Student Perceptions of an Online

Medical Dosimetry

Program

by

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ABSTRACT

The University of Wisconsin – La Crosse offers the first web-based medical dosimetry

program in the nation. There is no data to research a program of this type. This research

consisted of the evaluation of other distance education programs including health

profession programs in addition to face-to-face medical dosimetry programs. There was

need to collect and analyze student perceptions of online learning in medical dosimetry.

This research provided a guide for future implementation by other programs as well as

validated the University of Wisconsin - La Crosse program. Methodology used consisted

of an electronic survey sent to all previous and currently enrolled students in the

University of Wisconsin – La Crosse medical dosimetry program. The survey was both

quantitative and qualitative in demonstrating attitudinal perceptions of students in the

program. Quantitative data was collected and analyzed utilizing a five point Likert scale.

Qualitative data was gathered based on the open-ended responses and the identifying

themes from the responses. The results demonstrated an overall satisfaction with this

program, the instructor, and the online courses. Students felt a sense of belonging to the courses and the program. Considering that a majority of the students had never taken an online course previously, the students felt there were no technology issues. Future research should include evaluation of board exam statistics for students enrolled in the online and face-to-face medical dosimetry programs.

TABLE OF CONTENTS

List of Tables

Chapter I: Introduction

The University of Wisconsin – La Crosse (UW-L) has the first and only online medical dosimetry program in the nation. Medical dosimetry is a specialized field within radiation oncology. Medical dosimetry students learn how to calculate and generate radiation dose distributions to treat cancerous tumors while limiting dose to normal tissue. The medical dosimetry training programs consists of online didactic curriculum and clinical internship training in a radiation oncology department. Didactic coursework in the healthcare professions is the medical teaching by lectures or textbooks (Merriam-Webster, 2002). The clinical internship training is student involvement in direct observation and treatment of patients in a clinical setting (Merriam-Webster, 2002). Medical dosimetry programs are traditionally face-to-face instructor-led learning environments in which didactic and clinical internship training take place at an accredited medical institution. The only difference in the UW-L program versus the traditional face-to-face medical dosimetry programs is that the didactic coursework is delivered via online education.

There is a need to research student perceptions of the UW-L online program to make improvements for future students as well as validate the program for the establishment of future online medical dosimetry programs. The evaluation by students was in regards to student learning, online experiences, communications, and perceptions of difficulty, ease, and differences in online courses. Because the program is new and there are no other web-based medical dosimetry programs, this research is now more important than ever.

Online education, or web-based learning, is distance education over the Internet. This distance education can be delivered to remote (non-campus) locations via synchronous, asynchronous, instructor-led or computer-based means of instruction (Chela Education, 2006). Courses can be delivered in a format of real-time, self-paced, or a combination of both. Distance education is not a new concept. Gunderson (2006) gives a historical perspective of distance education:

> In early 1700's, advertisements first appeared for courses offered by mail through correspondence study. During the 1960s and 1970s, distance learning was expanded to geographically isolated areas with the advancement of technologies. In the 1980s, there was a greater need for distance education and more opportunities due to teacher shortages. Today, we have more computer-based interactions, using the Internet and the World Wide Web. The educational institutions are now present in the home and workplace around the world (p. 6).

A key issue in online educational delivery is how moving away from traditional face-to-face relationships between the professor and the student impact student learning and their perceptions of learning (O'Malley & McCraw, 1999). Over the years, much of the research has focused on technical issues of online learning and less attention to student perceptions of online learning. This study evaluated perceptions of students thus providing feedback for changes to be implemented in this program.

There is an urgent need for the establishment of new medical dosimetry programs, be it face-to-face or online. There are a limited number of programs that exist in this nation which contributes the to excessive workforce shortage of medical dosimetrists. According to a 2002 survey of the Workforce Committee of the American Society for

Therapeutic Radiology and Oncology (ASTRO), approximately 700 medical dosimetrists were needed nationwide, which was a 35% increase in workforce at that time (2003). Additionally, only about 25 to 30 individuals were graduating from the eight formal programs at that time. Currently, there are approximately 15 medical dosimetry programs in this nation, with only four of those being degree-granting programs. Many students in this nation live at great distance from the site of a medical dosimetry program and do not have the option or ability to relocate. The need to train those who do not live close to a medical dosimetry program is what led to the initiation of an online medical dosimetry program at UW-L. The online program offers the unique ability to serve various students throughout the United States as well as improve the workforce shortage in this profession. The establishment of additional online medical dosimetry programs could also help to alleviate the limited educational opportunities in medical dosimetry as well as improving the workforce shortage.

There is no data available regarding online medical dosimetry programs because there are no other online programs that exist. Therefore, this increases the need to research this topic, validate the UW-L medical dosimetry program, and use as a model for the establishment of new online medical dosimetry programs in the future. Research included other online healthcare programs but data was limited in this area as well. This study provided information regarding components of distance learning, characteristics of individuals in the study, structure of online courses, experiences of other health profession programs utilizing online learning, structure of face-to-face medical dosimetry programs, and surveys assessing student perceptions. Researchers have identified several variables that can affect students' perceptions of online instruction, including prior

computer experience, peer and teacher/student interaction, and institutional support (Ivers, Lee, & Carter-Wells, 2005). Those variables were evaluated in this survey to improve the program and offer data to be use for establishing new online medical dosimetry programs.

The technology of computers and the Internet have a major effect on students' online learning experiences. "As distance education becomes more popular, and as traditional courses require more online assignments, teachers must consider students' perceptions of online learning" (Peters, 2001, p.1).

Statement of the Problem

The UW-L is the first web-based medical dosimetry program in the nation. There is no data to research a program of this type. However, data can be researched in regards to overall distance education, other web-based health profession programs, and face-to-face medical dosimetry programs. There was a need for data to be collected and analyzed of students' perceptions of online learning in this type of program. A study of online learning in a medical dosimetry program needed to be completed to provide a guide for future program implementation by other institutions throughout the nation and to validate the current program that exists.

Purpose of the Study

The purpose of the study was to analyze student perceptions of an online medical dosimetry program at UW-L. The study will serve to improve and validate the program as well as provide data for implementation of new programs.

Assumptions of the Study

The assumptions of the study were that students would provide informative

feedback that would be used to improve the online delivery of the program. The data would be used to establish a model for future online programs.

Research Questions

The study sought to answer these questions:

1. What are student perceptions of the online medical dosimetry program?

2. What are student perceptions of peer interaction and student/teacher interaction in the online courses?

3. What previous experience did students have with technology required of them in the online program? What is their level of comfort with the technology?

4. How does their motivation of online learning affect their perception of the quality of the online program?

5. What steps could be taken to improve the online medical dosimetry program?

6. Is the quality of the online courses equal to previous face-to-face courses?

Definition of Terms

Medical Dosimetrist. A member of the radiation oncology team, who has knowledge of the overall characteristics and clinical relevance of radiation oncology treatment machines and equipment, is cognizant of procedures commonly used in brachytherapy and has the education and expertise necessary to generate radiation dose distributions and dose calculations in collaboration with the medical physicist and radiation oncologist (AAMD, 2006).

Medical Dosimetry. The calculation and generation of radiation dose distribution following a radiation oncologist's plan for treatment while utilizing physics, math,

anatomy, and radiobiology to design optimal treatments that target the tumor and spare healthy normal tissue around it.

Online medical dosimetry program. A program in which didactic courses are completed asynchronously via the web while clinical internship training is taking place at an accredited healthcare institution.

Face-to-face program. A teacher-directed environment with interaction in a live synchronous, high fidelity environment (Graham, 2005).

Distance Learner. A student who spends most of his/her class time and coursework in an off-campus site or at home (Hunter Library, 2006).

Asynchronous. Literally means "not at the same time". An asynchronous course is one in which the instruction is delivered at one time and the work can be done at a different time. Students and teachers use e-mail, listservs, and other technologies to communicate without having to be in the same place at the same time (Ohio Learning Network, 2006).

Web-based. A major service on the Internet (Farlex, 2006).

Online learning. A learning experience or environment that relies upon the Internet/WWW as the primary delivery mode of communication and presentation (Intelera, 2004).

Internet. A worldwide, interconnected system of computer networks (Education World, 2006).

Limitations of the Study

There were limitations in this study including the fact that there are no other medical dosimetry programs to compare this study to. This is the first and only online

medical dosimetry program in the nation. There are a limited number of face-to-face medical dosimetry programs to evaluate when comparing the quality of this online program to those. Finally, the UW-L online medical dosimetry program is relatively new so the number of responses received from students was less than desirable.

Methodology

A review of literature was conducted on student perceptions of online learning as well as the evaluation methods to consider when surveying the students. Research on traditional face-to-face medical dosimetry programs as well as other online health profession programs was used when evaluating the quality of this online program.

The researcher conducted a survey of student perceptions in this online medical dosimetry program in which all previous and current students received the electronic survey. The data was collected and analyzed for the results of the study.

