Faculty development for electronic technology-based distance education in public two-year institutions of higher education with allied health programs
by Irene Louise Elizabeth Mueller

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Education in Education
Montana State University

Abstract:
Public two-year higher education institutions in the United Sates are offering electronic-technology based distance education courses at a rapidly accelerating pace in response to multiple external and internal forces. Faculty competency in the use of electronic-technology based technologies and media appropriate teaching-learning methods is essential for the current and future success of distance education. This study examined the beliefs of deans, department heads, and distance education faculty members regarding what types of professional development education activities and support-related elements should be provided by public two-year higher education institutions that are offering electronic technology-based distance education.

This survey research used a researcher-developed instrument to investigate the beliefs of administrators and distance education faculty members regarding what types of professional development education activities and support-related elements should be provided by public two-year higher education institutions that are offering electronic-technology based distance education. The 48 institutions in this study also offered at least one allied health technical program. Three institutional attributes (size of institution, number of distance education courses, and number of years offering distance education courses) were also examined.

Usable responses came from 173 individuals or 73.9% of those surveyed. The overall beliefs of administrators and distance education faculty were very similar, with a few exceptions. Both groups rated the same ten professional development items as the most important. The top four support-related elements were: distance education equipment is well-maintained; on-site technical assistance; time to learn, plan, try, reflect, revise; and access to distance education equipment when faculty need preparation. The three top content topics were: instructional strategies that work well using distance education technologies; logistics of distance education teaching; and creating technology-appropriate teaching aids. The three top learning activities were: use of actual distance education equipment and technology; experiential (hands-on) learning activities; and practice activities in actual distance education setting.

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Irene Louise Elizabeth Mueller

This dissertation has been read by each member of the dissertation committee and has been found to be satisfactory regarding content, English usage, format, citations, bibliographic style, and consistency, and is ready for submission to the College of Graduate Studies.

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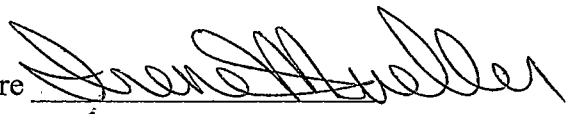
Signature 

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Abstract

Public two-year higher education institutions in the United Sates are offering electronic-technology based distance education courses at a rapidly accelerating pace in response to multiple external and internal forces. Faculty competency in the use of electronic-technology based technologies and media appropriate teaching-learning methods is essential for the current and future success of distance education. This study examined the beliefs of deans, department heads, and distance education faculty members regarding what types of professional development education activities and support-related elements should be provided by public two-year higher education institutions that are offering electronic technology-based distance education.

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Usable responses came from 173 individuals or 73.9% of those surveyed. The overall beliefs of administrators and distance education faculty were very similar, with a few exceptions. Both groups rated the same ten professional development items as the most important. The top four support-related elements were: distance education equipment is well-maintained; on-site technical assistance; time to learn, plan, try, reflect, revise; and access to distance education equipment when faculty need preparation. The three top content topics were: instructional strategies that work well using distance education technologies; logistics of distance education teaching; and creating technology-appropriate teaching aids. The three top learning activities were: use of actual distance education equipment and technology; experiential (hands-on) learning activities; and practice activities in actual distance education setting.

CHAPTER 1

INTRODUCTION

Background of the Study

As the amount of information in the world grows and access to information becomes more essential in all occupations (Stuart 1999), the need to continually learn becomes vital for both educators and students. Increasingly, the economy of the United States and the world is based on information. At the beginning of the 21st Century, over fifty percent of all workers in the United States are employed as knowledge workers in information-using or information technology-producing industries (Beniger, 1988; MacBrayne, 1995; U.S. Dept. of Labor, 1999). In a knowledge age, successful societies will be those that effectively and efficiently integrate information technologies with learning (Bates, 1995b; Stuart 1999). Lifelong learning and learning on demand (Klus, 1998) are becoming and will be central components of every workplace.

This increase in information-based work is linked to rapidly evolving technology that provides world-wide access to information. Information technology not only creates the need to learn new knowledge and skills, but also provides methods for meeting this need (Farman, 1995; Heterick, 1995; Klus, 1998). Descriptions of information technology (Gooler, 1987; Roth, 1995) include combinations of telecommunication and computer hardware and software that provide access to enormous amounts of many types of information, to many users, in many locations. In 1996, 80% of all business changes

involved information technology (Gehring, 1997). Information technology provides the infrastructure for the organizations of the future; flexible, organic, and cybernetic networks producing information processing, recognition of changing patterns, and societal learning within an environment of constant change (Henderson, 1996). Pressures from the growing volumes of information and the constant change of electronic-based technologies create a great need for continual learning.

As a response to the needs created by overwhelming amounts of information, changing technology, and the continuous learning required by many professions, educational institutions are using electronic-based distance education technologies to improve access to education (Lever-Duffy & Lemke, 1996a). At the turn of the 21st Century, higher education institutions are responding to multiple related challenges regarding outcomes, accessibility, and costs (Ehrmann, 1995a). Well designed electronic-based distance education programs can be effective in meeting all of these challenges. The increasing use of information technologies (including distance education technologies) within educational institutions directly impacts the faculty of organizations, including those in public two-year higher education.

Statement of Problem

Public two-year higher education institutions that offer profession-accredited technical education programs are facing increasing pressures to offer current, electronic technology-based distance education courses and curricula that meet the workplace needs of employers and employees. Research (Keast, 1997; Wolcott, 1997) has identified the

provision of support for learning and change through comprehensive faculty development programs as essential for an organization to successfully compete in higher education.

Provision of professional development for faculty is most effective when it incorporates adult learning theory and practices. The best practices identified in research on professional development reflect basic adult learning theory. However, the 1990s research literature does not address faculty development programs for distance education faculty using electronic technologies in public two-year higher education in general, or in terms of continuing education and support-related elements.

Studies conducted in the 1990s (Olcott & Wright 1995; Wolcott 1997) show that there are discrepancies between the support systems for traditional faculty duties such as research and traditional classroom teaching, and distance education teaching duties such as creating an effective mediated environment and matching subject content with appropriate media in four-year higher education institutions. However, little research has focused on distance education teaching in public two-year higher education institutions, although some research has examined the adoption process for educational technology in general.

Parisot (1995) conducted a qualitative case study of the adoption of electronic-based education technologies by the faculty of one community college. In another study, two-year higher education institutions were included in a national survey of distance education. Of the questionnaire's 20 questions, one asked about "training opportunities required of or available to faculty who teach distance education courses" and one asked about support of distance education teaching (Lewis, Alexander, & Farris, 1997, p. B-5).

A 1998 search of the online ERIC database conducted by the researcher found over 1700 citations for the term "distance teaching" from 1970 to 1998, but fewer than 10 were pertinent to this research study.

Significance of the Study

From studies of educational and other successfully adopted electronic-based technologies, it is known that faculty development is a key factor for successful distance education (Eraut, 1987; Fowler, 1995; Joyce & Showers, 1988; Wheeler, Batchelder, & Hampshire, 1996; Willis, 1992 & 1994a). For distance education faculty development, there were several reasons this study was undertaken.

The changing education environment embodied in distance education requires substantial professional development for an institution of higher education and its people to prepare for and successfully meet the challenges and different opportunities being created by the use of electronic based information and academic technologies. Effective distance education will have outcomes that measurably benefit distance education students and society as a whole. Effective implementation of very expensive electronic technology-based distance education requires the users of the technologies be confident and competent in their understanding and application of the theories and methods of distance education. Faculty competency in the use of electronic-based technologies and media-appropriate teaching-learning methods is essential for the current and future success of distance education.

With financial constraints in public two-year higher education limiting the amount of professional development and support provided to distance education teachers and other personnel, it is vital to use available resources wisely and effectively. Professional development and support resources that incorporate adult learning theory and practices will be more effective and successful. An understanding of distance education faculty as adult learners and the types of learning opportunities and support they need to develop new competencies will increase the efficiency and effectiveness of professional development programs. The results of this study will serve as a part of the needs assessment process for effective distance education professional development in public two-year higher education institutions, and add to the at-present small research base.

Purpose

This research study examined the beliefs of deans, department heads, and distance education faculty members regarding what types of professional development education activities and professional development support-related elements should be provided by public two-year higher education institutions that are offering electronic technology-based distance education. The institutions in this study also offered at least one allied health technical program since the allied health professions of the health care industry are extensively using electronic-based information technologies.

Research Questions

The following research questions directed this study:

Question 1. What elements of professional development and support for faculty using electronic technologies in distance education are most important to distance education faculty in institutions of public two-year higher education?

Question 2. What elements of professional development and support for faculty using electronic technologies in distance education are most important to department heads in institutions of public two-year higher education?

Question 3. What elements of professional development and support for faculty using electronic technologies in distance education are most important to deans in institutions of public two-year higher education?

Question 4. Are there significant differences among these three groups?

Question 5. Is the size of an institution (as measured by student population) a significant factor in the value ascribed to professional development and support elements for distance education faculty by these three groups?

Question 6. Is the number of years an institution has been providing distance education a significant factor in the value ascribed to professional development and support elements for distance education faculty by these three groups?

Question 7. Is participation in a profession-accredited health care technical program a significant factor in the value ascribed to professional development and support elements by Allied Health faculty?

General Procedures

This descriptive research study focused on public two-year higher education institutions in ten western states and Hawaii that offer electronic technology-based

distance education. These institutions were also offering at least one profession-accredited healthcare technical program. The study used a questionnaire to investigate what types of professional development and support were considered most important by three groups: deans; department heads; and distance education faculty. Quantitative data from the completed questionnaire were analyzed using descriptive statistics including means, *t*-tests, and one-way analysis of variance (ANOVA). Qualitative data in the form of written statements were also analyzed.

Limitations/Delimitations

This study's respondents were limited to deans, department heads, and distance education faculty of public two-year higher education institutions and excluded faculty, department heads, and deans of four-year or private institutions of higher education. The researcher further limited the study to distance education faculty and department heads and deans of public two-year higher education institutions offering at least one profession-accredited healthcare technical program. The study's scope was limited to investigating the types of professional development activities and support-related elements that were considered most important for distance education faculty members using electronic technologies.

There were several additional limitations of this research study, mainly related to the use of a survey research design. The use of a researcher-designed instrument to collect information is a limitation. The instrument was revised based on the results of pilot-testing and content review, but the respondents may not have interpreted the

questions asked as the researcher intended. Another limitation is that the researcher relied on the distance education coordinator at each institution in the survey population to identify distance education faculty, department heads and deans. This may have reduced the possibility of all potential subjects having an equal possibility of being selected for the study.

Definition of Terms

For the purposes of the study, the following terms were defined.

Continuing professional education – is education to maintain and improve professional competence, ... and is a special subset of the broad field of adult and continuing education (Hunt, 1992, p. 1).

Distance education – the various forms of study at all levels which are not under the continuous, immediate supervision of [teachers] present with their students in lecture rooms or on the same premises but which, nevertheless, benefit from the planning, guidance, and teaching of a supporting organization (Holmberg, 1989, p. 2).

Distance education department or office – A separate organizational entity that supports and coordinates the distance education activities of an institution.

Distance education teacher – An educator that is 1) a presenter of information, feedback, and skills development "through the use of interactive, prepared multi-media materials" and 2) a counselor providing "students guidance, knowledge building, argument and creative thinking, hypothesis development and testing, inter-personal skills development and group work" through mediated contacts (Bates, 1995a, p. 14).

Electronic technology-based distance education - education or training courses delivered to remote (off-campus) location(s) via audio, video, or computer technologies. Courses conducted exclusively via correspondence are not included, nor are courses in which the instructor travels to a remote site to deliver instruction in person. (Lewis, Alexander, & Farris, 1997, p. B-3).

Faculty development – Typically focuses on enhancing the talents, expanding the interests, improving the competence, and facilitating the professional and personal growth of faculty members, primarily in their role as instructors (Willis, 1994b, p. 279).

Information Technology – Information technology is a term that encompasses a variety of hardware and software configurations, including computer-based instruction systems, distance learning technologies, and integrated learning systems (Roth, 1995, p. 76).

Professional development support-related elements - Support-related elements include; access to well-maintained equipment, the presence of on-site technical support personnel, release time, an organizational structure that allows group collaboration, feedback from peers and experts, and in-class coaching (Joyce & Showers, 1988; Parisot, 1995; Willis, 1992 & 1994b).

Lifelong Learning - the desire to continue to learn throughout life and the capacity to do it. Lifelong learning occurs in different settings in response to change. Characteristics of lifelong learning are that it be lifelong, lead to a systematic increase of a person's knowledge and skills and also result in an attitudinal change, promote self-fulfillment (professional development) as its ultimate goal, strive to increase the learner's ability to be self-directed in learning, acknowledge the contribution of all available educational influences (the learning society) (Lewis, 1998, p. 62).

Profession-based accreditation – A process of external peer review [that] grants public recognition to a ...specialized program of study that meets established qualifications and educational standards, as determined through initial and subsequent periodic evaluations. To become accredited, programs are assessed for their compliance with national education standards. Standards are usually flexible enough to allow educational programs to respond to continuous technological changes. The agency evaluating the educational programs in accordance with national standards developed by the profession must be recognized for that purpose by the U. S. Department of Education, the Council on Recognition of Postsecondary Accreditation, or an equivalent agency. (American Medical Association, 1998, p. 1-2).

Professional development- The purpose of professional development is to help...practitioners acquire the knowledge, skills, attitudes, and behaviors needed to achieve the purposes of their jobs and to improve their performance (Galbraith & Zelenak, 1989, p. 126).

Public two-year higher education institution – any [non-federal] publicly supported institution that is accredited to award the associate in arts or sciences as its highest degree (Clearinghouse for Community Colleges, 1994, p. 1). Individual institutions can be classified as technical institutes, junior, or community colleges (Bredeson & Willower, 1991, pp. 862-863).

Staff development - a learning effort sponsored by an organization which considers previous learning and work of the staff, and the needs and goals of the organization. It includes training; development of the individual's career; and the organization's development and renewal. (Miller & Verduin, 1979, p. 4).

Technical program – those programs in two-year higher education that prepare people to be employable at the end of a one or two year certificate, diploma, or Associate of Applied Science degree.

Transfer – the incorporation of skills, strategies, and curriculum patterns into participants' active teaching repertoires (Showers, Joyce, & Bennett, 1987, p. 85).

In a global knowledge society, distance education can "extend and enrich traditional modes of instruction at the post-secondary level" (Advisory Committee for Online Learning, 2000, p. ix). Well-designed and effective distance education that meets the needs of students, employers, and continuing professional education requires competent and effective distance education faculty members.

CHAPTER 2

REVIEW OF THE LITERATURE

Higher education institutions are offering electronic technology-based distance education in response to multiple-related challenges including growing volumes of information, constantly changing technologies, and expectations regarding outcomes, accessibility, and costs. A key factor in the success of distance education is the distance education faculty member who requires support for learning and change through comprehensive faculty development programs due to the changing roles of the teacher in distance education.

Distance education history and broad societal and specific public education forces for the increasing use of distance education are reviewed first. This review continues with a section on the use of distance education in institutions of two-year higher education. Because change in both organizations and their people's roles results when distance education is used by an institution of higher education, a review of the change process in organizations is provided. Since change in roles and performance creates a need for learning and successful application of new learning for new performance, the research in continuing professional education, adult learning, and staff development is also reviewed. Then, the changing roles of administrators and distance education faculty members are reviewed. Finally, professional development for distance education faculty, including barriers and support elements, is reviewed.

Distance Education

Distance education (DE) has a centuries-long history in Europe and the United States, beginning with the use of non-electronic technologies (Holmberg, 1989). With the development of a fast and dependable mail service in the 1800s, modern distance education in the U.S. began with correspondence education and off-campus extension services (Bates, 1995b; Pittman, 1990). The term "distance education" was used in 1892 at the University of Chicago, but "correspondence education" was the generally accepted term during the first half of the 20th Century (Moore, 1987, p. 42).

The International Council on Correspondence Education (ICCE) was founded in 1938 with a membership drawn from five countries: Canada, United States, Scotland, Australia, and New Zealand (Moore, 1987; D. Sewart, personal communication, December 21, 2000). Radio, during the first half of the 1900s, was the first electronic communication medium used in distance education (MacBrayne, 1995). Telecourses using broadcast television began in the 1950s. The British Open University, established in 1969, was the first solely distance education higher education institution in the world.

The English term "distance education" is a translation of several terms ("Fernunterricht", in Germany and "Educacion a distancia" in Spain) used in European countries and was first widely used at a conference of the International Council for Correspondence Education (ICCE) in 1972. During the 1970s, use of television as an educational technology continued to grow, and by 1979, 71% of all U.S. colleges and universities were using instructional television. A formal recognition of the term

"distance education" occurred when the ICCE changed its name to International Council for Distance Education (ICDE) in 1982 (Moore, 1990).

In 1993, 34% of US colleges and universities were offering for-credit, distance education courses (Twigg, 1996). Many of these distance education offerings were at the two-year level; by 1994 over three-fourths of U.S. community colleges offered distance education in some form and 85% of two-year colleges will offer distance education by 2002 (National Center for Education Statistics, 1997; Parrott, 1998; Tech Notes, 1999). The percentage of higher education institutions using asynchronous distance education (anytime-anywhere learning) using online computer-based communication increased from 22% in 1992 to over 60% in 1995 (Going the Distance, 2000). Over 750,000 students were participating in distance education courses during 1994-1995 (Rucker, 1998). By September 1999, over 1,450 colleges and universities in the United States were connected to the World Wide Web (University of Texas, 1999). By the late 1990s, distance education providers more and more frequently used electronic communication media/technologies such as interactive video, e-mail, and computer systems that communicate over the Internet or World Wide Web.

Many European and U.S. authors and organizations have defined distance education, creating multiple variations, but most include two key components (American Council on Education, 1996; Feasley, 1992; Holmberg, 1989; Keegan, 1990; Orivel, 1994; Rumble, 1992; Thomson, 1995). One essential component is physical separation of teacher and learner and the other component is communication between learner and teacher that is mediated by a communication technology such as print, radio, or video.

A third element that distinguishes distance education within distance learning is the influence of an education organization (Kovel-Jarboe, 1990) in setting the goals of distance teaching (Saba, 1990). An educational institution's administrative influence directs the establishment of distance education goals, requirements, media selection, and time frames for distance students, faculty, and support staff.

A more specific definition pertinent to today's rapidly expanding electronic technology-based distance education refers to "third-generation" distance education, which is "based on the use of electronic information technologies. These provide far greater facility for two-way communication, and result in much more even communication between student and teacher (and also between students)" (Bates, 1995b, p. 23). This type of distance education is "a new situation that needs to be analyzed and understood as a system" in which the learning environment has changed and a completely new communicative situation exists (Ingesman, 1993, p. 83). During the 1990s, studies (Husen & Postlethwaite, 1994; Lucas, 1998) showed that electronic technology-based distance education was being rapidly added to the traditional methods of instruction used in public higher education as one way of adapting to a new global setting.

The use of electronic technology in distance education allows educational institutions to increase their abilities to serve all potential students, including those in formerly inaccessible rural, remote locations (Dubois, 1996; Hopey & Ginsburg, 1996; Obbink, 1998; Porter, 1997). Distance education is just one of the World Wide Web applications that are being used by higher education, which include other student services such as marketing, registration for courses, and providing Web-based forms for admission and requesting transcripts and financial aid (McCandless, 1999). The

increasing use of electronic technology-based distance education is one method that higher education in the United States is using in reforming itself "in terms of its fundamental purposes, organizational structures, desired outcomes, and populations it serves" (Bredeson & Willower, 1991, p. 865). Multiple forces are encouraging the use of distance education by public higher education institutions.

Distance Education Forces

The reasons for higher education's movement to distance education can be classified into two general categories. The first category includes broad societal changes that are part of the paradigm shift from Industrial Age to Information/Knowledge Age and the second includes more specific public education changes that are rapidly occurring in response to the broader pressures of socio-economic change. The broader, societal changes related to distance education include an increasing need for lifelong learning, electronic-based technologies, expectations of business and industry, and accreditation of education programs by various agencies and professional organizations. Education-specific changes include financial measures, accreditation of distance education, and the needs of distance education students.

Lifelong Learning. As new technologies change human lives (Bandura, 1986) in the rapidly changing global environment of the 21st century, lifelong learning is a key element and necessity for successful economic survival for individuals, organizations, and societies (Joint Committee on Education, 2000; Klus, 1998; Miller, 1990; Paulson, 1990; Stuart, 1999). Lifelong learning is "the inevitable reality for the future of education in affluent, technologically advanced, and pluralistic societies" (Tuijnman & Van Der

Kamp, 1992a, p. vii). The average worker in the near future will have six or seven different careers, each requiring new skills, new attitudes, and new values. In 2000, 75% of the work force needed retraining (MacBrayne, 1995; Twigg, 1994b), creating a constant need for formal learning opportunities that can be provided on demand (Klus, 1998). Distance education can help in addressing the issues of social equity and access to learning opportunities that can increase economic development for individuals and society as a whole (Bates, 1995b).

The federal government, working in partnership with labor unions and businesses, is making lifelong learning a major initiative and developing an e-learning agenda (Stuart, 1999; Web-Based Education Commission, 2000). One of the government's related policy goals is professional development in education (Krebs, 2000b). Lifelong learning requires the development of a learning society, which is "learner-based, has no access barriers, and provides a flexible, lifelong system of education" (Lewis, 1998, p. 62). Other social changes impacting the growth of lifelong learning include changing lifestyles, and the increased level of education in the populace (MacBrayne, 1995). One way to meet the lifelong learning needs of society and for institutions of higher education to continue serving their customers (students) long after graduation is by offering distance education opportunities (Davis, 1996). Many lifelong learning and continuing education needs are technology-related.

Electronic-Based Technologies. Just as electronic-based technologies are changing the way individuals live, work, and learn (Kasworm & Londoner, 2000; Wegner, 1992), they are a major change force in the adoption of distance education in

public two-year higher education. Electronic-based technologies continually create new learning requirements and also provide a way to meet the needs of students who cannot physically relocate to the traditional campus (Klus, 1998; Lever-Duffy & Lemke, 1996a; Mishoe, 1999, p. 1332). Educational technologies have multiple benefits including 1) increasing access to learning opportunities and more and better information resources, 2) accommodating a variety of learning styles and cooperative learning, 3) increasing motivation, and 4) individualizing learning (Niemi & Gooler, 1987). However, the new electronic-based educational technologies have not eliminated the teacher's key role in education in general or distance education in particular.

In education, the traditional direct connection between teacher and learner has existed for at least 3,000 years. The printed book has been an educational technology for 500 years, but did not replace or eliminate the teacher. An efficient postal service was added to educational technologies around 170 years ago as a communication medium. Then, in more rapid succession, radio (1920s), film (1930s), and television (1960s) were added to the mix of educational technologies. Although the pace quickened in the middle third of the century, there was still time to adapt. The rate of technology development has accelerated exponentially in the last half of the 20th Century. Just since 1980 (Bates, 1995b), at least 18 new technologies have been developed and used for distance education in educational institutions; ranging from audio and video cassettes, to cable and satellite television and compressed video using telephone lines, to the Internet and virtual reality. This increasing rate of development creates a constant need for change in higher education.

Higher education institutions will have to incorporate electronic-based technology into their curricula and make necessary systemic changes within their organizational structures or become unable to compete (Albright & Graf, 1992; Joint Committee on Education, 2000; Moore & Kearsley, 1996; Nixon & Leftwich, 1998). Traditional age students are entering colleges with increasing experiences and expectations for an Information/Knowledge Age learning environment as provided by distance education (Green & Gilbert, 1995; Steele, 1995). Rapidly evolving information technologies are increasing the number and types of private sector distance education organizations in direct competition with traditional campus-bound higher education. Business organizations such as Disney are rapidly becoming competitive in the distribution of distance education and are making distance education the newest major application of the Internet. As a result, potential adult learners now have more education provider choices than just the traditional higher education campus (Baker, 1994; Porter, 1997; Going the Distance, 2000). However, while some business organizations are competitors, other businesses are major consumers of public education.

Business and Industry. The use of information technologies is a basic component of many current and emerging knowledge occupations. Business and industry leaders expect and demand that the American higher education system produce prepared, highly-skilled graduates who can help companies compete successfully in the global economy (Albright & Graf, 1992; Bates, 1995a; O'Banion, 1997a). All employers, regardless of field or occupation, expect new employees to be competent in using the various types of electronic information technologies (Becker & Gibson, 1999; Green & Gilbert, 1995;

Porter, 1997; Webster & Hackley, 1997). An advantage of distance education is that in addition to learning a course's subject content, distance education students can learn "how to work independently, to budget their time effectively, and develop useful computer skills" (Gaud, 1999, p. 49). Other employee skills essential for Information/Knowledge Age work that can be learned and developed in well-designed distance education include teamwork, collaboration, and "skills of information navigation, acquisition, and analysis; application of knowledge to new situations; new knowledge creation; and decision-making" (Bates, 1997, p. 13). In 1994, the Distance Education and Training Council reported that "employers were pleased with the performance of graduates who earned their degrees through distance education" (Becker & Gibson, 1999, p. 1351).

Additionally, businesses also view distance education as a cost effective method to provide training and retraining on a continuous basis once they have hired employees (Bates, 1995b; Moore, 1993). Rumble (1992) stated that employers see many organizational benefits from using distance education for their continuing education and training needs, including: (1) employees do not have to be absent from work; (2) some costs of training may be assumed by the employee; (3) travel costs are not required; (4) employees may be more motivated because they do not have to be absent from their homes and personal responsibilities; and (5) trainers can reach physically dispersed employees more quickly.

As the nature of work changes due to rapid development of technologies, evolving career fields, and job mobility, employers and their employees need flexible and efficient methods for workplace-related learning such as those provided by distance

education. The broad societal changes of lifelong learning, electronic-based technologies, the continuing education needs of business and industry, can be viewed as distance education forces external to institutions of higher education. They are increasing the pressures of higher education internal forces such as financial measures and accreditation.

Financial Measures. Cost-effectiveness measures at many colleges and universities have focused administrators' interest on distance education as a way to meet the needs of additional students without adding buildings, other physical plant infrastructure, or incurring other financial costs (Joint Committee on Education, 2000; Page, 1999b; Spangler, Spear & Plavcan, 1995). Additionally, using electronic-based distance education is often seen as a method to save costs by replacing labor with technology (Bates, 1997). This viewpoint is a result of "misunderstanding the educational process" and can cause " a reduction in the quality of learning" (Bates, 1997, p. 3). One financial benefit of electronic technology-based distance education is that programs can share costs and experience at multiple sites (Webster & Hackley, 1997). However, creating a new digital infrastructure (Grush, 2000) using networks, servers, communication tools, applications software, and external services without competent people to effectively use the technology will not be cost effective.

As the use of distance education in higher education grows, the lack of acceptance of distance education by financial aid agencies is an additional financial issue for institutions providing electronic technology-based distance education. U.S. Department of Education regulations determined by the Higher Education Act of 1998, state that institutions that deliver more than 50% of their courses by distance education are not

Title IV program eligible and none of their students will receive federal financial aid funding (Dalziel, 1998; Tech Notes, 2000). However, all of the regional education accreditation organizations have recognized on-line distance education as a distinct part of higher education and included it in their accreditation standards (Office of Postsecondary Education, 2000).

Accreditation of Distance Education. As providing education becomes more competitive, the accreditation of higher education programs by educational and professional accrediting agencies has been and is a strong advantage. Often, a degree from an accredited higher education institution or program is seen by potential students and employers as advantageous for advancement in a career because the degree is seen as proof that an employee has attained a certain level of skills and knowledge (Rucker, 1998). Because the education accrediting agencies recognize that the mediated environment of distance education changes the teaching-learning process, their accreditation of a higher education institution does not automatically confer accreditation to its on-line courses (Rucker, 1998).

The federal government through "the Higher Education Act (HEA) require[s] accrediting bodies to reexamine distance learning to make sure the courses that receive federal funding are as rigorous and include the same quality educational objectives and outcomes as traditional on-campus programs" (Dalziel, 1998, p. 9). All regional education accreditation organizations are requiring that all on-line programs meet the U.S. Department of Education's twelve criteria for On-Line Accreditation (Rucker, 1998; Going the Distance, 2000), half of which concern faculty-related issues such as approval

by faculty curriculum committees, oversight by faculty, faculty-student interaction processes, training of faculty in delivery methods, and support for faculty. These 12 criteria are also reflected in the American Federation of Teachers' published guidelines for distance education in two- and four-year higher education institutions offering college credit-bearing degree programs (Going the Distance, 2000). The main focus of these criteria is to help ensure that an equivalent education is received by both on-campus and distance education students.

Distance Education Students. Distance education is one aspect of adult learning, a large and growing part of higher education. Higher education students at the end of the 20th Century are much more diverse than in the past and now make up higher education's new majority (Joint Committee on Education, 2000; MacBrayne, 1995; Miller, 1990; Twigg, 1994a). Over 50% of students in higher education are over 25, more than 50% are women, and over 16% are non-white. Higher education students are also much more diverse in terms of their available economic resources which leads to the increasing number of part-time adult students (Rosenquist-Buhler, 1996).

As busy adults, many higher education students need and expect educational opportunities that provide choice and convenience, conserve time, and are affordable. Adult learners are participating in distance education for many purposes (Rumble, 1992) including personal enjoyment, retraining, vocational education, or professional education. "Because of its flexibility, distance education is one of the most important means of providing for the education of adults both for on-going vocational and professional training and in non-vocational fields" (Rumble, 1986, p. 61).

Distance education adult students value continuous education, but have different needs and expectations about their relationship with an education provider than traditional college-age students (Bassett & Jackson, 1994; Bates, 1995a; Centra, 1993; Gregg, 1997; Dalziel, 1998; Dubois, 1996; Joint Committee on Education, 2000; Lytle, Lytle, & Youmans, 1994; Mood, 1995; Obbink, 1998; MacBrayne, 1995; Stuart, 1999; Twigg, 1994b). Their expectations include time and place independent options such as asynchronous, 24 hours a day, seven days a week learning that allows them to remain in their community, is affordable, of high quality, and provides customer-oriented support services and benefits. A further expectation is being treated as an equal by faculty. Seeing themselves as consumers (Berry, 2000), adult students in distance education are more likely to define quality in terms of the Continuous Quality Improvement movement that focuses on satisfying customer needs. All of these needs and expectations can be accommodated by effective distance education.

