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FACTORS IMPACTING DEVELOPMENT TIME
FOR ONLINE POSTSECONDARY INSTRUCTION

By

Karen Hughes Miller
B.A., University of Alabama, 1967
M.Ed., University of Louisville, 1991

A Dissertation
Submitted to the Faculty of the
Graduate School of the University of Louisville
in Partial Fulfillment of the Requirements
for the Degree of

Doctor of Philosophy

College of Education and Human Development
University of Louisville
Louisville, Kentucky

December 2005

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A Dissertation Approved on

August 23, 2005

By the Following Dissertation Committee:

Dissertation Director

DEDICATION

This dissertation is dedicated to my parents, Dr. John Paul Lisack
and the late Hildred Frandsen Lisack who taught me to love learning.

ACKNOWLEDGMENTS

I would like to thank the members of my dissertation committee including Dr. Carolyn Rude-Parkins for her leadership, Dr. Patricia K. Leitsch for her guidance in working with human subjects research, Dr. John L. Keedy and Dr. Stephen L. Merker for their assistance with research methodology, and Dr. Mike A. Boyle for his advice and encouragement. Thanks to Dr. Gale Rhodes, Joni Allison and Linda Leake, University of Louisville Delphi Center of Teaching and Learning, for their support with online survey design and implementation; and to Norma Northern, Dr. Randolph Hollingsworth, and the Kentucky Virtual University (KYVU) and Kentucky Council on Postsecondary Education (CPE) for their support.

Thanks to my husband David Warner Miller and my sons John Warner Miller and Davison Dalziel Hughes for their love and support; and to my dear role model, Evelyn Fisher Bingham.

My deep appreciation also to Dr. June Lee and Dr. Susan S. Easton, distance education researchers, who graciously responded to my questions about their recent studies.

ABSTRACT

FACTORS IMPACTING DEVELOPMENT TIME FOR ONLINE POSTSECONDARY INSTRUCTION

Karen Hughes Miller

August 23, 2005

This study focused on the development and validation of a web-based survey instrument designed to measure faculty perceptions on the importance of 24 variables that contribute to the facilitation of online postsecondary course development. It builds on the work of Lee (2001, 2002) and Easton (2003) who also investigated the faculty perceptions of the importance of specific variables in the development and delivery on online postsecondary education.

Knowing which variables contribute most to online course development is important because it helps faculty members estimate the time needed to develop particular courses by considering which variables apply to their situation; and it helps administrators make informed decisions about support for variables that facilitate online course development. Because there was no validated instrument that measured the importance of these specific variables, faculty and administrators often addressed the issues above using only anecdotal data.

The research questions addressed in this study were: (1) which variables have been researched in connection with online postsecondary instruction; and (2) which of those variables are most relevant to facilitating the development of online postsecondary course materials? Online postsecondary instruction is defined by the Kentucky Virtual University (KYVU) as courses that have 70% or more of their instructional content on the Internet; and facilitate is defined by Merriam-Webster Online (2004) as “to make easier or to help bring about.”

The development and validation of the survey instrument was a four-step process: (1) using a literature search to identify independent variables connected with online postsecondary instruction, (2) using an expert panel to identify which variables were most relevant to the issue of facilitating online postsecondary course development and to establish face validity, (3) developing an online survey instrument to measure faculty perceptions of the importance of 24 independent variables that facilitate the development of online postsecondary courses, and (4) validating the survey instrument using factor analysis to identify the latent structure (dimensions) of the 24 independent variables (Garson, 2004), and Cronbach’s alpha to estimate the reliability of data (Shifflett, 2004). The alpha was .8898, and 21 of the 24 variables loaded onto six factors that presented as logical categories. Three variables overlapped several factors, but no variables failed to load on a factor.