Chapter II: Literature Review

Introduction

Medical dosimetry is the calculation and generation of radiation dose distributions following the physician's prescription for treatment (AAMD, 2006). Medical dosimetry utilizes math, physics, anatomy, and radiobiology to generate the radiation dose distributions and calculations for treating patients' cancerous tumors while avoiding the normal tissues. The UW-L offers a Web-based medical dosimetry program which is the first and only of its kind in the nation. This program has many advantages of providing online education to adult learners throughout the nation who have no access to a program in their region of the country. Historically, medical dosimetry programs have been traditional face-to-face programs. In this literature review, the structure of medical dosimetry programs, online or traditional face-to-face was reviewed. Online health profession programs were reviewed as well. In order to describe the online component of the UW-L program, the structure of online courses and components of distance learning needed to be discussed in detail. Medical dosimetry programs involve the education of adult learner students. The individuals described in this study were characteristic of online students, adult learners, and online instructors. Finally, since the purpose of the study was to evaluate student perceptions in an online medical dosimetry program, studies about general student perceptions of online education and affecting factors were reviewed.

Structure of Medical Dosimetry Programs

Traditionally, medical dosimetry programs are designed as face-to-face programs. The curriculum consists of both didactic and clinical coursework. Didactic coursework in

the healthcare professions is the medical teaching by lectures or textbooks (Merriam-Webster, 2002). This lecture or textbook instruction differs from the clinical demonstration and laboratory study for clinical curriculum. Clinical curriculum in healthcare professions is student involvement in direct observation and treatment of patients in a clinical setting (Merriam-Webster, 2002). In traditional face-to-face medical dosimetry programs, students go to a physical classroom where the instructor gives a didactic lecture and students listen and take notes. Generally this consists of only approximately 8 to 12 hours per week. For the remainder of the week students complete the clinical coursework in a patient care setting at a medical facility which is affiliated with the program. The actual hours of student didactic and clinical curriculum have not been established as a standard requirement in medical dosimetry educational programs. It is at the discretion of the program directors to establish the clinical and didactic component of the program. In the field of radiation therapy, where medical dosimetry is performed, students must demonstrate competence in clinical activities under the observation of a qualified instructor (ARRT, 2005). Didactic competence is accomplished when students successfully complete coursework recommended by the professional credentialing organization (ARRT, 2005). To date, medical dosimetry educational programs do not have clinical and didactic competency requirements, therefore radiation therapy guidelines (ARRT, 2005) as well as the AAMD educational curriculum (AAMD, 2000) are followed.

With respect to online education, "Teaching without the teacher's personal presence in the classroom to provide direct instruction is a modern day miracle of 21st century education" (Beard & Harper, 2002, p.658). The online medical dosimetry

program at UW-L is somewhat a modern day miracle in medical dosimetry education. Although the first of its kind, the program also consists of both didactic and clinical coursework just as the traditional face-to-face medical dosimetry programs do. The UW-L didactic coursework is delivered by means of a Web-based distance education learning platform at the University which is accessed via the Internet. The coursework can be completed at any time of the day. The instructor and the students are not physically present in a classroom but do interact with each other via distance education opportunities. In online education, opportunities for direct communication between teacher and students are in the form of e-mail, discussion boards, and virtual chat rooms (Beard & Harper, 2002). Other forms of communication can be via telephone, mail, and video-camera via the Internet. The clinical coursework is delivered in the same format as a traditional face-to-face medical dosimetry program. The students complete a face-to-face clinical internship in a patient care setting at a medical facility affiliated with the program. The clinical instructors provide the instruction to the students in the health care setting.

Online learning in health profession programs

Health profession programs consist of didactic and clinical curriculum. This is because the students cannot be educated in a health care field without clinical internship in a patient care setting at a medical facility. Nursing program accreditation requires both clinical and didactic components for a program to receive accreditation by the National League for Nursing Accreditation Commission (NLNAC, 2005). The Accreditation Council for Occupational Therapy Education (ACOTE) standards require both didactic and clinical curriculum for a program to receive accreditation (ACOTE, 2006). Physical

therapy programs are required to have didactic and clinical components as governed by their accrediting organization, Commission on Accreditation in Physical Therapy Education (CAPTE, 2006). The Joint Review Committee on Education in Radiologic Technology (JRCERT) established standards for accreditation of radiologic technology programs, radiation therapy programs, magnetic resonance imaging programs, and medical dosimetry programs. All of these programs are required to include didactic and clinical curriculum in their programs (JRCERT, 2006). Health profession programs must include both components in their program in order to receive accreditation and students must achieve competence in clinical and didactic curriculum in order to graduate from the program. These standards establish the validity and effectiveness of education for students while promoting patient safety in the healthcare environment.

These standards and requirements are no different in an online health profession program. The only difference in a Web-based program is that the didactic coursework can be completed online. The student will still be required to complete the clinical internship component which involves direct patient care and technical education on appropriate equipment within the department. Web-based courses are delivered in an asynchronous format allowing institutions and faculty to present course materials to students at a place and time of their choosing (Grimes, 2002). "Traditional classroom education can pose time and physical proximity barriers for the adult learner who is attempting to complete higher education" (Townsend et al., 2002, p.3).

"It is clear that technology has become an integral part of the health professional's workplace" (Townsend et al., 2002, p. 2). Health profession graduates must be sophisticated in the use of information technologies and understand how these

technologies interface with various health care systems. Online courses allow students the use of Internet and other various information technologies which will be used in their professional careers after graduation. An article in the Journal of Nursing Education titled "Enabling student nurses to use the information superhighway" stated that the benefits of online course delivery are especially crucial for growing numbers of nursing students who simultaneously juggle responsibilities in the workplace and at home, as well as for those students who are at distance education sites (Bachman & Panzarine, 1998). It is clear that the flexibility of Web-based courses offers an option for working professionals, adult learners, and rural students.

Distance education programs vary in their design and utilize a variety of techniques to bridge the time and space gap between the teachers and students (Treloar, 1998). Instructors need to be aware of the impact that their social presence or lack thereof may have on their students' satisfaction, motivation, and learning (Richardson & Swan, 2003). The key issue that must be addressed is how these new online delivery approaches that move away from face-to-face relationship between instructor and students impact learning and student perceptions of learning.

Structure of online coursework

Colleges and universities have been investing a great deal of effort and resources to modify existing face-to-face courses to meet the specific characteristics of online learning environments. Several studies and resources are available that identify the key components of online coursework to increase the outcomes of online learning (Chapman, 2005; Gerson, 2000; Hricko, 2002; IHETS, 2006; MSU, 2005; & Willis, 1995). It is possible that with all components in place, the success of online courses rests in the

perception of the student. As with any product in the marketplace, this success determines whether students continue to enroll in online courses.

No two online courses will be the same anymore than two professors will teach exactly the same way. Although online courses are not all the same, the structure of the courses is similar in all Web-based learning platforms. In general, online courses consist of: course/faculty information; announcements/lessons; external resources; discussion boards/groups areas/ communication; and end of course assignments/assessments. In 2002, Hricko studied the development of a Web-based classroom and quoted a handout presented by Zaccaria (2000) titled "Criteria for an Effective Instructional Web site" in which he described the general content of a web-based classroom. Table 1 lists the general content of a web-based classroom. Ells (1998) stated in an online workshop that making content available is not education. He said that learning requires action, interaction, and application.

Table 1

General Content of a Web-based Classroom

Instructor information, virtual office hours, announcements	Course description, course outlines, syllabi, and assignments
Lecture outlines, class notes, and web bibliographies	Testing and grading information, sample tests or test questions
Course management policies, means for submission of assignments	Interactive activities such as bulletin board, email links to classmates
Academic services support links such as the campus library and tutoring center	Links appropriate to lecture to assist students with review of material
Grade postings and/or a site by which students can check assignments	Password protection for pages with personal student content

On the surface, the structure of an online course does not differ much from a classroom course. Each component is present in both kinds of educational delivery systems. However, a common mistake of faculty is to try to reproduce a classroom environment in creating an online course. The challenge is not to create an online classroom; the challenge is to create a personal learning experience for students over the Web that takes full advantage of its incredible capabilities.

Howland and Moore (2002) stated that online courses require at least the same amount of work, if not more, for both students and instructors. They stated that time requirements increase due to the nature of electronic communications. For example, written discussions in online format take much longer than the verbal discussion taking place in a classroom. The reason for this is that in a face-to-face lecture, the instructor can quickly assess student comprehension, but in online courses it becomes very difficult to do this. Instructors also spend more time trying to orientate students in the online learning environment. Howland and Moore (2002) also stated that the instructional strategy used will not fit all learners, therefore requiring flexibility of all individuals involved. Although flexibility is seen as advantageous, the instructor must provide some guidelines for the number of times per week a student is required to be online in the discussion board or how much time should be allocated for coursework completion. Instructors must keep students engaged in periodic correspondence in order to keep them interested and connected. The more correspondence with the student, the less isolation felt by the student (Howland & Moore, 2002). Finally, instructors should establish the technological materials needed to improve the quality of learning prior to student enrollment.

As instructors continue to be challenged by the design of online courses, they must also learn how to keep students engaged without increasing workload for students and instructors. Instructors must use the power of technology to create a new generation of more adaptive and flexible thinkers. The technology offers capabilities of doing a better job while meeting challenges of communication, management of time, and assessment.

Characteristics of Individuals in Study

Distance education opportunities have brought the classroom from the university setting to the home, allowing students the privilege to pursue college degrees without the inconvenience of actually traveling to campus for course completion (Beard, 2004). O'Malley and McCraw (1999) describe the increased change in types of student learners:

> Until the late 1980's, the primary educational delivery model for collegiate professorial staff was essentially the traditional lecture. Student populations consisted of single, residential eighteen to twenty-three year olds, although working, non-traditional students had begun to increase dramatically. As we approach the year 2000, the student population has continued to change to married, employed, and non-residential students (p. 1).