Many public two-year higher education institutions are responding to these societal and educational forces through electronic technology-based distance education. Some see "the potential for distance education...to educate students throughout their lifespan [and] for institutions that offer...programs in fields that require lifelong learning such as health sciences...and education" (Rosenquist-Buhler, 1996, p. 223). Distance education students reflect the trend of an increasing number of adult students attending public two-year higher education institutions.

Distance Education in Two-Year Higher Education

Distance education is a new option in two-year higher education's long tradition of meeting the needs of adult learners through long-existing formats such as independent studies, weekend college, and outreach programs (Lever-Duffy & Lemke, 1996b; MacBrayne, 1995). Enrollment at two-year higher education institutions rose 21% between 1980 and 1995 (Stuart, 1999). Over half of all students enrolled in community colleges are over 21, and the number over 39 will increase significantly for several decades with traditional age students already becoming the minority (American Association of Community College Trustees, 1998; Dubois, 1996; Web-Based Education Commission, 2000). Additionally, 80% of current students enrolled in two-year higher education are employed and cannot afford to leave a job and their other family and community responsibilities to periodically return to a campus to update and maintain their occupational skills (Cross, 1995; Easterday, 1997; Page, 1999a).

Distance education can meet many of the educational needs of adults who previously were unable to benefit from traditional higher education. The majority of distance education students enrolled in public two-year higher education are 25-30 years old, usually female, have family responsibilities, and are employed (Cross, 1995). Many of these adult learners are taking courses to prepare for a new career or to improve their skills for their current occupation (Merriam & Caffarella, 1991).

Much of the growth in distance education programs began, and is taking place, in two-year higher education. The most rapidly increasing type of distance education is two-year associate degrees (Connick, 1999). Since one of public two-year education's main

functions is preparing graduates for employment (Cohen, 1997; Dede, 1987; O'Banion, 1997b), public two-year higher education institutions must use and regularly upgrade their electronic-based technologies in order to reflect the workplace's new technology applications and environment. Two-year higher education must respond to the needs of employers and employees by connecting learning and productivity through adapting subject content, learning resources and tools, and their availability to learners' situations (Joint Committee on Education, 2000; Klus, 1998; Verduin & Clark, 1991). Workplace entry-level competencies are a major focus of profession-based organizations. These adult learner, employee, and employer needs can be met through distance education, which is being recognized by profession-based accrediting agencies.

Profession-Based Accreditation. Public two-year higher education institutions that offer profession-accredited technical education programs are facing increasing pressures to offer current, electronic technology-based distance education courses and curricula that meet the workplace needs of employers plus future and current employees. Technical programs are those programs in two-year higher education that prepare people for employment following successful completion of a one- or two-year certificate, diploma, or Associate of Applied Science degree.

For many technical programs in public two-year higher education institutions, the profession or field for which the program prepares students requires an additional accreditation process, which greatly influences the stature of the educational program (Bredeson & Willower, 1991, p. 863). Accreditation in the United States is "a means of creating non-governmental, peer evaluation of educational institutions and programs" that

insures a basic level of quality (Office of Postsecondary Education, 2000, p. 1). Profession-based accreditation is most prevalent for healthcare technical programs.

Healthcare Technical Programs in Two-Year Higher Education. Technical healthcare professions include those whose members "identify, prevent, or treat diseases, provide counseling for diet and nutrition, promote good health behaviors, provide maintenance, rehabilitation, or definitive treatment services, manage information or health services, or address mental and intellectual needs" (American Medical Association, 1998, p. 1). During the 1990s, the number of health profession certificates and associate degrees earned were in the top three and administrators reported that allied health programs were four of the top five "hot programs" (American Association of Community Colleges, 1998). For the future, the Bureau of Labor Statistics (2000) is reporting that eight of the 20 fastest growing occupations from 1998 to 2008 are in health care. Especially in health care, many organizations in rural America are using telemedicine and distance education on a daily basis (Mishoe, 1999; Web-Based Education Commission, 2000; Whitener, 1996).

Accreditation of the health care professions' educational programs is "a process of external peer review [that] grants public recognition to a ...specialized program of study that meets established qualifications and educational standards, as determined through initial and subsequent periodic evaluations" (American Medical Association, 1998, p. 2). In 1999, over 1800 allied health education programs in 17 disciplines were profession-accredited through the Commission on the Accreditation of Allied Health Education Programs (Annual Report, 1999). "To become accredited, programs are

assessed for their compliance with national educational standards. Standards are usually flexible enough to allow education programs to respond to continuous technological changes" (p. 1-2). Constant changes in technology create an ongoing need for revision of technical programs' curricula.

Large numbers of public two-year higher education faculty and students are participating in healthcare technical programs. "Accreditation helps prospective students identify institutions with programs that meet standards established by and for the field(s) in which they are interested" (American Medical Association, 1998, p. 2). Usually, only students graduating from profession-accredited programs in a field are eligible to take state or national certification exams. Successful completion of these examinations is a basic requirement for being hired as a professional in the certifying field.

An additional factor in healthcare technical programs is that potential students already working in the technical professions "expect broader access to information and formal degrees based on trends in education, health care, and technology" (Mishoe, 1999, p. 1333). This is related to the growing need for lifelong learning. Lifelong professional learning is vital in health care as demonstrated by its key placement in the mission statement of the American Health Information Management Association (Kloss, 1998).

> As the membership organization of health information management professionals, the American Health Information Management Association (AHIMA) fosters the professional development of its members through education, certification, and lifelong learning thereby promoting quality information to benefit the public, the healthcare consumer, providers, and other users of clinical data (AHIMA, 2001).

As distance education becomes more available from profession-accredited technical programs in higher education, some professional health care organizations are ceasing to

offer their own traditional mail-based correspondence courses and mandating that an Associate's degree from an accredited education program be the minimum entry-level for their professions.

Both the American Association for Respiratory Care and the American Health Information Management Association have "recommended that distance education be utilized to help underserved areas as a bridge to meet a higher educational level... for advanced and continuing education" (Mishoe, 1999, p. 1333). This recognition of distance education by professions provides an opportunity for associate degree and other terminal programs in health care to increase their student population by providing distance education. The demand for and recognition of distance education by employers, employees, students, and professions are forces impacting public higher education.

Higher education institutions in the United States are responding to these broad societal and education-specific forces by becoming more market-driven and responsive to changing needs (Albright & Graf, 1992; Palmer, 2000; Waring, 1996). Offering electronic technology-based distance education as a successful use of electronic-based technologies requires major changes by and within an educational institution (Baird & Monson, 1992; Bates, 1995a; Dubois, 1996; Heterick, 1995; Joint Committee on Education, 2000; Obbink, 1998). An organization "must effect the changes necessary to produce a highly qualified, critical-thinking, and problem-solving workforce that can respond creatively to those changes" (Rowden, 1996, p. 8). The change process necessary for integrating innovations such as electronic technology-based distance education into an existing organization is complex.

Change in an Organization

Many models of the change process in organizations are currently available to aid in understanding how technological and social changes happen, are adopted and adapted, and what elements are necessary for changes (innovations) to be successfully integrated into an organization's culture and administrative structure (Hobbs & Christianson, 1997; Merriam and Caffarella, 1991; Miller & Verduin, 1979; Office of Technology Assessment, 1995; Parisot, 1995). Acceptance of any technology-based innovation by an organization's people requires time (Guskey, 1990), support for trial and error, and also making resulting changes in task, structure, and culture aspects of the organization (Abernathy, 1998). A final essential component for a successful change process is alignment of and consistency between planned changes and the organization's actual values as demonstrated in its allocation of resources. An organization must support its people at each stage of a successful change process.

The successful adoption and effective use of any innovation within an organization requires five interrelated stages to occur. These are (1) introducing; (2) implementing, (3) adopting/adapting; (4) diffusing; and (5) integrating the innovation into the organization's tasks, structure, culture, and people. Although these five stages are discussed sequentially, each stage influences the others. Without realigning the social and cultural environment or context (multiple components of an organization such as rewards and roles) to correspond with an innovation, true change will be delayed or stopped (Milleron & Leach, 1997; Ragsdale, 1991). When related contextual changes needed by an innovation are not carried out in all five of these stages, the innovation usually is not

successful. Therefore, the most successful change processes recognize that change needs to occur systemically and not in a strict linear progression.

Introducing and Implementing Innovation

From the very beginning, the people affected by the selection of a technology-based innovation should be involved. However, often this first decision is made by only one or two people (usually administrators) or imposed by a higher ranking organization within a system. As soon as possible, the people affected by an innovation should be brought into the introduction process (Gizinski, 1995). This can be done by providing multiple opportunities to learn about and consider the innovation's uses and potential through general sessions and demonstrations. Once an innovation has been introduced, the implementation process begins.

This change stage often requires large financial investments for equipment, materials, training and staff development, and follow-up support. However, frequently the investment is only made for equipment, materials, and very basic initial training. During the implementation process, certain people in an organization become early adopters (Rogers, 1979) and begin the next stage of innovation adoption.

Adopting Innovation

If an organization's people do not become comfortable with a technology, they will be unable to use it to full advantage (Hazen, 1992; Niemi & Gooler, 1987). An employee's comfort level with and adoption of an innovation such as a new technology is directly determined by three main factors: the individual's initiative; organization-provided support and resources; and incentives (Hazen, 1992). Careful planning for

effective use of an innovation and then providing a continuous supporting infrastructure and on-going funding base are necessary to ensure the successful adoption of an innovation (Albright & Graf, 1992; Ehrmann, 1995b; Guskey, 1990; Hazen, 1992).

As staff members adopt an innovation, they will modify it to meet their and the organization's specific needs, thereby adapting it. This adaption process requires time and support. "All forms of discussion and cooperative professional inquiry take time. Acquiring new skills takes time. Changing one's [professional] practice takes time" (Eraut, 1987, p. 732). When an organization's people see early adopters gaining benefits (i.e., rewards) through the use of an innovation, additional people also begin using the innovation, leading to the diffusion stage of the change process.

Diffusing Innovation Through an Organization

When the initiative of early adopters is supported and rewarded by an organization, then the rate of adoption and diffusion of technology use through the rest of the organization greatly increases (Hazen, 1992). Developing the knowledge necessary to effectively use an innovation requires "a combination of information, contexts, and experiences," and "knowledge centric organizations" will support the transfer of knowledge between individuals, acquisition of new knowledge, and the incremental growth of knowledge (Harris, 1996, p. 8). Once a critical mass of adoption occurs, an innovation begins to be integrated into the organization.

Integrating Innovation into an Organization

For change to occur among staff members of an organization, an environment conducive to learning and change must be present (Miller & Verduin, 1979; Twigg,

1994a). The successful integration of an innovation into an organization depends on change occurring at two levels: the organizational level where structure and environment changes; and the individual level where performance changes. "Structure determines behavior and ...true change evolves only from creating new structures that are more supportive of the desired outcome" (Bierema, 1996, p. 26). When an organization's goals and tasks are modified by the adoption of an innovation, change at the organizational level must occur in order for change at the individual level to occur, continue, and become established.

Critical factors (Keast, 1997) for the change process at the integration stage include: (1) the amount of material and human resources; (2) administrative commitment to the innovation; and (3) formal institutional support. All three of these factors require changes in an organization's structure.

Change in an Organization's Structure. When an innovation changes the tasks of an organization, it must also collectively change its processes using open, sharing problem-solving and decision-making (Harris, 1996; Keast, 1997). Change at the institutional level, which is beyond the control of individuals, can be assisted by recognizing that the adoption and reinvention (adaption) processes are changes in habit that require: time; availability of tools and resources for learning; reinforcement, repetition, and infrastructure to support habits of inquiry, analysis and experimentation; and reflective thoughtfulness (Boettcher, 2000; Twigg, 1994a). Since integration of an innovation also changes the context of related tasks (Harris, 1996), an organization must

complete the integration process by making structural changes that create congruity between tasks, people, and environment.

The time consuming and difficult change process necessary for true learning and transfer of new skills into the workplace must be recognized and rewarded by an organization's support and reward structures. Until new tasks and skills are internalized by both individuals and the organization's structure and culture, the change process will not be complete (Schein, 1972). The adjustment in goals "must be reinforced with an appropriate change in the reward structure. To achieve effective and prolonged knowledge transfer, knowledge acquisition and transfer must be rewarded" (Harris, 1996, p. 6). Organizational change is essential to support an individual making changes in performance.

Change in Performance. The goal of the change process in any organization is a change in the performance of its people. Change in performance (transfer) occurs in a complex interaction between the individual, other people, new learning, tasks, and the social and cultural environment of the workplace. Organizations "must recognize that only through relationships does anything get done and to cultivate strong relationships throughout the organization is a key performance strategy" (Bierema, 1996, p. 27). During this complex process, an individual must be supported by an organization (Fowler, 1995) through the provision of both learning activities and follow-up support elements such as incentives, tools and resources, and opportunities for practice and reflection. Organization members at all levels "need to recognize that knowledge transfer takes place primarily in the workplace, not in a structured training setting. Often the

training setting is blamed for the lack of transfer, when the problem relates more to the actual workplace" (Harris, 1996, p. 6).

Although there are variations among different researchers' change models, one element is consistently described as a requirement for desired change to occur within an organization; staff and professional development (Ginzinski, 1995; Merriam & Caffarella, 1991; Office of Technology Assessment, 1995; Parisot, 1995). "In a world where the rate of learning falls far behind the rate of change, adult education theory and practice have emerged as necessities that offer a rich vein of ore for understanding and practicing professional development" (Willis, V., 1996, p. 36). The effectiveness of a change process in an organization is increased when staff and professional development programs are well designed. The effectiveness of these programs is enhanced when their design incorporates the knowledge base of continuing professional education and adult learning.

Continuing Professional Education and Adult Learners

Continuing professional education (CPE) is a large subset of adult learning concerned with individual needs and organizational survival that has a significant influence on the American economy and professionals. "The largest and most rapidly growing category of continuing education, probably in all societies, is that directed toward upgrading the knowledge and skills of people in their jobs" (Wlodkowski, 1999, p. 12). Econometric models demonstrate that workplace-related learning accounts for 85% of lifetime earnings variations (Watkins, 1995). Additionally, in the

Information/Knowledge Age, the survival of an organization is dependent on the continuous development of its staff members.

Recognizing that a Information/Knowledge Age organization's most important resources are its people, employers offer continuing professional education for multiple reasons including: changing technologies; growing complexity of job duties; a need for productivity increases; and the evolving expectations of clients and society (Darkenwald & Merriam, 1982; Joint Committee on Education, 2000; Miller & Verduin, 1979; Taking Charge, 1999). Continuing professional education has formal and informal components. Informal continuing professional education includes mentoring, self-directed learning, social networking within the context of a specific system, and progression through planned sequences of responsibilities that have varying learning potentials (Nowlen, 1988; Watkins, 1995). Formal continuing professional education includes organization-provided education and training activities to improve current job knowledge and skills (Miller & Veduin, 1979). The goals of continuing education for professionals are enhancement of the professional role and maintenance and improvement of a professional's competence in the work setting (Lewis, 1998; Stern & Queeney, 1992).

Research studies based on Fishbein & Ajzen's Theory of Reasoned Action have shown that the attitude of a professional about continuing professional education outcomes is a significant predictor variable for participation in continuing professional education (Becker & Gibson, 1998). "Lifelong learning critically depends not only on access and opportunity to learn but especially on the willingness and capacity of adults to learn effectively" (Tuijnman & Van Der Kamp, 1992a, p. viii). A professional's attitude toward participating in continuing professional education also involves motivation.

Bandura's (1986) social cognitive theory sees motivation based on the interaction of two perceptions: expected outcomes; and the value assigned to those outcomes by an individual. People also consider their own abilities, skills, and available strategies in addition to their beliefs about expected outcomes. Cross' Chain of Response model (1981) also assumes that a participant's involvement in adult learning processes is not one conscious decision, but results from a continuing series of responses and assessments of the environment over time. Original motivation for participation is internal and based on a self-evaluation considering previous experiences in continuing education and needs based on changing life stages or job-related goals. Following the original internal responses, external forces become more important in a participant's decisions to remain involved. These external forces include the importance of the continuing education goals to a participant and the belief the goals will be met, and the perceived potential interactions between the learning tasks and other life stage tasks. Other external forces are the barriers to and opportunities for participation in learning activities, including convenience of time and location, expense, access, etc. People have to have some motivation for participating in continuing professional education before the removal of external barriers makes any difference.

Changing performance also involves a professional making changes in perceptions, beliefs, values, and attitudes which do not change rapidly (Miller & Verduin, 1979). Since many of these personal perceptions are part of a profession-developed frame of reference, this type of change requires a group education process focusing on social, shared cognition, the context of reasoning, and a system-wide view rather than focusing on individual people or tasks (Watkins, 1995). A professional 'needs to see a range of

other [professionals] in order to learn, experiment, reflect, and create...interpretations" (Eraut, 1987, p. 736). This requirement for professional group learning is reflected by a 1990 survey finding that the opportunity to meet with other professionals was a major incentive for participation in continuing education (Hanson, 1991). For professionals, well-designed continuing education that acknowledges peer relationships can intensify professional identity and affiliations while strengthening group understanding (Baskett & Marsick, 1992; Bennett & Fox, 1993). This social aspect of continuing professional education is also necessary during the transfer phase following continuing professional education activities when changes are fully integrated into a professional's performance competencies.

Professional Competence

Professional competence is based on professional knowledge and skills, which are determined, organized, and delivered within collaborative communities of interpretation, which develop particular frames of reference. A profession's frame of reference is formed and evolves through many practical interactions between professionals, their environments, and the new knowledge constantly being created (Baskett & Marsick, 1992; Nowlen 1988). These professional frames of reference are one example of Mezirow's (1996) cultural frames of reference, which are "the boundaries and formulas with which the learner differentiates, assigns values, and integrates experience" (p. 162).

Competence-related continuing professional education learning activities are successful when the learner "integrates relevant experience and recent changes in knowledge, skills, and attitudes to produce improved performance" (Knox, 1977, p. 407).

In most new tasks that professionals "attempt to master, it is not just information but competence and performance that counts" (Knox, 1977, p. 408). Professional competence involves "a synthesis of all relevant knowledge" concerning a particular situation, while at the same time following the "highest possible standards of competence" (Houle, 1981, pp. 7, 43). A professional's competence is demonstrated through performance.

Professional Performance

In providing continuing education, organizations have a goal of learning defined by Gagne as "a [desired] change of state of the human being that is remembered and that makes possible a corresponding [desired] change in the individual's behavior in a given type of situation" (1984, p. 377). For professionals, one change in behavior is performance, which depends on changes in "their beliefs, values, attitudes" that must occur first (Miller & Verduin, 1979, p. 22). A change in performance cannot occur until the perceptions, values, and attitudes of the professional have changed. In the paradigm shift to the Information/Knowledge Age, many professionals need organization-provided continuing professional education and follow-up support to assist in the process of integrating information technologies into their professional performance.

Professions and Technology

Professional performance in the Information/Knowledge Age requires the use of electronic-based information technologies. The increasing availability and integration of electronic-based technologies such as information technology into all aspects of workplace environments increases the need for professionals to learn and adapt new essential skills (Marshall, 1993; McKinney, 1997). There is a growing recognition that

the key technology challenges are not hardware-related, but involve the people using the hardware and software programs (Joint Committee on Education, 2000; Krebs, 2000a). "The effect of technology on productivity is not linear and direct but dependent on interaction with other variables, of which skills formation and the organization of work are particularly important" (Tuijnman & Van Der Kamp, 1992b, p. 10). For many professions, information technologies (including electronic-based educational technologies) are threatening their traditional monopolies in controlling and accessing certain areas of knowledge.

However, as information technologies become more powerful and combine multiple applications, professionals must continue to value and use their human strengths such as identifying problems and using multiple approaches to their solutions including creativity, holistic thinking, and group decisions reached through cooperation and compromise (Dede, 1987). The applications of information technologies greatly benefit professionals in their role of expert knowledge purveyor, but the efficient and effective use of information technologies also requires significant investments of financial resources and time to continuously plan, learn, and use new and changing information technology products effectively.

Professionals as Adult Learners

Although specific content learning needs of various professions differ greatly, professionals as adult learners share a number of characteristics. They have much experience, both in practical work and in formal education. As working adults, professionals have "practical" intelligence and know- how and their own systems for

integrating the new into pre-existing competence and performance abilities (Bennett & Fox, 1993; Wagner, 1992). Professionals are adult learners leading busy lives with multiple roles and responsibilities. For purposes of designing effective continuing professional education for adults, their characteristics can be organized into four general groupings related to learning; learning readiness, learning processes, learning facilitation, and learning transfer to performance.

Learning Readiness. Adults are pragmatic and seek practical training or education that is quickly applicable to their daily work performance (Knox, 1977; Stern & Queeney, 1992; Wlodkowski, 1999). The continuous learning of adults is related to new developmental tasks that emerge from multiple roles in their homes, work places, and communities. Significant learning takes place when the subject matter is perceived as having relevance for an adult's own purposes (Rogers, 1979). This perception of relevance is often developed as the learner contributes to the decision process that leads to participating in continuing education. Without "buy-in" during the decision phase, "affected users may undermine a project" such as a continuing education program (Smith, 1999, p. 49).

A major characteristic of adults is self-direction in learning (Brookfield, 1986). However, not all adults are self-directed in all types of learning. Pertinent factors in organization-sponsored continuing education that modify self-direction in adults include the participants' existing level of familiarity with the content, the type of task, and the organization's political and cultural setting.

Adults with positive self-concepts learn meaningful content better. During the learning process, adults want to be successful and their motivation to continue learning will be negatively affected if their perceptions or expectations of success are low (Wlodkowski, 1999). Without personal meaning, little significant learning or change in performance may occur (Seaman & Fellenz, 1989). The interactions between pre-existing meaning perspectives, new experiences, and critical reflection result in learning. A learner's meaning perspective and scheme is composed of general, broad predispositions and specific attitudes, feelings, and beliefs (Mezirow, 1996).

> New information is only a resource in the adult learning process. To become meaningful, learning requires that new information be incorporated by the learner into an already well-developed symbolic frame of reference, an active process involving thought, feelings, and disposition (Mezirow, 1997, p. 10).

The meaningfulness of a learning process is determined by the learner (Hopey & Ginsburg, 1996; Miller & Verduin, 1979), who integrates new knowledge or skills into his/her own unique meaning perspective and scheme.

Learning Processes. "The educational process should be directed at and adjusted to the unique features of adult learning and the specific circumstances of adults in complex, changing societies" (Tuijnman & Van Der Kamp, 1992a, p. v). In learning content, adult learners want the opportunity to practice in meaningful ways, to work collaboratively with other students and a teacher, and to receive specific feedback on their progress towards competency. The affiliation needs of adults should be recognized by accommodating their "needs to form relationships that encourage learning [through] collaborative inquiry, cooperative communication styles, and a holistic and democratic

approach to learning" (Caffarella & Barnett, 1994, p. 33). Adults want interaction during learning including discussing, challenging, and debating (Carrier, 1987). Adults benefit from "self-diagnosis" which can be provided by "small group discussions and report-back procedures" (Brown and Smith, 1990, p. 62). Change in performance (transfer) occurs more often in small groups due to the relationships developed, which increase the learners' involvement (Kidd, 1973).

Adults prefer participative active learning using concrete experiences with practical problems (Rogers, 1979; Wood & Thompson, 1980). Adults want to share their experience during two phases of continuing education. First, they want involvement in decision-making and development of formal continuing education activities. This increases "buy-in" and "ownership", resulting in increased productivity of the participants (Caffarella & Barnett, 1994; Carrier, 1987; Miller & Verduin, 1979). Second, adults prefer to provide experience-based input during formal continuing education activities and to share their expertise with others (Caffarella & Barnett, 1994; Merriam & Caffarella, 1991). Adults also benefit by receiving other adults' experience-based input through collaboration, role modeling, and peer coaching.

A major aspect of learning for adults is their ability to observe and learn from role models in their environment (Merriam & Caffarella, 1991; Schein, 1972). Learning processes that acknowledge role modeling and its applicability for adult learning include: closely observing others; on-the-job training; peer coaching; practice and receiving feedback; and role-playing.

> Activities such as the reciprocal sharing of experiences and information, the mutual provision of emotional support, and the development of professional and personal identity through continued contacts with peers

> are as necessary for skill transfer as being able to demonstrate critical competencies (Jackson & Caffarella, 1994, p. 89).

The third group of adult learning characteristics relates to learning facilitation.

Learning Facilitation. Adults often experience new learning requirements as uncomfortable periods of change, stress, and anxiety (Brookfield, 1992; Reddick, 1994; Rogers, 1979). Adults tend to be anxious about new learning because it creates (at least temporarily) a competence deficiency. While this discomfort can be necessary for true learning, it creates a need for feedback and a comfortable learning environment that reduces external threats (Rogers, 1979; Seaman & Fellenz, 1989). Facilitation of adult learning involves consideration of three continuing education components: context; convenience; and collaboration.

The context of continuing education activities should respect and value the learner's previous experiences and abilities (Brookfield, 1986; Lewis, 1998; Brown & Smith, 1990; Mezirow, 1990). "[T]he learner's situation and the learning context are as important to the learning process as what the individual learner and/or instructor bring to that situation" (Caffarella & Merriam, 2000, p. 59). Respect for the learner is demonstrated by including the learner in the needs determination process and providing opportunities for critical reflection by the learner to create personal relevance and a new frame of reference for the new learning.

Providing convenience for adult learners requires scheduling of continuing education activities that acknowledges adults' work schedules and life responsibilities (Hanson, 1991). Additionally, ensuring easy access to any resources such as hardware and software required for learning tasks (Becker & Gibson, 1999; Carrier, 1987) and

providing frequent continuing education opportunities (Brookfield, 1986) will increase learning effectiveness. The convenience of learning is one aspect of how "the organizational context in which the learning takes place will have an impact on the nature of the learning transaction" (Caffarella & Merriam, 2000, p. 63).

Collaboration in continuing education activities requires recreating the teacher-learner relationship into one with a power ratio that is more equal and democratic (Caffarella & Barnett, 1994; Mezirow, 1996). Since adults bring large amounts of previous knowledge and experience to new learning, the teacher is much less of a purveyor of knowledge, becoming more of a guide through the learning process. Facilitation of collaboration among participants is also important to improve learning during and after activities, since learning is "a product of the interaction between the learner and the social context of learning" (Cafarella & Merriam, 2000, p. 66).

Understanding that professionals are non-traditional students (Parisot, 1995; Truman-Davis, 1999) requiring "just-in-time" learning activities is key to the continuing education teacher's roles of creator of a positive affective learning environment (Merriam & Caffarella, 1991) and knowledge validator (Hopey & Ginsburg, 1996). For many who work with adult learners who are already practicing professionals, the process in which instructors and participants validate each other's experience can sometimes be as important as new learning. "Validation lends authenticity to the activities of participants, many of whom may be experiencing uncertainty because of lack of support in their professional settings" (Jackson & Caffarella, 1994, p. 89). The final learning-related group of adult learner characteristics relates to learning transfer.

Learning Transfer. The return on an organization's and its staff members' investment in continuing education and learning only occurs when transfer of new knowledge to performance actually and consistently happens. Improvement of performance requires "acquisition of knowledge, skill, and appropriate use or transfer" (Showers, Joyce, and Bennett, 1987, p. 85). Transfer occurs when participants in a continuing education program consistently use new skills appropriately in their practice setting (Joyce & Showers, 1988; Terdy, 1993). For successful transfer to occur, learners must be motivated to engage in learning activities, retain the knowledge and skills, and actually apply the knowledge and skills (Cross, 1981). To make successful changes to performance requires a continuing education process that should be ongoing due to the rapid pace of change (Eraut, 1987; Rumble, 1986). The time and support available to learners after a learning experience also directly affects their perception of the value of the new learning and their ability to integrate the new information into new knowledge and practice competencies.

Incorporating the continuing professional education and adult learning knowledge base into the development of staff and professional development programs can improve the success of the change process in an organization. The provision of continuing professional education and support by an organization has the goal of learning transfer and changed performance. One component of continuing education for professionals is employer-sponsored organized learning activities, which focus on "learning outcomes related to the improvement of performance in job-related practices" (Harris, 1989, p. 18).

This type of continuing education is part of staff development, which includes all employer-sponsored employee activities that improve current job knowledge and skills that are required to accomplish the organization's mission and goals (Miller & Verduin, 1979). "The closest association between learning and performance occurs in educational activities sponsored by those who control the workplace" (Houle, 1981, p. 249). In higher education institutions, continuing professional education provided by the organization for faculty members is referred to as faculty development. As in all organizations, professional development is a key component for a successful change process in higher education.

Change in Higher Education

The new competencies and performance resulting from integration of an innovation also change the roles of an organization's people. Change is essential if a higher education institution is to offer effective electronic technology-based distance education. However, administrators can be as resistant to the change process as faculty members and other personnel.

Administrators and Change in Higher Education

Administrative leaders such as Deans have a key role in any change process in their institution. They need to be informed about and have technical knowledge in order to lead and support the process of integrating technology-related innovations across their institution.

Because of their daily interactions with faculty members, department and division heads are often more aware of change needs, but may not have authority to make necessary changes. Division Chairs/Department Heads must often serve as mediators between administration and faculty. They can help change occur constructively by helping to build team-teaching alliances, involving faculty in decision-making, freely providing information about a change process, and understanding why people resist change. As gatekeepers for the allocation of resources, administrators often are responsible for the types and amounts of professional development provided for faculty members.

Faculty Development in Higher Education

In higher education, professional development for teaching duties is a part of faculty development, which also includes "a wide range of activities including institutional and instructional research, faculty committee work, team teaching, and...support" (Millis, 1994, p. 1). "Providing opportunities for faculty to engage in professional development activities to better prepare themselves for their faculty roles and responsibilities in teaching and scholarship" is a necessity when change in work performance occurs in an institution of higher education (White, 1998, p. 42). As the teaching-learning paradigm shifts to meet the needs of society, higher education institutions must assist faculty members in remaining competitive (Head, 1992). Acquiring new competencies requires an on-going continuous process of professional development that includes "practice with new techniques, strategies, methods, and

approaches, with feedback in a non-threatening environment" (Jones & Lowe, 1990, p. 8).