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CHAPTER I

INTRODUCTION

More than 50% of the colleges and universities worldwide now offer at least a portion of their curriculum via distance education (Moe, 2003). Because online instruction is the most accessible and the least expensive to produce, it is the fastest growing delivery mechanism for distance education and is bringing educational opportunities to people who 10 years ago would not have considered postsecondary education within their reach (Foster, 2002). The Sloan Consortium (2004) reported that 74.4% of postsecondary institutions surveyed estimated an increase in online course enrollment between the fall of 2003 and the fall of 2004. That increase represented 662,792 students in a single academic year.

Not only is online instruction growing in popularity with students, it is also almost always profitable to institutions of higher education. But while some administrators see the trend toward online instruction as a partial solution to the increasing cost of expanding and/or maintaining the traditional bricks and mortar campus, they may overlook the fact that the major cost of online instruction is the cost of faculty time (Taylor, 1998). They may not consider that fact that faculty time is a limited commodity as responsibilities and expectations increase (Doyle, 2002).

Although online postsecondary instruction gives both students and faculty more control over the scheduling of instructional time, it actually requires more time to

accomplish the same tasks. On the faculty side, research has shown an approximate three-to-one ratio comparing time needed to develop online materials to time needed to develop face-to-face classroom materials (Palloff and Pratt, 1999; Mogk, 1999).

The research problem addressed in this study is grounded on three phenomena: (a) the demand for online postsecondary instruction is growing at an increasing rate; (b) there is an approximate three-to-one ratio when comparing the time needed to develop online course materials to the time needed to develop traditional classroom materials; and (c) faculty time is already committed to more than 45 hours of work per week. This chapter introduces the research problem and purpose of this study; the research questions addressed; and the methodologies, scope, and limitations of this study. It places the research problem in context by exploring: (a) the limits of faculty time; (a) the increased workload of online teaching; and (c) the value added component of online teaching.

The Limits of Faculty Time

Because postsecondary faculty members are professional and not hourly employees, the time they commit to work related activities is usually not measured in any formal way. It is their productivity that is measured in teaching, research, and service. Current research shows, however, that productivity expectations are increasing with no hope of relief in sight.

Doyle (2002) reported the results of a nationwide study of university faculty that found information technology (particularly computers) actually increased rather than decreased faculty workload. This finding was not specific to distance education, but to faculty responsibilities in general. Doyle also reported finding the perception that

although the total number of faculty has increased in most institutions; the scope of faculty responsibility has increased at an even greater pace.

Milem, Berger, and Dey (2000) reported, in a 20 year longitudinal study of faculty time allocation, that overall faculty expectations such as frequency of publication and acquisition of external funding were on a steady increase. They used Massy and Zemsky's term "academic ratcheting" to describe the concept of increasing expectations and responsibilities related to postsecondary teaching. In response to the criticism that faculty are allocating time to research at the expense of teaching, Milem et al. found that there was a statistically significant *increase* in the amount of time faculty reported as allocated to teaching and/or preparing for teaching. The researchers then analyzed the 20 year data to identify areas of significant decreases in time allocation. The *only* area of decrease was in student advising and counseling. In their conclusions, Milem et al. discussed the practical significance of these findings. Because other researchers found a correlation between student satisfaction, student success, and the amount and quality of student advising and counseling, the fact that time for this activity was becoming more limited should not be taken lightly. One would hope that it is not always advising and counseling that suffer when time is limited.

Singell, Lillydahl, and Singell (1996) found that faculty time allocation decisions were based to a high degree on institutional type and institutional mission. For example, at premier research institutions, faculty spent nearly 33% of their time in research related activities and 46% of their time in teaching related activities. At liberal arts institutions, faculty spent 10% of their time in research related activities and 68% of their time in teaching related activities. This finding suggests that institutional type and mission serve

as independent variables that could impact faculty time available to create online courseware. Faculty would be unlikely and/or unwise to make time allocation decisions that do not support their institutional mission.

