills but produces a poor video assignment." This idea was also discussed with the other SMEs and we all agreed that training of faculty should include a focus on "grading" of the student performance of the required activity, versus the students ability to perform in front of the camera. When prodded for any additional thoughts or observations, the SME suggested that "a web-cam should be included in the university welcome package for students in the program. Not just students in the PRF 711 course, but all students when they first enroll. This would ensure consistency across other university courses and among students and eliminate potential for scoring bias based on the particulars of camera quality of audio and video related to the type or model of camera and software used to record the video." The SME also suggested that we "run" a "pilot section of the PRF 711 course. One group of students utilizes the webcam assessments, whereas the others continue as is. This would more of an experimental design with a control group and experimental group. Follow up surveys of student experience and feedback regarding course delivery, integration of available technology, and appropriateness of performance assessments would provide valuable information to make a programmatic policy modification." This insight was also supported by the other SMEs and the instructor and I address the suggestion in greater detail in the last chapter of this document under future research.

When asked to provide final insight as to whether the new mode of assessment should be implemented for the PRF 711 course, the SME 1 excitedly stated "Absolutely! This assessment and interactive tool would add another layer of connectivity and objectivity to the course.

Although it may not be truly like in-class interaction, it is an affordable, high quality use of current and widely-available technology".

SME 2 Description: The subject matter expert 2 (SME 2) is a 30-year-old fitness professional with ten years experience as a fitness professional and no experience teaching online courses in wellness and fitness. The SME is nationally certified as an NASM Certified Personal Trainer and a Performance Enhancement Specialist. The SME has organized and developed content for several live workshops focusing on the Optimum Performance Training Model created by NASM. Additionally, the SME is responsible for overseeing all content development, including graphics, video, animations, and simulations for all NASM education programs. The SME had no prior experience using webcams, personally, or as tool in an online course.

SME 2 provided insight regarding a greater need, and ability to provide, feedback for students in the PRF 711 course. In fact, a majority of the discussion with SME 2 was focused on the best way to provide feedback, so that the video assessment protocol becomes a "true" learning experience, versus "just another graded evaluation of the student". Feedback provided to the student regarding video assessment activity performance became a common theme with participants in this study. Several possible models for providing feedback were discussed, with most involving text based narratives being returned to the student or the grading rubric being presented to students to show weaknesses in specific areas. After thinking about the feedback models over several weeks, I devised a strategy and will explore one innovative model later in this document.

SME 2 summarized thoughts on the advantages of the webcam video assessments protocol by stating "webcams offer several advantages when teaching online. Exams and essays

may accurately test the student's knowledge of principles discussed during online lectures. However, a webcam presentation helps the instructor to truly see whether or not the student can actually apply the information in a live environment. This information allows the instructor to give critical and most important individualized feedback for each student. For example, a student may understand the importance of proper posture and recognize proper posture from textbook images. However, can this same student identify proper posture when assessing an actual client? Webcam presentations capture student's abilities as well as their faults." SME 2 also independently stated several concerns and ideas previously collected from other sudy participants. The SME stated that "first, accessibility and usability of webcams may be an obstacle. Some students may require extra instruction installing and using webcams. This process can potentially stall projects and negatively alter deadlines. Also, there is a potential problem of the instructor not being able to view the webcam presentation. This will ultimately slow the grading process and not allow the instructor to give feedback in a timely manner. Secondly, the time to download each presentation can be extensive. This will undoubtedly challenge the instructor's time management limiting the ability for the class tackle new subject matter as scheduled." With regard to whether webcam protocol should be included in the PRF 711 course, the SME 2 provided a somewhat limited role of webcams in the course. SME 2 believes that "webcam presentations can be included as a final project but not as routine homework assignments. Webcams can negatively alter deadlines slowing down all subsequent course work because of the high probability of technology error. However, the advantages of webcams should not be overlooked. A video presentation can capture a student's ability, or inability, to understand and most importantly apply important topics discussed in class in a live environment. Thus, using webcam presentations as a final project should be utilized for all the advantages I

stated as will have a minimal effect of altering deadlines of projects." After discussing this comment with the other SME participants and the instructor, there was clear disagreement regarding the use of webcams, with all but SME 2 stating a desire to implement webcams in as many ways possible during the PRF 711 course.

SME 2 was asked to provide thoughts on potential limitations of the new webcam video assessment protocol and stated that "there are many potential problems when using webcams to assess students. First, the quality of the video may be an issue, even if the student takes every precaution such as proper lighting, and acoustics. A webcam may make it difficult to see and hear in detail what the student is intending to show. If the instructor misinterprets what the student is trying to illustrate, the student's grade ultimately will be affected. Secondly, students may become nervous when demonstrating in front of a camera. As compared to an exam, webcam presentations may cause a sense of "stage fright", which negatively alters the student's ability to demonstrate their level of knowledge. Third, student's lack of familiarity using webcams in conjunction with certain restrictions such as video file size or length of video may be counterproductive. Students may be more preoccupied staying with compliance of certain restrictions rather than performing up to the level expected of them."

SME 2 also specified the importance of adequate training and providing the students with as much information as possible in order to proactively avoid problems with technology set-up, submission of activities, etc. When I asked the SME to describe an actual scenario of how a student might have technical problems, the SME painted a very descriptive picture. The SME asked me to envision a very busy student, trying to complete the activities using the webcam, in a dark back corner of a gym, with weights clanging in the background and hard rock music blaring. It became evident that guidelines and strategies for the students should be developed so

that the aforementioned picture is not realized in future video submissions. The SME 2 summarized that "it is very important to give students proper instruction on how to use webcams. You should offer students a Frequently Asked Questions (FAQ) sheet to troubleshoot any potential problems. Important topics to address include lighting, using a microphone, and avoiding background noise."

Instructional Designer SME: Instructional Designer Description: The instructional designer is a 24-year-old professional with a background in multimedia development. The SME is employed at California University of Pennsylvania with a primary responsibility of educating and guiding faculty regarding instructional design in online courses. Additionally, the SME is responsible for training faculty on the use of innovative hardware and software programs for use in online courses. The SME had no prior experience using webcams as tool in an online course. The SME does however have experience using webcams to communicate to others via the Internet, primarily for social purposes.

The instructional designer SME provided a variety of input while the webcam video assessment protocol was being developed and was asked to summarize thoughts after viewing the completed course and submitted videos. The instructional designer stated that "besides the fact that you are introducing the student to a new technology, the webcam allows the professor to clearly see how the student will present himself and how he would deliver the exercise. This goes leaps and bounds above just having the student, for example, type out a set of instructions that he would follow." The instructional designer also supported previous statements of other study participants by saying "the student would need to be using a computer that is capable of running a webcam and its capture software. The student would also need a fast enough internet

connection to successfully upload a video clip." The instructional designer SME also added "not every student is a filmmaker. Many of the videos may contain poor video because of bad lighting or issues related to video compression, or audio quality being too loud or soft, and background noise. The quality of the clip could also depend on the quality of the webcam they purchased. A cheaper webcam often times underperforms a more expensive model."

The SME also suggested "I would clearly state that a webcam would be required for the program/course. You may want to even provide a list of recommended webcams that you know work well. I would also suggest a tutorial that included a recommended webcam with simple step by step instructions on how to record the video." Again, the common thread of training and clearly communicating what is expected of the students was highlighted.

4.6. Issues, Challenges, and Solutions

Each of the issues and challenges identified in this section were gleaned from various sources while collecting data over the course of the study, thus the triangulation approach during data analysis. These sources included my observations made during fieldwork notation and direct comments made by a variety of participants. Several of the issues were first raised by the student participants or by the instructor. I then approached each issue with an eye towards summarizing the issue or challenge as succinctly as possible, identifying if the issue was "real", then attempting to identify a resolution that would completely, or in some cases partially, provide for a solution. I will use the aforementioned approach as my outline for addressing each issue or challenge below.

4.6.1. File Size and Data Distribution Over Networks

Summary of the issue or challenge: Several of the participants in this study commented about the negative effect the large video file size had on the time required to upload (in the students case) or download (in the instructors case) the webcam assessment projects. Many students and the subject matter experts stated that the added time may have a negative impact on productivity of the student and instructor alike. They stated that time is already of a premium and any time added to complete projects could cause students to feel overwhelmed. Additionally, the PRF 711 online course is already very time intensive for the instructor as a result of the need to communicate regularly with students, address the 24/7 questions from student emails, and the extensive time required to grade projects which are typically text-based narratives.

Is the issue "real"?: As a result of the feedback from the study participants, I tried downloading a single video file from the course on three different computers. In order of bandwidth availability, I used a 128K modem (ISDN-2), a cable modem, and a T-3 line. All of these would be typical technology used by students and faculty to access the online course, depending on site where they were accessing the course. The T-3 line would most typically be available at some work sites, with the 128K and cable modem being available from home. As expected, the time required for the 128K modem was significantly longer than the cable or T-3 connections. The T-3 line, supplied by the University Ethernet connect, was by far the fastest with download speed at approximately 30 seconds. The cable modem download time was approximately 4 minutes. The 128k modem download time was approximately 38 minutes. I then corroborated these download times with the Numion Online Download Time Calculator (Numion Calculators, 2007) which calculates typical download times for various file sizes over various data connection bandwidths.

The calculator confirmed my findings regarding download times. Interestingly, the calculator also showed that a student using a 56k modem (still used by some students) would take 1 hour and 11 minutes to download one video from the PRF 711 course. Based on the aforementioned information, I concluded that the issue is "real".

Identified solution: The solution I proposed was introduced to the subject matter experts, as well as the instructor, and received unanimous support. The solution is one of policy creation. All students and instructors must have fulltime Internet connectivity, or at least have access several times during the course, to a bandwidth connection that is DSL/Cable modem speed or faster. One SME very directly stated that the solution must be adopted; otherwise implementation of the new webcam video assessment protocol is doomed to failure. I also observed that, based on the unique personal and professional situations of each student, there are always exceptions to policies in the online education world. Therefore, students who might be absolutely limited to slower connectivity speeds than those required in the policy, will need to be educated about the patience and strategies needed to download the large video files. In very few cases, the video assessment activities may need to be waived for certain students. A student on military active duty in Bagdad, Iraq, with limited access to Internet connectivity via a wireless laptop connection, may not have the opportunity to apply patience and strategies when uploading videos into the course.

4.6.2. The Problem with Codecs

Summary of the issue or challenge: In preparing to view the videos that were submitted by students into the PRF 711 course Drop Box, several participants in this study, including myself

experienced an interesting recurrence of events. Depending on the computer the individual was using, we could sometimes view certain video files and sometimes not be able to open the same files on a different computer. It was also noted that certain files would, at times, play as audio only or simply present an error message with no feedback. Lastly, some videos would run, but the audio track was not in sync with the video files. Again, this event was a "hit or miss" depending on the computer used. After much investigation by myself and discussion with the instructional designer, who has extensive multimedia development experience, I determined that the root of the problem was one of codecs. Therefore, I describe this issue as "The Problem with Codecs".

Is the issue "real"?: After discussing the aforementioned video viewing problems with the subject matter experts and the instructor, we all agreed that not investigating and addressing the issues related to codecs could be a "showstopper", as described by one SME. If students and the instructor are not able to consistently view the videos, or encounter recurrent video/audio synchronization problems, the functionality of the webcam video assessment protocol becomes very problematic. In order to determine if codecs were a "real" issue, I explored several Internet sites to collect information with regard to the definition of codes, how they function, and how codec issues can be resolved. I believe the description below, adapted from pcAnswers.com (2007), is a synopsis of codecs and potential issues related to codecs.

> With dozens of video codecs available to use, any AVI file you come across can be something of a gamble. Is your system equipped with the relevant codec to play both the video and audio stream correctly? If not you'll soon know about it, when Windows complains that it doesn't have the correct codec installed. If you need a particular codec, where do you find it? Many multimedia data streams need to contain both audio and video data, and often some form of metadata that permits synchronization of the audio and video. Each of these three streams may be handled by different programs, processes, or hardware; but for the multimedia data stream to be useful in stored or transmitted

> form, they must be encapsulated together in a container format. Windows does this by using pieces of software called codecs. The word codec means COmpressor / DECompressor: a software routine that compresses the raw video ready for storage, and then decompresses it to display on your PC.

Identified solution: Several possible solutions for the problem were identified, but each had its own challenges such as requiring that the student or instructor know some basic programming to install a "fix". The final agreed upon solution requires that any student or instructor experiencing a problem with viewing video projects, download a software product. The software, known as G-Spot, will identify what codecs are missing on the computer and supply access to a database so individuals can perform a simple download to correct the codec problem. As described on the download site for the software (Codec Information, 2007), "rather than installing every codec under the sun, there's a simple solution to identifying which compression codecs a particular AVI file requires - a piece of software called GSpot. The software's processes for finding codec information it's absolutely unparalleled."

4.6.3. The Webcam Complex

Summary of the issue or challenge: Two of the subject matter experts commented about the potential for stress related to video recording causing some added anxiety on the student. I coined the phrase "The Webcam Complex" for this study. The camera complex can be viewed in a couple different ways. First, four students in this study appear to be somewhat nervous during their presentations, almost a type of stage fright seemed to materialize. Second, three of the students appeared preoccupied with the camera. One student in particular, possibly as a result of increased anxiety, continually adjusted the camera during recording of the activity.

Is the issue "real"?: In an attempt to determine whether the issue was "real", I approached the investigation of the camera complex in two ways. I looked at research related to stage fright and performance anxiety related to video recording. Looking at the student remarks, it was confirmed by three of the five student participants that there was a clear added level of anxiety experienced when recording the videos. The students were not sure if the anxiety was related to making sure the video equipment and software worked correctly, or was related to the fact that they would be archived on digital video potentially into infinitely. Two students also observed that all previous assignments were submitted as narrative text projects, so the thought of having the instructor be able to "see what I really know and can do" was stressful and intimidating. Research related to performance anxiety clearly outlines the reality of the fear and stress perceived on the part of the student. As summarized by Petrovich (2003), "certain amount of stage fright is a normal and inevitable part of any performance that matters. It's a "good stress," a state of heightened physical and mental alertness, a type of emotional high that intensifies and can thus enhance the performance. Disabling performance anxiety, by contrast, is anything but helpful to the performance. Performance anxiety and stage fright have been categorized as a type of social phobia in the "Anxiety Disorders" section of the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association (American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders, 4th ed. Washington, D.C., 1994), According to the manual, performance anxiety causes its sufferer to experience the following symptoms:

- Anticipation of failure and fear of humiliation or exposure
- Intense anxiety and, sometimes, panic attacks
- Awareness that the fear is excessive

- Avoidance of performance situations or enduring performances with intense distress
- Impaired performance
- Shyness, sensitivity to criticism, increased anxiety in situations other than performing and lowered self-esteem

Identified solution: Creating a solution for this issue was more difficult than other issues identified during this study. The instructional designer commented that students would "get used to" the video assignments over time and it would become second nature to them after submitting a couple projects. In agreement with the instructional designer, I noted that the stress observed in "The Webcam Complex" is the same type of anxiety we see in students taking their first online course. Once the student completes the first module in the course, they tend to gain great confidence and the anxiety tends to cease. The SME 2 suggested that students be required to complete a "practice run" using the camera when completing each video assessment activity. The "practice run" would serve two purposes, stress reduction and elimination of any technical difficulties. Noting the pre-game anxiety experienced by athletes and pre-performance anxiety experienced by dancers and thespians, I suggested that the ten-minute relaxation and/or visualization techniques used by these individuals could be used by PRF 711 students to reduce stress. In fact, teaching the students about visualization techniques to be used before recording the video could have a significant impact on reducing anxiety. In future courses, the instructor and I will share techniques suggested for reducing stage fright as identified on anxietycoach.com (2007). These techniques include breathing techniques, using anxiety in a positive way to enhance performance, and focusing on performing the activities as opposed to the forthcoming evaluation of the videos by the course instructor.

4.6.4. Feedback and Cueing Challenge

Summary of the issue or challenge: One of the goals of creating the new video assessment protocol was to replicate a live laboratory situation as closely as possible. While the video assessment did address the visual presentation of information learned by the student, the concepts of feedback and cueing were not addressed in the protocol. Feedback is the ability of the instructor to observe the student, and then provide formative and /or summative feedback to the student during and/or after the student's performance of a psychomotor activity or hands-on skill. Cueing is described in psychomotor skill research as a form of instructor feedback that occurs throughout a practice session. In other words, cues are specific 'hints" provided by the instructor related to student hand placement, body movements, and other hands-on skills. Without addressing the feedback and cueing issue, two of the subject matter experts stated that the new assessment protocol lacked the opportunity for providing student feedback typically afforded in a live laboratory or workshop setting. Therefore, a true replication of the "live" activity could not be accomplished.

Is the issue "real"?: The feedback and cueing issue was clearly not addressed in the new video assessment protocol since videos were recorded and submitted, and then later evaluated and graded by the instructor. No direct feedback was provided other than a grade and some cursory comments submitted by the instructor into the gradebook on the PRF 711 course. Before discussing the general issue of feedback, I raised the question with the subject matter experts and the instructor as to whether cueing was a real issue related to this study. After much discussion, we unanimously decided that cueing in fact was not a feature we were striving for in this assessment protocol. The goal of the protocol was to record an uninterrupted video of the student

performing a psychomotor activity with no need for sporadic feedback being provided. In fact one SME observed that "cueing would be a great feature to add to the instruction provided to students in the course, but clearly would not be considered a component of the assessment strategies used". I noted that the only way cueing could be incorporated into instruction would be via synchronous activities where the instructor and student were able to visually see and hear each other in real time. The instructor could then cue the student regarding proper, or improper, performance during activity practice. With regard to whether feedback should be provided to the student regarding the assessment, all participants in the study, and most vocally the students, agreed that feedback must be incorporated into the protocol.

Identified solution: The ability to provide feedback in the online course is evident in several ways. The instructor could post comments in the students "outbox" when returning a grade for the video assessment activity. The instructor could email a narrative presenting a descriptive analysis of the student's performance including praise, as well as productive feedback for improvement. The instructor could provide the student with a "check-off" form which has the student's performance assessed, broken down by various categories, such as; knowledge of the material, proper instruction to the client, clarity in communicating skill to the client, identification of client biomechanical abnormalities, etc. All three of the aforementioned strategies "could" be used, but after much thought I created a solution for addressing the feedback issue. The solution involves using a video-based screen capture software named Camtasia to provide narrated audio and graphical notations directly overlaying the video submitted by the student. The instructor would be able to view the student's video while talking into a microphone adding feedback. At any point, the instructor can stop the student's video to

use the cursor as a pointing device, or even draw on the screen, to bring attention to ideas and thoughts regarding the student's performance. For example, the instructor may pause the student's video of their Overhead Squat Assessment activity and circle a biomechanical issue with the client's knee, which the student may have missed, while describing what the student should have seen when completing the activity. The narrated feedback video created by the instructor could then be saved as a Flash file (much smaller in megabytes than video files) and be uploaded into the students outbox, or simply be emailed to the student.

After discussing the solution with the subject matter experts and the instructor, all agreed that this would very closely approximate the feedback that is provided to students in a live laboratory environment. Other than the "delay" in feedback being provided, which could be several hours, or even several days, the solution was described by three of the SMEs as being superior to live laboratory assessment. The reasons identified for the "superior" observation are: 1) the instructor has the ability to view the performance several times, including pausing and rewinding the video, allowing for a better, more careful analysis of the student performance, 2) the student can watch the narrated feedback provided by the instructor several times in order to understand the expert critique, and 3) both student and instructor have an archived record of the students video performance, as well as the narrated appraisal of the student performance.