In the early 1990s, only half of four-year higher education institutions had faculty development programs (Albright & Graf, 1992). Even less professional development for distance education is provided to educators in the United States (Moore & Kearsley, 1996). Often, the assumption seems to be that if faculty and other staff members get hardware, they will easily, automatically, and quickly change their teaching tactics and course materials to take advantage of it (Ehrmann, 1995a; Klus, 1998). Not only does the US education sector have the lowest capital investment budget for technology (Albright & Graf, 1992), education's investment in technology-related professional development continues to lag far behind that of corporate America (Walczak, 2000) – eight percent for the average education budget versus up to 25 percent in an average business's budget.

For the public two-year higher education institution, "the goal of faculty development is change in the performance of faculty members" (Willis, 1994b, p. 279). "To assure that effective teaching is occurring...community and technical colleges must invest in their faculty by providing training programs that help teachers acquire the knowledge, attitudes, skills, and behaviors required" (Waring, 1996, p. 47) including those related to distance education. Research and experience have shown that successful transfer of new knowledge to improved performance requires: (1) systematic, formal continuing education programs that incorporate several related topics and multiple learning methods; and (2) additional follow-up continuing support factors that are available within an organization after the initial learning sessions (Eraut, 1987; Joyce & Showers, 1988; Moyer, 2000; Terdy, 1993; Willis, 1994a). In a study by Pelavin and

Associates, six components were identified as essential for staff development. These include: theory; demonstration; practice; structured feedback; application; and reflection opportunities (Terdy, 1993, p. 62).

Only when transfer to the teaching-learning process has occurred can a faculty development program be considered effective. For faculty members to complete a change of behavior through the desired transfer stage, they must anticipate positive consequences for participation in professional development activities and receive follow-up support during their adoption and adaption of new knowledge and skills.

Management often takes a "training" model of staff development as providing learning experiences that enable a faculty member to do a defined job. However, staff development for distance education has to be expanded because the job of teacher has expanded. Staff development for distance education can "be seen as both the induction into and active development of a DE community" (Lentell, 1994, p. 29). An implication of this is that "distance education organisations [sic] need to be learning organisations; ...those which research and learn from their practice and...which encourage learning among their staffs" (Lentell, 1994, p. 30). When there is incongruity between the faculty member's perceptions of the effort required and rewards expected for participation in professional development, a lack of necessary engagement, retention, and application will occur. "The interest, support, and enthusiasm of the faculty is required if a distance education program is to be successful" (Willis, 1994b, p. 280).

Leadership by administration is vital for the diffusion of technology-related change within an educational organization. When an institution of higher education

commits to the use of electronic technology-based distance education, the roles of both distance education faculty members and their administrators change.

Administrators' Roles in Distance Education

According to the 1999 annual survey of the Campus Computing Project, assisting faculty members to adapt technology into their instruction was the number one information technology challenge in American colleges and universities. The second ranked challenge was providing adequate user support. These responses reflect "the growing campus awareness that the key information technology challenges in higher education involve people, not products" (Green, 1999, p. 1). Effective distance education administrators at all levels have roles beyond the planning stage. They are "consensus builders, decision makers, and referees" (Willis, 1992, p. 31). They ensure that technological resources are deployed appropriately in carrying out the institution's academic mission.

When faculty members begin distance education teaching, the roles of the administrators in a distance education organization directly affect each faculty member's ability to effectively learn and apply new learning in his/her performance as a distance education teacher. "The ultimate challenge in organizations is to harness adult learners' propensity to be self-directed learners and not create barriers that prevent or discourage it" (Bierema, 1996, p. 25).

"Distance education systems have an unusually strong need for good leadership [and] management of the interface between the academic and the administrative and operational areas"... "to ensure integrated decision making across a range of functionally

distinct areas" (Rumble, 1986, pp. 178, 181). The distance education administrator must provide assistance and support for an institution's faculty members by ensuring that the organization assists them in meeting four conditions required in Centra's model (1993) of improving teaching. For distance education faculty members, these four conditions exist when they are able to: (1) gain new knowledge; (2) value the new knowledge; (3) effectively apply (know how to make changes) the new valued knowledge; and (4) want to make changes to incorporate the new, valued knowledge into performance. Administrators can support faculty members in each of these stages by providing many types of resources and support.

Gaining New Distance Education Knowledge

Administrators' roles while distance education faculty members gain new distance education knowledge have both personal and organizational aspects. Personally-related roles include: encouraging change by providing a climate of collaborative improvement during social/work activities (Miller & Verduin, 1979); becoming personally comfortable with technology by investing their own time in learning; and understanding how distance education impacts a faculty member's workload. Organizational-related administration roles include: demonstrating commitment to distance education by insuring that financial and personnel resources are allocated to training and technical support, not just the purchase of technology; and investing in the organization's distance education human resources beyond initial education activities by providing time for practice, collaboration with mentors and peers, and reflection (Easterday, 1997; Moore & Kearsley, 1996; Parisot, 1995).

Administrators must also insure that faculty receive continuing education that goes beyond basic technical training to include the advantages and disadvantages of each technology, teaching techniques, understanding distance education students, and course management (Gizinski, 1995; Moore & Kearsley, 1996). The time and support available to a faculty member after a learning experience also directly affects his or her perception of the value of the new learning and his or her ability to integrate the new information into new knowledge and performance.

Valuing New Distance Education Knowledge

Once new distance education learning occurs, each faculty member then begins a decision process to evaluate the value of his or her new knowledge. Administrators' roles during a faculty member's process of valuing new knowledge include: developing and committing publicly to meeting the organization's technology and distance education goals; involving faculty members in planning for distance education; recognizing the new faculty roles that result from the distance education environment; and redefining faculty members' responsibilities (Easterday, 1997). Additionally, administrators must also be involved in creating an organizational climate that facilitates and promotes cooperation and collaboration; and beginning to address how the institution's established reward structure should be changed to recognize distance education-related roles and performance (Moore & Kearsley, 1996). Part of the change to the reward structure is acknowledging the need for additional time by reducing work loads so distance education faculty members can spend more time in development, preparation, and management of distance education courses.

Knowing How to Use New
Distance Education Knowledge

Administrators have many roles as a distance education faculty member begins to understand how to use new, valued distance education knowledge and skills. Again, some of these roles are personal and some are organizational. Personal roles include encouraging faculty and support staff in their efforts to effectively work in the distance education environment and supporting the peer coaching process needed for transfer of learning into performance (Garmston, 1987). Organizational roles include: coordinating the integration of technology into the organization (Parisot, 1995); decentralizing technical support to meet the specific needs of different departments (Hazen, 1992); continuing to provide financial resources for recruiting and training technical support personnel to aid faculty and other staff members in developing technical self-sufficiency (Hazen, 1992; Moore & Kearsley, 1996); and providing a faculty development practice environment for experimenting and gaining technical competency (Moore & Kearsley, 1996). The final condition of Centra's model of improving teaching also requires providing continuing assistance for distance education faculty members.

Wanting to Use New Distance Education Knowledge

After faculty have accomplished the extensive and time-intensive process of learning, adopting, and adapting new distance education technologies and methods into their teaching, administrators have roles in keeping faculty motivated to continue working effectively in distance education. These roles include: providing incentives; reducing barriers; insuring that resources such as equipment and support are maintained

and remain available and accessible when needed (Miller & Verduin, 1979; Moore & Kearsley, 1996); and recognizing faculty ownership of instruction.

Administrators must understand the concept of an "enabling" economy in an institution of higher education. If the goal is to have technologies used as teaching tools, then the users cannot be charged through lack of support when learning to apply the technologies (Steele, 1995). The effective use of electronic-based distance education technologies requires extensive learning and major changes in the roles of higher education faculty members as they enter into a distance education environment.

Faculty Role Changes in Distance Education

As with other citizens, faculty members must expand their skills as the workplace and society continue to advance technologically (Porter, 1997). Additionally, faculty acceptance and successful use of technology are vital to truly synthesizing technology and education (McKinney, 1997; Moyer, 1999; Parisot, 1995; Willis, B., 1996). In many higher education institutions, the established organizational structure still reflects the time-fixed and place-based models of the Industrial Age paradigm of the factory (Davis, 1996; Tiffin & Rajasingham, 1995; Web-Based Education Commission, 2000) where raw materials (students) are transported to a factory (campus), processed (educated), and packaged (cap, gown, and diploma). The traditional academic year still follows the even older Agricultural Age paradigm with its smaller, shorter summer sessions. One consequence of the education paradigm shift from Industrial Age to Information/Knowledge Age is that the roles of the teacher change (Albright, 1992; Bates, 1997; Joint Committee on Education, 2000; Rumble, 1986).

In addition to preserving and passing on a profession's knowledge and skill content, a teacher in the Information Age has roles variously described as (1) resource manager, (2) learning facilitator, (3) monitor and mentor, (4) information counselor, (5) instruction specialist, and (6) leader/member of a team (Caffarella & Merriam, 1994; Forsyth, 1998; Lentell, 1994; Merriam & Caffarella, 1991; Mishoe, 1999; Schein, 1972). To be successful in these interrelated roles, a distance education teacher needs professional development activities and support (Fowler, 1995; Green & Gilbert, 1995; Klus, 1998) to gain and apply the distance education-specific knowledge and competencies necessary to insure that distance education courses meet the quality standards of profession-based and educational accrediting agencies (Care, 1996). Distance education knowledge and competencies can be categorized into two basic groupings: foundational and procedural.

Foundational Knowledge for Distance Education Teachers

To be effective in distance education, a distance education teacher needs foundational knowledge (Flaherty, 1997; Willis, 1992), including understanding of: (1) the specific subject content and skills to be learned during a distance education course; (2) distance education students' characteristics and needs; (3) the various distance education media and their strengths and weaknesses for different educational processes and types of content; and (4) the content and communication issues of the mediated distance education environment.

Subject Content and Skills. Academic goals should be the primary focus in all aspects of distance education (Lamb, 1992). In the fast-changing environment of the early

21st Century, faculty members must also keep their own discipline-related knowledge and skill base updated (Joint Committee on Education, 2000). While preparing a course, the distance teacher must identify the content, how to present a particular subject area's knowledge, and what kinds of learning are necessary to meet the goals and objectives of the course. This process is one of the traditional roles of teachers, but in distance education, this "synthesis of complex material and communicating a coherent view of it" is accomplished within a different context (Noblitt, 1997, p. 5). Identified subject content and learning goals must be matched to the most appropriate media in terms of their strengths and weaknesses in developing the knowledge and skills of distance education students.

Understanding Distance Education Students. Distance education teachers and students often do not approach the learning process with similar backgrounds or expectations. While the adult students who are a large majority in distance education "have maturity and experience and are more focused on their goals, they can lack skills in research, writing and/or analytical thinking" (Bludnicki, 1998, p. 2). Also, these adult students may have less experience with and less access to electronic-based technologies and therefore "may lack confidence, knowledge, and skill in using instructional technology" (Kasworm & Londoner, 2000, p. 238). Additionally, distance education students are often more isolated from other students and educational resources (Rosenquist-Buhler, 1996). In higher education, many educators are employed for their expertise in a subject field and often have little theoretical knowledge of the learning and teaching process or previous teaching experience in either traditional or distance

education environments (Bates, 1997; Joint Committee on Education, 2000; Schein, 1972).

Complicating the potential mismatch between teacher and learner is a frequent mismatch between learning styles. Research by Schroeder (1993) using the Myers Briggs Type Indicator (MBTI) instrument has found that most entering college students in the late 1980s were extrovert sensors who preferred concrete active learning, while most college faculty members were introvert intuitors who preferred abstract reflective learning (p. 3). This mismatch is now larger than in the past because of the changing college population, which reflects the makeup of the general adult population due to greater access to higher education. About 50 percent of freshman college students and adults are concrete active learners, but only 10 percent are abstract reflective learners. However, over 75 percent of higher education faculty are abstract reflective learners, but only 10 percent are concrete active learners.

Concrete active students have the following learning style characteristics. They are action-oriented, practical realists who seek direct, concrete experience, structure, a linear approach, and much feedback. They value the immediate and practical, and focus on the physical. Additionally, in the affective aspect of learning, these learners are often lacking confidence in their own abilities, uncomfortable with abstractions, and need immediate gratification. Abstract reflective teachers have the following learning style characteristics. They are global learners who love concepts and abstractions, and also value autonomy and knowledge for its own sake.

This potential mismatch of learning styles will be magnified in the distance education environment if the distance education teacher does not develop and manage a

distance education course in ways that acknowledge distance education students' needs and how the connections between subject content and distance education students are affected by various electronic technology-based distance education media. Distance education teachers also need to invest time in understanding their distance education students' feelings and motivations, especially at the beginning of courses.

> The more we transmit instruction technologically, the more adult learners need to know we care about them and reasonably understand them as human beings. The need for compassion on the part of the instructor is probably greater than it has ever been. Adult learners will immediately make judgments about [the instructor] the particular subject, the learning situation, and their personal expectancy of success (Wlodkowski, 1999, p. 73).

Often students are more anxious about a distance course, have difficulties in communicating their anxieties and do not have the same support and routine structure available through attending traditional face-to-face classes (Moore & Kearsley, 1996). The structure of distance education courses is directly affected by the types of distance education media used, such as audio, video, text, or graphic.

Distance Education Media. Each distance education medium has different strengths and weaknesses in being able to communicate varying types of content and skills (Florini, 1989). Some media are synchronous, simultaneous or "real-time" communication such as the telephone, while others are asynchronous, stored until the participant is ready, such as e-mail. All media can handle either written or spoken language, the primary way to distribute abstract knowledge.

However, media differ in their ability to handle other means of conveying concrete or abstract knowledge such as pictures or schematics. Since concrete examples

or demonstrations are important for the majority of college students (Bates 1995b; Schroeder 1993), it is essential that a distance education teacher consciously match appropriate media technologies, student needs, and the course's subject content and skills. This complicated process is integral to the effectiveness of distance education (Kasworm & Londoner, 2000; Mishoe, 1999). The final foundational knowledge that a distance education teacher needs is understanding how the teaching-learning process is changed when the environment (context) is changed by mediated communication.

Distance Education Environment

> Research indicates that the optimal learning environment exists when: 1) there is a high intensity of interaction and feedback; 2) there are specific goals and established procedures; 3) when there exists a continual feeling of challenge; 4) there is a sense of direct engagement; 5) appropriate tools are available; and 6) distractions and disruptions that intervene and destroy the subjective experience are avoided (Joint Committee on Education, 2000).

Maintaining active participation and interest in a course is very important for the success of distance education students. "Subject matter is not the only factor to consider in developing instruction; the environment in which the subject is studied-the technology and the method of delivery-are equally important to achieving results" (Miller, 1990, p. 219). The interactivity and user-friendliness of educational technologies vary depending on the particular media used in a distance education course. Some media allow only one-way communication (broadcast television or video cassettes), while others are two-way (such as interactive compressed video or computer-mediated communication).

Three theories of distance education emphasize the importance of interactivity for facilitating learning (Gibson, 1990). The theories of Holmberg, Baath, and Sewart

recognize that establishing a personal relationship (human element) within a distance education course helps to develop the negotiation of meaning and validation of knowledge during the student's learning process. The distance education teacher's roles in creating a positive learning experience must include developing a mediated environment that considers interactivity, social context, course structure, feedback, and distance education students' prior knowledge and characteristics.

In distance education, the teacher must build interactive opportunities into course design owing to the physical separation of the students. The key to success in a distance education course is interactivity that is highly developed in terms of both quantity and quality (Gibson, 1990; Mishoe, 1999; Obbink & Tuthill, 1998). Interactivity and the quickness of responses among students and between student and teacher "has been shown to create a social presence among class members" (Becker & Gibson, 1999, p. 1351). This social aspect of the learning process is a vital component for adult learners, that helps to bridge the physical and psychological separation of distance education (Mishoe, 1999). However, the interactivity component of distance education requires more time from the teacher at two stages of the teaching process.

First, interactivity must be carefully considered during the course design and preparation stages. Three types of interaction should be developed by the distance education teacher: (1) interaction between the course content and the learner; (2) each learner and the teacher; (3) and among all course members (Moore & Kearsley, 1996). Then, while managing the distance education course, interactivity requires additional time from the teacher (Schahczenski, 1998). The interactivity of a distance education

course directly affects the overall context of the learning environment for distance education students.

Since the teacher and student in distance education are physically separated, the vital human social and cultural contextual aspects of the education process can be lost (Merriam & Caffarella, 1991; Milleron & Leach, 1997; Shale, 1990). Additionally, "information technology's speed and novelty" can have a "dehumanizing effect" by "speeding interaction to the point of physical distress" and "making more superficial our most important relationships" (Milleron & Leach, 1997, p. 8). These serious potential problems in electronic-technology based distance education must be compensated for by appropriate course structure that increases distant learners' feelings of connectedness and reduces isolation (MacBrayne, 1995).

Since various telecommunications technologies have different strengths and limitations in the distance education environment, distance education teachers must restructure interactivity and the design of courses to maximize the strengths of each media. For true learning to occur, all distance education course members must become comfortable using the technology, have opportunities to get acquainted with each other and the teacher, and begin to feel they belong to the learning community. The social, interpersonal elements necessary for creation of these connections must occur at the beginning of the course (Mezirow, 1996; Wlodkowski, 1999). The structures of a distance education course must also create links between the subject materials and the learning processes of the students (Keegan, 1990). Much of the linkage that occurs in distance education courses depends on feedback processes.

Because of the lack of quick feedback from body language and facial signals that is available to students and teachers in the traditional face-to-face setting, the speed of feedback to distance education students is important (Becker & Gibson, 1999; Care, 1996; Mishoe, 1999; Rumble, 1986). Prompt responses that give a distance education student results, reinforcement, and psychological support are highly valued in distance education (Care, 1996; Pratt, 1987). Since feedback is the process the distance education teacher uses in his/her role as a "validator" (Hopey & Ginsburg, 1996) of the distance education student's constructed knowledge, it is essential that feedback be consistent and timely, personalized and pleasant, and encourage and reinforce effective study habits (Willis, 1992). More formal feedback, formative and summative evaluation processes, must also designed and prepared for use in a distance education course's environment (Lever-Duffy & Lemke, 1996b). All of the interrelated foundational distance education knowledge components and skills of integrating subject content with appropriate media, understanding distance education students, and creating an effective distance education environment must be understood and considered while carrying out multiple distance education processes and procedures.

During the process of creating a distance education course, the teacher needs to understand and effectively apply the procedural knowledge and skills required for (1) designing a distance education course and (2) preparing a distance education course including collaboration with other distance education team members. Finally, while conducting and leading the distance education course, a distance education teacher must understand and apply the knowledge and skills required for (3) using the distance education technology competently, (4) managing the distance education course, and (5)

facilitating distance education students' learning. These interrelated procedural roles require that the teacher (6) become a team member.

Procedural Knowledge for Distance Education Teachers

In the roles of distance education course designer, course preparer, and course manger, a distance education teacher must have knowledge of the four interrelated components previously discussed. The foundational knowledge areas that will improve a distance education teacher's performance are: (1) the traditional need to identify the content of a course and the kinds of learning necessary; (2) the characteristics and needs of distance education learners; (3) the various distance education media available and their content presentation abilities, as well as (4) the interactivity and user-friendliness of the media and how each medium varies in its ability (Bates, 1995b) to develop desired students' skills.

Course Design. Because of the separation of the teacher and the learner, both physically and often in time as well, in electronic-technology based distance education (Keegan, 1990), course design is central to the success of distance education for the student, teacher, and organization (Flaherty, 1997; Ingesman, 1993). "Electronic-technology based distance education course design is concerned with making sure that the students have access to the information and tools necessary for creating knowledge" (Noblitt, 1997, p. 5). While "instructional clarity is consistently and positively associated with learning" in general, the need for instructional clarity is even more important in distance education (Wlodkowski, 1999, p. 53). Each component of a distance education course must be carefully developed in an extensive and precise planning phase that

requires multiple knowledge and skills of the distance education teacher (Lever-Duffy & Lemke, 1996a) to make each distance education course element "optimally effective" (Carrier, 1987, p. 60) in successful learning.

During the design process, a distance education teacher must insure that methods for developing and integrating continuous feedback and interactions are incorporated into the mediated structure of the distance education course (Wilson, 1997). Another key consideration during course design is to integrate experience into learning through assignments that use the student's "community or workplace as a laboratory" (Miller, 1990, p. 217). At the conclusion of the distance education course design process, the distance education teacher begins to prepare the course.

Course Preparation. Once a course design has been developed, course preparation begins. In distance education, course preparation should occur well before the course is actually conducted. Creation of a distance education course requires "long lead-in times...to develop and produce materials" (Rumble, 1986, p. 225). This additional lead-time is necessary because of the need to compensate for the physical separation between teacher and student (Office of Technology Assessment, 1989) and a need to develop a distribution process that makes materials available to all students and other distance education team members at the scheduled times (Carter, 1995).

Course materials that meet the needs of the distance education environment must be identified, adapted from previously existing resources, or newly created. Well-structured course materials are essential as the skill of "winging-it" in a classroom is not effective in distance education (Page, 1999b). During the design phase, additional

thought should be given to how course evaluation and assessment methods and potential student conflicts will be handled (Ehrmann, 1995a; Mishoe, 1999). After the design and preparation for a distance education course, a distance education teacher will conduct the course. Effective distance education teaching depends on effective use of the distance education technology.

Use of Distance Education Technology. During a distance education course, a distance education teacher must use the distance education technology effectively and expertly in order to teach effectively (Moore & Kearsley, 1996). Distance education students are constantly exposed to high quality media presentations in all areas of their life (Head, 1992). The distance education teacher's comfort level with and ability to use particular electronic technology-based distance education media and technologies directly influence the perceptions and attitudes of the distance education students regarding the teacher's competency not only with technology, but also in the subject content area being taught.

The most expensive technologies are inefficient and ineffective if the faculty and students are uncomfortable when using them (Carter, 1995; Carrier, 1987; Head 1992). "The effectiveness of distance teaching is integrally related to how well an instructor uses the technology and understands its potential and limitations, and to his or her familiarity with associated instruction methods" (Mishoe, 1999, p. 1334). Distance education faculty members' and students' comfort level with the distance education technology increase when all course members receive training, practice, and support from support staff and

administrators (Willis, 1992). The distance education teacher's use of distance education technology is also a factor in the management of the distance education course.

Course Management. Management of a distance education course requires more work and more frequent involvement from the distance education teacher than managing a traditional classroom course (Mishoe, 1999; Parisot, 1995; Schahczenski, 1998). Required and spontaneous interactions must be monitored and encouraged. In one study "the technological demands of managing [one] Web-based course, such as checking links and continually updating and revising the pages" consumed more than twenty percent of a faculty member's workload (Gaud, 1999, p. 50). One recommendation from this study is that a three-credit course be weighted as a four-credit course for the distance education faculty member's workload to allow for effective Web-course management.

Learning Facilitation. Because of the physical separation of teacher and learner, learning facilitation must be consciously and carefully designed into every aspect of a distance education course, including the course materials, a comfortable mediated environment, and a high level of interactivity. Additionally, in the distance education environment, a major aspect of the education process is facilitating and validating the knowledge constructed by the student during his/her learning process (Shale, 1990).

In the distance education mediated environment, there is less synchronous, two-way interaction. The teacher organizes the course content presentation, which is then accessed by the student. It is only through a different two-way mediated communication process that the teacher and student will negotiate the meaning of the course's subject content for the learner (See Figure 1.). This separate two-way mediated communication

process is also the method used by the distance education teacher to validate the distance education student's course-related knowledge and skills. All of these components are interrelated and require constant interactions with other members of a higher education institution's distance education team.

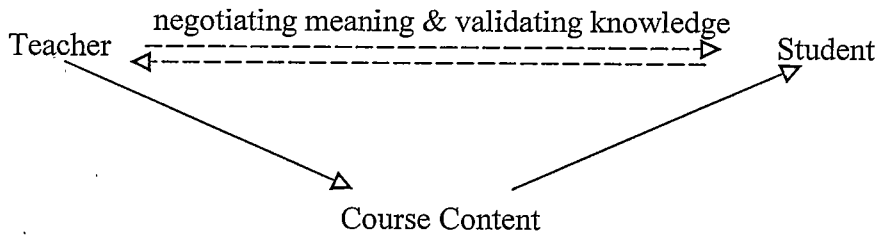

Figure 1. The education relationships in distance education (based on Garrison & Shale, 1987, as cited in Shale, 1990, p. 339).

Team Member. Becoming part of the distance education environment creates a need for the distance education teacher to work with additional staff members in order to effectively create and manage a distance education course. For many centuries, the academic profession's culture has valued autonomy (Florini, 1989; Noblitt, 1997; Rumble, 1986; Schein, 1972) and a faculty member's abilities to be independent and flexible in mostly solo teaching functions. However, in distance education, teachers need to collaborate and cooperate with other members of the delivery team such as technicians and program developers. "Effective distance education requires the integrated interest, participation, and enthusiasm of faculty, students, support staff, and administrators" (Willis, 1992, p. 31). The distance education teacher will need the ability and skills of a team leader/member to insure that all interrelated functions of the distance education system are collaboratively and effectively accomplished (Abernathy, 1998; Ragsdale, 1991; Schein, 1972).

Hundreds of studies over the last 75 years of the 20th century have shown that learning is not affected by the media used in the teaching-learning process (Pratt, 1987; Reid, 1995; Russell, 1999). What does increase learning are effective instructional processes such as content selection and course design including matching content with appropriate media and instructional strategies, and other learning factors, such as support and motivation (Clark, 1994; Florini, 1989; Hopey & Ginsburg, 1996; Lever-Duffy & Lemke, 1996b; McIsaac & Gunawardena, 1996; Moore & Kearsley, 1996; Pratt, 1987). Outcomes for distance education students have been shown to be the same as for traditional classroom students when the course content and distance education technologies are appropriately matched and the needs of distance education students are met (Hopey & Ginsburg, 1996; MacBrayne, 1995; Pratt, 1987; Reid, 1995; Russell, 1999; Spangler, Spear & Plavcan, 1995; Willis, 1992). The increasing use of electronic technology-based distance education is greatly affecting many faculty members in public two-year higher education institutions. A National Education Association survey found that distance education faculty members are concerned about being negatively affected in their personal financial situation by distance education. However, they are positive about and enthusiastically participate in distance education because of its ability to offer an education to students who can not obtain one any other way (Abacus Associates, 2000).

Finding the time and resources to learn and accomplish multiple role-related distance education tasks is almost impossible for even a motivated faculty member in an educational institution without a structure that supports and rewards this complex process (Ehrmann, 1995a; Fowler, 1995). Much of the necessary support can be provided through

an effective continuing education and professional development program provided by the distance education faculty member's organization.

Faculty Development for Distance Education

A key component for successfully offering electronic-technology based distance education within higher education institutions is effective organization-sponsored professional development opportunities and support for distance education faculty (Green & Gilbert, 1995; Imel, 1996; Levinson & Surratt, 2000; Wolcott, 1997).

> Any program designed to address the issues of technological change [in higher education] needs to address two major concerns. The first concern is to ease faculty members into change by alleviating any fears and demystifying the technology. Secondly, the faculty must be educated about how to use the equipment as well as effectively design and present course materials using technology (Gizinski, 1995, p. 26).

A faculty member's acceptance, adoption, and eventual effective use of distance education media and technologies are influenced by the presence of various factors, some negative (barriers), and some positive (support and incentives).

Barriers for Distance Education Faculty

Research has shown that barriers for distance education faculty exist at all stages of the change process from the introduction of distance education through the integration of distance education into a higher education institution's structure (Dubois, 1996; Mishoe, 1999; Parisot, 1995; Parry, 1990). Barriers to a faculty member's acceptance of and use of distance education have many interrelated causes (O'Banion, 1997a), some internal to the faculty member, and some present in the environment external to the faculty member.

Personal Internal Barriers. As with all humans, distance education teachers have needs and when those needs are not met, negative attitudes and resistance result (Seaman & Fellenz, 1989; Stone, 1990). Research shows faculty members' resistance as a major barrier in the technology adoption process (Albright & Graf, 1992; Guskey, 1990; Noblitt, 1997; Parisot, 1995). The attitudes of a faculty member regarding distance education are derived from a combination of internal concerns (Becker & Gibson, 1999; Gizinski, 1995; Hazen, 1992; McKinney, 1997; Schein, 1972). These internal personal concerns include fear of incompetence in a new setting; being replaced; losing academic freedom, autonomy, or tenure; as well as apprehension and anxiety regarding change and new learning. Other causes of resistance are a lack of evidence about how distance education can positively affect learning, concern about the value of a technology in accomplishing educational goals, and perceptions that buying technology will divert resources from other educational processes and reduce quality.

Often, faculty members do not see the use of educational technologies, including those used in distance education, as having any relevance or advantage in the learning process. This perception of non-relevance is related to the amount of involvement that a faculty member has in the technology decision process. The less involvement in the technology decision process, the more likely future users will be resistant to using a new technology (Smith, 1999) and therefore not ready to learn.

Faculty members must be involved in planning distance education, provided with opportunities to learn how to effectively use distance education technologies, and given flexibility to adapt their teaching. Skepticism and apprehension decrease once teachers

experience and understand how to use a new technology as just another teaching tool for the benefit of students (Parisot, 1995). Even if internal barriers have been reduced, a motivated distance education faculty member still faces external barriers.

Organizational External Barriers. The effectiveness and quality of distance education is dependent on the knowledge and skills of the faculty member. "Faculty not only need to learn about the technologies themselves, but also must learn how to appropriately apply the technology for learning" (Joint Committee on Education, 2000, p. 61). When a faculty member's organizational environment provides no evidence of the benefits of distance education (Moore & Kearsley, 1996; Parisot, 1995), little or no experience in distance education (Becker & Gibson, 1999; Smith, 1999), and little training, support, or reward for the faculty member (Hazen, 1992; Moore & Kearsley, 1996), the results are poor opinions of distance education and resistance. Faculty resistance "has been due, in large part, to the lack of an institutional support framework to train, compensate, and reward distance teaching faculty at levels commensurate with those in traditional instructional roles" (Olcott & Wright, 1995, p. 5). In most higher education institutions, distance education still has not been integrated into organizational structures. Reasons that instructional technologies (including electronic-technology based distance education) are not fully integrated include change-resistant institutional structures, lack of training, and absent or insufficient campus support services (Albright & Graf, 1992; Wagner, 1997). When distance education faculty do not have sufficient resources and time available to learn and transfer new learning and skills into their performance, the effectiveness of distance education is negatively affected.