The increase in adult learners is due to the increase in technology allowing distance education opportunities for these types of students as well as the need to retrain in a different career field. We not only see an increase in online learners, but we also see an increase in adult learners as well.

The distance education delivery methods allow working adults to pursue their education without interrupting their careers. Willis (1995) describes the profile of the

distance learner as older, employed, with families who must coordinate different areas of their lives which influence each other. They have a variety of reasons for taking courses. These learners are isolated learners who utilize technology as the conduit through which information and communication flow. They also have little in common with the instructor in terms of background and day to day experiences, therefore, taking longer for the student-instructor rapport to develop.

Online learning has no geographic boundaries. It reduces preconceived notions based on students' age, gender, race, background, or level of experience. This type of learning has the ability to promote contemplative and reflective learning while providing individualized attention with depth of interaction by instructors and students not possible in a large classroom. Online learning is flexible and convenient. Although these are all benefits of online learning, there are disadvantages for online students as well. Distance education students have feelings of isolation (Howland & Moore, 2002; Ivers et al., 2005; Peters, 2001; Smith, 2005; & Yilman & Tuzun, 2001). They may feel that communication is lacking between students and with the instructor. These students tend to procrastinate and can sometimes get off-track. Some students need direct interaction with instructors and students, therefore making distance education a more difficult choice. A study was completed by Yilmaz and Tuzun (2001) in which a random sampling of two instructors and two graduate students were interviewed. The instructors were required to teach at least one Web-based course and the students were required to take at least one Web-based course. The study suggested that, in Web-based instruction, the main problems faced by students are learning new tools, communication with instructor and students, and isolated learning. They also found that the problems faced by

instructors are support, communication with students, providing feedback, and the number of students.

Research has shown that students in a distance learning environment must have self-discipline and manage their time effectively (Ivers et al., 2005; Peters, 2001; RIT, 2006; Smith, 2005; & Willis, 1995). They must take an active role in the distance education course by independently taking responsibility for learning. For adult learners, they approach learning different than younger learners. The Rochester Institute of Technology (RIT) (2006) describes the adult learner as more self-guided in their learning; they bring more and expect to bring more to the learning situation, because of their wider experience, and they take more away; and they require learning "to make sense" in that they will not perform a learning activity just because the instructor said to do it. RIT also states that instruction designed for adult learners tends to be more effective if it is learner-centered than if it is instructor-centered. Learner-centered works best when learners are relatively mature and possess significant related knowledge where there is no particular sequencing of material to be learned. This adult learning theory is based on the original research of Malcolm Knowles.

Knowles discussed the educational research and practice in the 1970's and 1980's as the "shift from a focus on teaching to a focus on learning" (1980, p.19). This was due to the era of knowledge explosion, technological revolution, and a social policy of equal educational opportunities (Knowles, 1980). There was a spread of competency-based or performance-based education which put a new emphasis on education as a process of facilitating self-directed learning. It also redefined the role of the teacher as a facilitator of self-directed learning and a resource to self-directed learners (Knowles, 1980). This

style of learning developed new ways of delivering convenient education in terms of place and time. These new delivery systems were called "non-traditional", "community education", and "learning communities", just to name a few (Knowles, 1980, p.20). Knowles (1980) summarized this new learning theory as:

> Education is no longer seen as the monopoly of educational institutions and their teachers. We now perceive that resources for learning are everywhere in our environment and that people can get help in their learning from a variety of other people. The modern task of education, therefore, becomes on of finding new ways to link learners with learning resources (p. 20).

This was the forefront to the online learning of today. The current research of online learning focuses on methods of delivering this distance education and how it affects student learning.

Distance learning changes three important dynamics of instruction – the modalities of communication, the management of time, and the formats for assessment (Jurczyk, Kushner Benson, & Savery, 2004). Initially, not all successful on-campus instructors will be successful in the distance learning environment because they must learn the skills necessary to successfully educate students in this new environment. RIT (2006) describes the characteristics of a successful distance learning educator: (a) the ability and willingness to learn new technology, (b) project your own personality, sense of humor, and genuine interest in others, (c) use teaching techniques that may differ from those used on campus, (d) be a team player with distance learners, (e) prepare comprehensive course plans and yet be flexible about modifications, (f) develop and

work with new materials and methods, and (g) be interested in and responsive to students queries and to frequent student feedback.

There are six essential skills for online educators: (a) interaction, (b) management, (c) organization/instructional design, (d) technology, (e) content knowledge, and (f) teamwork skills (Lee & Hirumi, 2004, p.535). There have been a number of studies (Ivers et al., 2005; Jurczyk et al., 2004; Lee & Hirumi, 2004; Ragan, 1999; RIT, 2006; & Willis, 1995) that have researched the roles or skills that distance educators should possess. Although the skills mentioned above are the key to successful online instruction, there are also external resources that instructors need such as the support of the institution and the delivery methods of online courses. As online instruction accelerates, with an increase of 23% in 2004 and 35% in 2005 (Allen & Seaman, 2006), educators need to ensure that the quality of instruction is not overlooked, as well as address such issues as students' attitudes and perceptions of online instruction and how these issues may or may not influence their motivation or achievements in a course (Ivers et al., 2005).

Tello (2002) demonstrated in a doctoral dissertation that there is a positive correlation between faculty "presence" and positive student attitudes toward online learning as well as student retention. This is important to recognize especially when a large number of studies have shown that disadvantages students feel in online coursework is the feeling of isolation or the lack of communication with the instructor. In 1999, the Institute of Higher Education Policy (IHEP) commissioned a study by BlackBoard, a leading Internet education company, and the National Education Association, the nations' largest professional association of higher education faculty. The purpose of the study was to identify a list of standards within the distance education field. The standards developed

were based on literature reviews and interviews conducted with faculty, students, and administrators. Benchmarks were established and divided into seven major categories of quality measures currently used on campuses around the nation (IHEP, 2000). One way to facilitate the quality of online instruction is to base both the development and evaluation of online learning on established standards such as the IHEP benchmarks (Jurczyk et al, 2004).

The characteristics of online learners, adult learners, and online educators demonstrate individuals with self-discipline and motivation. They need to be flexible and responsible while effectively managing their time. The communication between all individuals involved is essential is limiting the feeling of isolation. Jurczyk et al. (2004) stated that the IHEP emphasizes that the ability of instructors and students to adapt to the capabilities and constraints of the online learning environment will directly influence the success of the undertaking.

Components of Online Learning

Effective distance education programs begin with careful planning and a focused understanding of course requirements and student needs (Willis, 1995). Higher education institutions face a tremendous challenge of designing effective online programs that offer quality education for students. The IHEP report published in 2000 described what constitutes quality in online education. There were twenty-four benchmarks placed into seven major categories. The seven categories include: (a) institutional support, (b) course development, (c) teaching/learning, (d) course structure, (e) student support, (f) faculty support, and (g) evaluation and assessment. These are important for assisting policymakers, faculty, and students in making reasonable and informed judgments with

regard to the quality of internet-based education (IHEP, 2000). Appendix A lists the

seven categories with the associated benchmarks which are essential for program success.

Successful distance education programs also rely on the consistent and integrated

efforts of students, faculty, facilitators, support staff, and administrators (Willis, 1995).

These key players face many challenges in a distance education environment. The hard

work and dedicated efforts of these individuals to overcome these challenges are

described in Table 2 (Willis, 1995).

Table 2

Key Players and Their Roles in a Distance Education Environment

Student	The primary role of the student is to learn. When instruction is delivered at a distance, additional challenges result because students are often separated from others who share the same background, have a few interactions with teachers outside class, and rely on technical linkages to bridge the gap separating class participants.
Faculty	The faculty of a distance education program will success if they realize the characteristics and needs of distance education students, adapt to teaching styles to diverse needs of students, develop a working understanding of delivery technology, and function effectively as a skilled facilitator and content provider.
Facilitators	The facilitator sometimes acts as a bridge between students and instructors. The facilitator must be willing to follow the directive established by the teacher.
Support Staff	These are the silent heroes of distance education. Functions include registrations, materials distribution, textbook ordering, processing grades, managing technical resources, etc.
Administrators	For distance education, they are more than idea people. They are consensus builders, decision makers, and referees. They maintain an academic focus, realizing that meeting the instructional needs of distant students is their future responsibility.

The careful planning of a distance education program will be most effective when it meets the needs of students within this unique learning environment. With the growing number of online courses, the increasing accessibility of computers, and the increasing number of computer users, students of all ages are taking advantage of distance learning (Peters, 2001). This popularity brings concerns of student perceptions of online learning. "The difference between the blackboard-bound classroom and the cyber-connected classroom is just a matter of space, and educators must learn how that space helps to define student perceptions of education" (Peters, 2001, p.4).

Student perceptions of online learning

Learning involves two types of interaction: interaction with content and interaction with people (Berge, 1995). This interaction with people can happen in an asynchronous classroom environment, which is independent of place and time. According to Berge, the role of the instructor in a web-based learning environment is categorized into four areas: pedagogical, social, managerial, and technical (1995). These areas are described as:

> The pedagogical area requires the instructor to be the moderator who asks questions and probes students for responses. The social area requires the instructor to create a friendly, social environment so that students are able to work together and develop relationships with each other. The instructor utilizes organizational skills by administering objectives, schedules, rules, and decisions in the managerial area. The technical area requires instructors to assist students in feeling comfortable with the learning system used for the online courses. Student must focus on academics, not technology issues (p. 22).