4.6.5. Facility Related Roadblocks

Summary of the issue or challenge: Facility-related roadblocks refer to access issues, as well as individual worksite or organization policy issues. Two of the students, and two of the subject matter experts, identified issues related to "access" within various work settings. Access in this case relates to having availability of hardware and software needed to complete the webcam

video assessment activities. Two subject matter experts, and a couple of the students providing pre-course survey data, also identified policies within organizations that could prevent a student from completing the webcam video assessment activities.

Is the issue "real"?: The access issues introduced above include having access to appropriate hardware and software. This could be an issue for students who do not have more recent versions of computer hardware and updated versions of software. This could also be an issue if the student did not have access to a webcam and included software. In addition, some employees are not allowed or, in some cases, not physically able to add new hardware and software due to lack of administrative privileges on their work computers. After discussing the issue with the subject matter experts, I was able to identify three known policy issues that could have an effect on the ability of the student to complete the assignments. In the first example, some military sites, such as protected military bases or aircraft carriers, have policies that do not allow the recording of video under any circumstances. The second example is related to protected patient information. Some of the students enrolled in past offerings of the PRF 711 course are health care professionals working in HIPPA regulated environments. In other words, any data or description of patients (video subjects) the students are working with, cannot be released in any form, especially as digitized video. Lastly, many of the students enrolled in current and past offerings of the PRF 711 course work in fitness centers and health clubs open to the public. Some of these work settings have set guidelines or employee rules that prevent videotaping any part of the facility or any member of the club. Typically, these rules are in place for liability reasons related to member confidentiality and as a result of protection of trade secrets from competitors such as other fitness chains.

Identified solution: Students who have challenges regarding access to webcams would be solved very easily. All students would be required to purchase a specific webcam model via the online bookstore used for all textbook purchases for the PRF 711 course. This would address issues of consistency regarding video hardware and software. It would also provide a low cost solution to students and allow for the development of standardized training modules regarding camera set-up and software installation. Regarding problems with access to hardware/software needed to run the webcams and policy related barriers; three solutions have been identified. First, the student could be directed to use public access computers, such as those found in libraries, community centers, or Internet Cafes, to complete the video assessment activities. This may not be a feasible solution due to the public nature of the settings. A second solution regarding policy issues is the creation of a cover letter from the instructor that would describe the activities and request an exemption from any policy or guideline preventing hardware installation and/or video recording of facilities or clients. The student would provide the letter to supervisors, managers, or owners at the beginning of the PRF 711 course. A third solution is the creation of an alternate activity that could be completed by the student in lieu of the video recording assignments.

4.6.6. The Question of Asynchronous vs. Synchronous Assessment

Summary of the issue or challenge: During data collection and analysis of several comments, the question of using an asynchronous versus synchronous assessment protocol arose at various times during the study. In short, asynchronous communication among students and the instructor is not in real time, but occurs over time within a web-based course. Examples of asynchronous communication in an online course are email, threaded discussions, and blogs. Synchronous

communication is in real time typically using chat rooms, telephones, web-conferences, or two-way desk-top video conferencing. A couple of the student participants suggested the possibility of use real time streaming technology to view video assessments via the webcam. In follow-up discussions, several of the SMEs also agreed that a synchronous version of the webcam video assessment protocol would allow for a process that is the most similar to a traditional fitness laboratory or exercise workshop environment.

Is the issue "real"?: The asynchronous versus synchronous concerns were confirmed by talking to all participants in this study. While several positives and negatives were identified by myself and the various subject matter experts, the underlying question as to which approach was most appropriate was certainly a real and valid question. To further examine the question of asynchronous versus synchronous, I evaluated the discourse amongst faculty colleagues during informal discussions, as well as on Internet sites containing online education related content. I found the following dialogue, provided by Goldberg (www.webct.com/otl, 2007) regarding the topic to be very enlightening and appropriate as an addendum to this section.

> The topic at hand is synchronous vs. asynchronous communication. In speaking with thousands of educators all over the world, as I have the privilege of having done and continue to do, I am always a little surprised when people speak of asynchronous communication as the necessary, but vastly inferior alternative to synchronous communication. Keep in mind, not everyone tells me this, but enough do that it caught my attention. It is their view that once the infrastructure and software for high quality synchronous communication is ubiquitous, asynchronous communication will go away. The only reason we use it now is because it is cheap and plentiful, and the bandwidth, software and equipment needed for synchronous is not quite there yet. I couldn't disagree more. First, let's get some grounding here for people new to this technology and jargon. Simply said, asynchronous communication is that which does not happen in real-time. In other words, people can communicate asynchronously without needing to have a common time available in their calendar. E-mail is an excellent example of asynchronous communication. So are electronic bulletin boards. I can send you a message at noon, and you will get that message without having to be logged in at the exact time I send it. You can read the message any time after it is sent and send a response anytime you want (an

inherent advantage to asynchronous communication - more on that later). Synchronous communication differs in that for two (or more) people to communicate synchronously, they have to be in the same place (physically or virtually) at the same time. Electronic chat is a good example here - you and I must sit at our respective computers "at the same time" if we are to exchange greetings in a chat room. Synchronous communication can be divided into two categories - fast and slow. Examples of "fast" are video and voice; an example of "slow," text (typing) based chat. Now, what are the obvious advantages of each communication mode with respect to teaching and learning? Let's look at synchronous first. In situations where physical constraints (i.e. location) prevent face-to-face meetings, there is clearly a need for electronic synchronous communication tools such as video conferencing. We all know by research or intuition that some people simply learn better when they can see a person's face and converse in real time with a peer or instructor. My own research shows that students perform best when they have access to lectures in addition to a web-based course as opposed to the web-based course alone. So clearly there is a need. However, synchronous communication tools bring nothing new to education. They simply take an existing teaching method (lectures, seminars and workgroups) and make them more available by removing location barriers. It can be said that this improves education by making it more widely available and allows people from a wider variety of backgrounds (influenced by location) to learn together. This "is" powerful and meritorious all by itself, but it is not revolutionary. What is revolutionary is the change that asynchronous communication has brought to education. On first glance, asynchronous communication is simply synchronous communication's poorer, slower brother, to be used when we lack the ability or infrastructure to achieve synchronous communication. But this is not the case. Asynchronous communication is not simply slower synchronous communication - it is "different". It has its own character, its own advantages, and its own disadvantages. It appeals to a different (but overlapping) set of people than does synchronous. Think of the differences. First, just the fact that it is asynchronous makes it different. This goes one step further than synchronous. Synchronous communication tools removed the geographical barriers. Asynchronous communication tools remove both the geographical and temporal barriers. Aside from making the communication that much more accessible, removal of the temporal barrier also has a side effect. People all of a sudden have time to consider the discussion they are part of a little more carefully. They have time to weigh the issues and form their argument or contribution. They can do some research to support their argument. They have time to proofread and spell check. All this tends to elevate the quality of the discussion. The removal of the temporal barrier also seems to open the discussion to a broader range of participants. In previous columns you've seen me cite our research which showed that nearly 90% of students were comfortable participating in at least one of a face-to-face (lecture) based discussion or electronic discussion, as opposed to only about 50% comfortable contributing to a lecture-based discussion. When the students were asked why they had a preference for electronic discussions, they cited the ability to perform the tasks mentioned above. Overall, the additional time allowed them to have more confidence in the contribution they were about to make to the discussion, which in turn encouraged them to participate. This is especially true for some people who speak English as a second language. Many who would not contribute verbally are prolific contributors to electronic discussions. One might argue that asynchronous

> communication, like synchronous communication, can exist without electronic help, and that the extent to which technology has improved each is simply a matter of degree. I disagree. In my experience electronic asynchronous communication tools are bringing about a revolution that has not been seen with synchronous tools."

Identified Solution: All SMEs and myself agreed that the question of asynchronous versus synchronous assessment needs to be investigated further as a separate study. One reason for further study is the instructor and I having a concern regarding the time requirements of students, as well as the instructor, when using the synchronous mode. Additionally, we need to investigate the availability of students to commit to real time interaction. Our students, being very busy working professionals, scattered across several time zones may not be logistically able to "fit" into the synchronous model. While we all agreed that synchronous assessment is the most similar to traditional classroom assessment, we remain unclear as to the implications of adopting a synchronous webcam video assessment protocol. I did however, with input from the instructional designer, create a scenario which describes how the synchronous model might work. Within the PRF 711 course, a feature, known as Classlive, is available that allows for real time web-conferencing between two or more individuals. The web conference includes a webcam video link and audio link using a microphone attached to the user's computer. A more detailed description is available from the Classlive website (http://www.elluminate.com/ecollege_ course_management_system.jsp, 2007):

> Powered by Elluminate, the eCollege ClassLive synchronous suite enables you to easily and seamlessly integrate live, synchronous distance learning and collaboration into your coursework. Using ClassLive, instructors can deliver interactive, real-time classes that include shared whiteboards, text messaging, video/audio, and record/playback capabilities. And participants can launch a synchronous session or recording using ClassLive directly from the eCollege Course Management System for a great user experience every time—regardless of connection speed.

In this scenario, the instructor would assign specific assessment times and dates for each student individually. At the assigned day and time, the student would log in to the PRF 711 course and access Classlive. The instructor would also login and would proceed with the various webcam video assessment activities, using the grading rubric to evaluate the student. During or after the completion of activities, the instructor could ask the student questions, provide feedback, and/or summarize a final critique of the student's performance. One advantage to using Classlive is that the assessment session would be recorded and be available to the student and the instructor over the length of the course term. The archived video is analogous to the student having a videotaped critique of their performance, including all instructor feedback.

4.6.7. The Three Most Important Words: Training, Training, Training

Summary of the issue or challenge: A recurring theme throughout the study was the need for training to be included as a key component of implementing the new webcam video assessment protocol. It almost seemed that my discussions with each participant always concluded with the importance of training both the instructor and students alike. The issue here is what future training materials need to be developed, by whom, and how will the materials be delivered.

Is the issue "real"?: The issue of training needs became apparent as the most discussed topic and finding under common themes during this study. Based on the amount of importance placed on the issue by participants, the issue is undoubtedly "real". As with any new implementation of new technology and identification of potential questions that arise during application of the new technology, a proactive approach to answering questions and parting knowledge is essential.

Identified solution: The solution for this issue will be the creation of a formal training design team made up of the instructor, the instructional designer, and myself. The team will create a list of FAQs addressing all identifiable potential questions related to the new webcam assessment protocol. The FAQ database will be made available within the PRF 711 course and will allow students and instructor's alike to find answers related to: hardware technology, codec downloads, webcam set-up, software installation, video recording lighting, video release forms, etc. The FAQ database will also provide links to software downloads including Windows, Media Player, G-Spot Codec software, and other to be identified useful programs. In some cases, where appropriate, FAQ answers will include streaming video clips showing and explaining how to perform certain tasks, such as web-cam set-up. The team will also contact the tech support team, provided as a 24/7 Help Desk service to students and instructors involved in California University of Pennsylvania's online courses, to provide a list of answers to commonly asked

Table 5.1 Summary of findings

questions. When at all possible, the Help Desk personnel will refer students to the FAQ database to gain answers to questions. In addition to the FAQ database creation, one of the members of the team will meet with instructors of the PRF 711 course at the beginning of each term to describe the webcam video assessment process, introduce known problems and issues, and to discover if any additional problems, as well as solutions, have been identified by the group.

Findings Summary

Table 5.1 is a summary of the findings as described in previous sections. The findings are

File Size and Data Distribution Over Networks	Several participants provided input regarding the large file size of the webcam video projects. The file size has a definite effect on the ability to view projects and time related to downloading projects.
The Problem with Codecs	Several participants cited "issues" with viewing the webcam videos including audio/video synching, poor or non-existent video, and other problems. Codec compatibility was found to be the underlying cause of the problems.
The Webcam Complex	Several students commented about the stress related to video recording their activities. A form of stage fright was identified and a preoccupation with the camera and related technology was noticed.
Feedback and Cueing Challenge	SME participants cited the need for a solution to provide cueing and feedback to students with regard to performance on webcam videos.
Facility Related Roadblocks	Various students cited challenges with webcam video set-up due to facility policy issues, administrative limitations, and technology infrastructure.
The Question of Asynchronous vs. Synchronous Assessment	Participants in the study identified the need to evaluate whether synchronous or asynchronous video assessments were appropriate for the activities studied.
The Three Most Important Words: Training, Training, Training	Several participants highlighted the need for adequate training protocols and methods for both faculty and students using webcam video protocols as an assessment tool in online courses.

a result of careful consideration of input from several stakeholders, including observations and feedback from students, subject matter experts, and the instructor of the PRF 711 course during the spring 2007 term at California University of Pennsylvania. Findings were collated after careful analysis and interpretation of data collected from the aforementioned study participants.

5. Conclusions and Implications

The development and implementation of this study has been challenging and insightful. Discovering answers to the research questions required analysis of thoughts, experiences, and opinions of a variety of stakeholders. While the solution for assessing psychomotor skills in online courses could have been addressed in a variety of ways, this study provided a comprehensive look at what appears to be a very viable, practical solution. The goal of this chapter is to provide a summative analysis of the results in this study. Within the previous chapter and in the following sections, I provide an "interpretive portrayal" of my experience during this study (Garman & Piantanida, 1999). According to Piantanida and Garman (1999, p. 136), "embedded within the interpretive portrayal are *lessons learned* from the inquiry. Thus, another portrayal is crafted as the researcher draws out the implications of these lessons and focuses the "major messages". Additionally, Garman & Piantanida (1999, p.136) state, major messages "take the form of recommendations for policy or practice, heuristic models, questions for further investigation, arguments for a specific position, guidelines, a polemic, and so on." Following the problem solving nature of this study, I now attempt to apply "lessons learned" in the form of a Plan of Action which includes several action steps. The plan of action includes a plan for policy development and practice guidelines development.

I have several objectives in bringing this study to closure. First, I will address the six guiding research questions posed in this study, including a plan of action for implementing the webcam video assessment protocol at California University of Pennsylvania. Second, I will analyze the implications that the study results produced and shaped for future research initiatives. I will then address the implications for future practice in online course environments as they

relate to my results. Lastly, I will provide final thoughts for implementing the webcam video assessment protocol at California University of Pennsylvania.

5.1. Study Conclusions and Researcher Reflections

This section will focus on my conclusions and reflections. First, I will address my conclusions and provide personal reflection for each research question posed in this study. My response to question 6 also includes a step-by-step "Plan of Action" for instituting the webcam video assessment protocol in several courses within the Exercise Science and Health Promotion (ESHP) program at California University of Pennsylvania (CUP). As a problem solving case study, I feel compelled to apply the results and my conclusions in the form of a strategic plan of action. While the plan of action is specific to goals within the CUP ESHP program, the plan can be utilized and adapted by other disciplines and programs at other universities, K-12 online programs, and even web-based corporate training environments.

The results in the previous chapter have generated important information to address the six guiding research questions. While some analysis of data has already been provided in the study results, this section will add additional insight and reflection. I start by addressing research question one.

Question 1: What are the issues related to assessing psychomotor and hands-on skills learned in online courses? A conceptual answer to this question was accomplished early on in the study, and in large part, before the study began. In fact, I started to envision a picture of the issues regarding assessment of psychomotor skills in online courses well before the study commenced. As my analysis of the issues, and attempt to confirm my beliefs, progressed, the picture became more and more clear.

In order to prepare for this study and address the question of identifying "issues", I approached several faculty colleagues and asked them to spend a few minutes with me discussing their perceptions of how well we assess student knowledge in our online courses in the Exercise Science and Health Promotion program. All of the aforementioned instructors have past teaching backgrounds in clinical coursework within psychomotor skill intensive disciplines (nursing, athletic training, physical therapy, exercise science, and occupational therapy). They also have many years of experience teaching clinical laboratory courses, and over the past three years have transitioned into teaching in the online environment. In depth discourse with my colleagues was invaluable in allowing the online assessment issues I acknowledged over the past few years to be corroborated by the faculty working in the trenches of online education.

The typical discussion with faculty started out with a focus on how well the threaded discussions work as an assessment of student knowledge and how impressive the discussion transcripts are with regard to topic synthesis and sharing of applied clinical case studies. Other dialogue focused on how "short" quizzes appear to be better assessment tools than "long" mid-term and final examinations. Often, topics of discussion leaned towards cheating on online examinations and exhaustive discourse on how we go about preventing cheating in our online courses offered by CalU Global Online. Based on the review of discourse discussed earlier in this paper, the aforementioned topics are commonly discussed in the literature and it was no surprise that our faculty had similar concerns of other online faculty and college administrators across the country. I would then ask my colleagues if there was one specific assessment issue that we could address, or provide a solution for, with relation to assessment in our online courses. My goal was to steer their thoughts toward our niche-based program and the unique attributes related to our course content and delivery methods. The recurrent theme discovered

when asking this question was clear; “the primary issue with evaluation in our online courses was assessing whether our students are learning the fitness assessment and exercise training skills”. More importantly, our faculty wanted to know the answer to the question: how do we know if our students can apply the information in the “real” world? One particular colleague, who I travel with quite often to market our program at various fitness industry conferences and trade shows, suggested that this is the number one pedagogical issue asked when exhibiting at the fitness events. I also agreed that prospective students are wary of a fitness program being delivered via the Internet, with a particular skepticism towards teaching and evaluating the skills required of a personal trainer or other fitness professional. The primary issue identified was the lack of course-based tools and program policies regarding assessing psychomotor skills. In reviewing the literature and the curricular outlines in several clinical skill based education programs, I realized that our program was a very unique exception in that we did not offer a clinical residency. Our courses did not offer a laboratory section tied to the course. And lastly, we completely lacked any formidable way of evaluating skill acquisition in our online courses, specifically in PRF 711.

At the beginning the study, I also conducted an Internet search to identify other programs offering fitness related coursework in the online environment. During an extensive search of programs listed on ClassesUSA.com, and various other websites listing online programs, I could find only one other University offering online courses in the fitness discipline. There were several programs offering nursing degree programs, but most either required a residency at the school or mandated a previous clinical nursing degree for admission. An informal poll of Exercise Science Education Program Directors at three conferences I attended showed that the

directors had several concerns regarding online education within the discipline. The most commonly mentioned issue was that of assessment.

After identifying the issues as the driving force behind this study, I gathered additional support from the subject matter experts involved in this study. I talked with two faculty members teaching the PRF 711 course as well as two faculty teaching similar courses, PRF 710 and PRF 712. Based on my discussions with faculty teaching in the program, a review of various literature and national dialogue in online education, the subject matter experts results discussed in the previous chapter three relative issues were identified. First, the PRF 711 course did not incorporate a method for assessing hands-on skills and psychomotor skill acquisition, other than self-report narratives submitted by the student. Second, there was not an identifiable model being used in similar online courses around the country. Lastly, there was a definite need for an assessment protocol to be created that would satisfy a "litmus" test comparing the new protocol to traditional laboratory based course assessment models.

Question 2: Who are the students (learners) studied in this case study including; background, credentials, years of professional experience, experience & confidence in using technology, and access to subjects to be used as clients in video assessment activities?

This question is answered based on the results of the pre-course survey adopted for use in the PRF 711 course. The survey was created by me and the instructor to provide a general "picture" of the students in the course. So that data can be tracked over several semesters, the survey will remain in future offerings of the course. The survey will also provide future instructors with a method for identifying students who may potentially struggle with the use of

webcam technology. This will allow instructors proactively train and mentor students who may need support above and beyond the training created in the plan of action.