Lack of time in a distance education faculty member's assigned work duties is the key barrier that directly increases the negative impact of all other barriers (Billings, 1995; Eraut, 1987). However, the need for more time for distance education is still not recognized in most higher education organizations (Abacus Associates, 2000; Mishoe, 1999; Parisot, 1995; Scheurman, 2000). Lack of time is a barrier at all stages of the change process that is often caused by the lack of change in an organization's support and reward structures including professional development. An additional time-related barrier is that "it is quite rare that ongoing 'traditional' responsibilities...are reduced in order to accommodate...new technology-related [duties]" (Gilbert, 2000, p. 18). Distance education teaching requires additional time for: (1) learning how to use distance education technologies and media effectively; (2) course design that fosters interactivity; (3) preparing media-appropriate course materials; and (4) interaction with distance education students and other members of the distance education team.

The changing roles of the teacher in the distinctly different learning environment of distance education require the provision of organization-sponsored learning opportunities that include not only the use of technologies, but also education applications, course design, and incorporating interactivity into distance education (Gizinski, 1995; Wagner, 1997). However, "many [two-year higher education] teachers have had little or no training in the process of instructional design and development of alternative instructional strategies and may require significant training and support" (Lever-Duffy & Lemke, 1996b, p. ix). A survey of almost 500 State University of New York faculty members found that three of four respondents reported receiving no training and two of three received no professional assistance to develop a distance education

course (Scheurman, 2000, p. 16). If a distance education faculty member does benefit from a faculty development program's learning activities, he or she then needs continuous access to technical and administrative support.

A National Education Association survey of higher education distance faculty indicates that "the level of technical support is the most important determinant of overall feelings toward distance learning" (Abacus Associates, 2000, p. 28). Positive feelings of distance education faculty are "related to whether they are satisfied with the training [and] technical support available", with technical support being "significantly more important to overall feelings" than other attributes available to them (Abacus Associates, 2000, p. 28). The Campus Computing Project's annual 1999 survey revealed that "user support levels in two- and four-year colleges and universities are well below those found in organizations and corporations of similar size and technical complexity" (Green, 1999, p. 2). While one industry guideline recommends one support person for every 50-75 users, the support-user ratio in higher education in the United States ranges from 1:150 up to 1:800 in community colleges.

A lack of support creates multiple barriers for distance education faculty members. When necessary electronic technology and support staff are not available or are not dependable, convenient, and easy-to-use, then distance education teachers may not make creative, effective use of technology (Boettcher, 2000; Parisot, 1995; Steele, 1995). Instead, they will "resort back to the methods with which they are most familiar and comfortable" (Hobbs & Christianson, 1997, p. 14). Often, these methods are not effective in the distance education environment.

In addition to on-going access to technical and administrative support, transfer support is necessary for accomplishing the "knowing how" and "applying" conditions of Centra's model. Although group and collaborative peer interactions are essential at this stage, there are "few opportunities for faculty to receive advice, trade ideas, and solve problems collaboratively" in most higher education institutions (Willis, 1994b, p. 280). Analysis of participants' lack of performance change at the end of one continuing education program showed that the program did not include developing collaboration in the workplace or provide opportunities for experiential applications of the content. Additionally, the participants' organizations did not have follow-up supportive structures that assisted the participants' efforts to change their performance in the workplace (Felton & Parsons, 1993).

The annual 1999 survey by the Campus Computing Project showed that while 76% of campuses reported having information technology development programs and 66% as having campus support centers that assist faculty members in integrating technologies into courses, only 14% of higher education institutions formally "recognize and reward the use of information technology as part of the faculty review process" (Green, 1999, p. 6). Although faculty work itself is changing because of changing delivery formats, institutional rewards are not changing, even though administrators acknowledge the additional preparation time and effort required (Wolcott, 1997). "Common Distance Teaching compensation and incentive issues include applicability of distance teaching towards promotion and tenure, release time, instructional and administrative support, monetary compensation, teaching load, and training" (Olcott & Wright, 1995, p. 7).

> Integration of distance education into mainstream higher education compels postsecondary institutions to reduce existing barriers to faculty participation by compensating, rewarding, and training faculty at levels commensurate with those of traditional instructional activities and to provide instructional and administrative support services designed to ensure student access to high-quality instructional programs (Olcott & Wright, 1995, p. 15).

"Technological innovation will become unsustainable as faculty become more experienced, suffer from increased work-loads, and find they are still unrewarded" (Bates, 1997, p. 14). The learning and support needs of distance education faculty members can be met by a well-designed professional development program that includes support for all phases of the learning process, and integrating distance education roles and tasks into the organization's culture and structure.

Support Factors for New Distance Education Faculty Roles

Faculty and administrators are the key change agents in the difficult process of effectively integrating electronic-technology based distance education into educational processes (Albright & Graf, 1992; Green, 2000; Willis, 1994a). "Educators are the ultimate knowledge workers. We know that more and different training will be necessary if...administrators and faculty members are to integrate the advances of technology into the curriculum and into their teaching" (Web-Based Education Commission, 2000, p. 131). Using Daloz' visual model of the interactions between a challenge (change, innovation) and support and development (learning, transfer to performance) is useful in understanding how vital support is in the change process (See Figure 2). It indicates that growth (change in performance) occurs when a challenge is matched with adequate

support. When a desired change is not supported, the result will be retreat (resistance) and the change will be delayed or not occur.

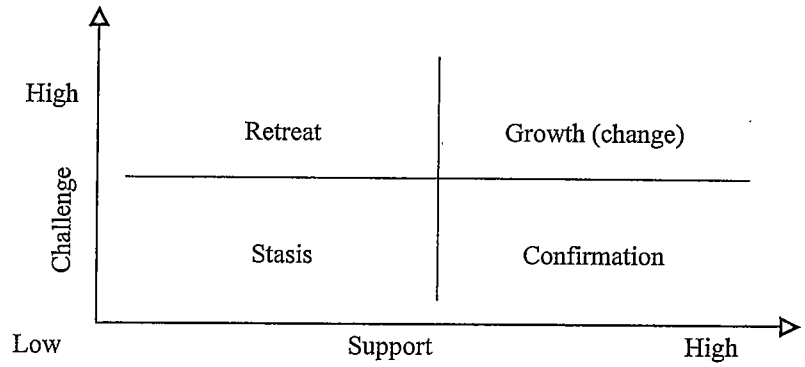

Figure 2. The effects of support and challenge on development. Daloz, 1999.

Organization-provided learning opportunities and follow-up transfer-related elements are identified by research as essential components of the provision of formal faculty support for successful adoption of technological innovation. In the constant change and lifelong learning needs of the Information/Knowledge Age paradigm, understanding of change theory and the importance of a continuing cohesive, cyclical model for professional development are necessary for helping distance education faculty members achieve effective transfer and productive performance (Fowler, 1995; Kovel-Jarboe, 1990; Lewis, 1998; Parisot, 1995; Tibbetts, 1990; Willis, 1994b). The continuing education provided by an educational institution for distance education faculty will be most effective when it recognizes and accommodates the continuing education needs and characteristics of faculty as adult learners (Brown & Smith, 1990; Joyce & Showers, 1988). Support elements and incentives for distance education faculty members during the implementation, adoption, and integration stages of the change process can be

considered in three interrelated categories: support for learning; support for transfer to performance; and support for changed performance.

Support for Learning. During the initial introduction and implementation phases of using distance education in an institution of two-year higher education, the provision of formal continuing education opportunities is essential. "It is essential that distance educators - subject matter experts in the subjects they teach – should be provided with strategies to integrate contemporary technologies of instructional delivery within existing instructional paradigms which are appropriate for use with their intended audience" (Wagner, 1990, p. 309). These professional development learning activities must include and integrate two major components: a) specific distance education content topics; b) and the most appropriate teaching-learning methods to be used in the learning events.

The content topics of effective continuing education for distance education faculty identified by research can be considered in four general categories (Bates, 1997; Fowler, 1995; Olcott & Wright, 1995; Verduin & Clark, 1991; Wagner, 1990; Willis, 1992 & 1994a). One topic category is research in and theories of distance education and computer-mediated communication, and the resulting changing roles of all participants in distance education including students, faculty, and support staff. A second topic category includes effective use of electronic technologies and media. A third topic category is the need and various strategies for establishing and maintaining high levels of interactivity in distance education. The multiple management aspects of distance education are the focus of the fourth content category.

Teaching-learning methods reported by researchers as effective in faculty professional development activities incorporate adult learning principles (Eraut, 1987; Fowler, 1995; Showers, Joyce & Bennett, 1987; Wood & Thompson, 1980). These methods include multiple demonstrations, observation of professionals, and opportunities for multiple practice sessions in realistic simulated settings, feedback during the transfer process, and learning methods that incorporate "experiential learning, reflection, and group discussion" (Eraut, 1987, p. 735).

Support for Learning Transfer to Performance. Once the formal learning activities for distance education faculty development conclude, the organization must continue to support the learning process. After becoming comfortable with distance education technologies, media, and theories, distance education faculty members will need support while completing the process of transferring new knowledge to their performance competencies. Regardless of how well professional development activities assist learners in acquiring, applying, and practicing a new skill, if the learning is not maintained and positively reinforced in the workplace by follow-up support elements, then new skills are not retained long enough to become the changes in behavior (new performance competencies) that are the goal of professional development (Eraut, 1987; Parry, 1990).

Research indicates that effective continuing professional development for distance education faculty requires the availability of follow-up transfer-related elements, especially during the period when a teacher is first integrating technology, curriculum, and subject content (Showers, Joyce, & Bennett, 1987). Several follow-up transfer-related elements increase the effectiveness of continuing education by improving transfer

of new knowledge and skills into the workplace. These relate to reinforcement of new desired competencies and to the group learning necessary for development of a distance education frame of reference. During the learning transfer process, technical and administrative support and assistance must be conveniently accessible to a distance education faculty member (Eraut, 1987; Parisot, 1995). Technical support includes flexible training, convenient access to well maintained equipment, and staff assistance. Practice teaching "will allow the faculty to practice their instruction and to receive critiques from the various members of the instructional team" (Carter, 1995, p. 151). Distance education faculty members can not be expected to perform their multiple teaching-related roles and provide "technical support for themselves as well" (Carter, 1995). Effective technical support for distance education faculty is provided by support staff.

Support staff also are important for administrative support functions such as "materials distribution, [and] facilities scheduling" (Willis, 1994a, p. vii). "Support personnel will be needed to work with teachers, organize and staff [professional development activities], develop instructional materials, and implement the training effort" (Willis 1994b, p. 282). Again, the investment in technology will not be cost-effective without knowledgeable and competent people to use it effectively. Since distance education requires extensive team work, "diffusion of technology throughout the instructional environment may be lessened if technical training necessary for support personnel is not provided alongside faculty" (Parisot, 1995, p. 119).

An organizational structure that encourages group collaboration, feedback from peers and experts, and workplace coaching and mentoring is also necessary for successful

transfer. "Direct experience, consultation with peers, and observation of other teachers are three main sources of teaching knowledge and skill" (Cambre, Erdman, & Hall, 1996, p. 41). Collaborative support includes providing collaborative opportunities such as peer role modeling and team groupings of staff members that allow distance education faculty to share and benefit from the experiences of other faculty members (Carter, 1995; Parisot, 1995; Wood & Thompson, 1980). "Many faculty prefer to consult with colleagues in their own academic discipline" (Willis, 1994b, p. 287). A study by Kasworm found that faculty members participating in sessions on new computing software did not feel learning had occurred. Their true learning and development of skill competencies "developed later through their reported personal interests, pursuits, and self-directed actions to create meaning, knowledge, understanding, and application. In particular they sought out mentors, colleagues, students, and friends for guidance in understanding and modeling of the desired expertise" (Kasworm & Londoner, 2000, p. 227).

The most essential transfer-related element is time. Time must be available for the practice, collaboration, and reflection necessary for transfer of new learning to performance (Bates, 1997; Billings, 1995; Joyce & Showers, 1988; Parisot, 1995; Willis, 1992 & 1994b; Wolcott, 1997). Once transfer to performance has occurred, support is still necessary to ensure that the changed performance continues.

Support for Changed Performance. As faculty members successfully integrate new distance education and skills into their performance, their success and efforts must be recognized and rewarded within the organization. "Rewards can include recognition of achievement, granting of workload credit, creating an intellectually stimulating

environment that ...fosters professional growth through collegiality, [and providing] regular opportunities for sharing ideas and collaborating" (White, 1998, p. 43). Other support requirements for changed performance include opportunities that provide interactions with other distance education faculty members. These interactions will reinforce the development of a professional distance education frame of reference. Distance education faculty members' changed performance will continue when their new tasks are performed within an organizational structure that has also been changed by integrating distance education into the institution.

Conclusion

This review of the literature has acquainted the reader with the theoretical base of this study. A brief history of distance education and a discussion of the broad societal and education-specific changes providing the impetus for higher education's moving into distance education were provided, as well as a review of distance education in two-year higher education and in Allied Health programs.

A discussion of organizational change and its relation to successful distance education was presented. This included the requirements for successful integration of an innovation such as the electronic-based technologies used in distance education. Because professional or staff development is a key to successful change in performance and organizations, continuing professional education and adult learning theory and research were then discussed. Continuing the review of change-related research and literature, the changing roles of administrators and faculty members involved in distance education were also reviewed. The final major area of literature reviewed concerned the existing

and potential barriers for distance education faculty members and the support-related elements recommended in the research literature.

The major points of this discussion serve as a foundation for this study's research questions about the beliefs of deans, department heads, and distance education faculty members regarding what types of professional development and support-related elements should be provided by public two-year higher education institutions that are offering electronic technology-based distance education.

CHAPTER 3

METHODOLOGY

Introduction

Electronic technology-based distance education is a rapidly growing delivery method in public two-year higher education. Research indicates that distance education changes the environment of the teaching-learning process, the roles of the faculty member, and the need for provision of professional development by institutions of higher education. This chapter describes the methodology used for conducting the research, which examined the beliefs of deans, department heads, and distance education faculty members regarding what types of professional development education activities and professional development support-related elements should be provided by public two-year higher education institutions that are offering electronic technology-based distance education. The chapter begins with a section on the study's research design and the process of identifying the research study's respondents. Next the data collection process and the instrument are described. The last section of the chapter describes the data analysis procedures used in this study.

Research Design

A descriptive research design using a survey technique was used in this research. Survey research "has considerable credibility [and] widespread acceptance and use in academic institutions" (Rea & Parker, 1997, p. 1-2). Survey research is used to gather

primary data in the form of "self-reported...information from people about themselves" (Rea & Parker, 1997, p. 2). The information collected in surveys is of three types: behavioral, descriptive, and preferential. "The term *survey* represents a broad category of techniques that use questioning as a strategy to elicit information. Written forms of survey are referred to as questionnaires" (Merriam & Simpson, 1995, p. 144).

Mail-out surveys have advantages and disadvantages (Orlich, 1989; Rea & Parker, 1997). Advantages of mail-out surveys include: cost savings when compared to in-person or telephone surveys; convenience for the respondent; a feeling of anonymity for the respondents; and reduced opportunities for bias since each respondent receives the same questionnaire. Disadvantages of mail-out surveys include: a lower response rate; a relatively longer time period due to mailing, follow-up, and replacements; a lack of interviewer involvement to clarify unclear questions or record and probe spontaneous reactions; and avoidance of questions requiring written responses.

Population

The benefits of distance education are most obvious for educational institutions serving states with smaller or rural populations and large distances between students and the educational institutions' physical locations. "In rural areas of the United States, there are fewer educational institutions, opportunities, and resources than in urban areas" (MacBrayne, 1995, p. 56). This descriptive research study was limited to public two-year higher education institutions located in the member states of the Western Rural Development Center (WRDC).

The WRDC was established "to strengthen rural families, communities, and businesses by facilitating collaborative socio-economic research and extension through higher education institutions in the western region" (Western Rural Development Center, 1998). In 1998, the member states of the WRDC were Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, and Washington. Guam was also a member of the WRDC. According to the 28th edition of Peterson's Guide to Two-Year Colleges (1998) there were 227 public two-year higher education institutions in these states and one in Guam. The researcher also collected data on each identified institution's student population for the Fall 1998 semester from Peterson's Guide to Two-Year Colleges.

This study focused on public two-year higher education institutions located in the WRDC member states that were offering at least one profession-accredited health care technical program. By checking the 26th edition of Health Professions Education Directory (American Medical Association, 1998) the researcher determined that 102 public two-year higher education institutions in the WRDC states met this criterion. From the institutions that met the health care program criterion, the researcher then identified public two-year higher education institutions currently offering electronic-technology based distance education by using the second edition of Peterson's Guide to Distance Learning (1997) and the Peterson's Life Long Learning site on the World Wide Web.

The identified institutions were also stratified by size of student population; less than 3,000 students, 3,000-5,999 students, 6,000-9,999 students, and 10,000 plus students. These strata were based on the categories in the Survey on Distance Education Courses Offered by Higher Education Institutions, which collected "the first nationally

representative data about distance education course offerings in higher education institutions" (National Center for Education Statistics, 1997, p. iii). Fifty institutions met all criteria of the research study; however, since one of the identified institutions employed the researcher, it was not included in the research population. On this basis, the population of this study was the participants in distance education decision-making and delivery processes in the 49 colleges that met all criteria established by the researcher. The researcher surveyed a purposive sample of these participants to obtain a broad range of discipline-based and institution-based opinions about professional development for distance education faculty members in public two-year higher education.

Sample

Current on-line catalogs, Web home pages, and telephone operators of the identified educational institutions were accessed or asked to identify the person serving as the distance education coordinator for each institution and this person's e-mail address. The researcher then contacted this person at each institution by telephone. When the researcher was unable to speak directly with the distance education coordinator by telephone after three or four attempts, an e-mail message was sent by the researcher (See Appendix A).

During the spring and fall of 1999, the distance education coordinators at the institutions were asked to identify deans of instruction and department heads whose faculty were involved in distance education at their campuses. The distance education coordinators were also asked to identify three faculty members currently involved in electronic technology-based distance education; one that taught an Allied Health-related

course, one that had a relatively long period of experience in distance education at their campus, and one faculty member that was just beginning to teach using distance education. The researcher assured the distance education coordinators that the confidentiality of respondents would be protected.

At one institution, distance education faculty were not using any electronic technology in their interactions with students since the students periodically met with the faculty members on campus; therefore, that college was not included in the research study. Thus, 48 institutions became the final survey population of this research study (McMillan & Schumacher, 1997). At the 48 institutions, 96 administrators and 138 distance education faculty members were named with their telephone and e-mail addresses provided. These identified distance education faculty members and administrators serving as department heads or deans constituted the sample for this research study.

Data Collection

A personal, toll-free 800 telephone number was used by the researcher for telephone calls to collect data, identify potential respondents at survey institutions, and pre-notify respondents when the questionnaire was mailed. The toll-free telephone number was also provided in the cover letter as a contact number for respondents with questions or concerns.

In November 1999, a cover letter, the questionnaire, a letter of endorsement from the Director of Distance Learning at the researcher's college, two pre-addressed, stamped postcards and a return stamped envelope were mailed to all identified respondents in the

three subgroups of the study (See Appendix B). The researcher used the following methods as ways to improve the response rate of the survey (Krathwohl, 1998; McMillan & Schumacher, 1997).

The cover letter on institutional letterhead was personalized and brief, indicated the importance of the respondent's reply to the research project, stated that the questionnaire could be completed easily, mentioned a relevant sponsoring organization, reported that the survey has administrative approval and backing from the researcher's institution, and expressed appreciation for a prompt response. The postcards were for use by each respondent to indicate that he or she had returned the questionnaire and to request results of the research. The cover letter also provided a web site address where the results would be published at the end of the research project. The respondents were also asked if they wished to receive a hard copy of the results at the conclusion of the research project.

Survey respondents were assured of confidentiality and that specific narrative data, such as job titles or program names would be reported only in aggregate data categories. The questionnaires were coded to allow identification of respondents for follow-up purposes only. The identification of individuals allowed the researcher to follow-up directly with non-respondents and to match responses to specific stratified size categories of public two-year higher education institutions. This allowed the researcher to create tailored reports for all respondents showing how their organization was positioned in relation to all other responding institutions.

Since research shows that the return rate for mailed surveys increases as the number of contacts increases, the researcher made a minimum of four contacts with each

identified respondent (Salant & Dillman, 1994, p. 147). While the questionnaires were in the mail, the researcher telephoned or e-mailed each respondent to let them know that the survey would be arriving and asking for their assistance. Thirteen days after the survey materials were mailed, the researcher mailed a follow-up postcard to all respondents for whom a questionnaire had not been received (See Appendix C). Seven weeks after the original mailing, a second survey packet with a new cover letter was mailed to each respondent for whom a questionnaire had not been returned (See Appendix D). Some respondents received one additional contact, because the distance education coordinator at their institution did not wish to identify persons without their knowledge. So the first notification of the survey for these faculty members came from someone at their own institution.

Instrument

A survey instrument was developed by the researcher to collect information from faculty members, department heads, and deans of instruction at selected public two-year higher education institutions that offered profession-accredited healthcare technical programs and that also provided electronic technology-based distance education (See Appendix B). The self-administered survey instrument, titled *Electronic Distance Education (DE) Professional Development Survey,* consisted of five sections with a total of 21 questions and 52 actual items. Demographic, institutional, and program information was collected as nominal or narrative data. Many of the demographic, institutional, and program questions were structured as closed-form items, which asked respondents to select one response from a list of provided options. In order to "allow a subject to write in

a response not anticipated by the researcher", the majority of questions also had an *other* choice with space for the respondent to write in a response not provided by the questionnaire (Gay, 1992, p. 256).

The first section of seven questions gathered individual attribute data about each respondent. These attributes included the respondent's gender, age, primary duties, position title, years of experience in teaching and distance education, and highest attained educational degree.

The next section of five questions collected data regarding distance education in the respondent's institution. These included the number of distance education courses offered and the number of years that distance education had been provided by the institution, the types of electronic technology being used within the institution, and the placement of the distance education activities and personnel within the institution's organizational structure.

The largest section of the questionnaire was concerned with the respondent's rating of various aspects of professional development, including necessary content, learning activities or methods, and transfer support-related elements within his or her institution. It used a scaled response mechanism, with a continuum of response alternatives provided for the respondent.

A Likert scale requires the respondent to select one response from "an equal number of positive and negative categories and one middle or neutral category" on a five- to nine-point rating scale (Rea & Parker, 1972, pp. 59-60). The Likert scale is useful within the context of a group of questions regarding attitudes about one specific subject. Principles for developing a series of scaled responses include: asking two to ten questions

on each subject; the questions should cover as many relevant aspects of the subject as possible; the questions should be unidimensional; the scale should be logical and have a continuum; and the dimensions of response should measure the responses in the same order.

A Likert scale of one through five, with one representing *Essential* and five representing *Not Important* was used to identify the level of importance of each content topic, learning activity, and support-related element of professional development for distance education faculty. The three questions of this section also provided the opportunity to write in additional comments. The three questions in this section had a total of 35 items. The last question in this section served to direct certain respondents to answer the fourth section. The question asked if the respondent was currently teaching a course. If the answer was no, the respondent was instructed not to answer the fourth section of the survey and to continue past the fourth section to the fifth section of the questionnaire.

The fourth section of the questionnaire was completed only by respondents teaching during the semester the survey was conducted. It collected data on the awareness of the respondent regarding the profession-based accreditation process for allied health programs.

The fifth and final section of the survey asked the respondent to mail the enclosed results request postcard separately if he or she wanted to receive a copy of the study's results. It also thanked the respondent for completing the survey and provided the researcher's mailing address, telephone number, FAX number, and e-mail address.

Validity

The research instrument was validated by conducting a pilot survey and having experts in the fields of education, distance education, and educational technology evaluate the questionnaire for content and clarity. These experts included distance education administrators and faculty in public two-year and four-year higher education, an educational technology researcher, and a developer of online distance education applications. Content review was completed in two phases.

As a result of the first content review, two changes were made in the first section of the instrument, four changes in the second section, and five changes in the third section. Then eleven faculty and administrators at a public two-year higher education institution meeting the geographical location, allied health program offering, and distance education criteria of the study field-tested the questionnaire. This institution was not included in the actual survey as it was the researcher's place of employment. The results of the pilot regarding directions, layout, and reporting procedures were used to review and revise the questionnaire, which increased its clarity. One question was eliminated from the first section, two questions from the third section, and the instructions were expanded for the third section.

The content of the new version of the survey instrument was then reviewed by five additional experts. The researcher received helpful comments and suggestions for format improvement and clarification of the instrument. These recommendations were used to revise the instrument.

Reliability

Reliability is an indication of the dependability of a measuring instrument. When an instrument is reliable, it will have "results that are consistent with each other over repeated trials" (Osborn, 1998, p. 6). Since the instrument designed by the researcher was only administered once, Chronbach's alpha (coefficient alpha, Chronbach's coefficient alpha) was used to analyze the reliability of the instrument. Chronbach's alpha measures the internal consistency of an instrument using average correlation between items on an instrument. Chronbach's alpha is used for instruments that have items with scoring "such that different answers are worth different numbers of points, e.g., 0, 1, 2, or 3" (Gay, 1996, p. 149). The results of the Chronbach's coefficient alpha for the questions on the survey instrument about content topics, learning activities, and support-related elements for professional development for distance education faculty are shown in Tables 1, 2, and 3. Chronbach's coefficient alpha is a conservative reliability estimate. It provides a value from 0.00 to 1.00, with a higher value indicating a more reliable instrument. A Chronbach's coefficient alpha value of at least 0.80 is considered necessary for instruments used repeatedly.

Table 1. Correlation Matrix of Instrument Items on Content Topics.

N = 164	Alpha = .723				Standardized item alpha = .739					
	13a	13b	13c	13d	13e	13f	13g	13h	13i	13j
13a	1.000									
13b	.409	1.000								
13c	.226	.268	1.000							
13d	.269	.251	.349	1.000						
13e	.148	.149	.322	.193	1.000					
13f	.011	.191	.169	.150	.424	1.000				
13g	.152	.152	.404	.184	.479	.442	1.000			
13h	.097	-.096	.064	.094	.254	.300	.345	1.000		
13i	.022	-.100	-.037	-.020	.189	.308	.239	.773	1.000	
13j	.184	.274	.331	.274	.415	.199	.337	.090	.043	1.000

Table 2. Correlation Matrix of Instrument Items on Learning Activities.

N = 161	Alpha = .7228				Standardized item alpha = .7292					
	14a	14b	14c	14d	14e	14f	14g	14h	14i	14j
14a	1.000									
14b	.157	1.000								
14c	.376	.478	1.000							
14d	.242	.234	.210	1.000						
14e	-.126	.096	.117	.066	1.000					
14f	.194	.217	.157	.586	.081	1.000				
14g	-.116	.204	.148	.186	.553	.127	1.000			
14h	.444	.121	.313	.325	-.088	.311	.023	1.000		
14i	.448	.144	.234	.300	.023	.287	.103	.670	1.000	
14j	.268	.128	.269	.258	.061	.122	.072	.273	.252	1.000

Table 3. Correlation Matrix of Instrument Items on Support-Related Elements.

N = 168				Alpha = .8373					Standardized item alpha = .8418			
	15a	15b	15c	15d	15e	15f	15g	15h	15i	15j	15k	15l
15a	1.000											
15b	.349	1.000										
15c	.160	.308	1.000									
15d	.171	.445	.390	1.000								
15e	.091	.239	.366	.260	1.000							
15f	.193	.235	.296	.136	.497	1.000						
15g	.066	.305	.320	.166	.457	.538	1.000					
15h	.334	.252	.162	.135	.392	.367	.388	1.000				
15i	.233	.346	.326	.341	.275	.263	.309	.315	1.000			
15j	.186	.361	.367	.181	.350	.541	.525	.327	.309	1.000		
15k	.160	.287	.260	.153	.404	.624	.551	.344	.326	.712	1.000	
15l	.259	.317	.089	.173	.199	.200	.227	.397	.315	.331	.372	1.000

Another measure of internal consistency reliability that can be used for an instrument that is administered only once is split-half reliability (Gay, 1996; Hayes, 1997). This procedure divides each instrument into halves, computes the responses for each half, correlates the two sets, and applies the Spearman-Brown correction formula to determine a reliability coefficient. If the resulting reliability coefficient is high, then "the test has good split-half reliability" (Gay, 1996, p. 148). A reliability coefficient of .80 or above is the acceptable value in most cases.

The questionnaire had three questions on the content, learning activities, and support-related elements of distance education faculty professional development programs. Therefore, the questionnaire had three related subtests, each of which was evaluated for reliability. Since the estimate of split-half reliability is affected by the

number of items in a scale, each subtest included at least 10 items. The results of the split-half reliability measurement of the questions on content, learning activities, and support-related elements are presented in Tables 4, 5, and 6.

Table 4. Split-Half Reliability of Items on Content Topics.

Reliability Coefficients			
N of Cases	= 164.0	N of Items	= 10
Correlation between forms	= .3348	Equal-length Spearman-Brown	= .5016
Guttman Split-half	= .5015	Unequal-length Spearman-Brown	= .5016
5 Items in part 1		5 Items in part 2	
Alpha for part 1	= .6344	Alpha for part 2	= .6985

Table 5. Split-Half Reliability of Items on Learning Activities.

Reliability Coefficients			
N of Cases	= 161.0	N of Items	= 10
Correlation between forms	= .6031	Equal-length Spearman-Brown	= .7524
Guttman Split-half	= .7516	Unequal-length Spearman-Brown	= .7524
5 Items in part 1		5 Items in part 2	
Alpha for part 1	= .5300	Alpha for part 2	= .5729

Table 6. Split-Half Reliability of Items on Support-Related Items.