The challenge of the online instructor is to lead the interactions by creating a social environment comfortable for students and limit the technological frustrations students may have. The lack of interaction with peers and instructors as well as technological problems will result in frustrated students which inhibits learning.

Student interaction with faculty and other students is an essential characteristic with online learning (Chapman, 2005). The interaction can be facilitated in a variety of ways in distance education. Many authors have stated that positive interaction in online courses influence a students' perception of learning (Beard, 2004; Goetz, 2004; Hricko, 2002; Ivers et al., 2005; Lee, Bray, Carter-Wells, Glaeser, Ivers, & Street, 2004; Lim, Morris, & Kupritz, 2006; Peters, 2001; Smith, 2005; & Willis, 1995). Unfortunately, not all online courses include various means of interaction which results in negative student perceptions of online learning experiences. Several studies have been done to demonstrate student perceptions of online learning (Belcheir & Cucek, 2001; Ivers et al., 2005; Jurczyk et al., 2004; Lim et al., 2006; McFadden, 2006; O'Malley & McCraw, 1999; Scanlan, 2003; & Watson & Rutledge, 2005). All of these studies were completed using a survey method to collect feedback from students who had taken online courses. The feedback from these surveys demonstrated clear, repetitive responses with both positive and negative perceptions of the online learning environment. Table 3 shows a summary of the most common perceptions of students involved in the studies.

Learners enjoy the benefits of being able to take online classes while still maintaining their jobs and their personal and family commitments (Jurczyk et al., 2004). They like the convenience of accessing the class from a computer at various locations. Several students felt that they were able to communicate more freely in online discussion

Table 3

Common Perceptions of Students in Online Learning Surveys

Positive Perceptions	Negative Perceptions/ Challenges
Flexibility	Feeling of isolation
Convenience	Lack of interaction with other students and faculty
Proceeding at their pace	Lack of technology skills
Not commuting to campus	Time management
Freedom/Flexibility to communicate in discussions	Lack of feedback from instructor

forums. Time management and lack of technology skills were viewed as challenges for

students taking the online courses. The flexibility of online courses can cause problems

when students cannot stay on task and procrastinate with assignment completion. The

lack of technology skills or technology interruptions causes student frustrations.

Technology accessibility and reliability is a critical factor for learning and online

community development (Lee et al., 2004). Before starting online classes or being

accepted into an online program, students should demonstrate proof of computer

experience with computers (Lee et al., 2004; & Goetz, 2004).

The studies that were reviewed also demonstrated that the most common negative

perceptions of students in online courses are the lack of interaction with students and

instructors and the lack of feedback from instructors. Both of these issues led to the

feeling of isolation for students enrolled in online courses. Support for distance education

students takes the form of some combination of student-instructor and student-student

interaction (Willis, 1995). Hricko (2002) stated, "The goal is to give remote access

students the same feeling of a campus community that their on-campus peers receive. This element can prove very significant in the retention of distance learning students". Not only do students need to feel like part of a campus community, they also need to feel like part of a learning community. Goetz (2004) says that cohort based learning is the foundation of an effective online learning community. He continues to say that the more interaction and sense of community in online courses, the more likely that students will remain enrolled until completion.

Effective online learning communities are founded on social constructivist pedagogy which involves student-student and student-teacher interactions (Lee et al., 2004). Both of these interactions create a learning community where the curriculum is created both by the students and instructors resulting in resources which everyone can learn from. In a true online learning community, knowledge is co-created by members of the learning community with each person contributing his or her additional resources to the curriculum of the course (Lee et al., 2004). The sense of community is what distinguishes online learning from a single correspondence course delivered electronically (Goetz, 2004; & Lee et al., 2004). In a correspondence course, students only access the course, respond to it, and submit assignments.

Meaningful learning in online programs is a result of students' interactions with each other, rather than through students' individual learning efforts (Lee et al., 2004). Goetz (2004) says that online education requires us to shift from instruction to learning, develop a sense of community, train faculty, and help students with the transition through means of an orientation. He states that a minimum online orientation should include: (a) guidance on using online tools and learning platform, (b) time management skills, (c)

introduction to peers and faculty, (d) proper etiquette for communicating, (e) guidance on differences between face-to-face learning and online learning, and (f) how to get technological, academic, or administrative help.

Creating an online learning environment through positive social relationships can support active interaction with other learners and contribute to the development of the learning community (Lee et al., 2004). Learning will be more meaningful if students and instructors share responsibility for developing learning goals and objectives, actively interacting with peers, promoting reflection on experiences and new information, and evaluating what is being learned (Willis, 1995). Educators need to ensure that the quality of online instruction is not overlooked by addressing students' perceptions of the online instruction and how these issues may or may not influence their motivation or achievement in the course. To evaluate student perceptions of online learning, one must determine what instrument will be used to acquire this information. This research study analyzed student perceptions of an online medical dosimetry program through the use of a student survey. The data was used to evaluate and improve the effectiveness of the program and student learning. Details of the methodology used for this study are discussed in chapter three.

Chapter III: Methodology

Introduction

The UW-L is the first Web-based medical dosimetry program in the nation. There is no data to research a program of this type, however research can be done in regards to distance education, other online health professions programs, and other face-to-face medical dosimetry programs. There is a need for data to be collected and analyzed of students' perceptions of online learning in this type of program. A study of online learning in a medical dosimetry program should be completed to provide a guide for future program implementation by other institutions throughout the nation as well as to validate the current program that exists.

This chapter describes the research design utilized in this study including the research questions and procedures used in the development and implementation of the study. A full description of the selected subjects, instrumentation, collection and analysis of data, and limitations of the research are presented. The objective of this study was to examine the students' perceptions of the online medical dosimetry program at UW-L. In the end, the data reflected important issues for students in the online program and provided feedback for the instructor regarding the needs of the learner and strategies in the online coursework.

Subject Selection and Description

The subject selection was composed of all students who have been enrolled in the online medical dosimetry program at UW-L. The selection consists of the entire population in this study therefore sampling will not be used. The entire population is

selected due to the nature of the program being relatively new thus resulting in only 39 students being surveyed.

The students being surveyed were all adult learners with prior higher education and professional experience in the healthcare environment. All students belonged to a cohort of students accepted during their year of enrollment. The students were located throughout the United States at various medical institutions. Their educational experience while enrolled in this program is a combination of online didactic coursework with a face-to-face clinical internship at an affiliated medical institution. The didactic online coursework is structured with scheduled deadlines for completion of course materials. Although students have access to course content 24 hours per day, 7 days per week, the courses are not entirely self-paced. Students progress through the course materials and weekly lessons as a cohort group.

Instrumentation

To gain a better understanding of students' perceptions in an online medical dosimetry program, a mixed quantitative and qualitative methodology was used. A survey with closed-ended and open-ended questions was designed. The researcher designed the survey based on the literature review of other surveys completed regarding students' perceptions of online courses (IHEP, 2000; O'Malley & McCraw, 1999; McFadden, 2006; & Scanlan, 2003). Students responded to the survey by indicating their attitudinal perceptions about the online medical dosimetry program.

The sub-questions for this study were:

1. What are student perceptions of the online medical dosimetry program?

2. What are student perceptions of peer interaction and student/teacher interaction in the online courses?

3. What previous experience did students have with technology required of them in the online program? What is their level of comfort with the technology?

4. How does their motivation of online learning affect their perception of the quality of the online program?

5. What steps could be taken to improve the online medical dosimetry program?

6. Is the quality of the online courses equal to previous face-to-face courses?

The survey questions were related to the following themes: (a) comfort level with computers, (b) previous experience with online courses, (c) learning experience, (d) learning strategies, (e) peer interaction, (f) student/teacher interaction, (g) perceived difficulty or ease of online courses, and (h) perceived differences between online courses and previous face-to-face courses.

The questions on the survey were asked in a consistent manner so that interpretations are the same by all students. The survey was designed for a specific group of individuals therefore the entire population had equivalent experience to report on the survey. No measures of reliability or validity have been documented since this survey was designed specifically for this study. This lack of reliability or validity could be seen as a disadvantage, but this self-designed instrument tailored to this specific research topic proved to be advantageous (Crowl, 1993). Crowl stated that the final outcome can be no better than the measures used to collect data, no matter how well designed a study is (1993, p. 315). Therefore, every attempt was made to ensure that the survey instrument was valid.

Data Collection Procedures

Students were emailed a description of the research, a consent form, and an electronic survey which consisted of rating scale items and open-ended questions as well as demographic questions. There was an internet link provided which took them to the electronic survey for completion. Data was stored in the electronic survey tool which was password protected. The students were advised that their participation in this study was voluntary and their response was anonymous and confidential. A copy of the email letter can be found in Appendix B. The research study was reviewed and approved by the University's Institutional Review Board (IRB) prior to the commencement of data collection. The researcher abided by guidelines established by the IRB. The implied consent form was included in the email letter sent to the students. A copy of the implied consent form can be found in Appendix C.

The survey utilized a mixed-method approach that combined closed-ended and open-ended questions. The closed-ended part of the survey used a five point Likert-type scale to measure the perceptions of students' in the online program. The open-ended part of the survey asked questions about student perceptions of the online program as well as demographics. Utilizing the mixed-method approach in the collection of data confirmed and corroborated each other which provided better details and feedback for the purpose of the study (Lim et al., 2006; Richardson & Swan, 2003). A copy of the survey can be found in Appendix D.