While specific data results from the survey were discussed in the results section in the previous chapter, this section provides a more in-depth analysis of the results. All of the students reported working in the fitness field, although based on the reported certifications; the fitness field was broadly interpreted by the students to mean health, fitness, physical education, and athletic training. Over two-thirds of the students enrolling in the PRF 711 course were students who have been working professionally for more than one year with over one-third having greater than five years experience. The online Exercise Science and Health Promotion program is advertised as being "perfect" for the working adult who has a busy schedule. With regard to the survey results, the average student enrolled in the PRF 711 course is a working adult that has professional experience and can be assumed, based on the reported disciplines, to lead a busy lifestyle. Based on the self-reported certifications, approximately half of the students possess some sort of certification in fitness or health/physical education. This finding is consistent with previous database analysis of students enrolled in the ESHP program. On one hand are the students with previous certifications. Over the past three years, I have found that these students enroll in the program because they presently hold fitness positions and have been certified by one or more organizations. This particular group tends to enroll so they can expand their knowledge in fitness and "move up" the management ladder within their existing place of employment. On the other hand are students who do not possess any certification credentials and may or may not work in a related area such as teaching health and physical education, athletic training, physical therapy, or other related discipline. These students want to "learn" more about fitness-related material so they can apply it to their unique work settings or, in some cases, are

looking to transition into the fitness field from unrelated careers. The survey results show that seven students had less than one year experience and that thirteen had no previous certifications. This group of students would include the aforementioned individuals looking to make a career change into the fitness industry.

Of the students who held a certification of some type, six of the students were health and physical education teachers, and seven of the students held a national certification as a Certified Personal Trainer from one of four organizations. The certifications reported include the National Academy of Sports Medicine (NASM) CPT, American College of Sports Medicine (ACSM) CPT, the National Strength and Conditioning Association CPT, and the American Aerobics Association International (AAAI) CPT.

The overwhelming majority of students enrolled in the PRF 711 course had very little prior experience in online courses and only four had ever used webcams in the past. Based on the requirements for this study, I raised a concern with the fact that this student population does not appear to be experienced with technology as it relates to online course delivery and essentially lacks any pre-acquired knowledge in the use of webcams. Based on the outcomes of the experience of the five student participants in this study, the concern appears to be insignificant based on the relative ease in use of the webcams. Additionally, the survey found that all but three students polled felt that they would be confident in using a webcam in the course. It appears that minimal online course experience and lack of webcam experience does not discourage the students from having a positive perception of their ability to apply webcam technology.

Question 3: What are the experiences of the instructor and students who are introduced to the new protocols for accessing psychomotor skill performance using webcam video/audio assessment?

Based on the results and reported experiences in the previous chapter, I found that the instructor and students involved in this study overwhelmingly supported the implementation of the new webcam assessment protocol. While issues and challenges were identified and discussed (see previous chapter), each issue could be addressed by adopting solutions. These solutions included creation of training sessions for both faculty and students prior to using webcam assessment activities, as well as adoption of policy related to hardware and software specifications. The collective solution resulted in the plan of action discussed later in this section (question six). Summative evaluation of the protocol supports the implementation of the protocol into all future PRF 711 courses.

Question 4: How does pre-course and post-course feedback from several stakeholders (instructional designer, faculty, leaders in the discipline) affect the formative and summative evaluation and development of the video assessment protocols and processes?

This question is addressed via question/answer comments from the instructor of the course, an instructional design expert, as well as two subject matter experts who are leaders in the fitness discipline. The specific insight and observations of these individuals is presented in the previous chapter. The input of these individuals was invaluable in identifying the various issues related to development and implementation of the webcam video assessment protocol. Confirmation from these stakeholders that the protocol is feasible and protocol adoption will result in enhancement of the present assessment protocol. Additionally, having "buy-in" from the

various stakeholders will allow me, as the Program Coordinator, to convince faculty members to adopt the protocol into their courses. Instructors are often hesitant to adopt new assessment tools in existing courses. Reasons include longstanding use of traditional assessment tools (quizzes, small group projects, short papers) and discomfort with new technology. Providing faculty with a protocol supported and evaluated by ESHP colleagues, assessed by leaders in the fitness discipline, and reinforced by an instructional designer will reduce the level of anxiety, as well as preconceived skepticism.

The data collected from the subject matter experts provided the basis for designing the Plan of Action for future courses. Without the insight of the SMEs, the summative plan of action could not have been created and adopted for implementation.

Question 5: What new assessment instruments can be developed during this study that will allow instructors to adequately evaluate student performance via online video projects?

This question is addressed via question/answer comments from the instructor of the course, as well as two subject matter experts who are leaders in the fitness discipline. Based on the results and feedback discussed in the previous chapter, the grading rubric developed for this study is a quality assessment tool that could be used for a wide variety of skills included in the PRF 711 course. The instructor was comfortable with the ease of use when evaluating the webcam video activities and particularly liked the ability to pause and rewind the videos to confirm whether a student completed a specific task. The instructor noted that the rubric, used with the assessment videos, was more accurate that evaluating a student in a live laboratory. The instructor stated that he often finds it difficult to “keep up” with a student when evaluating a live student presenting activities at a rapid pace. Additionally, the SMEs suggested that the rubric be

implemented, with some customization, in other Exercise Science and Health Promotion courses that require assessment of hands-on skills. As noted in the Plan of Action addressed in Question 6, I plan to create a faculty team which will be charged with independently evaluating the grading rubric and comparing the rubric to similar rubrics used in live laboratory based courses within the athletic training, exercise science, and nursing programs offered at California University of Pennsylvania. The goal is to confirm the results of this study with regard to the assessment instrument and to refine the PRF 711 rubric, for future iterations in other courses.

The webcam video activity format created for this study was also supported by the subject matter experts and the instructor. While some discussion occurred regarding the amount of structure needed within the activity format, the study participants agreed that the activity description should be "short and to the point". The thought behind this was that any additional details or directions added to the activities could possibly confuse the student or add to the pre-performance anxiety already identified during observations and discussions with students. The SMEs also agreed that the simplicity of the activity format would allow the format to be used as a template for any psychomotor skill in future online courses.

The instructor and I also discussed future versions of the grading rubric designed in this study. We agreed that a digital version of the form, which could be completed by the instructor via keyboard inputs into a word processing file, would be very valuable for archiving the completed rubrics on the computer and for sharing the completed rubrics with students in the online course. After conferring with the instructional designer, the suggestion was made to convert the existing grading rubric from Microsoft Word format into a digital interactive form using Adobe Acrobat PDF file formats. This will allow instructors to watch the video assessments submitted by students and immediately record grades and comments on the digital

interactive form. After inputting the grades and comments, the instructor will add his/her digital signature to the form before saving. The form would then be emailed to the student providing feedback.

Question 6: Based on the results in this study, what are the implications for online learning?

I will address this question by generally discussing the implications, then describing a plan of action for implementing the new webcam video assessment protocol into all future PRF 711 course offerings at California University of Pennsylvania.

The results and conclusions from this study will have a significant impact on the quality of assessment performed in several ESHP courses. The plan of action includes adoption of the new webcam assessment protocol in all sections of the PRF 711 course as well as two other psychomotor skill intensive courses, *PRF 710: Performance Enhancement in Physical Activity* and *PRF 712: Corrective Exercise in Rehabilitation*. The adoption of the new webcam assessment protocol has significant implications for California University of Pennsylvania.

First, the new protocol will be introduced to all faculty currently teaching, or planning to teach, web-based courses that require performance evaluation. This will not only include clinical courses in the fitness and health care areas, but also courses in other disciplines that require evaluation of technique, performance, or skill. One example at California University is an introductory Oral Communications course for undergraduate students. The current online version of the course has been assailed by some faculty because of the inability to conduct assessment activities of students public speaking projects. The new webcam assessment protocol supplies a solution for this issue. Another set of California University courses that can benefit from implementation of the new protocol are teaching pedagogy courses offered in an online format.

The new webcam assessment protocol will allow school of education faculty to assign students with webcam activities providing an opportunity to assess teaching skills of the students.

Second, adoption of the new webcam assessment protocol has implications related to online course quality issues. California University of Pennsylvania will be able to promote the webcam assessment protocol as an innovative technique for evaluating learning outcomes in online courses. This is particularly important with regard to university accreditation evaluations scheduled within the next couple years. Additionally, the protocol provides "deeper" evaluation of goal setting and achievement when courses and programs are evaluated by the University Wide Outcomes Assessment Committee. This Committee is charged with confirming that each program can adequately assess and track whether students are meeting course level and program level learning outcomes.

Third, the addition of the new webcam assessment protocol will allow faculty and university marketing staff to showcase the protocol as an innovative technique for assessing students. Being able to address the question of "how does the ESHP evaluate hands on-skills" will be easy to explain and will add to the "quality experience" reputation of CalU Global Online. Until such time that other competing programs learn about and adopt the webcam assessment protocol, the ESHP program will be able to claim ownership and sole proprietorship over the protocol, with a goal of reinforcing student recruitment.

Lastly, the adoption of the new protocol keeps the ESHP program on the "leading edge" of online course delivery. This reinforces my desire to present our methodologies and study results at various elearning conferences around the world. I also believe that striving to be early-adopters of technology and adding evidence-based protocols into our online programs motivates faculty teaching in the program, and creates an atmosphere of friendly competition to see which

instructors can identify, study, and implement other innovative protocols into the CalU Global Online programs.

The implications of this study related specifically to California University of Pennsylvania have been addressed. Implications for online learning on a more general plane are discussed later in this chapter. The following section describes the Plan of Action created by myself and supported by results in this study. This plan meets the practical solution objective described earlier in this document. The plan is described in several action items.

Action Item 1

In order to implement the new webcam assessment protocol across several courses in the ESHP program, I plan to create a faculty "Policy Team" that is comprised of four faculty teaching in the program. The faculty members will include instructors for the PRF 710, PRF 711, and PRF 712 courses. I will serve as team leader and will request that the California University instructional designer, who participated in this study, also contribute. The primary goal of the team will be to oversee the plan of action described here. Another goal is to create policy based on suggestions and results generated during this study. Specific policies that will be created are as follows. 1.) a program policy describing how faculty will be trained with regard to use of webcams, downloading of video files, and grading of video assessment projects, 2.) a program policy describing how students will be trained with regard to use of webcams (positioning, lighting, formatting, etc.), uploading of video files, and recording of video assessment projects, 3.) a program policy defining computer hardware-software requirements, specifications for Internet connections, and download speed connectivity guidelines, 4.) a program policy regarding camera uniformity and selection of a single standardized webcam protocol to be

purchased by students, 5.) a program policy regarding standard CODEC requirements on both faculty and student computers, and 6.) a course policy requiring "practice runs" for recording each video activity. The team will also address any new issues that arise as a result of the webcam video assessment protocol evolution.

Action Item 2

Simultaneously with the "Policy Team", a "Training Team" will be assembled with a dual charge. The first assignment is to design, create, and implement a frequently asked questions (FAQ) database and the second assignment is to develop and implement online tutorials related to the webcam assessment protocol for instructor training and for student training. The FAQ database and tutorials will be created using Camtasia™ software which will provide narrated video training and troubleshooting. Training topics will include hardware set-up, webcam positioning, room lighting, pre-recording relaxation techniques, Camtasia™ software training for faculty, and using G-Spot to identify CODEC issues & provide CODEC downloads.

Action Item 3

As Program Coordinator, I will work with instructors to implement the grading rubric and video assessment protocol into half (eight) of the course modules in all fall 2008 sections of PRF 710, PRF 711, & PRF 712. This will provide adequate time for the Policy Team and Training Team to prepare relevant material. I will also work with these instructors to incorporate Camtasia™ software using narrated feedback to supplement student critiques. Per the suggestions made in this study, I will identify one course and one instructor to experiment with synchronous assessments of psychomotor activities using real-time technology. The instructor will be taught

how to use Classlive™ software to evaluate student video assessments during synchronous class sessions. I will design a method for the students and instructor to track time requirements related to synchronous sessions required of this protocol. The information gathered in the trail course will be analyzed by the Policy Team at the end of the fall 2008 term to determine whether the synchronous protocol of video assessment is feasible, with regard to time requirements, for future course offerings.

Action Item 4

Based on a suggestion by various participants in this study, I will work with the course instructors to include the webcam set-up and software installation in the first module of the PRF 710, PRF 711, and PRF 712 courses. This will require students to install the software early on in the course with a goal of identifying "problems" and individual issues before students use the webcams for assessment purposes. Another goal is to increase student comfort with the technology and to add a more personal touch to the courses (connecting a face, voice, and personality with a name). An assignment will be added in the first week of the courses requiring students to record webcam video bios introducing themselves in the "class lounge". The "class lounge" is an informal threaded discussion that allows students to converse regarding casual topics and social topics. The five minute video bios will be posted by the students as an addendum to their personal bio submitted in the "class lounge" discussion page.

Action Item 5

During summer 2008, I will prepare a survey for all faculty teaching PRF 710, 711, & 712 in fall 2008. The minimal number of course sections will be six, with as many as eight sections to be

offered. The faculty survey will include several satisfaction indicators related to implementation and experience with the new webcam assessment protocol. These indicators include time requirements, student issues, ease of use, suggestions for the future, and best practices. I will collect and analyze the data in December 2008. The survey data will be used to determine satisfaction with the assessment protocol and to "drive" the next generation of the video assessment protocol to be implemented in spring 2009.

In addition, data from the pre-course survey created for this study will be analyzed in a separate study looking at technology experience and student confidence in using technology in online courses.

Action Item 6

The Policy Team will work closely with the Training Team, course instructors, instructional designer, and subject matter experts to ensure continuous improvement over the next several terms. The ongoing goal is to identify new web-based technologies, experiment with more real-time synchronous teaching and assessment protocols, and track satisfaction results related to ongoing evaluation of the webcam video assessment protocol. Ultimately, the team will develop one or more models of using webcams for assessment in online courses. These models will be introduced to other faculty in a variety of disciplines.

5.2. Recommendations for Future Research

At the conclusion of the study, I conceived several potential follow-up research studies focusing on the webcam video assessment protocol. I then discussed the possibility of these future research studies with colleagues. The discussion regarding the future research ideas was

not a single meeting with any one of my colleagues. Rather, the suggested studies were broached with each individual independently and exclusively from feedback from the others. The goal was to ascertain each constituent's feelings about future research approaches. I also requested each person to suggest their own ideas for research. The only guideline provided was that proposed studies should be similar in content focus, but free-standing, from the body of research produced in this study. After identifying the independent ideas and proposals of each person, I then collated the input along with my suggested studies. As a follow-up to the initial collection of suggestions, I then talked to each person again independently, introducing the "full slate" of ideas presented by myself and the group members. The merits and possible pitfalls of each potential study were discussed via informal conversations or via emailed questions and answers. The following studies were recognized as being the most logical and significant next steps in the pursuit of related research.

The study supported most by colleagues was an experimental design protocol comparing assessment of two student groups. While they agreed that the qualitative analysis provided in this study was impressive, the need for a complementary quantitative, experimental design was a logical future study. Specifically, I suggested comparing two groups of students, most likely in the form of two sections of the same online course being taught by the same professor during the same academic term. One section of the students would be evaluated using traditional classroom methods of assessment and one using webcam video assessment via the Internet. Possible variables to be evaluated include student satisfaction, faculty satisfaction, and assessment of learning outcomes and/or student grades.

The next suggested study is an experimental design comparing assessment of two student groups (one online and one traditional). Similar to the previous research study, I suggested

comparing two groups of students, most likely in the form of two sections of the same course being taught by the same professor during the same academic term. One section of the students would be evaluated using traditional methods of assessment and one using webcam video assessment via the Internet. The primary difference would be the course delivery would be "live" with one group and fully online with the other. Possible variables to be evaluated include student satisfaction, faculty satisfaction, and assessment of learning outcomes and/or student grades.

A third suggested study is a comparison of synchronous vs. asynchronous models. This study proposed by the group would be a mini-case study of sorts, looking at a comparison between synchronous video assessment (realtime) vs. asynchronous assessment (viewing of archived videos). The primary factors to be explored would be the effect of realtime, immediate feedback on student learning, in contrast to delayed feedback provided in the asynchronous protocol used in this larger study.

A fourth suggested research design included the testing of the grading rubric created in this study. The goal would be to expand on the existing rubric by including subcategories of grading criterion and an accommodation for the evaluation of each activity as a subset of skills. An example would be student hand placement, several components of positioning of the client, etc. Rater reliability of the rubric would be assessed to refine the grading rubric as a standardized course assessment tool for the stated activity.

The final area I suggest for future research is replication of study in other disciplines. In an attempt to make the results and implications of this study more "far reaching", I suggested similar case studies in a variety of disciplines, including nursing, journalism (most notably in oral communications courses), athletic training, and physical therapy.

5.3. Recommendations for Future Practice

The results of this study not only lend themselves to suggesting future research, but also provide a platform for recommending future practice. I believe there are four distinct areas where future practice can be affected by this study: policy making, instructional design, technological innovations, and training. I will look at each of these areas individually.

The study results suggest the need for policy making related to courses which present, and are intended to evaluate, hands-on and psychomotor skills. The outcomes of this study clearly result in an answer to a problem found in many disciplines that explore online learning. While I will not suggest that universal rules or policies be required regarding the use of webcams to perform assessments in online courses, I will state that general guidelines should be developed for web-based courses with similar assessment issues. In fact, I have already begun to create new internal program policies regarding assessment techniques in such courses in the Exercise Science and Health Promotion program at California University. The new policies, which will affect how faculty implement assessment measures in online course modules, are soon to be implemented. The reasons are two-fold: 1.) to provide a better, more complete system of evaluating students in online courses and applying appropriate grading of skills learned in such courses, and 2.) to allow those representing the program (faculty, staff, & administrators) to provide prospective students, as well as others with an interest in the program, with a very concrete answer to the question "how do you verify that students in your program learn, and more importantly, can apply, the skills taught in the online courses?"

One specific example of policy creation includes the requirement that, prior to completing the webcam assessment activities, all students will view several videos showing an NASM expert assessing several clients with a variety of biomechanical issues. The NASM expert would use Camtasia™ to narrate and circle various issues for each client. Another

example of policy creation include the creation of peer evaluation models within the courses and the inclusion of graduate assistants/ teaching assistants to reduce the time required of faculty to evaluate webcam video activities.

In addition to policy making, this study also suggests a very specific protocol for implementation in all courses that require the evaluation of psychomotor skills. In fact, the instructional designer at California University, who participated in this study, will likely refer to this study as an example of quality instructional design implementation with regard to assessment. Future research in this area of inquiry will hopefully add to the need for more specific instructional design strategies and online assessment protocols in real practice. Additionally, one primary future goal is to create a refined, standardized model of using webcam videos for assessment in online courses.

The third area of practice that potentially can be affected by this study is the area of technology selection and innovation. The regular improvements that occur as new generations of software and hardware are developed happen at a very rapid rate. This study can have an effect on the specific software and hardware needs required by faculty and students in online courses. The software needs include video development software for faculty who are assessing video clips and potentially repurposing the videos for use as instructional presentations. The hardware implications are seen on both the instructor and student perspective. The hardware implications of this study run the gamut from computer processing speed requirements and network data transfer, to video board requirements and webcam installation issues.

The last area of practice is training, of both the students and the faculty. Faculty need to be provided with the knowledge and skills to implement such video assessment procedures as discussed in this study. The faculty also need a more refined method for training students how to

install software, connect webcams, record video, and upload the data into courses. One such suggestion I have envisioned is the development of a one module online course that provides faculty and students alike with all of the information they need to complete the aforementioned requirements. The course would include streaming narrated lectures, and streaming video showing the actual processes in great detail.