Reliability Coefficients					
N of Cases	=	169.0	N of Items	=	11
Correlation between forms	=	.6662	Equal-length Spearman-Brown	=	.7997
Guttman Split-half	=	.7989	Unequal-length Spearman-Brown	=	.8008
6 Items in part 1			5 Items in part 2		
Alpha for part 1	=	.7477	Alpha for part 2	=	.7459

Data Analysis

As each completed questionnaire was received, the date received was recorded. Data entries for all of the questions were coded and entered into a database. To reduce data capture errors, the researcher compared all of the entered data with the original surveys. Identified inconsistencies were corrected in the database. Appropriate statistical procedures including calculating means, t-tests, and analysis of variance (ANOVA), were applied to the collected data, using Statistical Package for the Social Sciences (SPSS). Open answer responses were analyzed by using a word processing program to identify, tabulate, and categorize related open answer questions.

Scoring of Responses

Since the SPSS database management program was used for analysis in this research study, the data for all subjects and variables were entered into a database after being converted to numerical values. Each respondent was assigned an ID number and

categorical data, such as *distance education faculty member* or *administrator*, were coded using numerical values. The ratings assigned by the respondents for each professional development content topic, learning activity, and support-related item were selected from a five point scale ranging from 1, indicating an essential item, to 5, indicating an item that was not important. Each rating number for these item questions was scored in the research database with the same value.

Determining Administrators and Distance Education Faculty Respondent Subgroups

The three subgroups originally identified by the researcher during early 1999 were deans, department heads, and distance education faculty members. In the first section of the questionnaire, respondents were asked to select their primary job duties and to provide their current job titles. Since "survey research involves soliciting self-reported verbal information from people about themselves", this self-reported information was used by the researcher to create the three subgroups for the study (Rea & Parker, 1997, p. 2).

Twenty-five of the respondents selected the *other* answer to describe their primary duties in question one. Using the position titles provided by these respondents, the researcher determined that 19 of these respondents would be most appropriately placed in their originally identified subgroups. Three of the *other* respondents were moved into different subgroups than their original subgroup based on their self-reported position titles. Two of the *other* respondents could not be placed into any of the subgroups due to a lack of or incomplete data.

If the position title provided by the respondent for question three indicated administrative duties in only one academic program and the answer to question 16 indicated that the respondent taught during the semester the survey was conducted, then a respondent that had selected *other* in question one was placed in the Faculty subgrouping. If the position title provided by the respondent for question three indicated administrative duties in multiple program or discipline-related areas, then the respondent was placed in the Department Head subgrouping. Titles reflecting a department level focus and responsibility included Coordinator, Director, Program Coordinator, and Division Chair. If the position title provided by the respondent for question three indicated administrative duties across multiple institution-wide responsibilities, then the respondent was placed in the Dean subgrouping. Titles reflecting institutional focus and responsibilities included Dean, Associate Dean, President, Campus President, Vice-President, and Executive Vice-President.

This subgroup assignment process resulted in the following three subgroups: 91 distance education faculty; 24 department heads; and 56 deans. Since there was a wide variation in group size, the researcher recombined the department heads and deans into one subgroup of administrators. The two subgroups used for data analysis were 91 distance education faculty and 80 administrators. This strengthened the equivalency of the two groups when their responses were analyzed. It also acknowledged that there is a greater expected difference between faculty and administrators in general than there would be between two types of administrators. This also collapsed the second and third research questions of the study into a new Question 2 "What elements of professional development and support for faculty using electronic technologies in distance education

are most important to administrators (department heads and deans) in institutions of public two-year higher education?"

Research Questions

The ratings assigned by the respondents for each professional development content topic, learning activity, and support-related item were selected from a five point scale ranging from 1, indicating an essential item, to 5, indicating an item that was not important. Each rating number for these item questions was scored in the research database with the same value. The scores were then used to calculate a group mean for each professional development item. These group means reflected the rating scale used by the respondents, in that the lower the group mean (the closer the mean was to 1), the more essential or important the item had been rated by the group's respondents.

These calculated means were used to investigate the first research questions about the most important elements of professional development for distance education faculty and administrators. The calculated group rating means for all items were then used to answer Research Question 3 by using a *t*-test to determine if any statistically significant differences existed between the two subgroups' rating of each item. A *t*-test is used with two means to determine if the means are different at a statistically significant level for a selected probability level. For this study, the researcher selected a .05 level of significance.

The level of significance is a probability that defines how rare or unlikely data must be before a researcher can reject the null hypothesis embodied in each of the statistical tests used to answer the research questions. Since this study was a beginning of

the needs assessment process for distance education faculty development in public two-year higher education institutions, the "most commonly used probability level" of .05 was chosen (Gay, 1996, p. 471). After computing a calculated value for the level of significance by applying an appropriate statistical test, the researcher rejected or failed to reject the null hypothesis for research questions 3 through 6, which all concerned differences. The possibility of a Type I error exists anytime a null hypothesis is rejected because it might have been rejected when it was actually correct. The possibility of a Type II error exists any time a null hypothesis is not rejected because of failing to reject it when it was actually false. "In hypothesis testing...we are looking at differences" (Krathwohl, 1998, p. 465). When making a decision about any null hypothesis, a researcher may commit a Type I error (rejecting the null hypothesis when it is actually true) or a Type II error (failing to reject the null hypothesis when it is actually false). The calculated group means for the professional content, learning activities, and support items were then used to create ranked listing of all items for each subgroup in descending order. The group means that were closest to 1 were ranked as most important. The group ratings means and group ranked means for the professional development items were used to investigate research questions one, two, and three.

All respondents' means were also used to investigate research questions four and five. For question four, the means were categorized into two groups based on the size of their institutions, one group of respondents from institutions with less than 10,000 students and one group of respondents from institutions with 10,000 or more students enrolled during the Fall 1998 semester. A *t*-test was used to determine if there were any statistically significant differences between the group means at the .05 level of

significance. For question five, the means of all respondents for each professional development item were categorized into three groups based on the range of years their institutions had offered distance education. These groups of respondents were from institutions that had offered distance education courses for one to five, six to ten, and over ten years. A one-way analysis of variance (ANOVA) test was used to determine if there were any statistically significant differences between the three group means for each professional development item at the .05 level of significance.

Conclusion

This research study examined the beliefs of administrators and distance education faculty members regarding what types of professional development education activities and professional development support-related elements should be provided by public two-year higher education institutions with at least one allied health program and that are offering electronic technology-based distance education. Data were collected from respondents at 48 public two-year higher education institutions by use of a researcher-developed questionnaire. The research data were analyzed using frequency of responses and percentages, *t*-tests, and one-way ANOVA. The findings of the research study are presented in Chapter 4.

CHAPTER 4

ANALYSIS OF DATA

This chapter presents the analysis of data related to the research questions posed in this study. Data were gathered by means of a questionnaire with four major sections that collected demographic, institutional, professional development, and program accreditation information from three subgroups at public two-year higher education institutions offering electronic technology-based distance education. Each institution had at least one allied health program accredited by the Commission on the Accreditation of Allied Health Education Programs. The findings relating to the respondents are presented first, followed by the findings for the research questions in this study.

Respondents

By the first week in December 1999, 174 of the 234 individuals, or 74.4% had returned the questionnaire. Follow-up for the 60 individuals not responding was conducted in January, 2000. This follow-up consisted of a repeat mailing with a modified cover letter and an identical set of the materials included in the first mailing. By February 2000, the researcher assumed all potential responses from the follow-up process had been collected, and additional efforts to obtain additional responses ended. A total of 194 (82.9%) had returned the questionnaire.

However, 23 returned questionnaires were not included in the data analysis phase. Since the main focus of the questionnaire was the section "Electronic distance education

faculty professional development" and the three questions it contained, returned forms that did not have all three of these questions completed using the scale provided for answers were not used. Respondents for unused questionnaires used check marks, left more than half of the items blank, or did not rate any items on one or more of the three questions in the professional development section of the questionnaire. Usable completed questionnaires were received from 173 individuals. As the final response rate was adequate at 73.9% (Gay, 1996), a follow-up survey of non-respondents was not performed. The response format provided for these questions was a rating scale. An inadvertent use of the word rank was made in the directions only. An examination of responses indicated that respondents used the rating format without any problem.

Respondent Demographics

Frequencies of response and percents were used to describe the respondents. Demographic data were obtained from respondents' answers to the questions in the first section of the survey instrument. Of the 171 respondents that provided gender data, 91 were female (53.8%) and 80 were male (46.8%). The administrators were 53.2% female and 46.8% male and the faculty were 53.3% female and 46.7% male. Respondents were also asked to indicate their ages. Table 7 provides this information for all respondents and the two subgroups of the study. The majority (74.3%) of all respondents were between the ages of 41 and 60.

Table 7. Age Category.

		Faculty		Administrators		Total	
		n	%	n	%	n	%
Age	20-30 years	1	1.1	1	1.3	2	1.2
	31-40 years	18	19.6	9	11.4	27	15.8
	41-50 years	33	35.9	27	34.2	60	35.1
	51-60 years	33	35.9	34	43.0	67	39.2
(total may be more than 100% due to rounding)	60+ years	7	7.6	8	10.1	15	8.8
N = 171	TOTAL	92		79		171	

Respondents were asked to indicate a range of years that they had a) taught in a traditional classroom setting (Table 8) and b) taught using electronic distance delivery technology (Table 9). Of the administrators, 3.8% had no experience teaching and 18% had less than five years of experience teaching in the traditional classroom. All of the distance education faculty had some traditional classroom teaching experience, while 9.9% had less than five years of experience in that setting. Almost half of each subgroup (48.4% of faculty and 48.7% of administrators) had 5 to 16 years of experience in the traditional classroom. Even more experience (17+ years) in traditional classroom teaching was reported by 41.8% of the distance education faculty and 29.5% of the administrators.

Over half of the administrators (58.2%) had no experience in teaching using electronic technologies for distance delivery. Almost seven percent (6.6%) of the faculty had no experience teaching using electronic technology for distance delivery. Another

14% of administrators and 16.5% of the faculty members had less than one year of teaching experience using electronic technology for distance delivery.

Table 8. Number of Years Teaching in Traditional Classroom.

		Faculty		Administrators		Total	
		n	%	n	%	n	%
The number of years teaching in the traditional classroom (without using distance education technologies)	0 years	0	0	3	3.8	3	1.8
	< one year	1	1.1	1	1.3	2	1.2
	1-4 years	8	8.8	13	16.7	21	12.4
	5-8 years	18	19.8	11	14.1	29	17.2
	9-12 years	18	19.8	14	17.9	32	18.9
	13-16 years	8	8.8	13	16.7	21	12.4
(total may be more than 100% due to rounding)	17+ years	38	41.8	23	29.5	61	36.1
N = 168	TOTAL	91		78		169	

Table 9. Number of Years Teaching Using Electronic Distance Delivery Technologies.

		Faculty		Administrators		Total	
		n	%	n	%	n	%
The number of years teaching using electronic distance delivery	0 years	6	6.6	46	58.2	52	30.6
	< one year	15	16.5	9	11.4	24	14.1
	1-4 years	47	51.6	16	20.2	63	37.1
	5-8 years	13	14.3	6	7.6	19	11.2
	9-12 years	6	6.6	1	1.3	7	4.1
	13-16 years	2	2.2	1	1.3	3	17.6
(total may be more than 100% due to rounding)	17+ years	2	2.2	0	0	2	1.2
N = 168	TOTAL	91		19		170	

At the time they completed the questionnaire, 5.4% of the distance education faculty and 71.3% of the administrators were not teaching (Table 10). Almost ten percent of the distance education faculty were teaching in traditional classrooms only, slightly more than 4% were distance education teaching only and over four-fifths (80.4%) were teaching in both traditional classrooms and the distance education environment. Of the administrators, 12.5% were teaching in the traditional classroom only, slightly more than 6% were distance education teaching only, and 10% were teaching in both settings.

Table 10. Teaching Duties of Respondents at Time of Survey.

		Faculty		Administrators		Total	
		n	%	n	%	n	%
Teaching at the time of survey	No	5	5.4	57	71.3	62	36.0
	Traditional classroom only	9	9.8	10	12.5	19	11.0
	DE only	4	4.3	5	6.3	9	5.2
(total may be more than 100% due to rounding)	DE and Traditional classroom	74	80.4	8	10.0	82	47.7
N = 172	TOTAL	92		80		172	

All respondents were asked to indicate the highest education degree they currently held (Table 11). A little over 59% of the respondents had a Master's, 22.2% had earned a Ph.D., 12.9% an Ed.D., and 1.8% indicated that they had some other type of degree. Of the three administrators who indicated *other* for their highest earned degree, one held a D.V.M, one was a D.D.S., and one was a J.D.

Table 11. Highest Academic Degree Currently Earned.

		Faculty		Administrators		Total	
		n	%	n	%	n	%
Highest completed degree	Bachelor	6	6.6	1	1.3	7	4.1
	Master	64	70.3	37	46.3	101	59.1
	Ph.D.	18	19.8	20	25.0	38	22.2
	Ed.D.	3	3.3	19	23.8	22	12.9
(total may be more than 100% due to rounding)	Other	0	0	3	3.8	3	1.8
N = 171	TOTAL	91		80		171	

Respondents' Institutions

The Institutional Information section of the questionnaire was used to investigate how long distance education had been part of the respondents' institutions, what volume of distance education courses were offered at these institutions, and what types of electronic-based distance education technologies were being used. This section also included two questions that investigated if the respondents' institutions had formally included distance education in their organizational structures.

Respondents were asked to indicate a range of years that their institution had been offering distance education courses (Table 12). Over half of the administrators (55.7%) and faculty members (57.8%) indicated that their institutions had been offering distance education courses for 10 or fewer years. Slightly over one-quarter of the respondents (27.2%) indicated that the number of years their institutions had offered distance education courses was 5 years or less. A higher percentage of distance education faculty

members (11.1%) than administrators (3.8%) indicated that they did not know how many years their institutions had offered distance education.

Table 12. Number of Year's Distance Education Courses Offered by Respondents' Institutions.

		Faculty		Administrators		Total	
		n	%	n	%	n	%
Years distance education courses offered by institution	1-5 year(s)	25	27.8	21	26.6	46	27.2
	6-10 years	27	30.0	23	29.1	50	29.6
	11-15 years	11	12.2	14	17.7	25	14.8
	16-20 years	10	11.1	9	11.4	19	11.2
	21-25 years	3	3.3	2	2.5	5	3.0
	26-30 years	3	3.3	5	6.3	8	4.7
	31+	1	1.1	2	2.5	3	1.8
(total may be more than 100% due to rounding)	I don't know	10	11.1	3	3.8	13	7.7
N = 169	TOTAL	90		79		169	

All respondents were asked to indicate a range for the total number of distance education courses that their institution offered during the 1999-2000 academic year (Table 13). A little less than half of the respondents (47.3%) indicated that their institutions offered between 10 and 40 distance education courses during the 1999-2000 academic year. Twelve percent indicated less than 10 courses were offered, 21.0% indicated 26-40 courses, 19.2% indicated 41-85, and 13.8% indicated that over 85 distance education courses were offered by their institutions during the 1999-2000 academic year.

Table 13. Number of Distance Education Courses Offered by Respondents' Institution During the 1999-2000 Academic Year.

		Faculty		Administrators		Total	
		n	%	n	%	n	%
The number of distance education courses offered during the 1999-2000 academic year	1-9	14	15.7	6	7.7	20	12.0
	10-25	26	29.2	18	23.1	44	26.3
	26-40	14	15.7	21	26.9	35	21.0
	41-55	5	5.6	11	14.1	16	9.6
	56-70	2	2.2	6	7.7	8	4.8
	71-85	2	2.2	4	5.1	6	4.8
	85+	9	10.1	6	7.9	15	9.0
(total may be more than 100% due to rounding)	I don't know	17	19.1	6	7.9	23	13.8
N = 167	TOTAL	89		78		167	

Respondents were asked to indicate the types of electronic technologies that were being used by their institutions for distance education (Table 14). The types listed were the three most common technologies in use during the Fall 1995 semester as reported in a survey conducted by the National Center for Education Statistics (Lewis, Alexander, & Farris, 1997, p. 11).

Of the 45 institutions with at least two respondents providing data on distance education technologies, only a few institutions had total consistency among their respondents' indications of which technologies were being used for distance education. For the use of one-way video technology, only 19 institutions (42.2%) had total consistency in all of their respondents' indications of whether or not that technology was

being used by the institutions. Regarding the use of computer-based technology, 36 institutions (80%) had total consistency in their respondents' indication of whether or not that technology was being used, while 25 institutions (55.6%) had total consistency in the use of two-way interactive video.

Table 14. Types of Electronic Technologies Used in Institutions.

		Faculty		Administrators		Total	
		n	%	n	%	n	%
Distance education technologies	2-way interactive video	50	29.2	52	30.4	102	59.6
	1-way video N = 170	68	40	50	29.4	118	69.4
	Computer-based technology	84	49.1	71	41.5	115	67.3
N = 171	Other	15	8.8	25	12.3	40	

Totals will exceed N because respondents were asked to "check all that apply"

Overall responses to this question demonstrated that a large majority of the institutions represented were using multiple electronic-based technologies in providing distance education. Further review of this data for the 45 institutions that had more than one respondent providing data found that 37.8% of the institutions used all three of the technologies, 51.1% used two of the technologies, and 11.1% used only one of the technologies listed in Table 14. The information provided by the 40 respondents who indicated that their institutions were using "Other" technologies in distance education is presented in Table 15. Responses demonstrated a great variety in the types of electronic-based technologies being used in distance education. These reflected the history of

distance education, from using correspondence via the mail system, to using radio, the telephone, television, videos, and the Internet.

Table 15. Other Technologies Used for Distance Education.

Technology	n
Correspondence	2
Radio	1
Audio - Bridge (3), Conferencing (3), Telephone (2), Tapes (1)	9
Television (broadcast)	14
Video	5
Email	1
Telecollege	1
Multi-media	
Audio Tapes/Phone Conferencing	1
Audio conference/e-mail	1
Independent learning packages/campus-based instruction	1
One-way audio via Internet	1
Traditional/online/teleconference combos	1
Television (public TV) with phone call-in	1
One-way video, one-way direct phone line	1
Video & Internet (Telenet)	1
Video/audiotape, e-mail	1
Radio/2-way voice	1
Videos/correspondence, home study/video	2

Two questions investigated respondents' knowledge of the absence or presence of a distance education office or department within the organizational structure of their institutions (Table 16). About one-fifth (19.0%) of all respondents indicated that their institution did not have a distance education office or department. An additional 1.8% indicated that they did not know if their institution had a distance education office or department.

Table 16. Presence of Distance Education Office/Department in Institution.

		Faculty		Administrators		Total	
		n	%	n	%	n	%
Does your institution have a distance education office or department?	No	20	22.5	12	15.2	32	19.0
	Yes	67	75.3	66	83.5	133	79.2
	I don't know	2	2.2	1	1.3	3	1.8
N = 168	TOTAL	89		79		168	

Of the 133 respondents answering yes to the question "Does your institution have a distance education office or department", 10 (7.5%) did not provide a position title for the administrator to whom the distance education office reports. Another three respondents answered with a question mark (?) and six respondents answered with "I don't know" or some variation.

Research Questions

Each of the research questions in this study was investigated using the data collected from a survey questionnaire. The data provided included both quantitative and

qualitative data, and the findings based on the analysis of both types of data are presented for each research question.

Analysis of the comments written by respondents in response to the open questions on professional development found that most of the comments were related to specific professional development items. More comments were made for the content topics and support-related elements than for the learning activities items. However, a number of comments included statements about one or more of the other question areas rather than the one for which the response was written. Therefore, the written comments are described in the discussions of the relevant aspects of professional development and in terms of the faculty and administrator respondents' teaching experience in distance education.

Research Question 1

> What elements of professional development and support for faculty using electronic technologies in distance education are most important to distance education faculty in institutions of public two-year higher education?

This question was investigated using the data provided by respondents in answering questions 1, 3, 13, 14, and 15 of the survey questionnaire (See Appendix A). The importance of each professional development and support element to distance education faculty was determined by calculating a group mean using the ratings assigned by respondents in this group. The ratings were selected by the respondents based on a Likert scale of 1 through 5, with 1 representing *Essential*, and 5 representing *Not*

Important. Then the group means of all distance education faculty for the three aspects of professional development were ranked by the researcher (Tables 17, 18, and 19).

Content of Professional Development. The content topics group means of the distance education faculty members were ranked in descending order from most important to least important (Table 17). The group means of the distance education faculty members indicated that they considered content topics concerned with how to teach in the distance education environment as most important. Content on how to operate equipment was also important for distance education faculty. Theory of distance education was the least important content topic for distance education faculty.

Table 17. Distance Education Faculty Members' Ranked Means for Content Topics for Professional Development.

Content of distance education faculty professional development should include:	M
instructional strategies that work well using DE technologies	1.648
logistics of DE teaching	1.681
creating technology-appropriate teaching aids	1.824
equipment operation	2.011
integration of distance education methodologies & specific subjects	2.056
equipment troubleshooting	2.220
characteristics of distance students	2.231
creating medium-appropriate course policy	2.242
changes caused by different forms of mediated communication	2.716
theory of distance education	3.045

Fourteen comments were written by faculty members that provided other content topics that they believed should be provided in professional development programs. For distance education faculty members with less than one year of distance education experience, their four following comments indicated a need for understanding institutional goals for distance education, the change process, and how to meet the needs of distance education students. These comments were:

> adapting to change and dealing with resistance in faculty and students
>
> (Faculty member 8905)
>
> institution vision and commitment
>
> (Faculty member 8805)
>
> outcomes tracking; feedback from students
>
> (Faculty member 8603)
>
> how to overcome the problem of "talking heads" putting students to sleep!
>
> (Faculty member 4104)
>
> ways to include students at distant sites so they don't feel like second class
>
> (Faculty member 8905)

The five following written comments of distance education faculty members with one to four years of distance education experience indicated a need for content on how to design courses to meet the needs of distance education students and the context requirements of the distance education environment. Comments included:

> student interaction
>
> (Faculty member 1004)

course management for students in distance education classes

(Faculty member 5405)

how to optimize learning online; time management/learning style differences

(Faculty member 803)

developing easily understood web lectures, assignments, discussions, student interaction

(Faculty member 705)

how to work around computer services

(Faculty member 905)

Faculty members with five or more years of distance education experience indicated a continuing need for content on how to assist distance education students and course management content topics.

email management including list serves

(Faculty member 1904)

mixed media - multi-platform approaches

(Faculty member 7105)

motivation of distance students

(Faculty member 3403)

unfortunately content update is often overlooked. When videos are purchased, they are often of low quality and used forever. The students get more information from their textbook. This seems to be more "independent study" than learning via videotapes.

(Faculty member 7404)

Learning Activities in Professional Development

Next, the learning activities means of the distance education faculty members were ranked in descending order from most important to least important (Table 18). The distance education faculty members considered experiential learning activities as most important. They also considered opportunities to benefit from their peers' knowledge important. Faculty also considered conducting learning sessions during their regular work hours and at their work site as more important than learning sessions not at their work sites.

Table 18. Distance Education Faculty Members' Ranked Means for Learning Activities Professional Development.

Learning activities of distance education faculty professional development should include:	M
use of actual distance education equipment and technology	1.681
experiential (hands-on) learning activities	1.901
Practice activities in actual distance education setting	2.054
round table talks with peers already teaching in DE	2.231
Sessions at the regular work site	2.511
Sessions during regular working hours	2.744
collaborative (group) learning activities	3.033
faculty, admin, & support all learn together	3.326
Sessions outside regular working hours	3.714
outside the regular work site	4.023

The four following comments relating to learning activities were written by distance education faculty members. Two of the comments reflected the need for collaborative learning and one was concerned with the need for teamwork in the distance education environment.

> mentoring session for faculty new to distance learning
>
> (Faculty member 4404)

> conference - yearly for all faculty teaching on ITV [interactive television] system - network with other institutions for professional development
>
> (Faculty member 6603)

> teaming with technology experts - on camera tips
>
> (Faculty member 7204)

The last comment was more general, indicating a general lack of professional development learning activities for the distance education faculty at the respondent's institution.

> ALMOST NONE OF THIS IS AVAILABLE ROUTINELY AT MY SCHOOL (capitalization by respondent)
>
> (Faculty member 5204)

Support-Related Elements of Professional Development

Table 19 presents the support-related element means of the distance education faculty members ranked in descending order from most important to least important. The group means of distance education faculty members indicated that well-maintained distance education equipment and on-site technical assistance were the most important

professional development support-related elements. The third most important support-related element was time.

Table 19. Distance Education Faculty Members' Ranked Means for Support Elements.

Support-related elements for professional development of distance education faculty should include:	M
DE equipment is well-maintained	1.264
on-site technical assistance	1.413
time to learn, plan, try, reflect, revise	1.612
access to DE equipment when faculty needs it for instruction prep/rehearsal	1.707
distance education resource center	2.065
practice opportunities under simulated conditions	2.620
opportunities to observe distance teaching role models	2.630
feedback from peers in distance education	2.641
resources to facilitate development of network of faculty	2.659
access to an instructional designer	2.663
peer self-help groups	2.750
coaching by peers	2.802

The three most important support-related elements had more important group means than any other professional development items (content topics or learning activities). Ten comments relating to support-related elements were written by distance education faculty members.

Six of these ten comments were written by faculty respondents with four or less years of distance education experience. Of these, four of the following comments were

concerned with the availability of support staff that can troubleshoot, answer questions, or help with other resources for distance education faculty.

> my school needs more full-time workers in its department, way too many classes, not enough help; one full-time, rest part-time.
>
> (Faculty member 3005)

> troubleshooting when students experience problems with access
>
> (Faculty member 5405)

> [a distance education resource center and on-site technical assistance] were essential to me. I practically lived in the de resource center the first semester I taught online – the staff was great.
>
> (Faculty member 903)

> support staff to answer questions
>
> (Faculty member 1005)

The following comment was related to support that financially recognized the changing roles of a distance education faculty member.

> to be paid for hours used for above activities
>
> (Faculty member 1905)

The final support-related element comment for a distance education faculty member with four or less years of distance education experience was more general.

> all essential because any support related elements are desirable
>
> (Faculty member 8904)

Three comments were written by distance education faculty members with five to eight years of distance education experience. One of the following comments related to developing a distance education teaching competency, one to collaborative peer

interactions, and one emphasized the importance of support that recognized the need for time in successfully accomplishing distance education duties.

> practice sessions PRIOR to class times
>
> (Faculty member 6603)

> TIME, TIME, TIME – release time from "other duties as assigned" or COURSE LOAD REDUCTION (capitalization by respondent)
>
> (Faculty member 5204)

> user groups and peer exchange – continual, ongoing
>
> (Faculty member 7105)

The last comment (written by a distance education faculty member with 20 years of distance education experience and 31 years of traditional classroom teaching experience) related to the need for continuing support of distance education after an initial adoption phase.

> I believe that we should do quality work with the courses we have before putting more time and money into projects that are funded for start-up but are not well-maintained.
>
> (Faculty member 7404)

This study also investigated whether full time/part-time teaching duties were significant factors in the rating of professional development items made by distance education faculty members. This question was investigated using the data provided by respondents in answering questions 13, 14, 17, 18, and 19 of the survey questionnaire (See Appendix A). Of the 86 faculty members that were teaching at the time of the survey, 87.2% (75) indicated that they were full-time faculty/instructors. Eleven (12.8%) of the faculty indicated that they were part-time faculty/instructors. Of the 23

administrators that completed the Program Information section, 14 (60.1%) indicated that they were full-time, while nine (39.1%) were part-time faculty/instructors.

One item did have a statistically significant difference between the full-time faculty and part-time faculty members. The complete results of this *t*-test are presented Table 41 in Appendix E. The results of this *t*-test for the statistically significant item are presented in Table 20. The group mean of full-time faculty members indicated a statistically significant higher level of importance for "opportunities to observe distance teaching role models" than the group mean of part-time faculty ($t = 2.426$, $df = 29.190$).

Table 20. *t*-Test Results for Full-Time and Part-Time Faculty Members.

	M		SD				
	full-time faculty	part-time faculty	full-time faculty	part-time faculty	*df*	*t*	(2-tailed) sig.
opportunities to observe distance teaching role models	2.778	2.900	.997	.945	29.190	*2.426	.022

N=110 *p < .05

To investigate if years of teaching experience in distance education was a significant factor for distance education faculty members' responses, these respondents were grouped into distance education faculty members with four years or less of distance education experience and five or more years experience. The results of a *t*-test for these two groups of distance education faculty members are presented in Table 42 Appendix E. There were no statistically significant differences for any professional development or support-related items between the means of these two distance education faculty groups.

However, an examination of the top ten priorities based on the rating means calculated for these two groups did show some interesting findings (Tables 21 and 22).

Both groups ranked the same two support-related items as their top priorities, and overall, the same eight professional development items appear on both lists. The distance education faculty members with less than five years' experience ranked learning the "use of actual distance education equipment and technology" as their third priority and also ranked the content topic of "equipment operation" in their top ten. The primary focus of these faculty members appears to be becoming technically competent in the use of distance education technology and how to teach in the distance education environment.

Table 21. Top Ten Items for Distance Education Faculty with Four Years or Less Experience.

	M
distance education equipment that is well maintained (support)	1.296
on-site technical assistance (support)	1.398
use of actual distance education equipment and technology (learning activities)	1.529
instructional strategies that work well using DE technologies (content)	1.621
logistics of distance education teaching (content)	1.655
time to learn, plan, try, reflect, revise (support)	1.636
access to DE equipment when faculty needs it for instructional prep/rehearsal (support)	1.750
creating technology-appropriate teaching aids (content)	1.770
equipment operation (content)	1.816
experiential (hands-on) learning activities (learning activities)	1.931

The distance education faculty members with five or more years of distance education experience continued to rank professional development items related to technology competency as priorities, but also included a more intense focus on items that related to the learning aspects of the distance education environment. The two content topics items that they included in their top ten items that are not in the less-experienced distance education faculty members' list are "characteristics of distance education students "and" integration of distance education methodologies and specific subjects".

Table 22. Top Ten Items for Distance Education Faculty with 5+ Years of Distance Education Experience.