Data Analysis

Quantitative analysis of the study will consisted of utilizing the Likert scale technique to score the subject's response to each closed-ended statement. Each statement

was individually scored and then all statements were summed to get representation of the student's attitude or perceptions. The scoring is based on higher points for positive responses and lower points for negative responses. For example, the rating scale is strongly agree (4), agree (3), disagree (2), strongly disagree (1), and not applicable (0).

Qualitative analysis of the study consisted of utilizing content analysis procedures. The researcher sorted through the open-ended responses and identified themes that characterize the reasons for promoting or hindering the students' learning.

Limitations

The limitations to the methodology and survey included:

1. The survey had no documented actions of reliability or validity as this was a self-designed survey for a specific group of individuals.

2. The population size surveyed was small due to the limited number of students enrolled in the program.

Summary

The electronic survey, both qualitative and quantitative in nature, was sent to all previous and current enrolled students in the online UW-L online medical dosimetry program. The quantitative questions were measured with a five point Likert-type scale while qualitative questions were open-ended allowing for participant comments. The survey collected attitudinal perceptions of the students in regards to the web-based program. Limitations include lack of reliability and validity and a small population size for survey results.

Chapter four will discuss the results of the survey that was given to the student's enrolled in the online medical dosimetry program.

Chapter IV: Results

This chapter details the results from the electronic survey that was sent to students who were previously and are currently enrolled in the UW-La Crosse online medical dosimetry program. The results can be reviewed in Appendix E. A link to the electronic survey was emailed to 39 students. There was an introduction letter describing the research as well as a consent form for the participants to review. The survey consisted of 59 questions both quantitative and qualitative in nature. Thirty-five students completed the survey which resulted in a 90% response rate. Some questions were skipped by one student which resulted in 34 responses.

The objective of this study was to examine the students' perceptions of the online medical dosimetry program at UW-L. The data reflects important issues for students in the online program and provided feedback for the instructor regarding the needs of the learner and strategies in the online coursework.

The sub-questions for this study were:

1. What are student perceptions of the online medical dosimetry program?

2. What are student perceptions of peer interaction and student/teacher interaction in the online courses?

3. What previous experience did students have with technology required of them in the online program? What is their level of comfort with the technology?

4. How does their motivation of online learning affect their perception of the quality of the online program?

5. What steps could be taken to improve the online medical dosimetry program?

6. Is the quality of the online courses equal to previous face-to-face courses?

There were several questions asked on the survey in order to answer the sub-questions of the study.

Item Analysis

The first sub-question of this study asks about the student perceptions of the online medical dosimetry program. There were specific survey questions that asked the participants to evaluate the instructor, the courses, and the online program in general. Although additional questions specifically asked participants to evaluate instructor teaching effectiveness and communication, the question in table 4 was a generalized question regarding the instructor.

Table 4

Overall, I was satisfied with the instructor.

	# of responses	Mean	Standard Deviation
Strongly Agree	23		
Agree	10		
Disagree	1		
Strongly Disagree	0		
	34	3.65	0.54

There were several questions on the survey asking students to evaluate aspects of the online courses. Questions were directed at evaluating course syllabi, discussions, outcomes, and objectives. In finding the answer to the first sub-question of this study, table 5 represents student responses towards the courses in general.

Table 5

Overall, I was satisfied with the online courses.

	# of responses	Mean	Standard Deviation
Strongly Agree	18		
Agree	15		
Disagree	1		
Strongly Disagree	0		
	34	3.50	0.56

Again, the sub-question asked what the perceptions were of the online medical dosimetry program. The specific question regarding the overall satisfaction of the online program is displayed in table 6.

Table 6

Overall, I was satisfied with the online medical dosimetry program.

	# of responses	Mean	Standard Deviation
Strongly Agree	20		
Agree	14		
Disagree	0		
Strongly Disagree	0		
	34	3.59	0.50

The second sub-question of this study addresses student perceptions of peer interaction and student/teacher interaction in the online courses. When asked if the

instructor had the ability to involve students with classroom interaction, the response was very favorable (M = 3.48, SD = 0.57). All but one response was positive. The survey demonstrated that approximately 97% of students thought that the instructor had an online presence in the courses, was available to students, responsive to email, and provided timely, constructive feedback to students. One specific question directly addressed the interaction of the instructor and students. Table 7 demonstrates the overall perception to this sub-question.

Table 7

My interaction with the instructor and students was facilitated through a variety of ways.

	# of responses	Mean	Standard Deviation
Strongly Agree	14		
Agree	19		
Disagree	1		
Strongly Disagree	0		
	34	3.38	0.55

Sub-question 3 of this study asks what previous experience students had with technology required of them in the online program and what was their level of comfort with the technology. Sub-question 4 asked how their motivation of online learning affected their perception of the quality of the online program. Sub-question 4 asked how their motivation of online learning affected their perception of the quality of the online program. These questions were asked because lack of technology or online coursework experiences can affect student perceptions of taking web-based distance education

courses. When student frustration occurs due to lack of technological or web-based experience, the perceptions reflect an affect on learning outcomes and experiences. In this survey, students were asked if they were advised about the technology and skills required to be successful in online courses prior to starting the program. The response was 100% in agreement with the question. Ninety-seven percent agreed that they received necessary orientation information to gain access to the online course learning platform. When asked how the user-friendliness and ease of navigation was for the web-based courses, the results were 97% positive by answering excellent and above average. Seventy-six percent of respondents reported that they were knowledgeable in the level of computer expertise but approximately 71% of respondents had never taken an online course prior to this program. The above mentioned results support the 97% of respondents who stated they would take another online course at UW-L again.

Sub-question 5 asked what steps could be taken to improve the online medical dosimetry program. This was an open-ended question asking for respondents to type an answer if they wanted to suggest improvements. Some suggestions were instructional in nature. Some responses were:

1. You might try recording the instructor actually working equations in physics and dose calculations on a whiteboard and having students download and play the video or mail a CD to each one.

2. The audible component is essential.

3. More example practice problems.

4. More weekly test and homework assignments.

Overall the responses to this open-ended question were positive and supportive of the online program. There were also negative responses towards the dosimetry training tool (DTT) which is a beta grant project we were asked to take part in. This tool is strictly supplemental to the UW-L courses and not primary curriculum delivered therefore not considered in this study.

The last sub-question to this study asked if the quality of the online courses were equal to previous face-to-face courses. The survey asked how the online courses were compared to other face-to-face courses. The response was 62% answered excellent and above average. The remaining 38% answered average. No respondents answered below average or poor. However, table 8 displays responses specifically regarding the interaction with the instructor and students compared to other face-to-face courses.

Table 8

The quality of interaction with the instructor and students equaled or surpassed the quality of interaction of face-to-face courses I have taken.

	# of responses	Mean	Standard Deviation
Strongly Agree	7		
Agree	16		
Disagree	9		
Strongly Disagree	2		
	34	2.82	0.83

Chapter 5: Discussion

Purpose and Objectives

The purpose of this study was to analyze student perceptions of an online medical dosimetry program at UW-L. This study will serve to improve and validate the program as well as provide data for implementation of new programs. The research objectives of this study sought to answer these questions:

1. What are student perceptions of the online medical dosimetry program?

2. What are student perceptions of peer interaction and student/teacher interaction in the online courses?

3. What previous experience did students have with technology required of them in the online program? What is their level of comfort with the technology?

4. How does their motivation of online learning affect their perception of the quality of the online program?

5. What steps could be taken to improve the online medical dosimetry program?

6. Is the quality of the online courses equal to previous face-to-face courses?

Data Collection

An email was sent to all previous and current students enrolled in the online medical dosimetry program at UW-L. The email requested completion of an electronic survey (Appendix D). A cover letter (Appendix B) and a consent form (Appendix C) were included in the email. The survey responses indicated their attitudinal perceptions about the program. The survey questions related to the following themes: (a) comfort level with computers, (b) previous experience with online courses, (c) learning experience, (d) learning strategies, (e) peer interaction, (f) student/teacher interaction, (g) perceived

difficulty or ease of online courses, and (h) perceived difference between online courses and previous face-to-face courses. Survey questions were both quantitative and qualitative in nature. There were 39 surveys sent out for participation in the study. In general, 35 surveys were completed with the exception of some questions having only 34 responses. The data was collected and analyzed with quantitative data being scored on a Likert scale technique and the qualitative data summarized by utilizing content analysis procedures. The data analysis summary is located in Appendix E.

Limitations

The limitations to the methodology and survey included:

1. The survey had no documented actions of reliability or validity as this was a self-designed survey for a specific group of individuals.

2. The population size surveyed was small due to the limited number of students enrolled in the program.

Although the population size was small, the overall response rate was 90%. Although this survey instrument was not previously measured for validity or reliability, the fact that the survey was tailored to this specific research topic proved to be advantageous.

The limitations of this study included:

1. There are no other online medical dosimetry programs to compare this study to. This is the first and only online dosimetry program in the nation.

2. There are a limited number of face-to-face programs to evaluate when comparing the quality of this online program to those.

3. The UW-L online medical dosimetry program is relatively new so the number of responses received from students was less than desirable.

Although the limitations are based on a limited number of programs, no other existing online programs, and a limited population to survey, the results of this study will provide future data for implementation of new programs as well as assist in validating the current online program. The response rate of the survey proved to be beneficial in data collection considering the small population of participants.