5.4. Final Thoughts

The goal of this case study was to identify a solution to a significant problem encountered by myself and other faculty with regard to assessing online students in the *PRF 711: An Integrated Approach to Fitness and Wellness* course. The study results and experiences allowed me, with the input of several stakeholders, to identify issues, challenges, and concerns, but most importantly solutions. Now that a strategic Plan of Action, based on the identified solutions in this study, has been created, faculty, administrators, and instructional designers at California University of Pennsylvania will move toward implementation of the unique webcam video assessment protocol. The assessment protocol and Plan of Action can serve as template for several courses offered at California University of Pennsylvania and potentially at other universities looking to enhance assessment methods in online courses.

Future technologies and software capabilities may allow for further evolution of the webcam assessment protocol. I, along with other faculty members, will continue to identify, research, and implement innovative variations of the protocol identified in this study. I will also share the results found in this study with faculty in other disciplines which show prior struggles with assessment in the online education environment.

APPENDIX A.

EXERCISE SCIENCE PROGRAM PROPOSAL

Proposal for the Development and Implementation of a Web-Based Graduate Program in Exercise Science and Health Promotion

A Collaborative Effort Between California University of Pennsylvania and the Keystone University Network

California University of Pennsylvania

Respectfully submitted by:

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Appropriateness to Mission

The proposed academic program must be appropriate to the Pennsylvania State System of Higher Education mission and to California University Mission.

The goals and objectives of the program, as well as the amount and proportion of resources to be dedicated to it, must advance the respective missions.

This document proposes the development of a Master of Science in Performance Enhancement and Injury Prevention to be designed and implemented at California University of Pennsylvania. This completely web-based graduate program will be California University's first contribution to the Keystone University Network. The Keystone University Network, as part of the State System of Higher Education, "draws upon the educational excellence of the System's universities and their partners to deliver online education and training services."

Program length will consist of 12 consecutive months beginning the second week of July of each year, with students finishing the following July, and graduating in August. Thirty students per year will work, learn, and communicate online and will regularly function as a group of interactive peers. This virtual community – known as a cohort – creates a lively, dynamic educational experience that enriches the collaborative skills essential in the contemporary workplace.

The curricular content is well positioned to be presented via the Internet. Performance enhancement and injury prevention strategies and methodology will be presented with streaming video, narrated PowerPoint presentations, and online forums. Threaded discussion groups, chat rooms, and e-mail will allow the cohort to communicate and interact, adding unique insight into the discussion. Each student will use their existing place of employment as their "working laboratory," applying concepts and techniques learned online into their daily practice.

The six primary Performance Enhancement and Injury Prevention Program learning outcomes/objectives are listed below.

Upon completion of the program, students will be able to:

Plan, administer, and evaluate wellness and fitness programs, nutrition projects, and exercise physiology tracks based in sport, clinical, industrial, and corporate environments.

Teach and perform integrated, functional rehabilitation techniques including core stabilization, neuromuscular stabilization, reactive neuromuscular stabilization, integrated flexibility, integrated strength, speed training, foot training, and vision training.

Describe the launching of new ventures, as well as business and management practices, including: management theory, financial management, personnel management, record keeping, risk management, marketing, billing and technology issues.

Analyze and apply fitness & injury prevention research, focusing on current clinical outcomes research, psychology and physical activity research, and performance enhancement research, such as research related to special populations, (e.g. athletes at opposite ends of the age spectrum.)

Work in teams to develop a performance enhancement program proposal including program elements, rationale, innovative design, and supporting research.

Describe and apply principles and applications of leadership, including persuasiveness, leading and directing teams, leading within organizations, leadership opportunities in shaping fitness policy, techniques for managing change and empowerment.

The establishment of the MS in Performance Enhancement and Injury Prevention is in harmony with the National agenda "Healthy People 2010," developed by the Office of Disease Prevention and Health Promotion, U.S. Department of Health and Human Services. Simply stated, "Healthy People 2010" is a comprehensive set of health objectives for the nation to achieve over the first decade of the new century. Created by scientists both inside and outside of Government, it identifies a wide range of public health priorities and specific, measurable objectives. Since "Physical Activity" and "Injury Prevention" are two of the key focus areas, "Healthy People 2010" has created a major need for health care and fitness professionals educated in innovative, research-based performance enhancement and injury prevention strategies.

In addition to advancing the national health and physical activity agenda, the proposal for the Master of Science in Performance Enhancement and Injury Prevention advances the State System of Higher Education mission and the California University mission. California University's special mission is to develop programs in science, technology, and applied engineering. The proposed program upholds the science (health science) and technology objectives. The following objectives in the California University Mission Statement are directly supported in the Performance Enhancement and Injury Prevention program:
offers a graduate education to, and beyond, the Master degree, in certain areas of study;
fosters research and service;
encourages the intellectual growth of its faculty, as well as its students.

The mission of the Master of Science degree program in Performance Enhancement and Injury Prevention is to provide a high quality educational experience via distance learning methods. To this end, the program is:

oriented toward professional development, leadership, and management;

designed to prepare the student for performance enhancement management and leadership positions in self-owned business, sports medicine clinics, fitness & wellness centers,

hospitals, industry, universities, high schools, and private practice;
directed toward practical approaches for meeting the challenges of the new healthcare, fitness, and wellness marketplace; and
easy to work into busy schedules with asynchronous courses offered via the Internet.

The program's Mission Statement is compatible with the State System of Higher Education Mission in that the program will build a very diverse virtual community with a link to California University and the Commonwealth of Pennsylvania. The Keystone University Network will be the Internet portal allowing disparate professionals the opportunity to meet and function as a cohort of peers. Furthermore, the program is committed to excellence in education at the lowest possible cost for students from the Commonwealth, as well as nationally, and internationally. Specifically, students will be able to complete a graduate degree for less than $10,000, an extremely reasonable price for high quality education. The costs to the students will include State System of Higher Education Distance Education credit pricing and minimal costs related to learning aids, textbooks, etc. The web-based distance education model will negate the need for travel, room and board, and other related expenses.

There is current program interest from health professionals and undergraduate students within the Commonwealth of Pennsylvania. In order to expand this interest, marketing efforts will be focused on specific undergraduate programs within Pennsylvania, such as Athletic Training, Health Promotion, Wellness, Exercise Science, Health and Physical Education, Physical Therapy, etc. Performance and injury-prevention related companies will also be targeted, such as fitness facilities, wellness companies, hospitals, professional sports teams, collegiate sports teams, high school and amateur sports teams, etc. Additionally, articulation agreements and outreach programs via the Educational Resources Group (ERG) could be established; for example, with Pennsylvania-based health care employers. These outreach programs could be developed in the future with employers (hospitals, sports medicine facilities, fitness facilities, etc.) who agree to fund annually a specific number of employees for matriculation in the graduate program. Assuming that the funded employees meet the designated program's entry requirements, a specific number of slots could be guaranteed for said employees. Employees would proceed through the program as members of the 30-member cohort following the proposed course sequence.

In addition, articulation agreements could be developed with State System of Higher Education sister institutions allowing for contractual student acceptance. These agreements could be developed with programs in Athletic Training, Health and Physical Education, Exercise Science, and other similar content areas. For example, there are six CAAHEP accredited undergraduate athletic training programs within the Pennsylvania State System of Higher Education (California University, East Stroudsburg University, Indiana University, Lock Haven University, Slippery Rock University, and West Chester University).

As an example of the program's alignment with present State System and University efforts, the proposed program is closely tied with the Imperatives for the Future- A Plan for Pennsylvania's Pennsylvania State System of Higher Education (http://www.Pennsylvania State System of Higher Educationchan.edu/stplan.htm)

As stated in the Pennsylvania State System of Higher Education Imperatives for the Future, Goals and Objectives:

Goal 1: We shall expand access to new and existing clientele, with attention to the increasingly diverse and nontraditional student members.

"Expand access to State System of Higher Education graduate programs through sharing resources, using distance education technologies, and developing more flexible and imaginative program structures and course scheduling, recognizing that more working adults are seeking graduate education, but are unable to pursue it in the traditional manner."

The web-based delivery model and accelerated format of the MS in Performance Enhancement are specifically designed to meet Goal 1. The program is flexible and imaginative to the extent that no other program of its type has been identified. The expected clientele is very diverse (Appendix II, Program Interest Statistics). The applicant pool will include mostly working health care and fitness professionals, who have a variety of backgrounds and areas of expertise. Due to numerous factors, these working professionals would not otherwise pursue graduate education.

Goal 2: We shall enhance and expand learning opportunities for Pennsylvanians and others through information and communication technologies.

"Provide incentives and resources for entrepreneurial exploration of the more dramatic applications of technology now emerging in the higher education environment."

As part of the Keystone University Network, using the eCollege learning platform, all program courses are being designed for delivery via the Internet (Appendix III, Curriculum Design). Creative instructional design strategies will be used to foster learning among a 30-member cohort communicating in a virtual community. The online graduate program in Performance Enhancement and Injury Prevention is intended to reach working athletic trainers, physical therapists, exercise physiologists, fitness professionals, and other healthcare professionals who cannot adhere to the traditional course schedule. Rather, California University of Pennsylvania and the

Keystone University Network will bring the courses to the students by means of the Internet-based course program using eCourse courseware. In this manner, students from Pennsylvania, across the United States, and around the globe can fit courses around their work and home schedules, completing an accelerated Master of Science degree within one year.

The MS in Performance Enhancement and Injury Prevention graduate program is logically housed within the California University Department of Health Science & Sport Studies. The degree has a very specific focus on preventing injury and enhancing sport and work performance. The proposed program has the goal of preventing injury and illness, as compared to the other department programs' focusing on injury and illness care and treatment.

The program will draw upon department faculty expertise already serving programs in undergraduate and graduate Athletic Training, as well as Sport Management, Occupational Therapy Assistant and Physical Therapy Assistant. The programs can comfortably coexist with no competition for budget resources, faculty or staff. The proposed program complements current offerings and has drawn great interest from students currently matriculating in the undergraduate Athletic Training program. Many of the professionals enrolling in the program

will in fact be Certified Athletic Trainers, Licensed Occupational Therapists, and Licensed Physical Therapists.

The addition of a new web-based graduate program within the Department complements the existing accredited graduate athletic training program. The existing program has a national reputation that will lend respect and credence to the proposed MS degree. The Performance Enhancement and Injury Prevention program will also help support existing programs by drawing national and international attention to existing offerings, while also enhancing professional growth of faculty. Department faculty are very pleased about the chance to teach within the Keystone University Network, providing learning opportunities to a much wider range of health professionals.

Need

The proposal shall include, depending upon type of program, sufficient information relative to intellectual value, student demand, regional and national market demand for program completers, and value to such things as student breadth, faculty vitality, and community enhancement.

All higher education institutions are challenged to find new ways to attract nontraditional students effectively, improve course quality and flexibility, increase efficiency, increase student success, and create new streams of revenue. This proposal would create a dynamic, innovative collaboration between California University and the Keystone University Network, meant to meet the abovementioned challenges head-on.

Sports performance programs have been growing rapidly over the past few years resulting in a need for qualified leaders, facilitators, and instructors. Simultaneously, work performance enhancement and corporate fitness for the "Industrial Athlete" has also recently received much interest due to the financial savings afforded corporations that adopt such programs. Performance enhancement through physical activity, behavioral and psychological change, and prevention of injury and illness are the keystone of the aforementioned programs. Although most students will already be employed, career opportunities for program graduates are numerous. These opportunities will continue to expand greatly over the next several years. According to the Bureau of Labor Statistics, "Employment of fitness workers—who are concentrated in the rapidly growing amusement and recreation services industry—is expected to increase much faster than average due to rising interest in personal training, aerobics instruction, and other fitness activities"(http://stats.bls.gov/oco/ocos058.htm). The MS in Performance Enhancement and Injury Prevention will supply the unique education required for management expertise in performance enhancement fields.

As mentioned, the proposed program was developed to address both sport and work performance & injury prevention. Individuals graduating from this program will have the knowledge to develop and manage injury prevention programs during sport and via corporate wellness / industrial athletic training programs. Regarding the extent of preventable sport related injury, statistics are listed below:

In children alone, each year, more than 775,000 children ages 14 and under are treated in hospital emergency rooms for sports-related injuries.
It is estimated that half of all significant sports-related injuries are treated in sports medicine clinics instead of hospital emergency rooms.
Thirty percent of parents report that their child has been injured while playing a team sport, half of which say the child has been injured more than once.
Nearly a quarter of these parents report the injury was serious.

(National SafeKids Campaign).

In Pennsylvania, when looking at industrial/corporate intervention programs alone, literally millions of dollars of direct and indirect worker's compensation could be saved using the Industrial Athlete model presented as a core philosophy in California University's proposed graduate program.

An example of the type of company where Performance Enhancement & Injury Prevention students will be employed is Prevention Services Inc., based in Harrisburg, PA, which has saved companies like Roadway trucking thousands of dollars by reducing or preventing work-related injuries. PSI places Certified Athletic Trainers onsite in trucking terminals applying the Industrial Athlete Model. "One freight / transportation company with whom PSI works has realized tremendous results. Initial implementation of the program produced up to 30% reduction of Musculoskeletal Disorders (MSD's) and significant cost savings. The ongoing long-term results are just as impressive, with a 70% reduction of MSD's from date of implementation. Other sites within this company have seen similar results. One site reduced its injuries from 63 down to 13 in a four year period. Other clients have seen lost time accidents reduced to almost zero and still others have seen the cultural change they could have never expected (employees taking ownership for their own safety and health)." (Source: www.preventionservicesinc.com).
Additional information reinforcing the great need for the California University Performance Enhancement and Injury Prevention program is evidenced by the following work-related injury statistics.
More than 700,000 Americans suffer injuries due to Work-Related Musculoskeletal Disorders each year, accounting for more than 35% of all lost-workday injuries and costing employers up to $20 billion annually in direct workers compensation.
Every 6 minutes, someone in Pennsylvania is injured on the job.
On average, U.S. Fortune 50 corporations have spent as much as 61.2% of after-tax profits on medical care.
Eight out of ten adults suffer low-back pain at some time in their lives.
About 2.7 million injuries & illnesses were lost-workday cases, that is, they required recuperation away from work, or restricted duties at work, or both.
(Source: www.preventionservicesinc.com)
To date, numerous prospective students have voiced interest in the program. Most of these are categorized as "extremely interested" (Appendix II, Program Interest Statistics). Students currently enrolled in the California University CAAHEP Accredited Athletic Training program have officially stated their intentions to apply for program acceptance. Additionally, students from other Pennsylvania accredited athletic training programs (for example, Duquesne

University, Lock Haven University, & East Stroudsburg University) have inquired about the program.

The National Academy of Sports Medicine has stated that their market research shows the interest level in the thousands. It is projected that the applicant pool will number well over 200 annually.

Based on data collection from more than 325 professionals interested in the program, many of the prospective students are interested in the degree due to curricular content. This is supported by the number of business owners and mid to high level managers inquiring about the program. These individuals are not necessarily concerned with job advancement, but are particularly interested in the knowledge gained by communicating with other professionals within the virtual cohort. There is another cross section of professionals who are interested in advancing within their present organization, but have reached a glass ceiling created by the lack of a graduate degree. The majority of inquiries thus far are not looking to change career paths with movement to other employers. They are simply looking to advance within their respective organizations.

The program will bring a unique vitality to the California University campus and State System of Higher Education by the innovative design and pioneering position within the Keystone University Network. The program will become a model allowing other imaginative State System of Higher Education programs to springboard and evolve. Faculty involved in distance learning pedagogy throughout the University and State System of Higher Education will look to this program for insight and creativity. After implementing the graduate program, the Program Coordinator (Appendix IV, Program Coordinator – Qualifications and Position Responsibilities) will be available to assist other potential distance learning programs within California University and the State System of Higher Education.

In summary, there is extensive evidence and widespread interest, at the state, national, and international level, justifying the development and implementation of the MS in Performance Enhancement and Injury Prevention at California University of Pennsylvania.

Academic Integrity

The proposal shall include sufficient information to demonstrate the adequacy and the appropriateness of the proposed curriculum, standards, instructional staffing, and other resources. For graduate programs and for certain undergraduate programs where the university lacks sufficient experience or involvement, the university and the Office of Academic and Student Affairs shall cooperate in identifying an appropriate consulting individual or team to assist in evaluating and enhancing the proposal.

The proposed program will be a Master of Science degree program housed in the Department of Health Science and Sport Studies. This Department has successfully provided undergraduate and graduate degree programs in Athletic Training for several years. In fact, California

University is one of only a few universities nationwide to maintain accredited undergraduate and graduate athletic training curricula.

California University will award the degree in the area of Performance Enhancement & Injury Prevention. Additionally, students will be eligible to sit for a written National examination covering many aspects of performance enhancement. Successful examinees will be awarded NASM National Certification as a Performance Enhancement Specialist (PES).

The MS in Performance Enhancement and Injury Prevention will maintain the highest level of academic integrity, working with respected leaders and professional groups to create a high level of standards. In fact, the National Academy of Sports Medicine (NASM) will support California University in developing the Masters Degree program (Appendix V, Courses & Course Sequence). In addition to extensive internal review by Department faculty, the University Curriculum Committee, and the University Graduate Council, leaders within the National Academy of Sports Medicine are providing free consultation regarding proposal and program design and development. These expert consultants include the President of NASM, Mike Clark, and an NASM Consultant and Education Liaison, James Thornton. The National Academy of Sports Medicine (NASM) was founded in 1987 by physicians, physical therapists and fitness professionals. Since its inception, the organization has expanded throughout the United States, Asia and Europe and has always focused on the development, refinement and implementation of superior educational programs for fitness, performance and sports medicine professionals. The NASM believes it is their responsibility to provide curricula using the most advanced research and practical application information available.

As previously mentioned, the Academy has identified a substantial need for this type of degree program and has recognized California University and the Keystone University Network as an excellent affiliation, perfectly positioned to deliver high level, research-based educational content, while allowing for flexibility and accessibility for working professionals. Many NASM members and attendees at the Academy's workshops have requested a program of this type and design. Prospective students will be required to meet specific prerequisites (Appendix VI, Program Entry Requirements) before being considered for acceptance.

Coordination of Other Programs

For purposes of possible resources sharing, student transfer or articulation, and avoidance of unnecessary duplication, the proposal shall report communication with other appropriate institutions.

Duplication of existing programs is not a concern. As previously mentioned, the proposed program is not only unique to the State System of Higher Education, but has not been identified anywhere else, nationally or internationally. The course of study is distinctive, as well as the method of delivery, resulting in an extremely exceptional program. This distinctiveness is one reason for the great national and global interest.

At this point, no specific articulation agreements have been developed. However, it is possible that agreements could be developed in the future with employers (hospitals, sports medicine facilities, fitness facilities, etc.) who agree to annually fund a specific number of employees for matriculation in the graduate program. The agreements could be developed collaboratively between California University, the Keystone University Network, the State System of Higher Education Educational Resources Group (ERG), and individual businesses. Assuming that the funded employees meet the designated program entry requirements, a specific number of slots could be guaranteed for said employees. Employees would proceed through the program as members of the 30-member cohort following the proposed course sequence (Appendix V, Courses & Course Sequence).

In addition, articulation agreements could be developed with State System of Higher Education sister institutions allowing for contractual student acceptance. These agreements could be developed with programs in Athletic Training, Health and Physical Education, Exercise Science, and other similar content areas. For example, there are six CAAHEP accredited undergraduate athletic training programs within the State System of Higher Education (California University, East Stroudsburg University, Indiana University, Lock Haven University, Slippery Rock University, and West Chester University).