	M
distance education equipment that is well maintained (support)	1.100
on-site technical assistance (support)	1.452
instructional strategies that work well using DE technologies (content)	1.613
experiential (hands-on) learning activities (learning activities)	1.774
access to DE equipment when faculty needs it for instructional prep/rehearsal (support)	1.774
time to learn, plan, try, reflect, revise (support)	1.807
characteristics of distance students (content)	1.871
logistics of distance education teaching (content)	1.871
integration of distance education methodologies and specific subjects (content)	1.936
creating technology-appropriate teaching aids (content)	1.968

After analyzing the distance education faculty members' means for items in each of the three aspects of professional development, the researcher investigated the ten most important professional development items overall. The ten professional development and support items with the highest overall means for all of the distance education faculty respondents are presented in Table 23.

Table 23. Faculty Members' Top Ten Professional Development Elements for Distance Education (DE) Faculty.

Professional Development Element	Priority	Mean
DE equipment is well-maintained (support-related element)	1	1.264
on-site technical assistance (support-related element)	2	1.413
time to learn, plan, try, reflect, revise (support-related element)	3	1.620
instructional strategies that work well using DE technologies (content)	4	1.648
logistics of DE teaching (content)	5	1.681
use of actual DE equipment & technology (learning activities)	6	1.681
access to DE equipment when faulty need prep (support-related element)	7	1.707
creating technology-appropriate teaching aids (content)	8	1.824
experiential (hands-on) learning activities (learning activities)	9	1.901
practice activities in actual DE setting (learning activities)	10	2.054

All three professional development content topics that the distance education faculty member respondents rated as priorities are concerned with teaching-related competencies in distance education. All three professional development learning

activities that these respondents rated as priorities reflect the adult learner characteristic of preferring experiential learning that relates directly to competencies. The other four of the top ten priorities for distance education faculty are support-related elements, of which three are their top priorities. These support-related elements are reflective of the need for technical access and support during the adaption/adoption phase of the change process. A key finding is the high priority given to time by the distance education faculty respondents.

Research Questions 2

> What elements of professional development and support for faculty using electronic technologies in distance education are most important to department heads in institutions of public two-year higher education?
>
> What elements of professional development and support for faculty using electronic technologies in distance education are most important to deans in institutions of public two-year higher education?

These original second and third research questions were combined into "What elements of professional development and support for faculty using electronic technologies in distance education are most important to administrators (department heads and deans) in institutions of public two-year higher education?" These questions were combined when the department head and dean subgroups were collapsed into one administrator group as described in Chapter 3. This question was investigated using the data provided by respondents in answering questions 1, 3, 13, 14, and 15 of the survey questionnaire (See Appendix B). The importance of each professional development and support item was determined by calculating a group mean using the ratings assigned by respondents in the administrators group. The ratings were selected by the respondents

based on a Likert scale of 1 through 5, with 1 representing *Essential*, and 5 representing *Not Important*. The content topics means of the administrators were ranked in descending order from most important to least important (Table 24).

Table 24. Administrators' Ranked Content Topics Means for Professional Development for Distance Education Faculty.

Content of distance education faculty professional development should include:	M
instructional strategies that work well using DE technologies	1.494
logistics of DE teaching	1.550
creating technology-appropriate teaching aids	1.700
integration of distance education methodologies & specific subjects	1.850
equipment operation	1.924
creating medium-appropriate course policy	2.050
characteristics of distance students	2.088
equipment troubleshooting	2.125
changes caused by different forms of mediated communication	2.363
theory of distance education	3.025

The administrators considered content topics concerned with how to teach in the distance education environment as most important. Content on how to operate equipment was also important for administrators. The least important content topic for administrators was "theory of distance education". Eight comments were written by administrators that related to content topics for professional development for distance education faculty members. None of the administrators that wrote content topic-related

comments had teaching experience in distance education, although they did have varying amounts of traditional classroom teaching experience.

The two following comments were written by administrators with one to four years of teaching experience. One of these was about measuring distance education student competencies and one related to using distance education technology for professional development.

online authentication of skills/competencies

(Administrator 4702)

develop an online session to teach "instructing online"

(Administrator 4702)

The two following comments were written by administrators with 9 to 16 years of teaching experience. One comment acknowledged that professional development programs often lack needed content and the other related to content regarding course preparation.

[these content topics] <u>should</u> happen, but often don't

(Administrator 7102)

<u>planning</u> a distance education course

(Administrator 8802)

The four following comments were written by administrators with 17 to 20 years of teaching experience. All of these comments related to student-related aspects of distance education.

adult learner theory; brain development; motivation for students

(Administrator 2501)

information from students

(Administrator 1101)

the transfer of the personal dynamics an instructor imparts that engages students in the learning process - whether traditional or distance "classroom

(Administrator 2101)

discipline of unruly students, support strategies for students without local resources

(Administrator 202)

Next, the learning activities means of the administrators were ranked in descending order from most important to least important (Table 25). No comments were written by administrators that related to learning activities for professional development for distance education faculty.

The administrators considered experiential activities involving learning to use actual distance education equipment and technologies as most important and opportunities for distance education faculty to benefit from their peers' knowledge as important. Administrators also considered conducting learning sessions for distance education faculty during their regular work hours and at their work site as more important than learning sessions not at their work sites.

Table 25. Administrators' Ranked Learning Activities for Professional Development for Distance Education Faculty.

Learning activities of distance education faculty professional development should include:	M
use of actual distance education equipment and technology	1.456
experiential (hands-on) learning activities	1.600
practice activities in actual distance education setting	1.709
round table talks with peers teaching in DE	2.160
sessions during regular working hours	2.430
sessions at the regular work site	2.494
collaborative (group) learning activities	2.563
faculty, admin, & support all learn together	3.213
sessions outside regular working hours	3.325
outside the regular work site	3.636

The support-related elements means of the administrators were ranked in descending order from most important to least important (Table 26). The group means of administrators indicated that well-maintained distance education equipment, access to equipment, and on-site technical assistance were the most important professional development support-related elements. The fourth most important element was time. For administrators, the two most important support-related elements had higher group means than any other professional development items (content topics or learning activities).

Table 26. Administrators' Ranked Support-Related Elements for Professional Development for Distance Education Faculty.

Support-related elements for professional development of distance education faculty should include:	M
DE equipment that is well-maintained	1.203
on-site technical assistance	1.350
access to DE equipment when faculty needs it for instruction prep/rehearsal	1.688
time to learn, plan, try, reflect, revise	1.750
distance education resource center	1.924
practice opportunities under simulated conditions	2.050
access to an instructional designer	2.125
feedback from peers in distance education	2.338
opportunities to observe distance teaching role models	2.363
resources to facilitate development of network of faculty	2.380
coaching by peers	2.475
peer self-help groups	2.588

The two following comments were written by administrators that related to support-related elements. One of the comments related to providing technical assistance and one acknowledged the importance of including faculty development when planning for distance education.

> we are in the process of developing a distance ed plan which would involve faculty development as well as course development
>
> (Administrator 7102)

twenty-four – seven DE hotline

(Administrator 2101)

After analyzing the administrators' means for each of the three aspects of professional development for distance education faculty (Tables 24, 25, and 26), the researcher investigated their ten most important items overall. The ten professional development and support elements with the highest means for the administrators are presented in Table 27.

Table 27. Administrators' Top Ten Professional Development Elements for Distance Education (DE) Faculty.

Professional Development Element	Priority	Mean
DE equipment is well maintained (support)	1	1.203
on-site technical assistance (support)	2	1.350
use of actual distance education equipment & technology (learning activities)	3	1.456
instructional strategies that work well using DE technologies (content)	4	1.494
logistics of DE teaching (content)	5	1.550
experiential (hands-on) learning activities (learning activities)	6	1.600
access to DE equipment when faculty need prep/rehearsal (support)	7	1.688
creating technology-appropriate teaching aids (content)	8	1.700
practice activities in actual DE setting (learning activities)	9	1.709
time to learn, plan, try, reflect, revise (support)	10	1.750

All three professional development content topics that the administrators rated as priorities were concerned with teaching-related competencies in distance education. All three professional development learning activities that these respondents rated as priorities involved experiential learning. The other four of the top ten priorities for administrators were support-related elements, of which two were their top priorities. Three of these concerned the technology-related aspects of distance education and the other was time, which is ranked as the tenth priority by administrators.

Research Question 3

Are there significant differences between these two groups?

This question was investigated using the data provided by respondents in answering questions 1, 3, 13, 14, and 15 of the survey questionnaire (See Appendix A). The importance of each professional development content topic, learning activity, and support-related element was determined by calculating two group means using the ratings assigned by respondents in the faculty and administrators groups. Then a *t*-test was used to determine if any statistically significant differences existed between the two groups.

For the 10 individual content topic items, the group means for administrators and distance education faculty members are presented in Table 28. The one item that did have a statistically significant difference ($t = 2.113$, $df = 164.05$, $p < .05$) was "Content of distance education faculty professional development in my institution should include changes caused by different forms of mediated communication." Administrators rated this item at a statistically significant higher mean level (2.363) than distance education faculty did (2.716).

Table 28. *t*-Tests for Content Topics Means of Faculty and Administrators.

Content of distance education faculty professional development should include:	M		SD		*df*	*t*	(2-tailed) sig.
	faculty	admin	faculty	admin			
theory of distance ed	3.045	3.025	1.127	1.166	162.19	.111	
characteristics of distance students	2.231	2.088	.990	.917	168.53	.982	
integration of distance education methodologies & specific subjects	2.056	1.850	1.004	.873	166.82	1.428	
changes caused by different forms of mediated communication	2.716	2.363	1.193	.971	164.05	*2.113	.036
logistics of DE teaching	1.681	1.550	.918	.761	168.46	1.022	
creating medium-appropriate course policy	2.242	2.050	.935	.953	165.33	1.324	
creating technology-appropriate teaching aids	1.824	1.700	.865	.770	168.97	.994	
equipment operation	2.011	1.924	1.169	.997	167.95	.523	
equipment troubleshooting	2.220	2.125	1.209	1.141	168.15	.527	
instructional strategies that work well using DE technologies	1.648	1.494	.861	.732	167.93	.127	

*p < .05

For the ten individual learning activities items, the group means of administrators and distance education faculty members are presented in Table 29. Three items had statistically significant differences between the means of the two groups.

Table 29. *t*-Tests for Learning Activities Means of Faculty Members and Administrators.

Learning activities of distance education faculty professional development in my institution should include:	M		SD		*df*	*t*	(2-tailed) sig.
	faculty	admin	faculty	admin			
experiential (hands-on) learning activities	1.901	1.600	1.106	.894	167.87	1.966	
faculty, admin, & support all learn together	3.326	3.213	1.360	1.198	169.97	.582	
collaborative (group) learning activities	3.033	2.563	1.227	1.078	169.98	*2.676	.008
sessions during regular working hours	2.744	2.430	1.195	1.258	161.65	1.658	
sessions outside regular working hours	3.714	3.325	1.214	1.209	166.35	2.097	
sessions at the regular work site	2.511	2.494	1.271	1.240	166.28	.089	
outside the regular work site	4.023	3.636	1.033	1.235	164.00	*2.194	.030
use of actual distance education equipment and technology	1.681	1.456	1.032	.765	164.12	1.633	
practice activities in actual distance education setting	2.054	1.709	1.142	.894	167.61	*2.217	.028
round table talks with peers teaching in DE	2.231	2.160	1.076	.999	168.47	.430	

*p < .05

The first item was "Learning activities of distance education faculty professional development in my institution should include collaborative (group) learning activities". The administrators rated this item at a higher mean level (2.563) than distance education faculty (3.033) did. The second item was "Learning activities of distance education faculty professional development in my institution should include sessions outside the participants' regular work site." The administrators rated this item at a higher mean level (3.636) than distance education faculty did (4.023).

The third item was "Learning activities of distance education faculty professional development in my institution should include practice activities in actual distance education setting used in institution". The administrators rated this item at a higher mean level (1.709) than distance education faculty did (2.054).

For the 12 individual professional development support-related items, the group means of administrators and distance education faculty are presented in Table 30. Four support-related items had statistically significant differences between the means of the two groups.

The first item with a statistically significant difference in the group means was "Support-related elements for professional development of distance education faculty in my institution should include practice opportunities under simulated conditions of instructional delivery." Administrators rated this item at a higher mean level (2.050) than the distance education faculty members did (2.620).

The second item was "Support-related elements for professional development of distance education faculty in my institution should include feedback from peers in

distance education." The administrators rated this item at a higher mean level (2.338) than the distance education faculty did (2.641).

Table 30. *t*-Tests for Support-Related Elements of Faculty and Administrators.

Support-related elements for professional development of distance education faculty should include:	M		SD		*df*	*t*	(2-tailed) sig.
	faculty	admin	faculty	admin			
distance education resource center	2.065	1.924	1.087	.971	168.73	.897	
on-site technical assistance	1.413	1.350	.814	.658	169.13	.561	
access to DE equip when faculty need prep	1.707	1.688	.819	.739	169.75	.160	
DE equipment is well-maintained	1.264	1.203	.612	.490	166.99	.724	
practice opportunities under simulated conditions	2.620	2.050	1.137	1.005	169.95	*3.487	.001
peer self-help groups	2.750	2.588	1.076	.896	169.71	1.081	
opportunities to observe dist teaching role models	2.630	2.363	1.056	.875	169.63	1.819	
resources to facilitate development of network of faculty	2.659	2.380	1.128	1.054	167.07	1.670	
time to learn, plan, try, reflect, revise	1.620	1.750	.924	.893	168.09	-.940	
feedback from peers in distance education	2.641	2.338	.956	.841	169.97	*2.217	.028
coaching by peers	2.802	2.475	1.137	.900	167.21	*2.097	.037
access to an instructional designer	2.663	2.125	1.286	1.173	169.60	*2.868	.005

*p < .05

The third item was "Support-related elements at my institution should include coaching by peers." Administrators rated this item at a higher mean level (2.475) than distance education faculty members did (2.802). The fourth item was "Support-related elements for professional development of distance education faculty in my institution should include access to an instructional designer." Administrators rated this item at a higher mean level (2.125) than distance education faculty members did (2.663).

There was only one item in all three questions that reversed the general pattern of administrators rating items at a higher mean level than distance education faculty members. This was indicated by the negative *t* value for item 15i ($t = -.940$, $df = 168.09$). The item was "Support-related elements for professional development of distance education faculty in my institution should include time to learn, plan, try, reflect, revise." Distance education faculty members rated this item at a higher mean level (1.620) than administrators did (1.750), although there was not a statistically significant difference between the means of the two groups.

The group mean scores based on the ratings selected by the administrator and distance education faculty respondents were used to develop priority rankings for all of the professional items. The data for content topics, learning activities, and support-related element priorities are presented in Tables 31, 32, and 33.

Table 31. Priorities of Distance Education Faculty and Administrators for Content of Distance Education (DE) Faculty Professional Development as Indicated by Means.

Content topics	Faculty Members' Priority	Administrators' Priority
instructional strategies that work well using DE technologies	1	1
logistics of DE teaching (assignments, evaluation methods, etc.)	2	2
creating technology-appropriate teaching aids	3	3
equipment operation	4	5
integration of DE methodologies and specific subjects	5	4
equipment troubleshooting (knowing what to do when something doesn't work)	6	8
characteristics of distance students	7	7
creating medium-appropriate course policies	8	6
changes caused by different forms of medicated communication	9	9
theory of DE	10	10

For content topics that should be included in professional development programs for distance education faculty (Table 31), both groups selected the same three items as first, second, and third priorities. Both groups also ranked the same two items in the ninth and tenth sequence order. There was more divergence between the two groups in the sequencing of the fourth through eighth rankings. The distance education faculty ranked

equipment troubleshooting as more important than the administrators. Administrators ranked creating medium-appropriate course policies as more important than the distance education faculty.

Table 32. Priorities of Faculty and Administrators for Learning Activities of Distance Education Faculty Professional Development as Indicated by Means.

Learning Activities	Faculty Members' Priority	Administrators' Priority
use of actual DE equipment and technology	1	1
experiential (hands-on) learning activities	2	2
practice activities in actual DE setting used in institution	3	3
round table talks with peers already teaching in DE	4	4
sessions at the participants' regular work site	5	6
sessions during participants' regular work hours	6	5
collaborative (group) learning activities	7	7
faculty, administrators, and support personnel all learn together (at the same sessions)	8	8
sessions outside participants' regular work hour	9	9
sessions outside participant's regular work site	10	10

For learning activities that should be included in professional development programs for distance education faculty, both groups were even more consistent in their ranking of the ten items (Table 32). Both groups selected the same items in first through fourth priority order and the same four items in seventh through tenth place. The only priority difference in these ten items was that the distance education faculty ranked

learning "sessions at the participants' regular work site" in fifth place, while it was in sixth place for administrators.

For support related elements that should be included in professional development programs for distance education faculty (Table 33), both groups demonstrated less consistency in their rankings of the twelve items. Only the first, second, and sixth items were the same for both groups. The greatest difference between the two groups was for "access to an instructional designer," which the distance education faculty group ranked ninth, but the administrators ranked sixth. Another difference was for the item "opportunities to observe distance teaching role models," which the distance education faculty ranked sixth, but the administrators ranked eighth.

Table 33. Priorities of Faculty and Administrators for Support-Related Elements for Distance Education Faculty Professional Development as Indicated by Means.

Support-related elements	Faculty Members' Priority	Administrators' Priority
distance education equipment that is well-maintained	1	1
on-site technical assistance	2	2
time to learn, plan, try, reflect, revise	3	4
distance education resource center	4	5
access to DE equipment when faculty needs it for instruction prep/rehearsal	5	3
practice opportunities under simulated conditions of instructional delivery	6	6
opportunities to observe distance teaching role models	7	8
feedback from peers in DE	8	8
resources to facilitate development of a structured network for DE faculty	9	10
access to an instructional designer	10	7
peer self-help groups	11	12
coaching by peers	12	11

While the administrators and distance education faculty selected the same ten professional development elements as the most important of the 32 provided on the survey questionnaire, there were several differences within the two priority listings (Table 34). The most obvious difference was the ranking by distance education faculty of time as the third most important element, while it was ranked as the tenth most important element by administrators. For distance education faculty, support-related and teaching-related elements were the top five rated items, while for administrators the top four rated items were all directly related to technical equipment.

Table 34. Top Ten Faculty Professional Development Items Prioritized by Faculty and Administrators.

Professional Development Items	Faculty Members' Priority	Administrators' Priority
DE equipment is well-maintained (support-related element)	1	1
on-site technical assistance (support-related element)	2	2
time to learn, plan, try, reflect, revise (support-related element)	3	10
instructional strategies that work well using DE technologies (content)	4	4
logistics of DE teaching (content)	5	5
use of actual DE equipment & technology (learning activities)	6	3
access to DE equipment when faculty need prep (support-related element)	7	7
creating technology-appropriate teaching aids (content)	8	8
experiential (hands-on) learning activities (learning activities)	9	6
practice activities in actual DE setting (learning activities)	10	9

Research Question 4

> Is the size of an institution (as measured by student population) a significant factor in the value ascribed to professional development and support elements for distance education faculty by these three groups?

This question was investigated using the data provided by respondents in answering questions 13, 14, and 15 of the survey questionnaire (See Appendix B). The size of each respondent's institution was determined by the number of students enrolled during the Fall 1998 semester/quarter as reported in Peterson's Guide to Two-Year Colleges (1998).

The responses of all respondents were regrouped into two institution size categories by student enrollment: less than 10,000; and 10,000 or more. A *t*-test was used to test the differences between the means of these two groups for all professional development items. The complete results for this t-test are presented in Table 42 in Appendix E. There were no statistically significant differences between the two groups except for one item, "Support-related elements for professional development of Distance Education faculty in my institution should include a distance education resource center." Table 35 presents the results of the *t*-test for this item. The mean for respondents at institutions with 10,000 or more students enrolled indicated a higher level of importance for this item (1.818) than for respondents at institutions with less than 10,000 students enrolled (2.247).

An additional analysis based on the size of an institution (as measured by the number of distance education courses offered) was performed using the data provided by respondents in answering questions 9, 13, 14, and 15 of the survey questionnaire (See

Appendix A). The responses were grouped into three categories: those from respondents at institutions offering 1-25 courses; those at institutions offering 26-40 courses, and those from institutions offering 41 or more distance education courses. The results of a one-way ANOVA test indicated there were no statistically significant differences for any professional development or support-related items among these three groups of respondents. These tests results are presented in Table 43 in Appendix E.

Table 35. *t*-Test for a Distance Education Resource Center in institutions with <10,000 and 10,000+ students.

Support-related elements for professional development of distance education faculty should include a distance education resource center	M		SD				
	<10,000	10,000+	<10,000	10,000+	*df*	*t*	(2-tailed) sig.
	2.247	1.818	1.077	.962	144.8	*2.696	p =.008
N = 172							

*p < .05

Research Question 5

> Is the number of years an institution has been providing distance education a significant factor in the value ascribed to professional development and support elements for distance education faculty by these two groups?

This question was investigated using the data provided by respondents in answering questions 8, 13, 14, and 15 of the survey questionnaire (See Appendix A). A one-way ANOVA was used to test for differences among all respondents at institutions that had provided distance education for one to five years, six to ten years, and over ten years. The complete results of this ANOVA test are reported in Table 44 in Appendix E.

Four professional development content topics and learning activities elements were found to have statistically significant differences between these groups (Table 36).

For the first significant item, content of distance education faculty professional development in my institution should include equipment operation, the mean for responses from respondents at institutions offering distance education for 1 to 5 years indicated this element was more important (1.511) than for the other two groups (1.920 for 6 to 10 years and 2.466 for 10 or more years). For the second significant item, content of distance education professional development in my institution should include equipment troubleshooting, the mean for responses from respondents at institutions offering distance education for 1 to 5 years indicated that this element was more important (1.638) than for the other two groups (2.280 for 6 to 10 years and 2.466 for 10 or more years).

For the third significant item, learning activities of distance education faculty professional development in my institution should include practice activities in actual distance education setting, the means for responses from respondents at institutions offering distance education for 1 to 5 and 6 to 10 years indicated this element was more important (1.609 and 1.660) than for the 10 or more years respondents (2.250). For the fourth significant item, learning activities of distance education faculty professional development in my institution should include round table talks with peers already teaching in distance education, the mean for responses from respondents at institutions offering distance education for six to 10 years indicated this element was more important

(1.860) than either the one to five years (2.196) or the 10 or more years (2.400) groups. These priorities indicated some general differences among the three groups.

Table 36. Analysis of variance for number of years distance education offered and importance of elements in professional development for distance education faculty.

Element		SS	*df*	MS	F	(2-tailed) sig.
Content – equipment operation	Between groups	24.144	2	12.072	*11.624	.000
	Within groups	157.856	152	1.039		
	Total	182.000	154			
Content – equipment troubleshooting	Between groups	23.502	2	11.751	*9.597	.000
	Within groups	187.338	153	1.224		
	Total	210.840	155			
Learning activities – practice in actual distance education setting	Between groups	14.009	2	7.005	*7.172	.001
	Within groups	149.427	153	.977		
	Total	163.436	155			
Learning activities -round table talks w/peers already teaching in distance education	Between groups	8.008	2	4.004	*3.935	.022
	Within groups	155.659	153	1.017		
	Total	163.667	155			

*$p < .05$

For respondents at institutions that had offered distance education for one to five years, professional development content topics and learning activities relating to using technologies competently were more important than for the other respondents. For

respondents at institutions that have offered distance education for six to 10 years, collaborative learning with peers was more important than for the other respondents. An additional analysis using the top ten priorities of respondents in these three groups based on the number of years an institution had offered distance education was performed (Table 37, 38, and 39).

For respondents at institutions offering distance education for one to five years, the primary focus of their priorities appeared to be becoming competent in the use of the technologies and then on how to use the distance education technologies for instruction. The ability to benefit from their peers' previous experience was also important for these respondents.

For respondents at institutions offering distance education for six to 10 years, their priorities appeared to shift to an increased focus on the teaching-learning process in the distance education environment and the need for time and practice. For respondents at institutions offering distance education for more than 10 years, their priorities appeared to continue focusing on the teaching-learning process with an increased recognition of the need to integrate distance education methods and specific subjects. Although this group's means indicated a lower level of importance overall for their priorities, time did remain a priority. Regardless of the number of years of distance education experience, these respondents placed well-maintained equipment and technical assistance at the very top of their priorities ranking. This may be a recognition of the fact that nothing else can happen in distance education if the technology is not working.

Table 37. Top Ten Priorities of Respondents at Institutions Offering Distance Education for 1 to 5 Years.

	Priority	Mean
Distance education equipment that is well-maintained	1	1.255
On-site technical assistance	2	1.277
Use of actual distance education equipment and technology	3	1.383
Feedback from peers in distance education	4	1.468
Equipment operation	5	1.511
Instructional strategies that work well using distance education technologies	6	1.532
Practice activities in actual distance education setting used in institution	7	1.609
Equipment troubleshooting	8	1.638
Creating technology-appropriate course policies	9	1.702
Experiential (hands-on) learning activities	10	1.723

N = 47

Table 38. Top Ten Priorities of Respondents at Institutions Offering Distance Education for 6 to 10 Years.

	Priority	Mean
Distance education equipment that is well-maintained	1	1.220
On-site technical assistance	2	1.320
Logistics of distance education teaching	3	1.420
Instructional strategies that work well using DE technologies	4	1.449
Use of actual distance education equipment and technology	5	1.449
Experiential (hands-on) learning activities	6	1.531
Practice activities in actual distance education setting used in institution	7	1.660
Time to learn, plan, try, reflect, revise	8	1.680
Access to distance education equipment when faculty needs it for instruction prep/rehearsal	9	1.720
Creating technology-appropriate teaching aids	10	1.740

N = 50

Table 39. Top Ten Priorities of Respondents at Institutions Offering Distance Education for more than 10 Years.

	Priority	Mean
Distance education equipment that is well-maintained	1	1.237
On-site technical assistance	2	1.483
Instructional strategies that work well using distance education technologies	3	1.644
Access to distance education equipment when faculty needs it for instruction prep/rehearsal	4	1.700
Logistics of distance education teaching	5	1.712
Use of actual distance education equipment and technology	6	1.767
Time to learn, plan, try, reflect, revise	7	1.817
Creating technology-appropriate teaching aids	8	1.881
Integration of distance education methodologies and specific subjects	9	1.966
Experiential (hands-on) learning activities	10	1.967

N = 60

Research Question 6

> Is participation in a profession-accredited health care technical program a significant factor in the value ascribed to professional development and support elements by Allied Health faculty?

This question was investigated using the data provided by respondents in answering questions 18, 13, 14, and 15 of the survey questionnaire (See Appendix B). A *t*-test was performed to test the difference between the means of the Allied Health and non-Allied Health respondents. The complete results of this *t*-test are presented in Table 45 in Appendix E. A statistically significant difference was found for one item, "Theory of distance education." Table 40 presents the results of the t-test for this item. The mean

for Allied Health respondents indicated a higher level of importance for this item (2.566) than for non-Allied Health respondents (3.119).

Table 40. *t*-Test for Theory of Distance Education for Allied Health and Non-Allied Health Respondents.

	M		SD				
	Allied Health	Non-Allied Health	Allied Health	Non-Allied Health	*df*	*t*	(2-tailed) sig.
Content topics for professional development of distance education faculty should include theory of distance education	2.577	3.119	1.102	1.129	35.230	*-2.298	.028

N=169 *p < .05

Conclusion

Response analysis and statistical testing of questionnaire data were used in this study to investigate research questions about professional development for distance education faculty members in public two-year higher education. Three questions were concerned with the beliefs of administrators and distance education faculty members regarding the importance of content topics, learning activities, and support-related elements of professional development. Another two research questions investigated whether institutional characteristics such as size or years of distance education experience related to the importance ascribed by the study's respondents to the specific professional development elements. One research question investigated whether additional Allied

Health faculty duties related to the importance ascribed by the study's respondents to the specific professional development elements. Overall, administrators and distance education faculty members at the surveyed institutions agreed in their beliefs regarding the most important content topics, learning activities, and support-related elements of professional development programs for distance education faculty. Differences were found for the priority sequencing of these elements, primarily in the support-related elements.

Except for the presence of a distance education resource center, size of institution and total number of distance education courses offered by an institution were not statistically related to the importance value ascribed each professional development item. However, the number of years an institution had offered distance education did appear to be statistically related to the value ascribed by distance education faculty members to some specific professional development elements. A discussion of these findings follows in Chapter 5.

CHAPTER 5

DISCUSSION OF FINDINGS

Summary

The purpose of this study was to examine the beliefs of administrators and distance education faculty regarding what types of professional development activities and support-related elements should be provided for distance education faculty members by public two-year higher education institutions that offer electronic technology-based distance education, each offering at least one profession-accredited allied health program. ANOVA and *t*-tests were used with data gathered by a questionnaire completed by administrator and distance education faculty respondents employed at 48 two-year higher education institutions.

This chapter integrates the research findings regarding professional development programs for distance education faculty in public two-year higher education institutions with previous relevant findings from the literature. Conclusions are drawn and implications are suggested for the study findings. This chapter concludes with recommendations for policy, practice, and additional research.

Several significant findings came from the questionnaire data. First, the overall beliefs of the administrators and distance education faculty were very similar with only a few exceptions. The similarities in both groups' overall beliefs may be due to the demographic, experience, and institutional similarities of the groups.

Both groups were 53% female, and the majority of both groups' respondents were between the ages of 41 and 60. Additionally, most of the administrator respondents had teaching experience in both the traditional classroom (97%) and distance education environments (70%). Over half (52.6%) of the administrators and 23.1% of the faculty members held a doctorate. A majority of the respondents' institutions (56.8%) had offered distance education for 10 or fewer years. Almost half of the respondents (47.3%) were at institutions that offered from 10 to 40 distance education courses during the 1999-2000 academic year. Additionally, a large majority (88.9%) of the respondents' institutions were using more than one electronic-based technology for distance education. These institutional characteristics were very similar to the findings of the National Center for Education Statistics 1994-1995 survey on distance education in higher education institutions, which found that 51% of all institutions in the United States were offering 11 or more distance education courses and a large number of public two-year institutions used more than one technology (Lewis, Alexander, & Farris, 1997).