Conclusions

UW-L offers the first and only online medical dosimetry in the nation. Typically, these programs are face-to-face programs. The study sought to gain attitudinal perceptions of students enrolled in the UW-L program. The program is designed for adult learners who typically juggle responsibilities at their workplace and at home. The literature suggests that adult learners prefer the flexibility of online courses. It has also been reported that students may sometimes feel isolation due to lack of communication and interaction with instructors and peers. The results of this study suggest that factors important in their decision to take online courses were flexibility, work schedule, family responsibilities, convenience, cost, and reputation of the institution. Ninety-four percent of the respondents stated they felt a general sense of belonging to the program and 97% felt that the interaction with the instructor and students was facilitated through a variety of ways. When asked about the quality of interactions with the instructor and students being equal or surpassing face-to-face courses, the positive response was only 68%. This suggests that although they were satisfied with the sense of belonging and interaction in the web-based program, many still feel that the quality is not the same as face-to-face courses.

Sometimes, the technology can prohibit student learning and frustrations with technology will affect their perceptions of online learning. Although a large majority of students had never taken an online class prior to this program, the overall perceptions of this study were that the students received orientation therefore successful at navigation through the online courses and they felt knowledgeable with computers. In this study, 100% of the students stated that, prior to starting the online courses; they were advised about technology and skills required to be successful in the online courses. Ninety-seven percent stated they felt that the web-based learning platform was user-friendly and easy to navigate. This was a positive response to technology concerns considering seventy 71% of the students had never taken an online course previously. Overall, the general perception is that they would take online courses at UW-L again.

Studies have shown that adult learners are self-guided in their learning and are more effective at being learner-center. Online learners need to be motivated and self-disciplined. Motivation in online learning can affect student perceptions of learning. These students participating in this survey are all adult learners with previous professional education. They chose to further their education in medical dosimetry. Overall, the results were positive in regards to learning, the online community, the organization of the online courses, and technology. The IHEP report listed several categories that constitute quality online education. Some of these included course structure, student support, and teaching/learning. This study suggests that the UW-L online courses are perceived as quality online courses.

Students were asked an open-ended question on the survey about steps that could be taken to improve the online program. In identifying themes of the responses, a

common theme was to add various means of instruction such as more audio and visual components. The key to any learning environment is to offer instruction in various ways in order to adapt to all types of learners. This is especially important in online learning. Another theme included more weekly practice problems or assignments. Although not part of the literature review, recent articles suggest that smaller chunks of information on a weekly basis are more effective for online learning.

In summary, there was an overall satisfaction with the UW-L online medical dosimetry program. The participants in this study were satisfied with the instructor, the online courses, the online program, and the institutional support.

Recommendations

The following recommendations can be made based on the results of the study:

1. The instructor or program director should advance the level of interactions and incorporate techniques into the coursework to ensure all students feel like part of the online community and the program, particularly when comparing to a face-to-face classroom environment.

2. Continue to incorporate a variety of learning methods and techniques into the online courses. This will enable a variety of learning styles to be included in the successes of the courses.

3. For online course development, encourage instructors to prepare learning material and the appropriate assessment methods into smaller chunks at one time. Students learn better when a smaller section of curriculum is delivered and assessed before advancing to the next section.

This research analyzed the perceptions of the adult learners in an online Medical Dosimetry Program at the University of Wisconsin – La Crosse. The study included an online survey instrument completed by students previously and currently enrolled in the program. Based upon the survey results, the majority of students were satisfied with the instructor, the online courses, and the program. The researcher recommends additional research of national board exam statistics comparing students of online medical dosimetry programs with face-to-face medical dosimetry programs. This would evaluate the assessment in various areas of learning and possibly provide further information of strengths and weaknesses between the two types of programs.

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Appendix A

"Quality on the line: Benchmarks for success in Internet-based distance education"

(IHEP, 2000).

Institutional Support	A documented technology plan that includes electronic security measures is in place and operational to ensure both quality standards and the integrity and validity of information.
	The reliability of the technology delivery system is as failsafe as possible.
	A centralized system provides support for building and maintaining the distance education infrastructure.
Course Development	Guidelines regarding minimum standards are used for course development, design, and delivery, while learning outcomes determine the technology being used to deliver course content.
	Instructional materials are reviewed periodically to ensure they meet program standards.
	Courses are designed to require students to engage themselves in analysis, synthesis, and evaluation as part of their course and program requirements.
Teaching/Learning	Student interaction with faculty and other students is an essential characteristic and is facilitated through a variety of ways, including voice-mail and/or e-mail.
	Feedback to student assignments and questions is constructive and provided in a timely manner.
	Students are instructed in the proper methods of effective research, including assessment of the validity of resources.
Course Structure	Before starting an online program, students are advised about the program to determine (1) if they possess the self-motivation and commitment to learn at a distance and (2) if they have access to the minimal technology required by the course design.
	Students are provided with supplemental course information that outlines course objectives, concepts, and ideas, and learning outcomes for each course are in a clearly written, straightforward statement.
	Students have access to sufficient library resources that may include a "virtual library" accessible through the World Wide Web.
	Faculty and students agree upon expectations regarding times for student assignment completion and faculty response.
Student Support	Students receive information about programs, including admission requirements, tuition and fees, books and supplies, technical and proctoring requirements, and student support

	services.
	Students are provided with hands-on training and information to aid them in securing material through electronic databases, interlibrary loans, government archives, news services, and other resources.
	Throughout the duration of the program, students have access to technical assistance, including detailed instructions regarding the electronic media used, practice sessions prior to the beginning of the course, and convenient access to technical support staff.
	Questions directed to student service personnel are answered accurately and quickly, with a structured system in place to address student complaints.
Faculty Support	Technical assistance in course development is available to faculty, who are encouraged to use it.
	Faculty members are assisted in the transition from classroom teaching to online instruction and are assessed during the process.
	Instructor training and assistance, including peer mentoring, continues through the progression of the online course.
	Faculty members are provided with written resources to deal with issues arising from student use of electronically-accessed data.
Evaluation and Assessment	The program's educational effectiveness and teaching/learning process is assessed through an evaluation process that uses several methods and applies specific standards.
	Data on enrollment, costs, and successful/innovative uses of technology are used to evaluate program effectiveness.
	Intended learning outcomes are reviewed regularly to ensure clarity, utility, and appropriateness.

Appendix B

University of Wisconsin – Stout
Menomonie, WI 54751

April 27, 2007

Dear: (name of a student)

You are invited to participate in this study about *Student Perceptions of an Online Medical Dosimetry Program*. You have been selected to participate due to your enrollment in online courses for the UW-L medical dosimetry program.

This research is part of a thesis project headed by Nishele Lenards, MS Education student at UW-Stout. This study involves the completion of a brief survey about your student experiences while taking the online courses. It will take approximately 5 minutes to complete.

This purpose of this study is to improve the online courses as well as validate the program to use as a guide for future implementation of other programs. This survey is being sent to approximately 40 students who have been enrolled in online courses for the UW-L medical dosimetry program. I would greatly appreciate your cooperation in completing the survey. Completing the survey is voluntary, and your responses are strictly confidential.

Attached is the consent to participate in the research study. Please read this prior to completing the online survey. Listed below is a link to the online survey form for completion. Please complete the survey by May 15, 2007.

If you have any questions about this research, please contact me or the research advisor for this study. We would be happy to answer any questions you might have. If you would like to receive a summary report, please contact the research advisor.

http://www2.uwstout.edu/GeneralSurveys/TakeSurvey.asp?SurveyID=631n55M2292KG

Sincerely,

Nishele Lenards

Nishele Lenards   James Lehmann
Research Investigator   Research Advisor
952-435-7096   509-529-4006
lenardsn@uwstout.edu   lehmannja@uwstout.edu

Appendix C

UW-Stout Implied Consent Statement for Research Involving Human Subjects

Consent to Participate In UW-Stout Approved Research

Title: Student Perceptions of an Online Medical Dosimetry Program

Investigator:	**Research Advisor**:
Nishele Lenards	James Lehmann
952-435-7096	509-529-4006
lenardsn@uwstout.edu	lehmannja@uwstout.edu

Description:
This is a research study. I am inviting you to participate in this research study because you enrolled in online courses for the UW-L Medical Dosimetry Program. The purpose of this research is to analyze student perceptions of an online medical dosimetry program at UW-L. The study will serve to improve and validate the program as well as provide data for implementation of new programs. Approximately 40 people will take part in this study at UW-Stout. If you agree to take part in this study, your involvement will only last for approximately 5 minutes. You will be asked to complete a brief survey packet which contains questions with rating scales as well as open-ended questions to allow for personal comments/feedback.

Risks and Benefits:
There are no foreseeable risks to participate in this study. You may not benefit personally from being in this study. However, it is hopeful that, in the future, other people might benefit from this study because it will assist in improving the online courses in the UW-L medical dosimetry program and also serve as a guide for future programs.

Time Commitment and Payment:
The time commitment for completing the survey is approximately 5 minutes. There is no cost for being in this study. You will not be paid for being in this research study.

Confidentiality:
It will be impossible to link responses to individuals. Your participation in this research study is confidential to the extent permitted by law. However, it is possible that other people may become aware of your participation in the study. For example, federal government regulatory agencies and the University of Wisconsin – Stout Institutional Review Board (a committee that reviews and approves research studies) may inspect and copy records pertaining to this research. If a report or article is written about this study, we will describe study results in a summarized manner so that you cannot be identified.