Periodic Assessment

The proposal shall include information regarding periodic institutional, professional, and/or accreditation reviews to which program will be subjected.

The proposed program is seeking initial approval at the departmental, college, and university levels. In keeping with Total Quality Management and Performance concepts, annual department reviews will help the program to continually improve, evolve, and adapt. These reviews will include insight from the Program Coordinator, program faculty, Department Chair, distance learning and technology experts, and most importantly, graduates of the program. The program will also receive continual guidance from an Advisory Board (Appendix VII – Proposed Advisory Board), consisting of ten individuals, including one licensed physician, three representatives from the National Academy of Sports Medicine (NASM), two educational technology/distance learning experts, the Department Chair of Health Science and Sport Studies at California University of Pennsylvania, and three members who are leaders and innovators in the growth of performance enhancement as a career (i.e., educators, fitness executives, entrepreneurs, and sports medicine managers.)

Other institutional initiatives, such as outcome assessments, (i.e., student satisfaction surveys, employer satisfaction surveys, etc.) will be conducted by the program to ensure continuous quality improvement. In addition to course-focused assessments, graduates will be asked to comment on the strengths and weaknesses of the overall educational experience, including course content and delivery methods.

Due to the uniqueness of the program, no accrediting body exists. However, as previously stated, the program is being developed with support from the National Academy of Sports Medicine (NASM). The NASM will annually review the program and collaborate with California University to strengthen program content and augment delivery methods. Also, as an added check on program quality and credibility, successful graduates will be eligible to sit for the NASM Certification as a Performance Enhancement Specialist (PES).

Resources Sufficiency

The program proposal shall detail the need and availability of such resources necessary to support the program during the initial and subsequent four years. The statement shall include a description of the internal reallocation process by which resources are assured:

During this initial year of program development, a Program Coordinator (Appendix IV, Program Coordinator – Qualifications and Position Responsibilities) has been hired to 1.) prepare and submit documents for STATE SYSTEM OF HIGHER EDUCATION approval, 2.) develop syllabi and course outlines, and 3.) develop and implement courses as web-based instruction delivered by the Keystone University Network and supported by eCollege. The Program Coordinator, who will also teach several program courses, is the only new hire required for the program. Additional program faculty includes faculty members already employed in the Department of Health Science and Sport Studies. Existing support staff, already employed in the department, will provide secretarial and administrative assistance.

The proposed program has received unanimous support at all levels of faculty evaluation. Four existing members of the Health Science and Sport Studies Department are looking forward to teaching in the program. See faculty teaching assignments (Appendix V- Course Sequence and Course Descriptions). More than 15 Health Science & Sport Studies faculty unanimously approved the program in early fall, 2002 (9/03/02). Shortly thereafter, the University Curriculum Committee unanimously approved the proposed program (10/28/02). More recently, a Graduate Council consisting of all California University Program Coordinators unanimously approved the proposed program (11/21/02). Lastly, the California University Council of Trustees unanimously approved the proposed program supported with glowing comments (12/04/02).

There is also strong support for the proposed program from University administrators including the Graduate Dean (Dr. Thomas Kinsey), Provost (Dr. Curtis Smith), and President (Dr. Angelo Armenti, Jr.). Lastly, the President of the Educational Resources Group (Dr. Kim T. Coon) has voiced strong support for the program.

Due to the distance learning model of providing a high level educational experience, all learning materials will be available via online courses, Internet databases, streaming video, digitized documentation, etc. Technical equipment (servers, data storage, data transfer) and expertise will be provided through an agreement with eCollege. According to eCollege.com, eCollege is an "eLearning software and services provider. Comprised of educators and technologists, eCollege

partners with colleges, universities, schools and corporations to design, build and support high quality learning communities. eCollege also works with strategic, content and technical partners to bring a complete portfolio of eLearning offerings to their customers."

All faculty members teaching within the proposed graduate program are scheduled to take the six week long eCollege eCertification course. Following the maxim "learning by doing," faculty will learn about teaching online in the online environment. Faculty will virtually step into the students' shoes, understanding the learning process from the student's point of view and learning how to enhance that process in their own courses. Additionally, faculty will be required to create an online portfolio, which demonstrates proficiency with basic tools of online instruction, including pedagogical and visual design. As a culminating activity, faculty will be required to complete the eFaculty Certification Examination credentialing the instructors as eCollege Certified Online Instructors.

Facility requirements are minimal: an office for the Program Coordinator. An office space has been identified, but specific work needs to be accomplished, including the addition of HVAC, a data line, a phone and cable line, and electrical supply. The Coordinator will also be supplied with an annual administrative budget of $2500, office desktop computer, and a laptop computer. The administrative budget includes monies for mailings, office supplies, software purchases and professional development. Since students enrolled in the program will not be required to attend "on-campus" classes, no other facility, equipment, or supply demands are warranted.

Existing departmental resources available to the program include faculty expertise in the content areas being presented, secretarial support, office space, computer and copying / printing support. The Keystone University Network, as part of the State System of Higher Education, "draws upon the educational excellence of the System's universities and their partners to deliver online education and training services." Via the Keystone University Network website, students will be able to apply for the program, register for classes, and access the web-based courses required of the program. The addition of an online Writing Center and Academic Support Center is presently under discussion. All program reading materials including texts, journals, and downloadable PDF files will be available via the Internet. The Keystone University Network is supported technologically by eCourse, who will provide 24/7 technical support to students via the Internet and phone access. Computer servers will be housed at eCollege, with redundant back-ups supplying a 99.9% uptime rate.

Online library resources already available to California University students will be available to students enrolled in the program. Additionally, the Keystone Library Network will be available to the students as well as the PILOT online catalog system and numerous online journal indexes.

Impact on Educational Opportunity

The proposal shall include appropriate information regarding probable impact of the new program on goals for enhancing both educational opportunity and assurance of civil rights.

As the very first program proposed by California University for inclusion in the Keystone University Network, the program is projected to have a significant impact on educational opportunity. To emphasize, the educational opportunity created by the program is significant for both Pennsylvania residents and others. Students who would not otherwise be able to pursue graduate work due to job requirements, geographical boundaries, financial constraints, political controls and other barriers will be afforded the chance to pursue a high level, accelerated graduate degree from one of Pennsylvania's outstanding, accredited institution's of higher education. The asynchronous nature of web-based learning negates time barriers allowing students from around the world to "log-in" to class at their convenience. Asynchronous communication tools within the eCollege system (e.g. email, threaded discussion forums, doc sharing, journal, etc.) allow for time independent interaction, whereas synchronous communication tools (e.g., chatrooms) allow the instructor to engage students in live interaction. As another example of expanding educational opportunities, some of the courses planned for the MS in Performance Enhancement and Injury Prevention could be made available as stand-alone Specialty Certification courses, open to all Certified Athletic Trainers, Licensed Physical Therapists, and/or Certified Fitness Professionals as continuing education courses. In fact, the National Athletic Trainers' Association Board of Certification (NATABOC) is presently in the process of creating and recognizing continuing education credentials in the form of Specialty Certifications (Appendix VIII - Specialty Certifications).

The program will adhere to all university, college, and departmental policies regarding equal opportunity and equal admissions practices. The program is whole-heartedly committed to California University's ethical and legal stance on fair and open recruitment and acceptance of students regardless of sex, race, color, religion, lifestyle, affectional or sexual preference, disability, present or previous military service, ancestry, national origin, union or political affiliation, and/or age.

Appendices, MS in Performance Enhancement and Injury Prevention

I. Performance Enhancement and Injury Prevention Program Mission Statement
II. Program Interest Statistics
III. Curriculum Design
IV. Program Coordinator – Qualifications and Position Responsibilities
V. Course Sequence and Course Descriptions
VI. Program Entry Requirements
VII. Proposed Advisory Board for Graduate Program
VIII. Specialty Certifications

Appendix I-Performance Enhancement and Injury Prevention Program Mission Statement
Mission Statement:

The mission of the Master of Science degree program in Performance Enhancement and Injury Prevention is to provide a high quality educational experience via distance learning methods. To this end, the program is:

oriented toward professional development, leadership, and management;
designed to prepare the student for performance enhancement management and leadership positions in self-owned business, sports medicine clinics, fitness & wellness centers, hospitals, industry, universities, high schools, and private practice;
directed toward practical approaches for meeting the challenges of the new healthcare, fitness, and wellness marketplace; and
easy to work into busy schedules with asynchronous courses offered via the Internet.

Appendix II-Program Interest Statistics

Program Interest Statistics

The interest in the proposed Performance Enhancement and Injury Prevention graduate program has been tremendous. In order to gauge need, the Program Director, Barry E. McGlumphy, asked the National Academy of Sports Medicine to mail a summary of the proposed program to a sampling of professional members. The survey of potential students gauged interest in program content and interest in program delivery methods. Additionally, demographic information was collected including name, current job title, certifications, undergraduate degree(s), and contact information. The response from that mailing has included over 325 serious inquiries into the program. All inquiries have had direct correspondence with the Program Director. The inquiry group includes many Pennsylvania citizens, but is very diverse, with current interest coming from 15 countries and 33 states. The group demographics are listed below.

There are thousands of practicing healthcare and fitness professionals in various fields who have bachelor's degrees and who cannot afford to leave their positions to go to graduate school. The California University and Keystone University Network MS in Performance Enhancement & Injury Prevention program will allow many of these professionals the opportunity to work full time while completing their accelerated MS degree online in one year.

Accentuating the need for graduate degreed professionals, the International Health, Racquet & Sportsclub Association (IHRSA) is working with numerous other fitness and wellness organizations to develop and implement a new initiative "100 Million by 2010" (www.ihrsa.org). The initiative will create a tremendous demand for professionals in Performance Enhancement and Injury Prevention. The initiative is the fitness industry's answer to the question, "What can we do to help people become more physically active and enjoy a higher quality of life"? The industry's answer is to work together to have 100 million health club members globally by the year 2010, including 50 million in the US. In the process of accomplishing this goal, they expect not only to have 100 million individuals exercising in clubs, but also to attract an additional 100 million to the practice of exercising regularly on their own. The process involves educating the public about the benefits of exercise and the devastating health consequences of living a sedentary existence.

The following information has been collected from the aforementioned survey and e-mail inquiries into the program. An average of three e-mails per day are received by the Program Coordinator, with over three-hundred twenty-five (325) serious inquiries received as of February 10, 2003. Once the program is approved by the Pennsylvania State System of Higher Education Board of Trustees, a marketing campaign will commence directed towards healthcare and fitness professionals.

As of February 2003, professionals interested in the program hold a variety of undergraduate degrees. The following lists a sample of undergraduate degrees held by individuals who are very interested in matriculating:
Athletic Training
Kinesiology
Physical Education
Human Movement Science
Community Health
Ergonomics
Health Science
Health Promotion
Biomechanics
Health Education
Nutrition
Exercise Science
Occupational Therapy
Physical Therapist
Occupational Therapist
Fitness Director
Health Fitness Coordinator
Manager of Wellness
Manager of Ergonomics
Rehabilitation Specialist
President, Fitness Company
Personal Fitness Trainer
Exercise Physiologist
Certified Strength & Conditioning Specialist
Therapeutic Recreation Specialist
Sports Chiropractor
Physical Education Teacher
Lifestyle & Weight Management Consultant
Vice President of Clinical Services
Registered Dietician
Club Services Supervisor
Fitness Club Owner
Exercise Technician
Master Trainer/Head Trainer

As of February 2003, professionals interested in the program live and work in a variety of geographical locations. The following lists the current home states and countries representing individuals who are very interested in matriculating:

The program will be marketed via the California University of Pennsylvania website, the National Athletic Trainers' Association monthly newsletter (mailed to 30,000 members), and direct mailings to the various undergraduate programs within the Commonwealth of Pennsylvania. Money is also available from the Keystone University Network specifically targeted for marketing activities. The program will be fully described on the Keystone University Network website with online application and registration available for students.

As an added benefit of the close relationship with the National Academy of Sports Medicine (NASM), the Academy will, for no fee, market the program via various venues. They include, the NASM website (30,000 unique visitors/monthly, PTontheNet website (25,000 active members), Perform Better (325,000 mailings 4x/year), about 50 live seminars in front of approximately 15,000 participants, and to NASM corporate partners (24 hour fitness (8000 members), TSI (2500 members), Apex Fitness (10,000 members).

Appendix III-Curriculum Design

Curriculum Design

In order to meet the strong demand revealed by thousands of practicing fitness, wellness, and health care professionals, it is proposed that a Master of Science in Performance Enhancement and Injury Prevention degree be created and implemented within the California University Department of Health Science & Sport Studies in collaboration with Keystone University Network. A program of this type, consisting of the proposed curriculum, will be a unique offering. The program will use web-based distance learning as the primary pedagogical tool. In order to meet the needs of working professionals who are looking to increase knowledge in performance enhancement & injury prevention while obtaining a high level of professional growth, the program will include practical applications problem solving, case study analysis, and the creation of a CD-ROM electronic portfolio. The program will culminate in the development of a comprehensive plan for performance enhancement within sport, industry, or corporate settings.

Students in this online program will primarily be full-time working adults who are highly motivated and self-disciplined in seeking completion of their graduate degree. The students can complete the program entirely online while working a fulltime job by taking Web-based courses available through the Department of Health Science and Sports Studies. Distance learning via the Web is an exciting opportunity that will offer the student the flexibility to take classes and earn a graduate degree without leaving the home or job. The MS in Performance Enhancement and Injury Prevention allows the student to further an education anytime, anywhere, and at an affordable cost. Students will be able to apply online via the Keystone University Network website (www. Keystone-University.net). Additionally, students will be able to register for and access all program courses via the Keystone University Network website. An online bookstore,

online library, a technical Help Desk, and tutorial help are key features of the Keystone University Network website.

The program will take place in 12 consecutive months beginning in the second week of July of each year with students finishing the following July. The student will work online for each course with various instructors and will regularly function as a group of interactive peers. This virtual community – known as a cohort – creates a lively, dynamic educational experience that enriches the collaborative skills essential in the contemporary workplace.

The courses will be asynchronous; therefore the student will not need to be on their computer at the same time as the instructor or other students. The fall and spring semesters are approximately sixteen weeks long and summer terms are five weeks. Students will have to maintain and complete their studies within the semester time frame.

The key features of the online courses include PowerPoint presentations with audio narration, streaming video with sound, threaded discussions on various topics, and frequent assessment of the material (weekly quizzes, time-limited online examinations, journal entries, etc.) The PowerPoint presentations and streaming video will allow students to view course content presented by faculty members and expert guest lecturers. The threaded discussion will allow students to answer questions posed by the instructor or other students, and then build upon those answers. Thus, a dialogue will be created not only between instructor and student, but also among students in a cooperative venture. Frequent assessment (several times per week) ensures that students are cognizant of the material and what they need to do to expand their understanding. Advisory Board members and other experts in the specific course content will be invited to participate in threaded web-based discussion groups. The web-based model allows students access to a wide variety of professionals with varied backgrounds and philosophy's. Live Chat rooms will allow faculty to assign a few "office hour" meetings per week, where live chat can occur between students and faculty.

In line with distance education courses across the nation, each student generally receives more individual attention via the discussion group and e-mail than students in regular graduate courses.

Note that these online (or distance learning) courses are not merely correspondence courses; the rapidity of communication continues to evolve. Distance courses require more work than regular courses, due to the greater level of attention offered to the student. Students must also keep pace with the assigned material, lest they fall behind in their studies. Although the course is asynchronous, where no one has to be at the same place at the same time, the timeline must be maintained with some discipline to prevent the workload from accumulating.

The online degree program will emphasize case study learning. In a highly interactive virtual workspace, the student will develop practical knowledge in the area of performance enhancement and injury prevention. The student also will gain an understanding of entrepreneurial strategies, develop critical thinking and communication skills, and acquire a well-rounded leadership and management experience, qualities integral to an education that addresses both professional and personal growth.

As previously mentioned, the Web-based courses will give students the flexibility to study as their schedules dictate. Just as with on-campus studies, online students belong to a community where dialogue and interaction with other students and faculty will be central to the learning experience.

The emphasis of the program is on preparing students for positions of leadership and responsibility in performance enhancement and injury prevention. The program recognizes the need for developing the student's capacity to solve the many problems arising from ever-changing healthcare economics, political and regulatory conditions, and marketing strategies. The student will study and discuss real-life scenarios to ensure their competency in today's competitive sports medicine, fitness, and industrial/ corporate business world.
The method of instruction is designed to provide maximum comprehension of the material covered. Cohort size will be limited to no more than 30 students, permitting a closer interaction with highly qualified and experienced instructors selected for the program.

Appendix IV- Program Director – Qualifications and Position Responsibilities

Program Director Responsibilities

Design and implement curriculum for graduate program
Design and implement appropriate web-based learning pedagogy
Develop web-based coursework using eCourse from eCollege
Design and implement applications materials for the graduate program
Supervise application and admission process for graduate program
Support and assist other faculty teaching in the graduate program
Teach six graduate program courses
Advise students matriculated in program
Maintain outcomes data regarding student satisfaction, employer satisfaction, etc.

Program Director Qualifications

Barry E. McGlumphy, MS, ATC
Assistant Professor, Department of Health Science & Sport Studies
Mr. McGlumphy is a 1987 graduate of Lock Haven University, where he received a Bachelors of Science in Athletic Training / Health Science. Soon thereafter, he accepted a Graduate Assistantship at the University of Arizona, graduating in 1989 with a Masters of Science in Exercise and Sport Science / Athletic Training. Presently, he is in the dissertation phase of his doctoral work in Instructional Design and Technology at the University of Pittsburgh.
Prior to coming to California University of Pennsylvania, Mr. McGlumphy was an Assistant Professor for nine years within the CAAHEP-accredited Athletic Training curriculum at Duquesne University, teaching undergraduate courses in athletic training, and graduate courses in occupational therapy and multimedia technology. For the past year and a half, he has served as the Director of Health Safety & Health & Wellness for a Carnegie Mellon University Research institute.
From 1987 - 1989, he was the Head Athletic Trainer at Salpointe Catholic High School in Tucson, AZ. Between 1989 - 1992, he was the Head Football Athletic Trainer and Clinical Instructor at Bucknell University in Lewisburg, PA. More recently, he has served as an Athletic Trainer for a variety of events including the Philadelphia Eagles Mini-Camp, the Pittsburgh Marathon, the National High School Wrestling Championships, the Pennsylvania Special

Olympic Games, the Amateur Pittsburgh Penguins, and the 1997 NCAA Men's Basketball Tournament. He has been involved with athletic drug testing for the US Olympic Committee, NCAA, and the Pittsburgh Great Race. A Certified Instructor of CPR and First Aid for both the American Heart Association and the American Red Cross, Mr. McGlumphy is also a Certified Instructor for Automated External Defibrillators (AEDs).

Mr. McGlumphy has presented on "Multimedia Technology & Distance Learning in Athletic Training Education" at several state, regional, and national conferences. He was elected in 1999 as Treasurer for the National Athletic Trainers' Association District-2 and sits on the District Executive Council, which represents Pennsylvania, New Jersey, New York, and Delaware. He also serves on the Executive Board for the Eastern Athletic Trainers' Association, representing all Northeast states, and has served on the Pennsylvania Athletic Trainers' Society (PATS) Board of Directors, as Chair of the PATS Clinical Symposium Committee from 1991 - 1994, and as PATS Parliamentarian from 1994-2000. He has been very active in the Athletic Training Licensure process in Pennsylvania serving as Chair of the Legislative Committee for several years. Mr. McGlumphy has been a National Athletic Trainers' Association Board of Certification (NATABOC) Test Site Administrator for eight years, which has included such duties as administering the NATABOC Certification Examination and developing questions for the written simulation portion of the exam.