Similarities in the Beliefs of Administrators' and Distance Education Faculty Members

Both groups rated the same ten items as being the most important for professional development and also clearly indicated their beliefs regarding the importance of support-related elements in the professional development needs of distance education faculty members. The three professional development elements that the distance education faculty members rated the highest were all support-related; well-maintained distance education equipment, on-site technical assistance, and time. The two professional

development elements that the administrators rated the highest were also support-related, well-maintained distance education equipment and on-site technical assistance. This finding supports the work of Willis (1992, 1994a, 1994b, 1996) and Daloz (1999) and the need for organization-provided support during the adoption and integration of an innovation described in the change process literature (Hazen, 1992; Keast, 1997).

Both groups rated the same three experiential learning activities as the most important for professional development. The finding of the importance of experiential learning experiences (use of actual distance education equipment and technology, hands-on learning activities, and practice activities in the actual distance education setting) for distance education faculty members and administrators supports the adult learning research (Eraut, 1987; Merriam & Caffarella, 1991; Rogers, 1979; Showers, Joyce, & Bennett, 1987; Wood & Thompson, 1980), which emphasizes that adult learners prefer and benefit from hands-on learning activities.

The finding that both distance education faculty and administrators rated the theory of distance education as the least important content topic may be one reason that distance education professional development generally focuses on the technology and equipment more than how the distance education environment changes the roles and needed competencies of the distance education faculty member. Without the why (theory) of distance education, knowing how (developing effective competencies) becomes much more of an effort. It may also be an indication that the respondents' view distance education as simply the same educational process with an added delivery method.

The distance education faculty and administrators also indicated the importance of developing workplace competencies through their ratings of three content topics (instructional strategies that work well using distance education technologies, logistics of distance education teaching, and creating technology appropriate teaching aids) as priorities. The finding that distance education faculty want and need content about teaching-related competencies supports the continuing professional education literature and the adult learning research regarding the importance that adults place on quickly developing professional competency (Brookfield, 1992; Rogers, 1979; Seaman & Fellenz, 1989; Stern & Queeney, 1992; Wlodkowski, 1999). Additionally, the value ascribed to teaching-related competencies by the respondents supports the distance education research regarding the need for professional development programs to go beyond training on how to operate equipment. They should also help faculty members know how to effectively integrate distance education technologies and media with specific subject content and how to facilitate the learning of distance students by creating an interactive environment (Abacus Associates, 2000; Gizinski, 1995; Green, 1999; Hazen, 1992; Lever-Duffy & Lemke, 1996b; Parisot, 1995; Wagner, 1997; Willis, 1994).

In general, the findings regarding the importance ratings of professional development items by this study's respondents seem to reflect a teaching-process-centered approach to professional development, rather than a learner- or learning-focused approach. This is most evident in the seventh place ranking of "characteristics of distance students" of ten content topics by distance education faculty respondents. This content topic also had a seventh place ranking by administrators. This content topic was not

included in the top ten professional development items of the respondents. Again, the indication in the ratings of a strong focus on becoming competent in the technical and teaching aspects of distance teaching roles may be a reflection of the relatively short time most respondents and their institutions have been offering distance education. Other factors that may be related to this focus are the types of electronic-based technologies used by the study's respondents' institutions and that so many of them are using multiple electronic-based technologies.

Differences in the Beliefs of Administrators and Distance Education Faculty

Although there is overall similarity in the beliefs of distance education faculty members and administrators regarding the importance of specific elements of professional development programs for distance education faculty in the public two-year institutions of higher education in this study, analysis of the study's data also showed some differences. When analyzing the differences between distance education faculty members and administrators regarding each of the three aspects of professional development; one content topic, three learning activities, and four support-related elements had statistically significant differences. The administrators rated all six of these items at a higher level than the faculty members. Four of these items were concerned with collaborative and peer-related activities, which the continuing professional education and adult learning research literature indicated is important in continuing education for professionals (Baskett & Marsick, 1992; Caffarella & Barnett, 1994; Carrier, 1987; Eraut, 1987; Jackson & Caffarella, 1994; Kidd, 1973; Merriam & Caffarella, 1991; Schein,

1972), but which the distance education faculty members rated as less important. This finding is consistent with the literature about faculty members' long history of academic independence (Florini, 1989; Noblitt, 1997; Rumble, 1986; Schein, 1972).

A large number of institutions in this study were using interactive or one-way video technologies for distance education. This type of delivery is place- and time-dependent for the distance education faculty member. Use of this type of technology could be a reason why the faculty group indicated a high level of importance for a) access to distance education equipment when faculty needs it for instruction preparation/rehearsal and b) practice opportunities under simulated conditions. This delivery method also most closely replicates the traditional classroom teaching experience where academic autonomy is expected. This may be a reason why collaborative, peer-related support elements were rated as relatively less important by distance education faculty members.

The greatest difference in the two groups' ratings was the rating of time as the third most important item by distance education faculty, while the administrators rated this item as tenth most important. Additionally, this was the only item that distance education faculty members rated at a higher group mean level than administrators. This finding supports the research on distance education faculty members' need for time and the literature describing lack of time as a major barrier for distance education faculty members in their efforts to become competent and effective in the distance education environment (Billings, 1995; Gilbert, 2000; Mishoe, 1999; Parisot, 1995).

This difference in ranking of time by administrators and distance education faculty may be related to different types of technology, which may require different amounts of time to learn to use competently. Many (59.6%) of the institutions in this study were using interactive video, which places the distance education faculty member in front of an audience of students and distance education team members. Therefore, the distance education faculty member using this type of technology will be very concerned with attaining competency and need time for practice and other professional development elements. The time ranking difference may also be related to the fact that a large percentage (30.6%) of the administrator respondents in the study had no experience in distance education teaching. Another finding of the study may also relate to the time ranking difference. Both administrators and distance education faculty assigned a relatively low level of importance to having all distance education team members (including administrators) learn together. Therefore, most administrators may not understand the changing needs of distance education faculty because they have not participated in professional development programs for distance education or do not have distance education teaching experience.

Analysis of the distance education faculty members' written comments organized by the faculty members' years of distance education experience also provided an indication that professional development needs may change as faculty members progress through change process phases. The importance of time to the distance education faculty members in this study regardless of years of experience supports research in the areas of change processes in organizations (Boettcher, 2000; Eraut, 1987; Guskey, 1990; Twigg,

1994a), professional performance and competencies (Dede, 1987), and professional development programming (Rumble, 1986; Terdy, 1993).

Institutional Attributes and Beliefs Regarding Professional Development and Distance Education Faculty

Three institutional attributes were examined to determine if they were significantly related to the beliefs of distance education faculty members and administrators regarding the importance of various professional development items. These attributes were the size of the respondents' institutions as measured by student population, the number of distance education courses offered by the institutions, and the number of years the institutions had offered distance education courses. This research study's findings revealed only one professional development item with a statistically significant difference in the means of respondents from institutions with less than 10,000 students and the respondents from institutions with 10,000 or more students. Having a distance education resource center was more important for respondents at institutions with 10,000 or more students.

The number of distance education courses offered by the respondents' institutions did not significantly relate to the importance of any professional development item. This finding may be because the majority (59.3%) of the respondents indicated that their institutions were offering 40 or fewer courses a year at the time of the survey. However, the number of years that respondents' institutions had offered distance education courses was statistically related to four professional development items; two content topics and two learning activities.

Professional development content topics and learning activities relating to technical competencies were more important for all respondents at institutions that had offered distance education for five or fewer years. Professional development learning activities relating to collaborative learning with peers were more important for respondents at institutions that had offered distance education for six to ten years. Professional development content topics that focused on the teaching-learning process and integration of distance education methods with specific subjects were more important for respondents at institutions that had offered distance education for more than 10 years.

Additional study findings of the relationship between experience in distance education and the importance of specific professional development items for the distance education faculty members in this research study also showed a similar change in priorities from technical competencies and how to teach to an increasing focus on the learning aspects of distance education. Overall, this finding indicates that faculty members need to feel comfortable with using a technology and how to use it for teaching, before they can begin to consider the learning aspects of the technology. These findings support the adult learning, change process, and continuing professional education literature regarding the need for developing competencies and group collaborative learning (Bierema, 1996; Caffarella & Barnett, 1994; Ehrmann, 1995b; Hazen, 1992; Houle, 1981; Kidd, 1973; Knox, 1977; Merriam & Caffarella, 1991; Mezirow, 1996; Seaman & Fellenz, 1989; Watkins, 1995).

Other Findings

Other findings about the respondents' institutions were relevant to distance education research. One finding concerned the 19% of respondents that indicated their institutions did not have a distance education office or department and the 16.5% that did not know how their institution's distance education office was placed within their organization's hierarchy. This finding related to the work of Wolcott (1997) and Wagner (1997) indicating that distance education had not been integrated into the organizational structure of most four-year higher education institutions. An additional finding that may also indicate a lack of distance education's integration within the respondents' institutions was the inconsistency among many institutions' respondents when reporting which types of electronic-based technologies were being used for distance education in their own institutions.

The majority (56.8%) of respondents indicated their institutions had offered distance education for 10 years or less and a large number of the institutions were using multiple technologies. These findings may be relevant to the time needs of distance education faculty members, if they are constantly being required to learn and integrate new types of technologies into their distance education courses.

Conclusions and Recommendations

Based on the findings of this study, recommendations are made for policy, practice, and research. When the findings of this research study are combined with relevant distance education and educational technology research, a model incorporating

the Garrison & Shale model of the educational relationships in distance education can be proposed (See Figure 1 in Chapter 2). This model demonstrates the importance of support provided by an education institution for both distance education faculty members and distance education students. It also confirms the learning-centered focus of successful distance education. The various components of this model should have characteristics appropriate for the distance education environment.

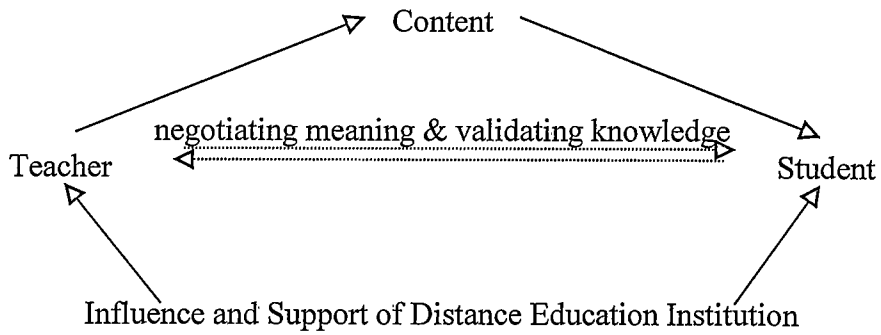

Figure 3. The essential relationships in successful distance education.

This model confirms that the influence and support of an institution are what distinguishes distance education within distance learning (Kovel-Jarboe, 1990; Saba, 1990). The education institution must assist both the distance education teacher and student in becoming comfortable with and effective in using distance education technologies. The education institution must also develop policies that encourage the distance education faculty member's motivation for effective distance education by reducing barriers and providing appropriate support.

The institution's support for the distance education student must be focused on assisting the student to stay motivated in the distance education environment. This requires that all interactions with the student are concerned with developing personal

relationships, consistency of information, coordination among institutional staff, and connections to the institution's learning community.

The content of a distance education course should be appropriately matched to the technology media. The content should also be organized and prepared well before the course is conducted. While a distance education course is being conducted, the distance education teacher and students need to constantly interact to insure that the understanding and knowledge of the student is appropriate.

Policy Recommendations

Since offering effective distance education requires changes, a public two-year higher education institution must carefully review all related policies. Policies are the broad guidelines that help an organization carry out its mission. Policy recommendations relating to distance education professional development are discussed within a conceptual framework developed by Parisot (1997). This framework is concerned with "the need to design institutional policies that will encourage the use of technology" and has four main phases: acknowledgment; awareness; acculturation; and affirmation (p.7).

Acknowledgment is concerned with building an understanding for the need for change, including changes in policies. This policy area is concerned with the introduction stage of the change process, the motivation factors of Cross' Chain of Response Model, and the "learning readiness" of adult learners. Several professional development elements are pertinent to this phase of developing institutional policies for distance education. These policies are concerned with developing an understanding of how distance education can help an institution and its people meet their mission and why distance

education is different and requires change. Learning activities related to acknowledgment include collaborative learning activities and round table talks with peers already teaching in distance education. Support elements for this policy development area include time to learn, a resource center, and opportunities to observe role models. Acknowledgment-related content topics include theory of distance education, characteristics of distance students, and changes caused by different forms of mediated communication.

Awareness is the phase in which the process of building knowledge and agreement occurs. This policy area is concerned with the implementation stage of the change process, the opportunities for participation in learning of Cross' Chain of Response Model, the gaining new knowledge conditions of Centra's Model of Improving Teaching, and the learning processes and facilitation of adult learners.

Awareness-related professional development content topics include equipment operation and logistics of distance education teaching. Professional development learning activities related to awareness include use of actual distance education technology and practice activities in the actual distance education setting. Support elements for this policy development area include practice opportunities, feedback from distance education peers, and time to learn.

Acculturation is concerned with the actual adoption of new learning. This area of institutional policies is concerned with the adoption/adaption stage of the change process, Mezirow's cultural frames of reference, Centra's applying new knowledge conditions, and the learning transfer of adult learners.

Acculturation-related professional development content topics include integration of distance education methodologies and specific subjects and instructional strategies that work well using distance education technologies. A learning activity that relates to acculturation is round table talks with peers. Support elements for acculturation include coaching by peers, feedback from distance education peers, and time to plan, try, reflect, and revise.

The affirmation process requires developing policies that "recognize the value and worth" of distance education faculty members' decision to make the changes in their roles necessary for an effective teaching-learning process in the distance education environment (Parisot, 1997, p. 11). This area of institutional policies should consider the diffusion and integration stages of the change process in organizations, Centra's conditions for wanting to use new knowledge, and the learning transfer of adult learners. Without positive reinforcement of the changes that distance education faculty make changes in performance with reverse.

Affirmation-related professional development content topics should be matched to the needs of distance education faculty and offered on a continuous basis. Learning activities should be conveniently available, frequent, collaborative, and validate the distance education faculty members' new knowledge. Support elements of professional development for affirmation include well maintained distance education equipment and on-site technical assistance that is available when needed, resources to facilitate the development of a distance education faculty network, and time to reflect and revise.

Institutional policies must be developed to assist and support distance education faculty through these stages. If distance education is helping to carry out part of the organization's mission, then distance education should be fully integrated into an organization's hierarchy and culture. Policies that mandate providing professional development that meets the needs of all distance education team members (administrators, faculty, and administrative and technical support staff) can assist the integration process. Professional development policies should insure that distance education team members learn together so that they can work together effectively to meet the learning needs of distance education students.

Policies should be developed to help increase the "buy-in" of all distance education team members. Professional development activities and support for distance education faculty members and other members of the distance education team must be continuous, cohesive, and cyclical. Professional development for distance education faculty members must be continuous to accommodate their adult learning characteristics. The cohesiveness of professional development must be planned carefully so that the content topics, learning activities, and support elements relate to specific electronic technologies and learning phases that assist faculty members to progress from technical competency to teaching competency to learning facilitation; from isolated autonomy to team member. Professional development must also be cyclical to meet the needs of distance education faculty members when technologies change and the learning begins again.

Practice Recommendations

Administrators and distance education faculty members should recognize that distance education is not the same as traditional classroom teaching with a simple addition of electronic-based technologies. Professional development programs should be offered to all members of the distance education team, including administrators, technical, and administrative support staff, as well as distance education faculty. Institutions providing professional development for distance education faculty members should consider the types of electronic-based technologies being used and the amount of experience that faculty members and the institution as a whole have in distance education. Each of these factors could change the focus of the professional development needed by distance education faculty members in a particular public two-year higher education institution.

Professional development content topics should include theory of distance education. This will help distance education faculty members understand the changes in their roles and why the teaching-learning process is changed by the distance education environment. Content topics of professional development sessions should include both technical and teaching competencies so that distance education faculty members will know what to do with the distance education technologies after learning how to operate them.

Professional development learning activities should incorporate both experiential learning and group collaboration. These activities should meet the needs of the participants and the institution by helping to create a distance education network that

includes faculty members, administrators, and support staff all working as a team to meet the learning needs of distance students.

Support-related elements should be integral components of any professional development provided for distance education faculty members. The changing roles of distance education faculty members require recognizing and rewarding changes in the organization of work and the different types of support needed.

Research Recommendations

There is some indication in this study that the types of electronic-based technology used in distance education creates the need for a differing focus in the professional development needed by distance education faculty members. This should be studied further to determine if different subsets of professional development elements are needed by distance education faculty members using different media and technology combinations.

The number of years distance education has been offered (or the number of years of experience that a distance education faculty member has in distance education) also changes the focus of the professional development needed by distance education faculty members and this relationship should be studied. The identified importance of time for a distance education faculty member should also be studied to determine when and how much time is needed for a distance education faculty member to successfully progress from the initial learning process through transfer to changed performance.

More research is needed on the distance education professional development needs of administrators. They play key roles in allocating resources for distance

education, developing policies, and encouraging change, but may not be effective in these roles without a clear understanding of the differing needs created by the distance education environment. Additional research on the degree of integration of distance education into the organizational structure and culture of institutions of higher education is needed. The relationships among years of distance education experience, specific elements of professional development programs, and the degree of formal integration should be investigated to determine what types of distance education professional development elements are most effective at each stage of the change process.

In conclusion, this study was conducted at a time of rapid change in two-year higher education and rapidly increasing use of electronic technology-based distance education. Since faculty acceptance and effective use of technologies is the key to successful distance education, public institutions of two-year higher education must provide professional development that enables and supports distance education faculty throughout the necessary change processes that are essential for creating effective distance education for students.

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APPENDICES

APPENDIX A

E-MAIL TO DISTANCE EDUCATION COORDINATORS

-----Original Message-----
From: Irene Mueller
Sent: Wednesday, October 13, 1999 5:25 PM
To:
Subject: Your help with a Distance Learning Survey

Dear,

Last spring you were identified as the Distance Learning Coordinator on your campus and this email address was provided to me. As part of my doctorate in Adult and Higher Education at Montana State University, I began identifying participants for a survey on Faculty Development for Distance Education using Electronic Technologies early this year. Since Distance Learning (DL) is a very rapidly growing and expensive education process, the purpose of the survey is to identify which Faculty Development activities and support elements are most important in two-year colleges, so that resources can be allocated effectively. Unfortunately, I was not able to complete the identification process due to a severe acute illness.

As DL Coordinator at one of the fifty public two-year higher education institutions selected for this survey, I would appreciate your help in identifying three DL faculty members at your college as respondents for the survey. The survey design requires faculty members employed at your college this semester who are teaching DL courses that use any electronic technologies such as interactive video or computers.

In order to collect a wide variety of information, please identify; 1) a faculty member with as much DL experience at your college as possible, 2) a novice in distance teaching, and if possible 3) a faculty member teaching an Allied Health related course such as Health or Medical Terminology. If no one fits the last category, please use your own discretion in selecting the third faculty member.

Since the survey will be in a traditional paper format, I will need the mailing address for each faculty member and an email address if possible. Of course, all personal information collected during the survey will be kept strictly confidential.

If you have any questions, please contact me immediately. My home telephone number is 800-690-2446 or you can contact me at my college. If you would like to receive a copy of the research results, please let me know and I will send them to you when the project is completed.

Thank you for your assistance.

Irene Mueller, MLS, RRA
HIT Program Director
Montana State University - Great Falls
College of Technology
imueller@msugf.edu
1-406-771-4358
FAX 1-406-771-4317

APPENDIX B

SURVEY MATERIALS

November 5, 1999

Dear:

You have been identified by a colleague as a higher education professional with experience and knowledge of Distance Education. Your assistance is needed for a survey of faculty and administrators in public two-year higher education institutions in the Western states that offer Distance Education and Allied Health programs. The purpose of this research is to establish what professional development and support should be provided for Distance Education faculty in these institutions. Your answers will provide a benchmark for future practices in Distance Education faculty professional development.

Your answers are very important to the accuracy and completeness of this research, which is supported by the Montana State University - Great Falls College of Technology and by the American Health Information Management Association (AHIMA), a 38,000 member national organization that accredits two- and four-year educational programs in Health Information Management.

It will take only 10 to 15 minutes to complete the questionnaire and mail it in the stamped return envelope. Only what you know about Distance Education at your institution is needed for this research. Please do not ask others for the requested information.

Your answers will be completely confidential and only used in the aggregate with those of other faculty and administrators. The questionnaires are coded only for follow-up and response analysis. In order to insure the confidentiality of the survey, please return the enclosed *returned survey* post card after completing and mailing the questionnaire.

Because MSU-GF College of Technology and AHIMA are planning to establish benchmarks for this important emergent instructional activity, we will make the results available to all participants. If you would like to receive a report of the research findings, please return the enclosed *requesting results* post card. The findings of the research will also be available at www.msugf.edu/imueller once the project is complete.

If you have any questions or concerns, please contact me at (toll-free) 1-800-690- 2446 or imueller@msugf.edu. Please return the completed questionnaire by November 19, 1999.

Thank you for your important and valuable help.

Sincerely,

Irene Mueller, MLS, RRA
HIT Program Director

November 5, 1999

RE: Distance Education Professional Development Needs Survey

Dear:

The Montana State University – Great Falls College of Technology has been engaged in Distance Education for five years, using compressed interactive video and computer-based internet technologies. As Director of Outreach (which includes Distance Education), I am very aware of the need for professional development for all faculty and staff in this rapidly expanding area of educational delivery. Our institution and many other two-year institutions need accurate information on the current state of affairs in this area of professional development.

Irene Mueller, Health Information Technology Program Director at our institution, is presently engaged in research on the professional development needs for faculty involved in Distance Education. Ms. Mueller's doctoral research can make a significant practical contribution to providing us with this information.

Please take this opportunity to provide us, Ms. Mueller, and the field, the informational input necessary for the development of effective and efficient professional development practices and policy at the faculty and institutional level. Ms. Mueller and our institution will share the results with all participants upon completion of this research project.

Thank you for your assistance with this research endeavor.

Sincerely,

Suzanne Waring

Suzanne Waring, Ed.D.
Director of Outreach

AHIMA
AMERICAN HEALTH INFORMATION MANAGEMENT ASSOCIATION

March 8, 1998

Irene Mueller
MSU College of Technology
PO Box 6010
Great Falls, Montana 59405-6010

Dear Irene:

Thank you for sharing your survey instrument on Electronic Distance Education Professional Development. The Education and Accreditation Department of AHIMA is very interested in the promotion of distance education technologies in its health information management academic programs. However, as you are well aware, appropriate use of these technologies is dependent upon understanding a whole range of theory and application. Unfortunately, it seems that there are limited opportunities for faculty to gain this knowledge.

Your research will help to answer the questions about the extent of DE technology use in allied health programs. It will also help to identify the breadth and depth of training and education currently available to faculty in the use distance education technologies. Hopefully, we will gain new insights about the gaps in current educational offerings that assist in updating faculty skills and knowledge in this area. This information would be of significant use to AHIMA as we proceed in developing our Institute for Health Information Learning Excellence, which is a web resource for faculty in our HIM accredited programs.

We look forward to the results of your survey. If we can be of any additional assistance, please feel free to contact us.

Sincerely,

Merida Johns/rg

Merida L. Johns, PhD, RRA
Vice President, Education and Certification

Electronic Distance Education (DE) Professional Development Survey

Respondent Demographics Section

1. My primary duties (*over 50% of an average work week*) are as:
   ❑ 1a. an instructor/professor. ❑ 1c. a Dean of Instruction/Academics/Division.
   ❑ 1b. a Department Head. ❑ 1d. Other. _____

2. I am:
   ❑ 2a. Female. ❑ 2b. Male.

3. My current position title is _____.

4. The number of years I have taught in the traditional classroom (*without using distance education technologies*) is:
   ❑ 4a. 0 years. ❑ 4c. 1 - 4 years. ❑ 4e. 9 - 12 years.
   ❑ 4b. Less than one year. ❑ 4d. 5 - 8 years. ❑ 4f. 13 - 16 years.
   ❑ 4g. 17+ years.*(Please specify number of years)* _____

5. The number of years I have taught using electronic distance delivery technology is:
   ❑ 5a. 0 years. ❑ 5c. 1 - 4 years. ❑ 5e. 9 - 12 years.
   ❑ 5b. Less than one year. ❑ 5d. 5 - 8 years. ❑ 5f. 13 - 16 years.
   ❑ 5g. 17+ years. (*Pleases specify*) _____

6. My age is:
   ❑ 6a. 20 - 30 years. ❑ 6d. 51 - 60 years.
   ❑ 6b. 31 - 40 years. ❑ 6e. 61+ years.
   ❑ 6c. 41 - 50 years.

7. My highest completed degree is:
   ❑ 7a. Associate. ❑ 7d. Ph.D.
   ❑ 7b. Bachelor. ❑ 7e. Ed.D.
   ❑ 7c. Master. ❑ 7f. Other. _____

Institution Information Section

8. Distance education courses have been offered by this institution for:
   ❑ 8a. 1-5 year(s). ❑ 8c.11-15 years. ❑ 8e. 21 - 25 years. ❑ 8g. 31+ years ____ *(Please specify)*
   ❑ 8b. 6 - 10 years. ❑ 8d.16 - 20 years. ❑ 8f. 26 - 30 years. ❑ 8h. I don't know.

9. The **number** of Distance education courses offered by this institution during the 1999-2000 academic year is:
   ❑ 9a. 1 - 9. ❑ 9c. 26 - 40. ❑ 9e. 56 - 70. ❑ 9g. 85+. (*Please specify*) _____
   ❑ 9b. 10 - 25. ❑ 9d. 41 - 55. ❑ 9f. 71 - 85. ❑ 9h. I don't know.

10. Distance education (DE) in this institution uses: (*Please check **all** that apply*)

- ❑ 10a. 2-way interactive video technology.
- ❑ 10b. 1-way video technology.
- ❑ 10c. computer-based (i.e. Internet or proprietary system) technology.
- ❑ 10d. other technology. (*Please specify*)_____
- ❑ 10e. I don't know.

11. Does your institution have a distance education (DE) office or department? (An organizational entity that supports and coordinates **any** of the DE activities of an institution)

- ❑ 11a. No. ***(Please continue to next section of survey)***
- ❑ 11b. Yes, a DE office, or a DE department, or an Online office, etc. *(Please continue to the next **question**)*
- ❑ 11c. I don't know. ***(Please continue to next section of survey)***

12. The head of the DE office/department/Online office reports to: ***(Please indicate a position title)***

_____

Electronic Distance Education Faculty Professional Development Section

Professional Development includes provision of new content and learning activities during sessions, and support-related elements after the original sessions.

Importance RANKING:				
1 = Essential	2 = Very important	3 = Important	4 = Somewhat important	5 = Not important

Please rank the following items in order of importance (which items are most needed for successful distance teaching) using the scale shown in box.

13. Content of Distance Education Faculty Professional Development in my institution should include: *(**More than one** topic can be ranked **at same level**)*

13a._____ theory of distance education.
13b._____ characteristics of distance students.
13c._____ integration of distance education methodologies and specific subjects.
13d._____ changes caused by different forms of mediated communication.
13e._____ logistics of distance education teaching (*assignments, evaluation methods, etc.*).
13f._____ creating medium-appropriate course policies.
13g._____ creating technology-appropriate teaching aids.
13h._____ equipment operation.
13i._____ equipment troubleshooting. (*knowing what to do when something doesn't work*)
13j._____ instructional strategies that work well using DE technologies.
13k. **Other** content topics that should be presented during Distance Education Professional Development sessions include:

_____

_____

(Please continue to the next question on reverse)

Professional Development includes provision of new content and learning activities during sessions, and support-related elements after the original sessions.

Importance RANKING:
1 = Essential 2 = Very important 3 = Important 4 = Somewhat important 5 = Not important

Please rank the following items in order of importance (which items are most needed for successful distance teaching) using the scale shown in box.

14. Learning Activities of Distance Education Faculty Professional Development in my institution should include: *(**More than one** activity can be ranked **at same level**)*

14a. _____ experiential (hands-on) learning activities.
14b. _____ faculty, administrators, & support personnel all learn together *(at the same sessions).*
14c. _____ collaborative (group) learning activities.
14d. _____ sessions during the participants' regular working hours.
14e. _____ sessions outside the participants' regular working hours.
14f. _____ sessions at the participants' regular work site.
14g. _____ outside the participants' regular work site.
14h. _____ use of actual distance education equipment and technology.
14i. _____ practice activities in actual distance education setting used in institution.
14j. _____ round table talks with peers already teaching in DE.
14k. **Other** learning activities made available during Distance Education Professional Development sessions should include:

_____

_____.

15. Support-related elements for Professional Development of Distance Education Faculty in my institution should include: *(**More than one** support-related element can be ranked **at same level**)*

15a._____ distance education resource center.
15b._____ on-site technical assistance.
15c._____ access to DE equipment when faculty needs it for instruction prep/rehearsal.
15d._____ distance education equipment that is well-maintained.
15e._____ practice opportunities under simulated conditions of instructional delivery.
15f._____ peer self-help groups.
15g._____ opportunities to observe distance teaching role models.
15h._____ resources to facilitate development of a structured network for DE faculty.
15i._____ time to learn, plan, try, reflect, revise.
15j._____ feedback from peers in distance education.
15k._____ coaching by peers.
15l._____ access to an instructional designer.
15m. **Other** support-related elements for Distance Education Faculty that should be available in my institution include:

_____

_____.

16. Are you currently teaching one or more courses **this** fall semester/quarter?

- ❑ 16a. No.
- ❑ 16b. Yes, ONLY course(s) in the traditional classroom setting.
- ❑ 16c. Yes, ONLY distance education course(s).
- ❑ 16d. Yes, course(s) in both settings.

(If you answered YES to the previous question, Please continue to the next section)
(If you answered NO to the previous question, Please continue to the Requesting Results Section at the bottom of this page)

Program Information Section

17. I am a:

18. I teach courses in the

- ❑ 17a. Full time faculty/instructor.

_____ Program(s).

- ❑ 17b. Part time faculty/instructor.

19. The program I teach the most courses for is accredited by:

- ❑ 19a. CAAHEP (*Commission on Accreditation of Allied Health education Programs*)
- ❑ 19b. a professional organization. (*Please name*) _____
- ❑ 19c. other. (*Please name*) _____
- ❑ 19d. I don't know.