Right to Withdraw:
Your participation in this study is entirely voluntary. You may choose not to participate without any adverse consequences to you. Should you choose to participate and later

wish to withdraw from the study, you may discontinue your participation at this time without incurring adverse consequences.

IRB Approval:
This study has been reviewed and approved by The University of Wisconsin-Stout's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and University policies. If you have questions or concerns regarding this study please contact the Investigator or Advisor. If you have any questions, concerns, or reports regarding your rights as a research subject, please contact the IRB Administrator.

Investigator:
Nishele Lenards
952-435-7096
lenardsn@uwstout.edu

IRB Administrator
Sue Foxwell, Director, Research Services
152 Vocational Rehabilitation Bldg.
Menomonie, WI 54751
715-232-2477
foxwells@uwstout.edu

Advisor:
James Lehmann
509-529-4006
lehmannja@uwstout.edu

Statement of Consent:
By completing the online survey you agree to participate in the project entitled, ***Student Perceptions in an Online Medical Dosimetry Program.***

Appendix D

Survey of UW-L Online Medical Dosimetry Program

Participation in study
Your participation in this study is entirely voluntary. Your participation is confidential and in no way can the responses be linked back to any individual. A consent form was attached to the email for you to read.

This research has been approved by the UW-Stout IRB as required by the Code of Federal Regulations Title 45 Part 46.

1. I have read the consent form and realize that I am taking this survey voluntarily.
  Yes   No

Instructor Effectiveness

The instructor....

2. had the ability to communicate concepts.
  Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

3. was successful in communicating or explaining subject matter.
  Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

4. had an online presence in the courses.
  Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

5. created a style of delivery appropriate to the courses.
  Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

6. demonstrated organization with course materials.
  Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

7. had the ability to involve students with classroom interaction.
  Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

8. was responsive to email.
  Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

9. motivated student interest and intellectual effort.
  Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

10. was available to students.
  Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

11. provided feedback in a timely manner.
     Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

12. provided feedback in a manner that was constructive and non-threatening.
     Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

Online Courses/Learning Experience

13. Before starting the courses, I was advised about the technology and skills required to be successful in online courses.
     Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

14. Before starting the courses, I received necessary orientation information to gain access to online courses (D2L).
     Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

15. The learning outcomes/objectives for each course were clear.
     Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

16. The course syllabi were clear.
     Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

17. The content of the courses was pertinent in attaining my professional goals.
     Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

18. The course discussions were conducive to learning.
     Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

19. The work required for the courses was appropriate for the program.
     Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

20. The textbook(s) and materials were appropriate for the courses.
     Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

21. My interaction with the instructor and students was facilitated through a variety of ways.
     Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

22. The quality of interaction with the instructor and students equaled or surpassed the quality of interaction of face-to-face courses I have taken.
     Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

23. I had a general sense of belonging in the online courses and the program.
     Strongly Agree   Agree   Disagree   Strongly Disagree   N/A

Rate the following:

24. How were the online courses compared to other face-to-face courses?
    Excellent   Above Average   Average   Below Average   Poor

25. How was the user-friendliness of Desire2Learn (D2L)?
    Excellent   Above Average   Average   Below Average   Poor

26. How was the ease of navigation of Desire2Learn (D2L)?
    Excellent   Above Average   Average   Below Average   Poor

Answer the following:

27. How would you rate your general level of computer expertise?
    Expert   Knowledgeable   Novice

28. On average, how many hours per week did you spend on the courses?
    up to 1   2-5   6-10   >10

29. Would you take online courses again at UW-L?
    yes   no

30. How many online courses did you take prior to this program?
    0   1   2   3   >3

31. Employment during the program.
    ≤15 hrs/week   16-34 hrs/week   35 or > hrs/week   not employed

Overall, I was satisfied with the:

	Strongly Agree	Agree	Disagree	Strongly Disagree	N/A
32. instructor					
33. online courses					
34. online Medical Dosimetry Program					
35. IT support					
36. Library Services					
37. Registration Office					
38. Financial Aid Office					
39. Admissions Office					
40. Cashier's Office					

How important were these factors in your decision to enroll in this online program?

	Very Important	Important	Unimportant	Very Unimportant	N/A

41. Distance from campus					
42. Conflicts with personal schedule					
43. Course not offered offline					
44. Family responsibilities					
45. Convenience					
46. Recommendation from employer					
47. Work schedule					
48. Flexible pacing in completing program					
49. Reputation of institution					
50. Cost					

51. Do you have any suggestions for improving the online courses?

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Demographics

52. Gender
  Male   Female

53. Age
  20-25   26-35   36-45   46-55   56-65   >65

54. Race/Ethnicity
  African-American   American Indian or Alaskan native

  Asian or Pacific Islander Caucasian/White   Hispanic

  Other _____

55. Marital Status
  Single   Single with children   Married   Married with children

56. Educational Goal

Associate Degree   Bachelor's Degree   Master's Degree

Doctorate Degree   Certification   Self-improvement

Job-related training   Other _____

57. Current employment
    Full time   Part time   Not employed

58. Current residence
    Own home   Rent home/apartment   Other _____

59. Year of enrollment
    2004-05   2005-06   2006-07

Appendix E

Data Collection and Analysis

1. I have read the consent form and realize I am taking the survey voluntarily.

Yes	No	Response total	Response percent
35	0	35	███
100%	0%	███	100%

Questions #2 – 12 asks the participant about the instructor effectiveness:
   (SA=strongly agree; A=agree; D=disagree; SD=strongly disagree)

2. The instructor had the ability to communicate concepts.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
17	17	1	0	0	35	███		
48.5%	48.5%	3%	0%	0%	███	97%	3.5	0.6

3. The instructor was successful in communicating or explaining subject matter.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
17	17	1	0	0	35	███		
48.5%	48.5%	3%	0%	0%	███	97%	3.5	0.6

4. The instructor had an online presence in the courses.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
25	9	1	0	0	35	███		
71%	26%	3%	0%	0%	███	97%	3.7	0.5

5. The instructor created a style of delivery appropriate to the courses.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
17	18	0	0	0	35	███		
49%	51%	0%	0%	0%	███	100%	3.5	0.5

6. The instructor demonstrated organization with course materials.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
26	9	0	0	0	35	███		
74%	26%	0%	0%	0%	███	100%	3.7	0.4

7. The instructor had the ability to involve students with classroom interaction.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
17	15	1	0	2	35			
48.5%	42.5%	3%	0%	6%		91%	3.5	0.6

8. The instructor was responsive to email.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
28	6	0	1	0	35			
80%	17%	0%	3%	0%		97%	3.7	0.6

9. The instructor motivated student interest and intellectual effort.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
15	19	1	0	0	35			
43%	54%	3%	0%	0%		97%	3.4	0.6

10. The instructor was available to students.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
23	11	1	0	0	35			
66%	31%	3%	0%	0%		97%	3.6	0.5

11. The instructor provided feedback in a timely manner.

SA	A	D	SA	N/A	Response total	SA+A %	Mean	Standard Deviation
22	12	0	1	0	35			
63%	34%	0%	3%	0%		97%	3.6	0.7

12. The instructor provided feedback in a manner that was constructive and non-threatening.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
18	16	1	0	0	35			
51%	46%	3%	0%	0%		97%	3.5	0.6

Questions #13-21 asks the participant about the online courses.

13. Before starting the courses, I was advised about the technology and skills required to be successful in online courses.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
19	15	0	0	0	34			
56%	44%	0%	0%	0%		100%	3.6	0.5

14. Before starting the courses, I received necessary orientation information to gain access to online courses (D2L).

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
21	12	1	0	0	34			
62%	35%	3%	0%	0%		97%	3.6	0.6

15. The learning outcomes/objectives for each course were clear.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
23	11	0	0	0	34			
68%	32%	0%	0%	0%		100%	3.7	0.5

16. The course syllabi were clear.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
23	11	0	0	0	34			
68%	32%	0%	0%	0%		100%	3.7	0.5

17. The content of the courses was pertinent in attaining my professional goals.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
18	15	0	0	0	33			
55%	45%	0%	0%	0%		100%	3.5	0.5

18. The course discussions were conducive to learning.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
14	20	0	0	0	34			
41%	59%	0%	0%	0%		100%	3.4	0.5

19. The work required for the courses was appropriate for the program.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
14	19	0	0	0	33			
42%	58%	0%	0%	0%		100%	3.4	0.5

20. The textbook(s) and materials were appropriate for the courses.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
18	15	0	0	0	33			
55%	45%	0%	0%	0%		100%	3.5	0.5

21. My interaction with the instructor and students was facilitated through a variety of ways.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
14	19	1	0	0	34			
41%	56%	3%	0%	0%		97%	3.4	0.6

Questions #22 – 26 asks participants about the student interaction with peers, instructors, belonging to the program, distance education vs. face-to-face courses, and web-based learning platforms.