In 1997, Mr. McGlumphy was awarded the Distinguished Alumnus Award from the Lock Haven University Department of Health Sciences and in 2001, he was awarded the Pennsylvania Athletic Trainers' Society Service Award. Mr. McGlumphy is listed in the Marquis Who's Who in the East and the International Who's Who for 2000-2002.

Appendix V-Course Sequence and Course Descriptions

Curriculum

Program course descriptions, academic schedules, and teaching assignments are listed below. All coursework will be delivered via the Internet. There are no formal internships or practica planned. However, due to the distance learning mode of delivery, each student may use their existing place of employment as their "working laboratory" applying concepts and techniques learned online into their daily practice.

A curricular plan for delivering the courses has already been devised and agreed upon by participating faculty. Additionally, course workload requirements have already been integrated into FTE requirements. The courses will be taught using existing faculty, who have great expertise and interest in the course content, as well as the mode of delivery.

I. Master of Science in Performance Enhancement and Injury Prevention: 30 credits

Proposed Course Descriptions

PRF 700 Orientation to Performance Enhancement and Injury Prevention

This course is designed to introduce basic information regarding the Performance Enhancement and Injury Prevention Program. Discussion will include performance enhancement and injury prevention models in sport and work environments. The course will also introduce the student to various types and styles of learning via web-based technologies, and will orient the student to web based methods of learning.

PRF 705 Industrial, Clinical, and Corporate Wellness
This course is designed to develop knowledge and awareness of the major issues in the field of worksite health promotion and clinical care. The focus of the course is on planning, administering, and evaluating wellness and fitness programs based in clinical, industrial, and corporate environments. The cost of unhealthy life style choices for the individual and employer and their relationship to the workplace will be explored. Topics include, the "Wellness Revolution", the "Industrial Athlete Model", benchmark programs, and outcomes assessment strategies.

PRF 710 Performance Enhancement in Physical Activity
This course offers a comprehensive discussion of functional anatomy, functional biomechanics, and motor learning as it related to functional rehabilitation and athletic reconditioning. The student will be introduced to integrated, functional rehabilitation techniques including core stabilization, neuromuscular stabilization, reactive neuromuscular stabilization, integrated flexibility, integrated strength, speed training, foot training, and vision training. The student will also be taught a comprehensive kinetic chain assessment to determine myokinematic, arthrokinematic, and neuromuscular deficits. After completing this course and Performance Enhancement Program Design, students will be eligible to sit for the National Academy of Sports Medicine Examination for Performance Enhancement Specialist certification.

PRF 715 Business and Entrepreneurship in the Fitness Industry
This course offers a comprehensive discussion of the practical aspects of starting and running a business in performance enhancement and fitness. The course focuses on launching new ventures, as well as business and management practices for individuals who are already in business but who want to learn how to improve their operations. Specific topics include, management theory, financial management, personnel management, record keeping, risk management and technology issues.

PRF 800 Research in Fitness and Injury Prevention
This course is designed to immerse the student in fitness & injury prevention research, focusing on current clinical outcomes research, psychology and physical activity research, and performance enhancement research. Topics include, research in resistance training, core stabilization, and aquatic therapy. Fitness and injury prevention research is discussed related to special populations, such as athletes at opposite ends of the age spectrum.

PRF 750 Performance Enhancement Program Design
This course requires the student to integrate knowledge learned from the course Performance Enhancement with professional experience and prior learning in fitness and rehabilitation. Students will work in teams to prepare a performance enhancement program proposal including program elements, rationale, innovative design, and supporting research. Each week, cohort members will professionally analyze and critique new proposals, resulting in high-level discussion and exchange. After completing this course and Performance Enhancement in Physical Activity, students will be eligible to sit for the National Academy of Sports Medicine (NASM) Examination for NASM Performance Enhancement Specialist certification.

PRF 755 Marketing and Billing in Performance Enhancement
This course is organized as a "how-to" approach to marketing performance enhancement and athletic training services. The course also covers current trends in health care and fitness reimbursement as well as future directions for reimbursement. Models of successful athletic training reimbursement are discussed. Topics include networking, generating leads, presentation skills, writing proposals, creating press releases, filing claims, appealing denials, and approaching payers. Reimbursement in all practice settings is explored.

PRF 760 Leadership and Professional Development
This course is intended to prepare students for the leadership decisions and actions that are inherent in performance enhancement management and fitness practice. Professional and personal growth will be discussed. Principles and applications of leadership will be explored, including persuasiveness, leading and directing teams, leading within organizations, and leadership opportunities in shaping fitness policy. Techniques for managing change and empowering others are included in this course. Topics related to effective leadership are issues of power, motivation, delegation, team building, persuasion and negotiation, and total quality improvement.

PRF 765 Nutrition for Peak Performance
An in-depth examination of contemporary issues such as performance enhancement dietary supplements, dietary lipids and heart disease, dietary fiber and health, influence of lifestyle factors on nutrition. Controversies in nutrition, ergogenic aides, and cultural aspects of food are also discussed. Energy and nutrient needs for activity with emphasis on particular physical and athletic activities; common myths and fallacies concerning diet and athletic performance; and appropriate dietary approaches for specific activities and active people.

PRF 770 Exercise Physiology: Assessment and Exercise Prescription
This course offers a comprehensive discussion of the knowledge, skills, and abilities needed for American College of Sports Medicine certifications and current clinical practices in sports medicine. Emphasis will be placed on the value and application of exercise testing and prescription in persons with and without chronic disease. Special topics to be addressed include, exercise prescription in children, the elderly, pulmonary patients, cardiac patients, and pregnant women.

Appendix VI-Program Entry Requirements

Program Entry Requirements

The Master of Science degree program is intended for post-baccalaureate students who want more intensive background and expertise in the specialized area of performance enhancement and injury prevention. For admission into this program, the student must have completed and/or met the following general requirements:

A bachelor's degree from a four-year accredited college or university.

A minimum 3.0 undergraduate grade point average, based on a 4.0 scale. If a prospective student does not meet this requirement, candidates will be considered if they submit two professional letters of recommendation and have a minimum undergraduate QPA of 2.50.

Acceptance to the School of Graduate Studies and Research.
All applicants must be a fitness/wellness professional **OR** be certified, licensed, or registered in one of the following: Athletic Training, Physical Therapy, Occupational Therapy, Nursing, Physician Assistant, Nutrition, or other healthcare profession.
Submission of a resume or curriculum vitae. Resume or CV must list three references.
A phone or e-mail interview with the Program Coordinator to determine potential for success in the web-based learning environment.****** See description below.

**Online courses can work for any student, just as a physical, onsite classroom with face-to-face instruction can work for any student–but we all know the quality of the "fit" with a particular instructor or a particular class environment varies. Taking an online class requires just as much time and effort as class on campus–and there are some new twists for most people. The Keystone University Network website has an online quiz which allows the prospective student to determine if web-based learning is appropriate for them.

Additionally, to determine if online classes are right for the student inquiring about the Master of Science in Performance Enhancement and Injury Prevention program, a phone or e-mail interview will be scheduled between the prospective student and Program Coordinator. During the interview, the student will discuss their answers to the following questions with the Program Coordinator:
Do you like to work independently?
Do you need convenience and an adjustable schedule?
Are you comfortable asking for clarification and continuing to ask when you need more information?
Are you comfortable working at a computer?
Do you have experience surfing the World Wide Web, using e-mail, and using Microsoft Office?
Are you comfortable working primarily within an online environment including text, graphics, and streaming video materials?
Would you be comfortable phoning, e-mailing, or faxing your instructor if you had problems with anything in the course?

If the prospective student answers "yes" to most of these questions, then they are well positioned do just fine with online courses. If the student hesitates on some of these questions, the student will probably do just fine also, but may need to work harder and more deliberately at staying in touch with the instructor. In addition, some prospective students may be referred to appropriate web-oriented training prior to beginning the graduate program. Lastly, students who show a clear potential for failure in the online learning environment will not be accepted into the program.

Appendix VII-Proposed Advisory Board for Graduate Program

Proposed Advisory Board

An outstanding Advisory Board will be organized to guide the program's growth and development. The Board will consist of ten individuals, including one licensed physician, three representatives from the National Academy of Sports Medicine (NASM), two educational technology and distance learning experts, the California University Health Science and Sport

Studies Department Chair, and three members who are leaders in the industry, and are innovators in the growth of performance enhancement as a career (i.e., educators, fitness executives, entrepreneurs, sports medicine managers.) Proposed

Board Members include the following:

Licensed Physician, TBA

Michael A. Clark, MS, PT, PES, IMT, CSCS –President, The National Academy of Sports Medicine (NASM)

Alan Russell, ATC, PES, NASM-CPT, CSCS
Education Instructor, The National Academy of Sports Medicine (NASM)

Jim Thornton, MS, ATC, PES – Consultant & Education Liaison, The National Academy of Sports Medicine (NASM), Head Athletic Trainer, Clarion University of PA, & Adjunct Faculty, California University of PA

Ellen P. O'Hara-Mays, PhD - Director, Distance Education
PA State System of Higher Education

Mark Bronakowski, PhD, - Professor & Campus Coordinator for Distance Education, California University of Pennsylvania

William B. Biddington, EdD, ATC – Professor and Chairperson, Department of Health Science and Sport Studies. Program Director, Graduate Athletic Training Education Program, California University of Pennsylvania

Linda S. Platt, EdD, ATC –Associate Professor in Athletic Training, Duquesne University

Rick Burkholder, MS, ATC -Head Athletic Trainer, Philadelphia Eagles Football Club

Matt Ficca, MS, ATC -Executive Vice-President, Prevention Services, Inc.

Appendix VIII-Specialty Certifications

Specialty Certifications

The National Athletic Trainers' Association Board of Certification (NATABOC) is in the process of creating and recognizing continuing education credentials in the form of Specialty Certifications. These Certifications will show that a certain level of competence in a specialty content area has been achieved by the Certified Athletic Trainer. Some of the courses planned for the Master of Science in Performance Enhancement and Injury Prevention program could be made available as stand-alone Certification courses, open to all Certified Athletic Trainers as continuing education courses. The courses would still require completion in one semester, and

would result in the granting of a Specialty Certification. For example, a Certification in Advanced Nutrition would be of great interest to Athletic Trainers. The graduate course in Billing for Services would also generate great demand as a stand-alone certification course, and/or as a course offered to other universities for senior undergraduate and/or graduate level athletic training students. Another possible Certification course is Business Administration and Entrepreneurship, designed for the healthcare professional that is interested in developing, marketing, and selling a product and/or service.
**The Specialty Certification courses could possibly be offered only during the summer course semesters, with a limit of 50 students per course.

APPENDIX B.

SYLLABUS - PRF 711 COURSE

CALIFORNIA UNIVERSITY OF PENNSYLVANIA
Department of Health Science and Sport Studies

A. Protocol

1. Course Name: An Integrated Approach to Fitness and Wellness

   Course Number: PRF 711

   Credits: 3

   Prerequisites: The prerequisite for An Integrated Approach to Fitness and Wellness is the successful completion of Essentials of Human Movement Science OR by permission of the Instructor.

B. Objectives of the Course

1. Upon completion of this course, students will be able to:

- Explain the history of personal training.
- Understand today's typical client.
- Rationalize the need for integrated program design.
- Describe the Optimum Performance Training (OPT™) model.
- Explain the structure and function of the nervous, skeletal, muscular, and the cardiorespiratory systems
- Analyze the concepts and theories of motor behavior.
- Explain the components and function of an integrated fitness assessment.
- Provide a scientific rationale for the use of an integrated flexibility-training program and differentiate between the types of flexibility techniques.
- Define integrated cardiorespiratory training.

- Analyze the importance of core training.
- Analyze the importance of balance training.
- Analyze the importance of integrated reactive training.
- Analyze the importance of speed, agility and quickness training.
- Describe the stages of the General Adaptation Syndrome and the Principle of Specificity.
- List and define the various stages of strength and training systems and alter program design for clients with various conditions.
- Define and describe conditions, dysfunctions or pathologies common in the special populations of clients.
- Describe the five steps to helping clients achieve more, including positive psychology and the importance of setting goals.

C. Catalog Description

This course will introduce the revolutionary exercise programming strategies of the Optimum Performance Training™ model. The student will receive a detailed insight into designing exercise programs for any personal training client. They will be shown how this systematic approach to program design uniquely blends the science of acute variables with the concepts of flexibility, core stabilization, balance, reactive training, speed, agility and quickness and strength training to develop safe and effective exercise programs for all individuals.

D. Outline of the Course

1. The Scientific Rationale for Integrated Training

2. Basic Exercise Science

3. The Cardiorespiratory System

4. Human Movement Science

5. Fitness Assessment

6. Flexibility Training Concepts

7. Cardiorespiratory Training Concepts

8. Core Training Concepts

9. Balance Training Concepts

10. Reactive (Power) Training Concepts

11. Speed, Agility and Quickness Training Concepts

12. Resistance Training Concepts

13. Special Populations

14. Behavior Modification

15. Introduction to Program Design

E. Teaching Methodology

This web-based course will follow a combined format of narrated PowerPoint presentations, streaming video-audio, web-based reading materials and assignments, online threaded discussion, and projects including case studies & interactive website exploration.

F. Text and Course Materials

Optimum Performance Training for the Health and Fitness Professional CD-ROM's

Optimum Performance Training for the Health and Fitness Professional. (2nd Ed.). 2004. Clark, M., Lucett, S., Corn, R National Academy of Sports Medicine.

Optimum Performance Training for the Health and Fitness Professional Study Cards

G. Assessment Activities

The students will be assessed using online quizzes, timed online tests, threaded discussion assessment, course assignments, and/or problem solving activities of pertinent topics.

H. Students with disabilities:

STUDENTS WITH DISABILITIES

- Reserve the right to decide when to self-identify and when to request accommodations
- Must register with the Office for Students with Disabilities (OSD) each semester to receive accommodations.

- Will present the OSD Accommodations Approval Notice to faculty when requesting accommodations.

- Might be required to communicate with faculty for accommodations, which specifically involve the faculty.

Office for Students with Disabilities

Requests for approval for reasonable accommodations should be directed to OSD. Approved accommodations will be recorded on the OSD Accommodation Approval notice and provided to the student. Students are expected to adhere to OSD procedures for self-identifying, providing documentation and requesting accommodations in a timely manner. The OSD is located in the Keystone Education Building – Room 112 and the phone number is (724) 938-5781.

I. Supportive Instructional Materials

Supportive materials can be found by logging on the course website (www.keystone-university.net). Materials include web-based library, webliography, technical help desk, and online bookstore.

J. Proposed Instructors

Qualified faculty members in the Department.

K. Rationale for the Course

Designed as a track-specific course for the proposed Fitness and Wellness track in the MS in Exercise Science and Health Promotion graduate program. Much of content is provided by the National Academy of Sports Medicine (NASM) leading to NASM Certification as a Certified Personal Trainer.

L. Specialized Equipment or Supplies Needed:

No specialized equipment or supplies are needed.

APPENDIX C.

STUDY INTRODUCTORY SCRIPT – INSTRUCTOR

Hello Faculty Member,

My name is Barry E. McGlumphy and I am contacting you regarding participation in a study using webcam videos to assess graduate level Exercise Science student's learning of fitness assessment and exercise technique in a Web-Based Course. The specific course is PRF 711: An Integrated Approach to Fitness and Wellness. The study is a part of my dissertation research at the University of Pittsburgh. The full title of the study is "**Exploring the Utilization of Webcam Videos to Assess Exercise Training and Fitness Assessment Skills of Students in an Online Graduate Exercise Science Course."** This project has been Approved by the University of Pittsburgh and California University of Pennsylvania (IRB) Institutional Review Boards.

While I know that this is a busy time of year, I would appreciate you taking a few moments to consider participating in the study. You will be asked to read the protocol for students submitting a webcam video assignment in the PRF 711 course. You will be required to view, via an online format, three video sessions (10 minutes each), submitted by students, related to material taught in the PRF 711 course. After viewing the videos, you will be required to participate in a 1 hour interview regarding your experiences and perceptions related to the use of webcams for use as an assessment toll in the PRF 711 course. The time it takes to complete the interview, is the only anticipated inconvenience or risk of participation.

Based on the interview results, I hope to identify areas for improved course development and strengthen the assessment methods for "hands-on" skills via web-based courses. Your participation in this research study will help to accomplish these goals and may benefit future generations of students, as well as faculty teaching psychomotor skills in web-based courses.

Your participation in this research is strictly voluntary. Please note that **your interview responses will be used for research purposes only and will be strictly confidential**.

Benefits of participating in the study may include the opportunity to reflect on your own beliefs and practices and the knowledge that you are contributing to the body of literature intended to improve the environment of web-based courses offered in higher education.

Your participation is important to the success of this project. The study will begin on March 1, 2007. Upon request after the study is completed, I would be pleased to supply you with a summary of the study results.

All interview material and responses are confidential, and results will be kept under lock and key in Hamer Hall Office 141. Your participation is voluntary, and you may withdraw from this project at any time.

If you agree to participate, please sign the enclosed **Informed Consent Form** and return to me at:

Barry E. McGlumphy
121 Forestwood Dr.
Venetia, PA 15367

This study is being conducted by Barry E. McGlumphy, who can be reached at mcglumphy@cup.edu or 724-255-6533 if you have any questions. Thank you for your time and consideration.

Sincerely,

Barry E. McGlumphy

APPENDIX D.

STUDY INTRODUCTORY SCRIPT – SME

Hello Professional Colleague,

My name is Barry E. McGlumphy and I am contacting you regarding participation in a study using webcam videos to assess graduate level Exercise Science student's learning of fitness assessment and exercise technique in a Web-Based Course. The specific course is PRF 711: An Integrated Approach to Fitness and Wellness. The study is a part of my dissertation research at the University of Pittsburgh. The full title of the study is "**Exploring the Utilization of Webcam Videos to Assess Exercise Training and Fitness Assessment Skills of Students in an Online Graduate Exercise Science Course."** This project has been Approved by the University of Pittsburgh and California University of Pennsylvania (IRB) Institutional Review Boards.

While I know that this is a busy time of year, I would appreciate you taking a few moments to consider participating in the study. You will be asked to read the protocol for students submitting a webcam video assignment in the PRF 711 course. You will be required to view, via an online format, three video sessions (10 minutes each), submitted by students, related to material taught in the PRF 711 course. After viewing the videos, you will be required to participate in a 1 hour interview regarding your experiences and perceptions related to the use of webcams for use as an assessment toll in the PRF 711 course. The time it takes to complete the interview, is the only anticipated inconvenience or risk of participation.

Based on the interview results, I hope to identify areas for improved course development and strengthen the assessment methods for "hands-on" skills via web-based courses. Your participation in this research study will help to accomplish these goals and may benefit future generations of students, as well as faculty teaching psychomotor skills in web-based courses.

Your participation in this research is strictly voluntary. Please note that **your interview responses will be used for research purposes only and will be strictly confidential**.

Benefits of participating in the study may include the opportunity to reflect on your own beliefs and practices and the knowledge that you are contributing to the body of literature intended to improve the environment of web-based courses offered in higher education.

Your participation is important to the success of this project. The study will begin on March 1, 2007. Upon request after the study is completed, I would be pleased to supply you with a summary of the study results.

All interview material and responses are confidential, and results will be kept under lock and key in Hamer Hall Office 141. Your participation is voluntary, and you may withdraw from this project at any time.

If you agree to participate, please sign the enclosed **Informed Consent Form** and return to me at:

Barry E. McGlumphy
121 Forestwood Dr.
Venetia, PA 15367

This study is being conducted by Barry E. McGlumphy, who can be reached at mcglumphy@cup.edu or 724-255-6533 if you have any questions. Thank you for your time and consideration.