20. What percent of the program's total credits are available through distance education?

- ❑ 20a. Zero %.
- ❑ 20b. 25% or Less.
- ❑ 20c. 26 - 50%.
- ❑ 20d. 51 - 75%.
- ❑ 20e. 76 - 100%.
- ❑ 20f. I don't know.

21. Are program graduates eligible for an additional certification process?

- ❑ 21a. No.
- ❑ 21b. Yes, graduates are eligible to take the _____.
- ❑ 21c. I don't know.

Requesting Results of this Study Section

If you would like to receive a copy of the results of this study, please provide the requested information on the enclosed Results Request postcard and mail it **separately**.

Thank you for completing this survey. Please return it in the envelope provided.

Irene Mueller imueller@msugf.edu
1-800-690-2446 FAX 1-406-771-4317
MSU-Great Falls College of Technology
PO Box 6010, Great Falls, MT 59406-6010

Pre-addressed, stamped return post cards with identifying information of respondent included

I returned the completed questionnaire for your research on:

Date:

Please send a copy of your research results to me at:

APPENDIX C

FOLLOW-UP POST CARD

Follow-up postcard to all respondents for
whom a questionnaire had not been received after 12 days.

Last week, a questionnaire seeking your important input on Professional Development for Distance Education was mailed to you.

If you have already returned the survey, please accept my grateful thanks for your time. If not, please do so today. Your responses are vital in ensuring the research results are useful for organizations involved in Distance Education. If you did not receive a questionnaire, or if it is misplaced, please call me toll-free at 800-690-2446 or email me at imueller@msugf.edu and I will mail out another one for you today.
Thank you,

Irene Mueller, MLS, RRA, HIT Program Director
MSU-GF College of Technology, (406) 771-4358

APPENDIX D

SECOND MAILING COVER LETTER

January 7, 2000

Dear :

Last November, I asked you to participate in a research project about professional development for Distance Education faculty. As of today, I have not received your completed questionnaire. I realize how busy two-year education administrators and faculty are, but I would genuinely appreciate your input about this important emergent instructional activity.

The study is being conducted so that educators like you can affect policies and procedures related to Distance Education. I am contacting you again because your completed questionnaire increases the usefulness of the study. Your were identified by a colleague at your institution as an education professional with knowledge and/or experience of Distance Education.

In the event that your questionnaire has been misplaced, a replacement is enclosed. I would appreciate your taking 10 to 15 minutes now at the beginning of the new semester/quarter to complete the questionnaire. I would be happy to answer any questions you have about the study. Please contact me at (toll-free) 1-800-690-2446 or imueller@msugf.edu.

Thank you for your important assistance,

Irene Mueller, MLS, RHIA
HIT Program Director
406-771-4358

APPENDIX E

TABLES

Table 41. *t*-Test for Full-Time and Part-Time Faculty and Importance of Elements in Professional Development for Distance Education Faculty.

	M		SD				
	full-time faculty	part-time faculty	full-time faculty	part-time faculty	*df*	*t*	(2-tailed) sig.
theory of distance education	2.966	3.053	1.1690	1.1291	26.997	-.302	.765
characteristics of distance students	2.191	2.100	.940	.912	28.802	.401	.691
integration of distance education methodologies and specific subjects	2.023	2.211	1.017	.976	27.111	-.755	.457
changes caused by different forms of mediated communication	2.655	2.474	1.218	.841	36.660	.779	.441
logistics of distance education teaching (assignments, evaluation methods, etc)	1.719	1.450	.904	.605	40.674	1.623	.112
creating medium-appropriate course policies	2.281	2.000	.879	.918	27.389	1.246	.223
creating technology-appropriate teaching aids	1.809	1.600	.851	.754	30.895	1.093	.283

	M		SD				
	full-time faculty	part-time faculty	full-time faculty	part-time faculty	*df*	*t*	(2-tailed) sig.
equipment operation	2.056	1.700	1.162	1.081	29.707	1.313	.199
equipment troubleshooting (knowing what to do when something doesn't work)	2.281	1.900	1.215	1.119	29.949	1.353	.186
instructional strategies that work well using DE technology	1.625	1.800	.835	.696	32.697	-.976	.336
experiential (hands-on) learning activities	1.843	1.700	.987	1.081	26.592	.542	.592
faculty, administrators, & support personnel all learn together	3.167	3.650	1.376	1.309	29.103	-1.480	.150
collaborative (group) learning activities	2.978	3.000	1.161	1.338	25.739	-.069	.946
sessions during the participants' regular work hours	2.674	2.389	1.146	1.290	22.749	.871	.393
sessions outside the participants' regular work hours	3.753	3.400	1.161	1.353	25.649	1.080	.290

	M		SD				
	full-time faculty	part-time faculty	full-time faculty	part-time faculty	*df*	*t*	(2-tailed) sig.
sessions at the participants' regular work site	2.416	2.650	1.185	1.182	28.243	-.800	.430
outside the participants' regular work site	4.000	4.053	1.018	1.177	24.291	-.181	.858
use of actual distance education equipment and technology	1.652	1.350	.955	.745	34.585	1.548	.131
practice activities in actual distance education setting used in institution	2.011	2.150	1.076	1.226	25.898	-.468	.644
round table talks with peers already teaching in DE	2.247	2.000	1.111	.918	32.801	1.045	.304
distance education resource center	2.022	2.050	1.049	1.146	26.540	-.100	.921
on-site technical assistance	1.333	1.300	.670	.470	38.375	.263	.794
access to DE equipment when faculty needs it for instruction prep/rehearsal	1.711	1.550	.811	.605	35.976	1.007	.321

	M		SD				
	full-time faculty	part-time faculty	full-time faculty	part-time faculty	*df*	*t*	(2-tailed) sig.
distance education equipment that is well-maintained	1.202	1.100	.457	.308	107	.952	.343
practice opportunities under simulated conditions of instructional delivery	2.533	2.550	1.041	1.395	108	-.061	.952
peer self-help groups	2.778	2.900	1.025	1.119	26.550	-.448	.658
opportunities to observe distance teaching role models	2.478	3.050	.997	.945	29.190	-2.426	.022
resources to facilitate development of a structured network for DE faculty	2.539	2.842	1.119	1.167	25.549	-1.034	.311
time to learn, plan, try, reflect, revise	1.556	2.050	.850	.999	25.460	-2.055	.050
feedback from peers in distance education	2.600	2.550	.884	.826	29.514	.242	.811

	M		SD				
	full-time faculty	part-time faculty	full-time faculty	part-time faculty	*df*	*t*	(2-tailed) sig.
coaching by peers	2.708	3.100	1.068	.912	31.868	-1.681	.102
access to an instructional designer	2.489	2.500	1.292	1.277	28.304	-.035	.972

N=110 *p < .05

Table 42. *t*-Test for Years of Distance Education Experience and Importance of Professional Development Elements.

	M		SD				
	≤ 4 years exper.	≥ 5 years exper.			*df*	*t*	(2-tailed) sig.
theory of distance education	2.954	3.167	1.167	1.085	114	-.877	.383
characteristics of distance students	2.310	1.871	.968	.957	53.4	*2.188	.033
integration of distance education methodologies and specific subjects	2.129	1.936	.961	1.209	44.6	.805	.425
changes caused by different forms of mediated communication	2.605	2.667	1.098	1.155	48.5	-.256	.799
logistics of distance education teaching (assignments, evaluation methods, etc)	1.655	1.871	.887	1.024	47.0	-1.042	.303
creating medium-appropriate course policies	2.253	2.194	.979	.946	54.5	.297	.768
creating technology-appropriate teaching aids	1.770	1.968	.845	.983	46.8	-.996	.324

	M		SD				
	≤ 4 years exper.	≥ 5 years exper.			*df*	*t*	(2-tailed) sig.
equipment operation	1.816	2.452	1.062	1.261	46.1	*-2.507	.016
equipment troubleshooting (knowing what to do when something doesn't work)	2.046	2.677	1.088	1.301	45.8	*-2.418	.020
instructional strategies that work well using DE technology	1.621	1.613	.810	.989	45.2	.039	.969
experiential (hands-on) learning activities	1.931	1.774	1.119	1.056	116	.680	.498
faculty, administrators, & support personnel all learn together	3.261	3.290	1.335	1.346	52.2	-.103	.918
collaborative (group) learning activities	2.989	2.710	1.208	1.216	52.3	1.100	.276
sessions during the participants' regular work hours	2.671	2.613	1.229	1.230	114	.224	.823
sessions outside the participants' regular work hours	3.557	3.516	1.276	1.208	55.3	.159	.874

	M		SD				
	≤ 4 years exper.	≥ 5 years exper.			*df*	*t*	(2-tailed) sig.
sessions at the participants' regular work site	2.557	2.452	1.258	1.287	51.6	.394	.695
outside the participants' regular work site	3.894	3.677	1.145	1.077	114	.916	.361
use of actual distance education equipment and technology	1.529	1.936	.913	1.181	43.4	-1.741	.089
practice activities in actual distance education setting used in institution	1.966	2.355	1.034	1.279	44.9	-1.525	.134
round table talks with peers already teaching in DE	2.241	2.194	1.131	1.108	116	.203	.839
distance education resource center	2.000	2.419	1.028	1.205	46.3	-1.729	.091
on-site technical assistance	1.398	1.452	.810	.850	50.5	-.307	.760

	M		SD				
	≤ 4 years exper.	≥ 5 years exper.			*df*	*t*	(2-tailed) sig.
access to DE equipment when faculty needs it for instruction prep/rehearsal	1.750	1.774	.861	.805	56.0	-.141	.888
distance education equipment that is well-maintained	1.296	1.100	.681	.305	108	*2.136	.035
practice opportunities under simulated conditions of instructional delivery	2.466	2.645	1.250	.950	68.9	-.828	.411
peer self-help groups	2.727	2.807	1.036	1.014	117	-.368	.714
opportunities to observe distance teaching role models	2.591	2.581	1.100	.765	75.8	.057	.955
resources to facilitate development of a structured network for DE faculty	2.460	2.833	1.065	1.234	44.8	-1.479	.146
time to learn, plan, try, reflect, revise	1.636	1.807	.886	1.078	45.1	-.790	.434

	M		SD				
	≤ 4 years exper.	≥ 5 years exper.			*df*	*t*	(2-tailed) sig.
feedback from peers in distance education	2.557	2.774	.945	.845	58.4	-1.193	.238
coaching by peers	2.724	2.839	1.064	1.128	116	-.507	.613
access to an instructional designer	2.432	2.613	1.303	1.407	49.3	-.628	.533

N=110 *p < .05

Table 43. *t*-Test for Size of Institution and Importance of Professional Development Items.

	M		SD				
	< 10,000	> 10,000	< 10,000	> 10,000	*df*	*t*	(2-tailed) sig.
theory of distance education	3.027	3.042	1.154	1.133	153.6	-.080	.936
characteristics of distance students	2.151	2.182	.923	.983	160.4	-.213	.832
integration of distance education methodologies and specific subjects	2.042	1.908	.985	.920	147.0	.898	.371
changes caused by different forms of mediated communication	2.556	2.546	1.060	1.137	158.5	.054	.957
logistics of distance education teaching (assignments, evaluation methods, etc)	1.658	1.596	.885	.820	148.3	.465	.643
creating medium-appropriate course policies	2.110	2.192	.921	.966	159.1	-.568	.571
creating technology-appropriate teaching aids	1.808	1.748	.892	.774	141.9	.467	.642
equipment operation	1.889	2.020	1.029	1.134	160.9	-.789	.431
equipment troubleshooting (knowing what to do when something doesn't work)	2.137	2.192	1.194	1.167	153.3	-.301	.764

	M		SD				
	< 10,000	> 10,000	< 10,000	> 10,000	*df*	*t*	(2-tailed) sig.
instructional strategies that work well using DE technology	1.534	1.602	.851	.770	146.2	-.536	.592
experiential (hands-on) learning activities	1.722	1.780	1.010	1.030	154.9	-.367	.714
faculty, administrators, & support personnel all learn together	3.247	3.270	1.245	1.332	160.9	-.119	.906
collaborative (group) learning activities	2.712	2.890	1.148	1.197	158.8	-.987	.325
sessions during the participants' regular work hours	2.671	2.546	1.248	1.216	153.1	.653	.515
sessions outside the participants' regular work hours	3.548	3.515	1.179	1.257	160.4	.175	.861
sessions at the participants' regular work site	2.438	2.556	1.213	1.280	159.6	-.612	.542
outside the participants' regular work site	3.722	3.926	1.091	1.178	158.5	-1.157	.249
use of actual distance education equipment and technology	1.528	1.606	.919	.924	153.6	-.549	.584
practice activities in actual distance education setting used in institution	1.764	2.000	.957	1.101	164.0	-1.498	.136

	M		SD				
	< 10,000	> 10,000	< 10,000	> 10,000	*df*	*t*	(2-tailed) sig.
round table talks with peers already teaching in DE	2.247	2.172	1.140	.959	170	.467	.641
distance education resource center	2.247	1.818	1.077	.962	144.8	2.696	.008
on-site technical assistance	1.384	1.380	.793	.708	144.5	.031	.976
access to DE equipment when faculty needs it for instruction prep/rehearsal	1.753	1.650	.778	.783	115.9	.861	.390
distance education equipment that is well-maintained	1.274	1.204	.584	.537	147.7	.802	.424
practice opportunities under simulated conditions of instructional delivery	2.356	2.360	1.098	1.124	157.4	-.022	.982
peer self-held groups	2.740	2.630	1.000	.991	154.5	.715	.476
opportunities to observe distance teaching role models	2.425	2.570	.927	1.018	162.8	-.977	.330
resources to facilitate development of a structured network for DE faculty	2.589	2.490	1.078	1.115	158.0	.587	.558
time to learn, plan, try, reflect, revise	1.699	1.660	.923	.901	153.1	.275	.784
feedback from peers in distance education	2.480	2.520	.835	.969	166.3	-.295	.769

	M		SD				
	< 10,000	> 10,000	< 10,000	> 10,000	*df*	*t*	(2-tailed) sig.
coaching by peers	2.589	2.697	.998	1.073	161.1	-.679	.498
access to an instructional designer	2.521	2.330	1.248	1.264	156.4	.986	.325

*p < .05

Table 44. Analysis of Variance for Number of Distance Education Courses Offered and Importance of Elements in Professional Development for Distance Education Faculty.

Element		SS	*df*	MS	F	(2-tailed) sig.
theory of distance education	Between groups	1.078	2	.539	.408	.666
	Within groups	183.859	139	1.323		
	Total	184.937	141			
characteristics of distance students	Between groups	9.638E-02	2	4.8E-02	.054	.947
	Within groups	125.230	141	.888		
	Total	125.326	143			
integration of distance education methodologies and specific subjects	Between groups	.470	2	.235	.284	.753
	Within groups	114.945	139	.827		
	Total	115.415	141			
changes caused by different forms of mediated communication	Between groups	2.720	2	1.360	1.141	.323
	Within groups	164.528	138	1.192		
	Total	167.248	140			
logistics of distance education	Between groups	.997	2	.499	.788	.457
	Within groups	89.225	141	.633		
teaching (assignments, evaluation methods, etc)	Total	90.222	143			
creating medium-appropriate course policies	Between groups	.525	2	.263	.297	.744
	Within groups	124.780	141	.885		
	Total	125.306	143			
creating technology-appropriate teaching aids	Between groups	.102	2	5.1E-02	.085	.919
	Within groups	84.391	141	.599		
	Total	84.493	143			

Element		SS	*df*	MS	F	(2-tailed) sig.
equipment operation	Between groups	2.749	2	1.374	1.193	.306
	Within groups	161.251	140	1.152		
	Total	164.000	142			
equipment troubleshooting (knowing what to do when something doesn't work)	Between groups	5.262	2	2.631	1.971	.143
	Within groups	188.231	141	1.335		
	Total	193.493	143			
instructional strategies that work well using DE technology	Between groups	.274	2	.137	.241	.786
	Within groups	79.390	140	.567		
	Total	79.664	142			
experiential (hands-on) learning activities	Between groups	1.144	2	.572	.569	.568
	Within groups	141.856	141	1.006		
	Total	143.000	143			
faculty, administrators, & support personnel all learn together	Between groups	1.789E-02	2	8.9E-03	.005	.995
	Within groups	231.389	142	1.630		
	Total	231.407	144			
collaborative (group) learning activities	Between groups	1.806	2	.903	.665	.516
	Within groups	192.787	142	1.358		
	Total	194.593	144			
sessions during the participants' regular work hours	Between groups	1.554	2	.777	.548	.579
	Within groups	199.884	141	1.418		
	Total	201.438	143			

Element		SS	*df*	MS	F	(2-tailed) sig.
sessions outside the participants' regular work hours	Between groups	4.287	2	2.143	1.560	.214
	Within groups	193.686	141	1.374		
	Total	197.972	143			
sessions at the participants' regular work site	Between groups	1.530	2	.765	.518	.597
	Within groups	208.220	141	1.477		
	Total	209.750	143			
sessions outside the participants' regular work site	Between groups	2.271	2	1.135	.896	.411
	Within groups	174.935	138	1.268		
	Total	177.206	140			
use of actual distance education equipment and technology	Between groups	1.940	2	.970	1.336	.266
	Within groups	101.668	140	.726		
	Total	103.608	142			
practice activities in actual distance education setting used in institution	Between groups	1.747	2	.874	.854	.428
	Within groups	144.190	141	1.023		
	Total	145.937	143			
round table talks with peers already teaching in DE	Between groups	.161	2	8.0E-02	.076	.927
	Within groups	149.166	141	1.058		
	Total	149.326	143			
distance education resource center	Between groups	.912	2	.456	.466	.628
	Within groups	138.840	142	.978		
	Total	139.752	144			

Element		SS	*df*	MS	F	(2-tailed) sig.
on-site technical assistance	Between groups	.244	2	.122	.260	.772
	Within groups	66.818	142	.471		
	Total	67.062	144			
access to DE equipment when faculty needs it for instruction prep/rehearsal	Between groups	1.566	2	.783	1.285	.280
	Within groups	86.544	142	.609		
	Total	88.110	144			
distance education equipment that is well-maintained	Between groups	.224	2	.112	.445	.642
	Within groups	35.161	140	.251		
	Total	35.385	142			
practice opportunities under simulated conditions of instructional delivery	Between groups	1.105	2	.552	.448	.640
	Within groups	175.033	142	1.223		
	Total	176.138	144			
peer self-help groups	Between groups	3.044	2	1.522	1.641	.197
	Within groups	131.715	142	.928		
	Total	134.759	144			
opportunities to observe distance teaching role models	Between groups	2.297	2	1.148	1.317	.271
	Within groups	123.869	142	.872		
	Total	126.166	144			
resources to facilitate development of a structured network for DE faculty	Between groups	1.265	2	.633	.502	.606
	Within groups	176.343	140	1.260		
	Total	177.608	142			

Element		SS	*df*	MS	F	(2-tailed) sig.
time to learn, plan, try, reflect, revise	Between groups	4.867E-02	2	2.4E-02	.029	.971
	Within groups	117.303	142	.826		
	Total	117.352	144			
feedback from peers in distance education	Between groups	2.383	2	1.191	1.540	.218
	Within groups	109.824	142	.773		
	Total	112.207	144			
coaching by peers	Between groups	1.643	2	.822	.762	.469
	Within groups	153.116	142	1.078		
	Total	154.759	144			
access to an instructional designer	Between groups	5.107	2	2.554	1.652	.195
	Within groups	219.486	142	1.546		
	Total	224.593	144			

Table 45. Analysis of Variance for Number of Years Distance Education Provided by Institution and Importance of Professional Development Elements.

Element		SS	*df*	MS	F	(2-tailed) sig.
theory of distance education	Between groups	7.157	2	3.587	2.843	.061
	Within groups	188.817	150	1.259		
	Total	195.974	152			
characteristics of distance students	Between groups	9.378E-02	2	4.689E-02	.052	.949
	Within groups	137.829	153	.901		
	Total	137.923	155			
integration of distance education methodologies and specific subjects	Between groups	1.061	2	.531	.615	.542
	Within groups	130.289	151	.863		
	Total	131.351	153			
changes caused by different forms of mediated communication	Between groups	3.608	2	1.804	1.506	.225
	Within groups	180.886	151	1.198		
	Total	184.494	153			
logistics of distance education teaching (assignments, evaluation methods, etc)	Between groups	3.218	2	1.609	2.385	.096
	Within groups	103.218	153	.675		
	Total	106.436	155			
creating medium-appropriate course policies	Between groups	3.289	2	1.644	1.910	.152
	Within groups	131.705	153	.861		
	Total	134.994	155			

Element		SS	*df*	MS	F	(2-tailed) sig.
creating technology-appropriate teaching aids	Between groups	.970	2	.485	.690	.503
	Within groups	107.619	153	.703		
	Total	108.590	155			
equipment operation	Between groups	24.144	2	12.072	11.624	*.000
	Within groups	157.856	152	1.039.		
	Total	182.000	154			
equipment troubleshooting (knowing what to do when something doesn't work)	Between groups	23.502	2	11.751	9.597	*.000
	Within groups	187.338	153	1.224		
	Total	210.840	155			
instructional strategies that work well using DE technology	Between groups	1.037	2	.519	.810	.447
	Within groups	97.350	152	.640		
	Total	98.387	154			
experiential (hands-on) learning activities	Between groups	5.202	2	2.601	2.697	.071
	Within groups	147.542	153	.964		
	Total	152.744	155			
faculty, administrators, & support personnel all learn together	Between groups	3.395	2	1.697	1.050	.352
	Within groups	248.898	154	1.616		
	Total	252.293	156			
collaborative (group) learning activities	Between groups	1.883	2	.941	.691	.503
	Within groups	209.761	154	1.362		
	Total	211.643	156			

Element		SS	*df*	MS	F	(2-tailed) sig.
sessions during the participants' regular work hours	Between groups	.529	2	.265	.182	.834
	Within groups	221.045	152	1.454		
	Total	221.574	154			
sessions outside the participants' regular work hours	Between groups	4.612	2	2.306	1.705	.185
	Within groups	208.280	154	1.352		
	Total	212.892	156			
sessions at the participants' regular work site	Between groups	.245	2	.122	.085	.919
	Within groups	220.595	153	1.441		
	Total	220.840	155			
sessions outside the participants' regular work site	Between groups	3.505	2	1.753	1.426	.244
	Within groups	183.172	149	1.229		
	Total	186.678	151			
use of actual distance education equipment and technology	Between groups	4.628	2	2.314	2.951	.055
	Within groups	119.962	153	.784		
	Total	124.590	155			
practice activities in actual distance education setting used in institution	Between groups	14.009	2	7.005	7.172	*.001
	Within groups	149.427	153	.977		
	Total	163.436	155			
round table talks with peers already teaching in DE	Between groups	8.008	2	4.004	3.935	*.022
	Within groups	155.659	153	1.017		
	Total	163.667	155			

Element		SS	*df*	MS	F	(2-tailed) sig.
distance education resource center	Between groups	1.048	2	.524	.475	.623
	Within groups	168.721	153	1.103		
	Total	169.769	155			
on-site technical assistance	Between groups	1.306	2	.653	1.336	.266
	Within groups	75.268	154	.489		
	Total	76.573	156			
access to DE equipment when faculty needs it for instruction prep/rehearsal	Between groups	3.717E-02	2	1.859E-02	.030	.971
	Within groups	96.893	154	.629		
	Total	96.930	156			
distance education equipment that is well-maintained	Between groups	3.022E-02	2	1.511E-02	.046	.955
	Within groups	50.194	153	.328		
	Total	50.224	155			
practice opportunities under simulated conditions of instructional delivery	Between groups	3.397	2	1.699	1.509	.224
	Within groups	173.380	154	1.126		
	Total	176.777	156			
peer self-help groups	Between groups	1.512	2	.756	.829	.439
	Within groups	140.513	154	.912		
	Total	142.025	156			
opportunities to observe distance teaching role models	Between groups	2.692	2	1.346	1.644	.197
	Within groups	126.098	154	.819		
	Total	128.790	156			

Element		SS	*df*	MS	F	(2-tailed) sig.
resources to facilitate development of a structured network for DE faculty	Between groups	6.507	2	3.253	2.810	.063
	Within groups	175.970	152	1.158		
	Total	182.477	154			
time to learn, plan, try, reflect, revise	Between groups	3.212	2	1.606	1.909	.152
	Within groups	129.565	154	.841		
	Total	132.777	156			
feedback from peers in distance education	Between groups	1.890	2	.945	1.240	.292
	Within groups	117.320	154	.762		
	Total	119.210	156			
coaching by peers	Between groups	.702	2	.351	.338	.714
	Within groups	159.871	154	1.038		
	Total	160.573	156			
access to an instructional designer	Between groups	.582	2	.291	.192	.825
	Within groups	233.443	154	1.516		
	Total	234.025	156			

*$p < .05$

Table 46. *t*-Test for Allied Health and Non-Allied Health Respondents and Importance of Elements in Professional Development.

	M		SD				
	Allied Health	Non-Allied Health	Allied Health	Non-Allied Health	*df*	*t*	(2-tailed) sig.
theory of distance education	2.577	3.119	1.102	1.129	35.230	*-2.298	.028
characteristics of distance students	2.423	2.123	.945	.953	34.677	1.488	.146
integration of distance education methodologies and specific subjects	2.192	1.924	.895	.954	36.038	1.394	.172
changes caused by different forms of mediated communication	2.346	2.587	.977	1.122	38.021	-1.130	.265
logistics of distance education teaching (assignments, evaluation methods, etc)	1.539	1.637	.647	.878	43.287	-.674	.504
creating medium-appropriate course policies	2.269	2.137	.827	.966	38.216	.731	.469

	M		SD				
	Allied Health	Non-Allied Health	Allied Health	Non-Allied Health	*df*	*t*	(2-tailed) sig.
creating technology-appropriate teaching aids	1.692	1.788	.788	.832	35.663	-.563	.577
equipment operation	1.734	2.007	1.251	1.057	31.726	-1.060	.297
equipment troubleshooting (knowing what to do when something doesn't work)	1.769	2.240	1.142	1.170	35.011	-1.928	.062
instructional strategies that work well using DE technology	1.680	1.555	.627	.831	39.989	.875	.387
experiential (hands-on) learning activities	1.808	1.747	.801	1.056	42.168	.340	.736
faculty, administrators, & support personnel all learn together	3.269	3.259	1.430	1.272	32.378	.036	.972
collaborative (group) learning activities	2.885	2.803	1.177	1.180	34.486	.327	.746
sessions during the participants' regular work hours	3.083	2.521	1.248	1.210	30.545	2.056	.048

	M		SD				
	Allied Health	Non-Allied Health	Allied Health	Non-Allied Health	*df*	*t*	(2-tailed) sig.
sessions outside the participants' regular work hours	3.500	3.534	1.364	1.199	32.246	-.120	.905
sessions at the participants' regular work site	2.400	2.534	1.225	1.257	33.193	-.465	.645
outside the participants' regular work site	3.870	3.833	1.290	1.122	27.575	.127	.900
use of actual distance education equipment and technology	1.577	1.572	.945	.919	34.009	.022	.982
practice activities in actual distance education setting used in institution	1.808	1.918	1.060	1.047	34.285	-.489	.628
round table talks with peers already teaching in DE	2.192	2.206	1.132	1.023	32.686	-.055	.956
distance education resource center	1.962	2.007	.916	1.054	37.819	-.227	.822
on-site technical assistance	1.231	1.408	.514	.774	47.732	-1.486	.144

	M		SD				
	Allied Health	Non-Allied Health	Allied Health	Non-Allied Health	*df*	*t*	(2-tailed) sig.
access to DE equipment when faculty needs it for instruction prep/rehearsal	1.731	1.687	.724	.792	36.416	.279	.781
distance education equipment that is well-maintained	1.115	1.255	.326	.587	59.051	-1.740	.087
practice opportunities under simulated conditions of instructional delivery	2.539	2.327	1.140	1.105	33.850	.878	.386
peer self-help groups	2.808	2.653	1.132	.970	31.819	.655	.517
opportunities to observe distance teaching role models	2.769	2.463	1.243	.924	171	1.476	.142
resources to facilitate development of a structured network for DE faculty	2.462	2.545	1.104	1.099	34.490	-.355	.725
time to learn, plan, try, reflect, revise	1.577	1.694	.809	.926	37.600	-.664	.510
feedback from peers in distance education	2.654	2.476	1.056	.886	171	.915	.362

	M		SD				
	Allied Health	Non-Allied Health	Allied Health	Non-Allied Health	*df*	*t*	(2-tailed) sig.
coaching by peers	2.880	2.612	1.092	1.030	31.687	1.142	.262
access to an instructional designer	2.385	2.415	1.472	1.221	171	-.113	.910

N=110 *p < .05

APPENDIX F

LIST OF INSTITUTIONS PARTICIPATING IN SURVEY

Institution	State	Institution	State
U of AK SE, Sitka	Alaska	West Valley College	California
Central Arizona College	Arizona	Yuba College	California
Pima Community College	Arizona	Arapahoe CC	Colorado
American River College	California	Colorado Northwestern CC	Colorado
Bakersfield College	California	CC of Denver (Aurora Campus)	Colorado
Cabrillo College	California	Front Range CC	Colorado
Cerritos College	California	Morgan CC	Colorado
Citrus College	California	Pikes Peak CC	Colorado
City College of SF	California	Pueblo CC	Colorado
College of San Mateo	California	Red Rocks CC	Colorado
Contra Costa College	California	Kapiolani CC	Hawaii
Cosumnes River	California	Clovis CC	New Mexico
Crafton Hills College	California	New Mexico Jr College	New Mexico
De Anza College	California	Blue Mountain CC	Oregon
Fullerton College	California	Chemeketa CC	Oregon
Long Beach City College	California	Lane CC	Oregon
Modesto Junior College	California	Portland CC	Oregon
Mt. San Antonio College	California	Bellevue CC	Washington
Ohlone College	California	Clark College	Washington
Palomar College	California	North Seattle CC	Washington
San Bernadino Valley College	California	Pierce College	Washington
Santa Rosa Junior College	California	Seattle Central CC	Washington
Southwestern College	California	Tacoma CC	Washington
Victor Valley College	California	Wenatchee Valley College	Washington