22. The quality of interaction with the instructor and students equaled or surpassed the quality of interaction of face-to-face courses I have taken.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
7	16	9	2	0	34			
21%	47%	26%	6%	0%		68%	2.8	0.8

23. I had a general sense of belonging in the online courses and the program.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
12	19	2	0	0	33			
36%	58%	6%	0%	0%		94%	3.3	0.6

24. How were the online courses compared to other face-to-face courses?

Excellent	Above Average	Average	Below Average	Poor	Response total	E + AA + A Percentage
8	13	13	0	0	34	
24%	38%	38%	0%	0%		100%

25. How was the user-friendliness of Desire2Learn (D2L)?

Excellent	Above Average	Average	Below Average	Poor	Response total	E + AA + A Percentage
14	13	6	1	0	34	
41%	38%	18%	3%	0%		97%

26. How was the ease of navigation of Desire2Learn (D2L)?

Excellent	Above Average	Average	Below Average	Poor	Response total	E + AA + A Percentage
14	12	7	1	0	34	
41%	35%	21%	3%	0%		97%

Questions #27 – 31 ask participants about their computer experience, prior online course experience, hours spent on coursework, and employment during the program.

27. How would you rate your general level of computer expertise?

Expert	Knowledgeable	Novice	Response total
4	26	4	34
12%	76%	12%	

28. On average, how many hours per week did you spend on the courses?

up to 1	2 - 5	6 - 10	>10	Response total
0	3	23	8	34
0%	9%	67.5%	23.5%	

29. Would you take online courses again at UW-L?

Yes	No	Response total	Positive %
33	1	34	
97%	3%		97%

30. How many online courses did you take prior to this program?

0	1	2	3	> 3	Response total
24	2	1	1	6	34
70.5%	6%	3%	3%	17.5%	

31. Employment during the program.

≤ 15 hrs/wk	16 – 34 hrs/wk	≥ 35 hrs/wk	Not employed	Response total
1	5	27	1	34
3%	15%	79%	3%	

Questions #32 – 40 ask the participant to rate their overall satisfaction.
(SA=strongly agree; A=agree; D=disagree; SD=strongly disagree)

32. Overall, I was satisfied with the instructor.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
23	10	1	0	0	34			
68%	29%	3%	0%	0%		97%	3.6	0.5

33. Overall, I was satisfied with the online courses.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
18	15	1	0	0	34			
53%	44%	3%	0%	0%		97%	3.5	0.6

34. Overall, I was satisfied with the online Medical Dosimetry Program.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
20	14	0	0	0	34			
59%	41%	0%	0%	0%		100%	3.6	0.5

35. Overall, I was satisfied with the IT Support.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
10	20	1	0	3	34			
29%	59%	3%	0%	9%		88%	3.3	0.5

97% - applicable responses

36. Overall, I was satisfied with library services.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
4	11	1	0	18	34			
12%	32%	3%	0%	53%		44%	3.2	0.5

94% - applicable responses

37. Overall, I was satisfied with the registration office.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
9	21	0	0	4	34			
26%	62%	0%	0%	12%		88%	3.3	0.5

100% - applicable responses

38. Overall, I was satisfied with the financial aid office.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
8	8	0	0	18	34			
23.5%	23.5%	0%	0%	53%		47%	3.5	0.5

100% - applicable responses

39. Overall, I was satisfied with the admissions office.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
9	19	0	0	6	34			
26%	56%	0%	0%	18%		82%	3.3	0.5

100% - applicable responses

40. Overall, I was satisfied with the cashier's office.

SA	A	D	SD	N/A	Response total	SA+A %	Mean	Standard Deviation
9	18	0	1	6	34			
26%	53%	0%	3%	18%		79%	3.4	0.5

96% - applicable responses

Questions #41 – 50 ask the participant how important these factors were in their decision to enroll in this online program.

41. Distance from campus.

Very Important	Important	Unimportant	Very Unimportant	N/A	Response total
15	2	9	6	2	34
44%	6%	26%	18%	6%	

42. Conflicts with personal schedule.

Very Important	Important	Unimportant	Very Unimportant	N/A	Response total
14	15	3	1	1	34
41%	44%	9%	3%	3%	

43. Course not offered offline.

Very Important	Important	Unimportant	Very Unimportant	N/A	Response total
15	7	4	3	5	34
44%	20.5%	12%	9%	14.5%	

44. Family responsibilities.

Very Important	Important	Unimportant	Very Unimportant	N/A	Response total
21	10	3	0	0	34
62%	29%	9%	0%	0%	

45. Convenience.

Very Important	Important	Unimportant	Very Unimportant	N/A	Response total
26	8	0	0	0	34
76%	24%	0%	0%	0%	

46. Recommendation from employer.

Very Important	Important	Unimportant	Very Unimportant	N/A	Response total
9	12	6	0	7	34
26%	35%	18%	0%	21%	

47. Work schedule.

Very Important	Important	Unimportant	Very Unimportant	N/A	Response total
20	12	2	0	0	34
59%	35%	6%	0%	0%	

48. Flexible pacing in completing program.

Very Important	Important	Unimportant	Very Unimportant	N/A	Response total
21	10	1	0	1	33
64%	30%	3%	0%	3%	

49. Reputation of institution.

Very Important	Important	Unimportant	Very Unimportant	N/A	Response total
14	17	0	1	2	34
41%	50%	0%	3%	6%	

50. Cost.

Very Important	Important	Unimportant	Very Unimportant	N/A	Response total
10	18	6	0	0	34
29%	53%	18%	0%	0%	

Question #51 is a qualitative question asking for any additional feedback.

51. Do you have any suggestions for improving the online courses?
- Make is a Master's Degree Program
- You might try recording the instructor actually working equations in physics and dose calculations on a whiteboard and having students download and play the video or mail a CD to each one. This might give additional help and reinforcement to the visual learners who are used to watching math problems worked out on a board initially. The current delivery method works, but this might be an additional boost. Overall the program is already really good.
- Add a basic math class.
- The audible component is also essential. I understand that now pictures of the other students are present. I could have gotten to know my fellow students better.
- More involvement with all students at the same time. Offer a review class prior to boards.
- I took my therapy training with distance learning courses. This is what online learning should be like. The instructor's responses were immediate and the class discussions had me discussing my coursework more than those in face-to-face classes in the past. I would (and have) recommend this program to others.
- The Stanford DTT needs a lot of work. As a student in the first online class I found many errors in the content and presentation of the DTT material but as of course end the errors were not yet corrected. There were also many graphics (in DTT) that were too small in format to be of value (CT slices). Overall the UWLAX portion is excellent. Either get DTT fixed or dump it from the curriculum. Why not advertise the program in the professional journals such as the ASRT and Radiation Therapy journals. There must be many people like me who would love to train for Medical Dosimetry but cannot attend a formal program. I found out about the program through the physicist at my facility.
- Some of the information require for reading/assignments was repetitious when using the Stanford DTTand the D2L although sometimes they did help clarify one another.
- A visual to help with calculation problems.
- Course content was challenging and structured to improve my knowledge of the courses material. This was my first opportunity to take a distance education program and this program surpassed my expectations. I can see the practical application of my knowledge gained through this training everyday. I will strongly recommend this program to my peers.
- I think it was a great program! I cannot think of anything I could add to id, maybe adding another instructor?
- I though everything ran smoothly. I was able to receive an advanced education online from a different state than the school was located in. This is the only

program of its kind for Medical Dosimetry and I would not have been able to go to school and achieve my goals without the online format. I enjoyed the experience and learned a tremendous amount through this format.

- More dosimetry calculations, less paper writing skills.
- Maybe looking at ways to supplement courses where DTT is the only reading. I found the some of their material was way over my head. I really don't care how to derive mathematically IMRT algorithms.
- Maybe some of the exams should be taken at a testing center.
- Seemed like a lot of information. Made it very hard to study for exams. Would be great to see there be a review course become available. Even if it is done on campus for 4-5 days. I really feel there needs to be some kind of review for students. The Stanford DTT modules were very frustrating. Didn't work, had to redo many of them because of their system. Was not happy at all with that.
- More example practice problems, especially more day to day problems rather than obscure stuff.
- I think more weekly test and homework assignments are needed.
- The program was great and I gained and enormous amount of knowledge in a short amount of time. I felt very prepared to perform the duties of a dosimetrist at an entry level position. Mentors play a huge role in the program. This could be a little more emphasized so that mentors are not just signing up to assist but are aware of their importance in the program.
- N/A. It is great! I wish they would offer an online medical physics program (master's level).
- N/A.

Questions #52 – 59 ask the participant demographic questions.

52. Gender.

Male	Female	Response total
9	24	33
27%	73%	

53. Age.

20 – 25	26 - 35	36 - 45	46 - 55	56 - 65	>65	Response total
1	17	10	4	1	0	34
3%	52%	30%	12%	3%	0%	

54. Race/Ethnicity.

African-American	American Indian or Alaskan Native	Caucasian/White	Hispanic	Asian or Pacific Islander	Other, Please specify	Response total
0	0	31	2	1	0	34
0%	0%	91%	6%	3%	0%	

55. Marital Status.

Single	Single with children	Married	Married with children	Response total
6	1	8	19	34
17.5%	3%	23.5%	56%	

56. Educational Goal.

Associate Degree	Bachelor's Degree	Master's Degree	Doctorate Degree	Job-related training	Certification	Self-improvement	Other, Please specify*	Response total
1	7	9	0	3	13	0	1	34
3%	21%	26%	0%	9%	38%	0%	3%	

*have a BS and CMD

57. Current employment.

Full time	Part time	Not employed	Response total
28	6	0	34
82%	18%	0%	

58. Current residence.

Own home	Rent home/apartment	Other, please specify*	Response total
29	3	2	34
85%	9%	6%	

*own a home and renting a home
*mortgage on home

59. Year of enrollment.

2004-05	2005-06	2006-07	Response total
9	15	10	34
26.5%	44%	29.5%	