Sincerely,

Barry E. McGlumphy

APPENDIX E.

INFORMED CONSENT FORM - FACULTY

University of Pittsburgh

School of Education
Department of Instruction and Learning

5300 Wesley W. Posvar Hall
230 South Bouquet Street
Pittsburgh, PA 15260
412-624-7254
Fax: 412-648-7081

INFORMED CONSENT FORM - FACULTY

University of Pittsburgh
Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

CONSENT TO ACT AS A PARTICIPANT IN A RESEARCH STUDY

TITLE: Exploring the Utilization of Webcam Videos to Assess Exercise Training and Fitness Assessment Skills of Students in an Online Graduate Exercise Science Course

PRINCIPAL INVESTIGATOR: Barry E. McGlumphy

Doctoral Student, University of Pittsburgh, School of Education
121 Forestwood Dr.
Venetia, PA 15367
Telephone: 724-255-6533
E-Mail: mcglumphy@cup.edu

Why is this research being done?

You are being asked to participate in this research study in which I will study the implementation of webcam videos to assess graduate level Exercise Science student's learning of fitness assessment and exercise technique in a Web-Based Course. The specific course is PRF 711: An Integrated Approach to Fitness and Wellness. The study is a

part of my dissertation research at the University of Pittsburgh. The full title of the study is "Exploring the Utilization of Webcam Videos to Assess Exercise Training and Fitness Assessment Skills of Students in an Online Graduate Exercise Science Course." This project has been Approved by the University of Pittsburgh and California University of Pennsylvania (IRB) Institutional Review Boards. I hope to identify areas for improved course development and strengthen the assessment methods for "hands-on" skills via web-based courses. Your participation in this research study will help to accomplish these goals and may benefit future generations of students, as well as faculty teaching psychomotor skills in web-based courses.

Participant's Initials_____

University of Pittsburgh
Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

Who is being asked to take part in this research study?

You are being invited to take part in this research study because you are the faculty member for the following course at California University of Pennsylvania during the spring 2007 semester - PRF 711: An Integrated Approach to Fitness and Wellness.

Students invited to participate in this study must be presently enrolled in the PRF 711: An Integrated Approach to Fitness and Wellness course and must have the ability to use a webcam with their computer and install the webcam software. A webcam and related software will be provided for students use in the study. The study is being performed with a total of 5 individuals in the course, as well as interviews of the faculty member teaching the course and three subject matter experts that can comment on the effectiveness of the webcam videos as an assessment tool for the course.

What procedures will be performed for research purposes?

If you decide to take part in this research study, you will participate in the following activities:

Video Download Procedures:

You will be provided full instructions explaining how to download and save the webcam videos from the PRF 711 course via the Drop Box.

Assessment of Video Procedures:

You will be provided full instructions explaining how to evaluate and document your assessment of the activities recorded via the webcam videos. You will be required to view three ten minute videos for each student (total of 2.5 hours) of the videos.

Post-Recording Interview:

You will be required to participate in a 1 hour interview with the researcher to discuss your perceptions and comments related to the use of the webcam to record and assess the activity assignments.

University of Pittsburgh
Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

What are the possible risks, side effects, and discomforts of this research study?

The possible risks of this research study are very minimal. The time it takes to download and assess the video, as well as the interview time, are the only anticipated inconveniences or risks of participation.

What are possible benefits from taking part in this study?

You will likely receive no direct benefit from taking part in this research study. Potential benefits of participating in the study may include the opportunity to reflect on your own beliefs and practices and the knowledge that you are contributing to the body of literature intended to improve the environment of web-based courses offered in higher education.

If I agree to take part in this research study, will I be told of any new risks that may be found during the course of the study?

You will be promptly notified if, during the conduct of this research study, any new information develops which may cause you to change your mind about continuing to participate.

Will I be paid if I take part in this research study?

No, you will not be paid for the study. However, you will be provided a webcam and related software (Approximate value= $120) which you will be able to keep and own after the study is completed.

Who will know about my participation in this research study?

Any information about you obtained from this research will be kept as confidential (private) as possible. All records and interview data related to your involvement in this research study will be stored in a locked file cabinet. Your identity on these records will be indicated by a case number rather than by your name, and the information linking these case numbers with your identity will be kept separate from the research records. You will not be identified by name in any publication of the research results.

Will this research study involve the use of the webcam video submissions for a graded project in the PRF 711 course?

No. The recorded activities will be evaluated by you as the instructor for study purposes only and will not count in any way or effect in any way, the student's course grade.

University of Pittsburgh
Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

Who will have access to identifiable information related to my participation in this research study?

The investigator will be the only person to have access to the information generated by the interview.

Authorized representatives of the University of Pittsburgh Research Conduct and Compliance Office may review your identifiable research information (which may include your identifiable video information) for the purpose of monitoring the appropriate conduct of this research study.

Is my participation in this research study voluntary?

Your participation in this research study is completely voluntary. (Note, however, that if you do not provide your consent for the use and disclosure of your interview information for the purposes described above, you will not be allowed to participate in the research study.) Whether or not you provide your consent for participation in this research study will have no effect on your current or future relationship with California University of Pennsylvania.

May I withdraw, at a future date, my consent for participation in this research study?

You may withdraw, at any time, your consent for participation in this research study. To formally withdraw your consent for participation in this research study you should provide a written and dated notice of this decision to the principal investigator of this research study at the address listed on the first page of this form. Your decision to withdraw your consent for participation in this research study will have no effect on your current or future relationship with the California University of Pennsylvania.

If I agree to take part in this research study, can I be removed from the study without my consent?

No. You will not be removed from the study.

Participant's Initials _____

University of Pittsburgh
Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

****

VOLUNTARY CONSENT

The above information has been explained to me and all of my current questions have been answered. I understand that I am encouraged to ask questions about any aspect of this research study during the course of this study, and that such future questions will be answered by a qualified individual or by the investigator listed on the first page of this consent document at the telephone number or e-mail given. I understand that I may always request that my questions, concerns or complaints be addressed by a listed investigator.

I understand that I may contact the Human Subjects Protection Advocate of the IRB Office, University of Pittsburgh (1-866-212-2668) to discuss problems, concerns, and questions; obtain information; offer input; or discuss situations in the event that the research team is unavailable.

By signing this form, I agree to participate in this research study. A copy of this consent form will be given to me.

_____	_____	_____
Participant's Signature	Printed Name of Participant	Date

CERTIFICATION of INFORMED CONSENT

I certify that I have explained the nature and purpose of this research study to the above-named individual, and I have discussed the potential benefits and possible risks of study participation. Any questions the individual has about this study have been answered, and we will always be available to address future questions as they arise.

Barry E. McGlumphy	Prinicipal Investigator
Printed Name of Person Obtaining Consent	Role in Research Study
_____	_____
Signature of Person Obtaining Consent	Date

 Participant's Initials _____

University of Pittsburgh
Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

APPENDIX F.

INFORMED CONSENT FORM – SUBJECT MATTER EXPERTS

University of Pittsburgh

School of Education
Department of Instruction and Learning

5300 Wesley W. Posvar Hall
230 South Bouquet Street
Pittsburgh, PA 15260
412-624-7254
Fax: 412-648-7081

INFORMED CONSENT FORM – SUBJECT MATTER EXPERT

University of Pittsburgh
Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

CONSENT TO ACT AS A PARTICIPANT IN A RESEARCH STUDY

TITLE: Exploring the Utilization of Webcam Videos to Assess Exercise Training and Fitness Assessment Skills of Students in an Online Graduate Exercise Science Course

PRINCIPAL INVESTIGATOR: Barry E. McGlumphy

Doctoral Student, University of Pittsburgh, School of Education
121 Forestwood Dr.
Venetia, PA 15367
Telephone: 724-255-6533
E-Mail: mcglumphy@cup.edu

Why is this research being done?

You are being asked to participate in this research study in which I will study the implementation of webcam videos to assess graduate level Exercise Science student's learning of fitness assessment and exercise technique in a Web-Based Course. The specific course is PRF 711: An Integrated Approach to Fitness and Wellness. The study is a part of my dissertation research at the University of Pittsburgh. The full title of the study is "Exploring the Utilization of Webcam Videos to Assess Exercise Training and Fitness Assessment Skills of Students in an Online Graduate

Exercise Science Course." This project has been Approved by the University of Pittsburgh and California University of Pennsylvania (IRB) Institutional Review Boards. I hope to identify areas for improved course development and strengthen the assessment methods for "hands-on" skills via web-based courses. Your participation in this research study will help to accomplish these goals and may benefit future generations of students, as well as faculty teaching psychomotor skills in web-based courses.

Participant's Initials_____

University of Pittsburgh
Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

Who is being asked to take part in this research study?

You are being invited to take part in this research study because you are a subject matter expert knowledgeable about content delivered in the following course at California University of Pennsylvania during the spring 2007 semester - PRF 711: An Integrated Approach to Fitness and Wellness.

The study is being performed with a total of 5 students in the course, as well as interviews of the faculty member teaching the course and three subject matter experts that can comment on the effectiveness of the webcam videos as an assessment tool for the course.

Students invited to participate in this study must be presently enrolled in the PRF 711: An Integrated Approach to Fitness and Wellness course and must have the ability to use a webcam with their computer and install the webcam software. A webcam and related software will be provided for students use in the study.

What procedures will be performed for research purposes?

If you decide to take part in this research study, you will participate in the following activities:

Video Viewing and Procedure Analysis:
You will be required to view three ten minute videos for each student (total of 2.5 hours) of the videos and read the video recording, submission, and assessment procedures.

Post-Recording Interview:

You will be required to participate in a 1 hour interview with the researcher to discuss your perceptions and comments related to the use of the webcam to record and assess the activity assignments.

Participant's Initials ____

University of Pittsburgh

What are the possible risks, side effects, and discomforts of this research study?

The possible risks of this research study are very minimal. The time it takes to download and assess the video, as well as the interview time, are the only anticipated inconveniences or risks of participation.

What are possible benefits from taking part in this study?

You will likely receive no direct benefit from taking part in this research study. Potential benefits of participating in the study may include the opportunity to reflect on your own beliefs and practices and the knowledge that you are contributing to the body of literature intended to improve the environment of web-based courses offered in higher education.

If I agree to take part in this research study, will I be told of any new risks that may be found during the course of the study?

You will be promptly notified if, during the conduct of this research study, any new information develops which may cause you to change your mind about continuing to participate.

Will I be paid if I take part in this research study?

No, you will not be paid for the study.

Who will know about my participation in this research study?

Any information about you obtained from this research will be kept as confidential (private) as possible. All records and interview data related to your involvement in this research study will be stored in a locked file cabinet. Your identity on these records will be indicated by a case number rather than by your name, and the information linking these case numbers with your identity will be kept separate from the research records. You will not be identified by name in any publication of the research results.

Will this research study involve the use of the webcam video submissions for a graded project in the PRF 711 course?

No. The recorded activities will be evaluated by the instructor for study purposes only and will not count in any way or effect in any way, the student's course grade.

Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

Who will have access to identifiable information related to my participation in this research study?

The investigator will be the only person to have access to the information generated by the interview.

Authorized representatives of the University of Pittsburgh Research Conduct and Compliance Office may review your identifiable research information (which may include your identifiable video information) for the purpose of monitoring the appropriate conduct of this research study.

Is my participation in this research study voluntary?

Your participation in this research study is completely voluntary. (Note, however, that if you do not provide your consent for the use and disclosure of your interview information for the purposes described above, you will not be allowed to participate in the research study.) Whether or not you provide your consent for participation in this research study will have no effect on your current or future relationship with California University of Pennsylvania.

May I withdraw, at a future date, my consent for participation in this research study?

You may withdraw, at any time, your consent for participation in this research study. To formally withdraw your consent for participation in this research study you should provide a written and dated notice of this decision to the principal investigator of this research study at the address listed on the first page of this form. Your decision to withdraw your consent for participation in this research study will have no effect on your current or future relationship with the California University of Pennsylvania.

If I agree to take part in this research study, can I be removed from the study without my consent?

No. You will not be removed from the study.

 Participant's Initials _____

University of Pittsburgh
Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

****

VOLUNTARY CONSENT

The above information has been explained to me and all of my current questions have been answered. I understand that I am encouraged to ask questions about any aspect of this research study during the course of this study, and that such future questions will be answered by a qualified individual or by the investigator listed on the first page of this consent document at the telephone number or e-mail given. I understand that I may always request that my questions, concerns or complaints be addressed by a listed investigator.

I understand that I may contact the Human Subjects Protection Advocate of the IRB Office, University of Pittsburgh (1-866-212-2668) to discuss problems, concerns, and questions; obtain information; offer input; or discuss situations in the event that the research team is unavailable.

By signing this form, I agree to participate in this research study. A copy of this consent form will be given to me.

_____	_____	_____
Participant's Signature	Printed Name of Participant	Date

CERTIFICATION of INFORMED CONSENT

I certify that I have explained the nature and purpose of this research study to the above-named individual, and I have discussed the potential benefits and possible risks of study participation. Any questions the individual has about this study have been answered, and we will always be available to address future questions as they arise.

_Barry E. McGlumphy_____	_Prinicipal Investigator_____
Printed Name of Person Obtaining Consent	Role in Research Study
_____	_____
Signature of Person Obtaining Consent	Date

 Participant's Initials _____

University of Pittsburgh
Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

APPENDIX G.

STUDY INTRODUCTORY SCRIPT – STUDENTS

Hello CalU Student,

My name is Barry E. McGlumphy and I am contacting you regarding participation in a study using webcam videos to assess graduate level Exercise Science student's learning of fitness assessment and exercise technique in a Web-Based Course. The specific course is PRF 711: An Integrated Approach to Fitness and Wellness. The study is a part of my dissertation research at the University of Pittsburgh. The full title of the study is "**Exploring the Utilization of Webcam Videos to Assess Exercise Training and Fitness Assessment Skills of Students in an Online Graduate Exercise Science Course."** This project has been Approved by the University of Pittsburgh and California University of Pennsylvania (IRB) Institutional Review Boards.

While I know that this is a busy time of year, I would appreciate you taking a few moments to consider participating in the study. You will be required to record three video session (10 minutes each) related to material taught in the PRF 711 course. A webcam, related software, and full instructions will be supplied to you by the researcher. You will then submit the videos via the PRF 711 course drop box. **The video assessments will not count towards your course grade.** After recording and submitting the videos, you will be required to participate in a 1 hour interview regarding your experiences and perceptions related to the use of webcams for use as an assessment toll in the PRF 711 course. The time it takes to record and submit the video, as well as the interview time, are the only anticipated inconveniences or risks of participation.

Based on the interview results, I hope to identify areas for improved course development and strengthen the assessment methods for "hands-on" skills via web-based courses. Your participation in this research study will help to accomplish these goals and may benefit future generations of students, as well as faculty teaching psychomotor skills in web-based courses.

Your participation in this research is strictly voluntary. Please note that **your interview responses and webcam video recordings will be used for research purposes only and will be strictly confidential**.

Benefits of participating in the study may include the opportunity to reflect on your own beliefs and practices and the knowledge that you are contributing to the body of literature intended to improve the environment of web-based courses offered in higher education.

Your participation is important to the success of this project. The study will begin on March 1, 2007. Upon request after the study is completed, I would be pleased to supply you with a summary of the study results.

All interview material and responses and webcam video recordings are confidential, and results will be kept under lock and key in Hamer Hall Office 141. Your participation is voluntary, and you may withdraw from this project at any time.

To be considered for participation, you must:

*be presently enrolled in the following course at California University of Pennsylvania, PRF 711 Integrated Applications of Fitness & Wellness.

*be able to connect a web camera and install related software on your computer

If you agree to participate, please sign the enclosed **Informed Consent Form** and return to me at:

Barry E. McGlumphy
121 Forestwood Dr.
Venetia, PA 15367

This study is being conducted by Barry E. McGlumphy, who can be reached at mcglumphy@cup.edu or 724-255-6533 if you have any questions. Thank you for your time and consideration.

Sincerely,

Barry E. McGlumphy

APPENDIX H.

INFORMED CONSENT FORM - STUDENTS

University of Pittsburgh

School of Education
Department of Instruction and Learning

5300 Wesley W. Posvar Hall
230 South Bouquet Street
Pittsburgh, PA 15260
412-624-7254
Fax: 412-648-7081

INFORMED CONSENT FORM - STUDENT

University of Pittsburgh
Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

CONSENT TO ACT AS A PARTICIPANT IN A RESEARCH STUDY

TITLE: Exploring the Utilization of Webcam Videos to Assess Exercise Training and Fitness Assessment Skills of Students in an Online Graduate Exercise Science Course

PRINCIPAL INVESTIGATOR: Barry E. McGlumphy

Doctoral Student, University of Pittsburgh, School of Education
121 Forestwood Dr.
Venetia, PA 15367
Telephone: 724-255-6533
E-Mail: mcglumphy@cup.edu

Why is this research being done?

You are being asked to participate in this research study in which I will study the implementation of webcam videos to assess graduate level Exercise Science student's learning of fitness assessment and exercise technique in a Web-Based Course. The specific course is PRF 711: An Integrated Approach to Fitness and Wellness. The study is a part of my dissertation research at the University of Pittsburgh. The full title of the study is "Exploring the Utilization of Webcam Videos to Assess Exercise Training and Fitness Assessment Skills of Students in an Online Graduate

Exercise Science Course." This project has been Approved by the University of Pittsburgh and California University of Pennsylvania (IRB) Institutional Review Boards. I hope to identify areas for improved course development and strengthen the assessment methods for "hands-on" skills via web-based courses. Your participation in this research study will help to accomplish these goals and may benefit future generations of students, as well as faculty teaching psychomotor skills in web-based courses.

Participant's Initials_____

University of Pittsburgh
Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

Who is being asked to take part in this research study?

You are being invited to take part in this research study because you are a student in the following course at California University of Pennsylvania during the spring 2007 semester - PRF 711: An Integrated Approach to Fitness and Wellness.

People invited to participate in this study must be presently enrolled in the PRF 711: An Integrated Approach to Fitness and Wellness course and must have the ability to use a webcam with their computer and install the webcam software. A webcam and related software will be provided for your use in the study. The study is being performed with a total of 5 individuals in the course, as well as interviews of the faculty member teaching the course and three subject matter experts that can comment on the effectiveness of the webcam videos as an assessment tool for the course.

What procedures will be performed for research purposes?

If you decide to take part in this research study, you will participate in the following activities:

Camera Set-up & Video Recording Release Procedures:

You will be provided full instructions explaining how to install the software and connect and use the camera. You will also be provided with Video Recording Release Forms to be signed by anyone included in the video recordings, then submitted to the researcher.

Video Recording Procedures:

You will be provided full instructions explaining how to use the camera to record video/audio. You will also be provided with three activities related to the content you learned in the PRF 711 course. You will be required to spend ten minutes (30 minutes total) on each activity following the activity instructions while recording your performance of the activity. The activities will ask you to show how you would teach a client how to do a particular exercise. For example, you may be asked to record yourself explaining and performing how to teach a client how to do a series of core strengthening exercises.

Video Submission Procedures:

You will be provided full instructions explaining how to save and submit the webcam videos into the PRF 711 course via the Drop Box.

Post-Recording Interview:

You will be required to participate in a 1 hour interview with the researcher to discuss your perceptions and comments related to the use of the webcam to record and submit the activity assignments.

Participant's Initials ____

University of Pittsburgh
Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

What are the possible risks, side effects, and discomforts of this research study?

The possible risks of this research study are very minimal. The time it takes to record and submit the video, as well as the interview time, are the only anticipated inconveniences or risks of participation.

What are possible benefits from taking part in this study?

You will likely receive no direct benefit from taking part in this research study. Potential benefits of participating in the study may include the opportunity to reflect on your own beliefs and practices and the knowledge that you are contributing to the body of literature intended to improve the environment of web-based courses offered in higher education.

If I agree to take part in this research study, will I be told of any new risks that may be found during the course of the study?

You will be promptly notified if, during the conduct of this research study, any new information develops which may cause you to change your mind about continuing to participate.

Will I be paid if I take part in this research study?

No, you will not be paid for the study. However, you will be provided a webcam and related software (Approximate value= $120) which you will be able to keep and own after the study is completed.

Who will know about my participation in this research study?

Any information about you obtained from this research will be kept as confidential (private) as possible. All records, webcam videos, and interview data related to your involvement in this research study will be stored in a locked file cabinet. Your identity on these records will be indicated by a case number rather than by your name, and the information linking these case numbers with your identity will be kept separate from the research records. You will not be identified by name in any publication of the research results.

Will this research study involve the use of the webcam video submissions for a graded project in the PRF 711 course?

No. The recorded activities will be evaluated by the instructor for study purposes only and will not count in any way or effect in any way, your course grade.

Participant's Initials ____

University of Pittsburgh
Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

Who will have access to identifiable information related to my participation in this research study?

In addition to the investigator listed on the first page of this authorization (consent) form and the course instructor, only the three subject matter experts involved in this study will have access to the video information. The investigator will be the only person to have access to the information generated by the interview.

Authorized representatives of the University of Pittsburgh Research Conduct and Compliance Office may review your identifiable research information (which may include your identifiable video information) for the purpose of monitoring the appropriate conduct of this research study.

Is my participation in this research study voluntary?

Your participation in this research study is completely voluntary. (Note, however, that if you do not provide your consent for the use and disclosure of your webcam video information for the purposes described above, you will not be allowed to participate in the research study.) Whether or not you provide your consent for participation in this research study will have no effect on your current or future relationship with California University of Pennsylvania.

May I withdraw, at a future date, my consent for participation in this research study?

You may withdraw, at any time, your consent for participation in this research study. To formally withdraw your consent for participation in this research study you should provide a written and dated notice of this decision to the principal investigator of this research study at the address listed on the first page of this form. Your decision to withdraw your consent for participation in this research study will have no effect on your current or future relationship with the California University of Pennsylvania.

If I agree to take part in this research study, can I be removed from the study without my consent?

It is possible that you may be removed from the research study by the researcher if, for example, your webcam video recording is not useable due to recording quality.

University of Pittsburgh
Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

****

VOLUNTARY CONSENT

The above information has been explained to me and all of my current questions have been answered. I understand that I am encouraged to ask questions about any aspect of this research study during the course of this study, and that such future questions will be answered by a qualified individual or by the investigator listed on the first page of this consent document at the telephone number or e-mail given. I understand that I may always request that my questions, concerns or complaints be addressed by a listed investigator.

I understand that I may contact the Human Subjects Protection Advocate of the IRB Office, University of Pittsburgh (1-866-212-2668) to discuss problems, concerns, and questions; obtain information; offer input; or discuss situations in the event that the research team is unavailable.

By signing this form, I agree to participate in this research study. A copy of this consent form will be given to me.

_____	_____	_____
Participant's Signature	Printed Name of Participant	Date

CERTIFICATION of INFORMED CONSENT

I certify that I have explained the nature and purpose of this research study to the above-named individual, and I have discussed the potential benefits and possible risks of study participation. Any questions the individual has about this study have been answered, and we will always be available to address future questions as they arise.

_Barry E. McGlumphy_____	_Prinicipal Investigator_____
Printed Name of Person Obtaining Consent	Role in Research Study
_____	_____
Signature of Person Obtaining Consent	Date

University of Pittsburgh
Institutional Review Board
Approval Date:
Renewal Date:
IRB Number: 0612127

APPENDIX I.

WEBCAM VIDEO RELEASE FORM

Video Release Form

Project Title: "Exploring the Utilization of Webcam Videos to Assess Exercise Training and Fitness Assessment Skills of Students in an Online Graduate Exercise Science Course"

Protocol Number: _____

Principle Investigator Name: Barry E. McGlumphy

I request the use of webcam video material as part of my study. I especially ask your consent to use this material as I deem proper. The material will be used for the research project as I have described it in the informed consent document you have signed. These materials may be used for news releases, professional publications, professional conferences, websites, and pictorial exhibits related to our study.

I also emphasize that the appearance of these materials on certain media (websites, professional publications, news releases) may require the transfer of copyright of the images or audio materials. This means that other individuals may use your video image or voice. Regarding the use of your likeness in photographs, tapes, or recordings, please check one of the following boxes:

☐ I do…

☐ I do not…

Give unconditional permission for the investigator to utilize video recordings of me.

_____ _____

Signature Date

Note: Even should you choose not to allow your image to be used, we can still benefit from your inclusion as a research study participant.

APPENDIX J.

FACILITY VIDEO RELEASE FORM

Project Title: "Exploring the Utilization of Webcam Videos to Assess Exercise Training and Fitness Assessment Skills of Students in an Online Graduate Exercise Science Course"

Principle Investigator Name: Barry E. McGlumphy **Protocol Number:** _____

I request your permission to use your facility for recording of webcam video material as part of my study. In addition, I ask your consent to use this material as I deem proper. The material will be used for the research project as I have described it in the informed consent document signed by the subject who will be recording the video at your facility. These materials may be used for news releases, professional publications, professional conferences, websites, and pictorial exhibits related to our study.

I am aware that video releases (Video Release Forms with signatures) will be obtained from any individuals being recorded via the webcams. Video release forms must be signed by: 1.) the student, 2.) any client/patient that is being recorded during the activity.

I am also aware that the positioning of the webcam will be done in such a manner that no other individuals will be inadvertently captured on the video (e.g. people standing in the background). In addition to video capture, this includes background audio (specifically voices or other conversations).

I also emphasize that the appearance of these materials on certain media (websites, professional publications, news releases) may require the transfer of copyright of the images or audio materials. This means that other individuals may use your facilities video image. Regarding the permission to video record at your facility and the use of your facilities likeness in photographs, tapes, or recordings, please check one of the following boxes:

☐ I do…

☐ I do not…

Give unconditional permission for the investigator to have the subject record via webcam video within my facility and for the investigator to utilize study-related webcam video recorded at my facility.

Signature:_____ Date:_____

APPENDIX K.

STUDENT PARTICIPANT INTERVIEW SCHEDULE

General Interview Questions:

1.) What advantages do you see regarding the implementation of webcams as an assessment tool in the PRF 711 course?

2.) What disadvantages do you see regarding the implementation of webcams as an assessment tool in the PRF 711 course?

3.) Describe your experience in preparing the technology set-up of webcams as an assessment tool in the PRF 711 course?

4.) Describe your experience in submitting webcams as an assessment tool in the PRF 711 course?

5.) Would you recommend that future PRF 711 courses include webcams video as a graded assessment tool in the course?

7.) Do you have additional suggestions for adding webcam assessments in the PRF 711 course?

8.) Do you have additional suggestions for revising the protocol for implementing webcam assessments in the PRF 711 course?

APPENDIX L.

SUBJECT MATTER EXPERT INTERVIEW SCHEDULE

General Interview Questions:

Pre-Course Questions:

1.) What type of activities should be evaluated in this study?

2.) For the selected activities, what type of grading rubric should be used?

3.) What process should be used for submission of video assessment activities?

4.) What content should be evaluated and what key points should the instructor look for while grading video assessments?

5.) What concerns, if any, do you have regarding the present method of evaluating students in the PRF 711 course?

Post-Course Questions:

1.) What advantages do you see regarding the implementation of webcams as an assessment tool in the PRF 711 course?

2.) What disadvantages do you see regarding the implementation of webcams as an assessment tool in the PRF 711 course?

3.) Would you recommend that future PRF 711 courses include webcams video as a graded assessment tool in the course?

4.) What limitations to you see in using video to perform an assessment of a student? Please explain.

5.) Do you have additional suggestions for revising the protocol for implementing webcam assessments in the PRF 711 course?

APPENDIX M.

INSTRUCTOR INTERVIEW SCHEDULE

General Interview Questions:

Pre-Course Questions:

1.) What type of activities should be evaluated in this study?

2.) For the selected activities, what type of grading rubric should be used?

3.) What process should be used for submission of video assessment activities?

4.) What content should be evaluated and what key points should you as the instructor look for while grading video assessments?

5.) What concerns, if any, do you have regarding the present method of evaluating students in the PRF 711 course?

Post-Course Questions:

1.) What advantages do you see regarding the implementation of webcams as an assessment tool in the PRF 711 course?

2.) What disadvantages do you see regarding the implementation of webcams as an assessment tool in the PRF 711 course?

3.) Describe your experience in assessing the webcam video submissions in the PRF 711 course?

4.) Describe your experience in downloading and accessing webcams as an assessment tool in the PRF 711 course?

5.) Would you recommend that future PRF 711 courses include webcams video as a graded assessment tool in the course?

6.) What limitations to you see in using video to perform an assessment of a student? Please explain.

7.) Do you have additional suggestions for adding webcam assessments in the PRF 711 course?

8.) Do you have additional suggestions for revising the protocol for implementing webcam assessments in the PRF 711 course?

APPENDIX N.

STUDENT ACTIVITY 1

PRF 711 An Integrated Approach to Fitness and Wellness

Activity 1-Core Training Exercises (Stabilization, Strength, & Power)

Show how you would teach a client to perform each one of the following exercises. Be sure to record these activities using the webcam. The video and audio should be good quality which will allow the instructor to complete a good assessment of your performance. Also, be sure that the webcam is positioned to clearly view the activities.

Exercise 1: Following the OPT Training Method, teach your client how to perform two Core Stabilization exercises. Select only TWO exercises. Be sure to have the client show one full repetition of the exercise.

Exercise 2: Following the OPT Training Method, teach your client how to perform two Core Strength exercises. Select only TWO exercises. Be sure to have the client show one full repetition of the exercise.

Exercise 3: Following the OPT Training Method, teach your client how to perform two Core Power exercises. Select only TWO exercises. Be sure to have the client show one full repetition of the exercise.

The total video recording time should be no more than 10 minutes. After recording the video, save it and submit the video in the Module 9 Assignment drop box.

APPENDIX O.

STUDENT ACTIVITY 2

PRF 711 An Integrated Approach to Fitness and Wellness

Activity 2-Balance Training Exercises (Stabilization, Strength, & Power)

Show how you would teach a client or patient to perform each one of the following exercises. Be sure to record these activities using the webcam. The video and audio should be good quality which will allow the instructor to complete a good assessment of your performance. Also, be sure that the webcam is positioned to clearly view the activities.

Exercise 1: Following the OPT Training Method, teach your client / patient how to perform two Balance Stabilization exercises. Select only TWO exercises. Be sure to have the patient/client show one full repetition of the exercise.

Exercise 2: Following the OPT Training Method, teach your client / patient how to perform two Balance Strength exercises. Select only TWO exercises. Be sure to have the patient/client show one full repetition of the exercise.

Exercise 3: Following the OPT Training Method, teach your client / patient how to perform two Balance Power exercises. Select only TWO exercises. Be sure to have the patient/client show one full repetition of the exercise.

The total video recording time should be no more than 10 minutes. After recording the video, save it and submit the video in the Module 9 Assignment drop box.

APPENDIX P.

STUDENT ACTIVITY 3

PRF 711 An Integrated Approach to Fitness and Wellness

Activity 3- Overhead Squat Assessment

This activity will require that you perform an Overhead Squat Assessment with a client.

Step 1: Show how you would teach a client to perform an Overhead Squat.

Step 2: Have the client perform an Overhead Squat. As the client is completing the squat, clearly describe what you are looking for during the assessment and verbally state anything that you have "discovered" while performing the client is completing the squat.

Be sure to record these activities using the webcam. The video and audio should be good quality which will allow the instructor to complete a good assessment of your performance. Also, be sure that the webcam is positioned to clearly view the activities.

The total video recording time should be no more than 10 minutes. After recording the video, save it and submit the video in the Module 12 Assignment drop box.

APPENDIX Q.

STUDENT PRE-COURSE SURVEY

California University of Pennsylvania

I. Student Survey

Please answer the following questions to the best of your ability.

1.) How many years of experience do you have in the field of fitness?

2.) What fitness and/or health profession certifications do you presently hold?

3.) Have you enrolled in online courses **before taking online courses at CalU**? If yes, how many?

4.) Have you used webcameras (webcams) hooked up to a computer in the past? If yes, explain the amount of experience you have with webcams.

5.) Do you feel confident enough in your technology ability to set-up a webcam on your computer?

6.) If your courses required that you submit webcam videos of you performing course activities (a fitness assessment, for example) would you have access to a client to use as your subject (the client could also include a spouse, friend, colleague, patient, etc.)?

APPENDIX R.

GRADING RUBRIC

PRF 711: Integrated Applications in Fitness and Wellness - Spring 2007
Webcam Video Assessment Activities Grading Rubric

Student Name: _____Date: _____ Course Section: _____

Fitness Assessment / Exercise Training Activity: _____

Criteria	Pts Possible	Pts Earned	Instructor Comments
Student introduced activity to client	5		
Student was professional when speaking with client	5		
Proper position/view of student during assessment/training session	5		
Student provided proper instructions to client during assessment/training session	10		
Student identified and corrected improper technique	10		
Student used equipment appropriately during assessment/training session	10		
Student summarized performance / explained findings to client	15		
Student was easy to understand (spoke loudly and clearly)	5		
Student was poised and confident during activity	5		
Total Points:	**70**		

APPENDIX S.

UNIVERSITY OF PITTSBURGH IRB APPROVAL

University of Pittsburgh
Institutional Review Board

3500 Fifth Avenue
Ground Level
Pittsburgh, PA 15213
(412) 383-1480
(412) 383-1508 (fax)

MEMORANDUM

TO: Mr. Barry E. McGlumphy

FROM: Christopher Ryan, PhD, Vice Chair

DATE: March 22, 2007

SUBJECT: IRB #0612127: Exploring the Utilization of Webcam Videos to Assess Exercise Training and Fitness Assessment Skills of Students in an Online Graduate Exercise Science Course

The above-referenced proposal has received expedited review and approval from the Institutional Review Board under 45 CFR 46.110 (6,7).

If applicable, please include the following information in the upper right-hand corner of all pages of the consent form:

Approval Date: March 22, 2007
Renewal Date: March 21, 2008
University of Pittsburgh
Institutional Review Board
IRB #0612127

Please note that it is the investigator's responsibility to report to the IRB any unanticipated problems involving risks to subjects or others [see 45 CFR 46.103(b)(5) and 21 CFR 56.108(b)]. The IRB Reference Manual (Chapter 3, Section 3.3) describes the reporting requirements for unanticipated problems which include, but are not limited to, adverse events. If you have any questions about this process, please contact the Adverse Events Coordinator at 412-383-1504.

The protocol and consent forms, along with a brief progress report must be resubmitted at least **one month prior** to the renewal date noted above as required by FWA00006790 (University of Pittsburgh), FWA00006735 (University of Pittsburgh Medical Center), FWA00000600 (Children's Hospital of Pittsburgh), FWA00003567 (Magee-Womens Health Corporation), FWA00003338 (University of Pittsburgh Medical Center Cancer Institute).

Please be advised that your research study may be audited periodically by the University of Pittsburgh Research Conduct and Compliance Office.

CR:kh

APPENDIX T.

CALIFORNIA UNIVERSITY OF PA IRB APPROVAL

Please attach a typed, detailed summary of your project AND complete items 2 through 6.

1. *Provide an overview of your project-proposal describing what you plan to do and how you will go about doing it. Include any hypothesis(ses)or research questions that might be involved and explain how the information you gather will be analyzed. For a complete list of what should be included in your summary, please refer to Appendix B of the IRB Policies and Procedures Manual*

2. *Section 46.11 of the Federal Regulations state that research proposals involving human subjects must satisfy certain requirements before the IRB can grant approval. You should describe in detail how the*

California University of Pennsylvania

Proposal Number 06-045
Date Received

PROTOCOL for Research Involving Human Subjects

Institutional Review Board (IRB) approval is required before beginning any research and/or data collection involving human subjects

(Reference IRB Policies and Procedures for clarification)

Project Title **Exploring the Utilization of Webcam Videos to Assess Exercise Training and Fitness Assessment Skills of Students in an Online Graduate Exercise Science Course**

Researcher/Project Director Barry E. McGlumphy

Phone # 724-255-6533 *E-mail Address* mcglumphy@cup.edu

Faculty Sponsor (if required) _____

Department Health Science & Sport Studies

Project Dates January 25, 2007 to May 8, 2007

Sponsoring Agent (if applicable) _____

Project to be Conducted at California University of Pennsylvania

Project Purpose: ☐ *Thesis* ☒ *Research* ☐ *Class Project* ☐ *Other*

Keep a copy of this form for your records.

Required IRB Training

The training requirement can be satisfied by completing the online training session at http://cme.nci.nih.gov/ *. A copy of your certification of training must be attached to this IRB Protocol. If you have completed the training at an earlier date and have already provided documentation to the California University of Pennsylvania Grants Office, please provide the following:*

Previous Project Title Graduate Exercise Science Students Perceptions of Psychomotor Skill Learning and Hands-On Skill Acquisition in Web-based Courses

Date of Previous IRB Protocol 11/28/06

Approved, September 12, 2005

FROM : FAX NO. : Feb. 08 2007 01:55PM P1

Project Director's Certification
Program Involving HUMAN SUBJECTS

The proposed investigation involves the use of human subjects and I am submitting the complete application form and project description to the Institutional Review Board for Research Involving Human Subjects.

I understand that Institutional Review Board (IRB) approval is required before beginning any research and/or data collection involving human subjects. If the Board grants approval of this application, I agree to:

1. Abide by any conditions or changes in the project required by the Board.
2. Report to the Board any change in the research plan that affects the method of using human subjects before such change is instituted.
3. Report to the Board any problems that arise in connection with the use of human subjects.
4. Seek advice of the Board whenever I believe such advice is necessary or would be helpful.
5. Secure the informed, written consent of all human subjects participating in the project.
6. Cooperate with the Board in its effort to provide a continuing review after investigations have been initiated.

I have reviewed the Federal and State regulations concerning the use of human subjects in research and training programs and the guidelines. I agree to abide by the regulations and guidelines aforementioned and will adhere to policies and procedures described in my application. I understand that changes to the research must be approved by the IRB before they are implemented.

Professional Research

Barry E. McDunphy — Project Director's Signature

[signature] — Department Chairperson's Signature

Student or Class Research

Student Researcher's Signature

Supervising Faculty Member's Signature if required

Department Chairperson's Signature

ACTION OF REVIEW BOARD (IRB use only)

The Institutional Review Board for Research Involving Human Subjects has reviewed this application to ascertain whether or not the proposed project:

1. provides adequate safeguards of the rights and welfare of human subjects involved in the investigations;
2. uses appropriate methods to obtain informed, written consent;
3. indicates that the potential benefits of the investigation substantially outweigh the risk involved.
4. provides adequate debriefing of human participants.
5. provides adequate follow-up services to participants who may have incurred physical, mental, or emotional harm.

as amended stipulations

☒ Approved ☐ Disapproved

[signature] — Chairperson, Institutional Review Board

02-07-07 — Date

Approved, September 12, 2005

FROM : FAX NO. : Feb. 08 2007 01:55PM P2

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