Singell et al. were among the few researchers to actually address the issue of faculty time in real hours. They found that faculty at liberal arts institutions average 50.1 hours of work per week; and faculty at either doctoral or comprehensive institutions average 47.7 hours of work per week. They compared this to Juster and Stafford's 1991 report that the average American male spent 44 hours per week in work or work related activities. From the higher education standpoint, both the 47.7 and the 50.1 hour work week have practical implications. Because Singell et al. did not consider distance education, their findings could be considered a baseline for time already committed *before* the element of online courseware development is even considered. For the typical postsecondary faculty member, there is already a productivity expectation that comes close to or exceeds a 6 day week of 8 hour work days. It reinforces Milem et al. in their point that faculty time is not an unlimited commodity.

The Increased Workload of Online Teaching

As online instruction in the postsecondary environment increases, faculty are realizing the increased time needed to develop and deliver this courseware. The 1998 American Association of University Professors (AAUP) Statement on Faculty Workloads reads:

No examination of teaching loads today would be complete without consideration of how distance education has affected the work of faculty members who engage in it. Since faculty members have primary responsibility for instruction, the curricular changes needed to implement the new technologies - including course design, implementation, review, and revision - require substantial faculty participation.

Consideration should be given to the matter of increases in contact hours in real or asynchronous time required to achieve interactive student learning. (p. 6)

Euben (2000), writing for the AAUP, further defined the issue by acknowledging that the time commitment for online instruction was estimated at roughly three times that for face-to-face delivery. This ratio of 3:1 is similar to the findings of Visser (2000) and Lazarus (2003).

In another attempt at estimating the time necessary to develop online course materials, Palloff and Pratt (1999) calculated their ratio of 1 hour (for face-to-face preparation) to 2.76 hours (for web-based preparation) by dividing actual hours documented during several course development projects. In a more lighthearted attempt to advise faculty how to plan their time, Mogk (1999) advised faculty who were planning to teach online to take the number of hours they would need to develop the materials for the traditional face-to-face environment and multiply by *pi*. He described the “payoff”, however, as an increased amount of faculty/student interactivity in online courses. On the extreme end of this rough estimation scale were several comments reported by the American Federation of Teachers, Higher Education Department (2000) that course preparation and teaching online can take up to 66% longer than for traditional courses.

This increased time demand has a very real impact on academia as a whole because faculty time is already fully committed to traditional teaching, research (including writing), and service, the components of the faculty workload credited towards promotion and tenure. The increased time demand related to online instruction is no secret. Betts (1998) found that faculty awareness of the additional time necessary to develop online materials is one of the major barriers to faculty accepting online teaching assignments.

Parrish and Parrish (2000) writing for the American Council on Education (ACE) Division of Government and Public Affairs identified seven issues relating to distance education and faculty workload that should be addressed in institutional policy statements relating to distance education. The first and second issues in priority order were: (a) will teaching load credit be given for course development; and (b) will faculty be expected to devote more time to the development of new courses after the successful launch on an online course.

Although this increased demand on faculty time related to online instruction is accepted as common knowledge, there were no major studies before Visser (2000) that identified faculty time as a focus of research. And not until 2003 did Lazarus conclude that the additional time commitment was actually related to the development of the online course materials rather than teaching of the course itself.

Research in this area is very new but has the potential to be extremely useful to both administrators and faculty as they plan for support of online postsecondary instruction. This area of study also has the potential to attract both educators and human resource researchers because it combines issues of instructional design, instructional technology, and person hour studies (also addressed in the literature as manpower studies). As administrators, deans, and department chairs plan faculty workloads for coming semesters, they need some kind of benchmark by which they can estimate the time needed to develop online courseware. Faculty time must also be estimated in grant and contract proposal writing where projected schedules and budgets can suddenly become real obligations when funding is granted. In both cases, the valuing (converting hours to dollars) of faculty time allows for more efficient and effective planning.

There are two expert sources of information on how online course development time is estimated. The first group, academicians, includes instructors, department chairs, administrators, and professional technical support staff. The second group, professional commercial courseware developers, also provides valuable insight because they must equate development time with real hours and costs.

In the academic arena, several experts agreed that the de facto standard in faculty workload planning was one-to-one release time; that is, being released from teaching one course in order to develop one online course (S.M. Keating, personal correspondence, April 14, 2004; C. Rude-Parkins, personal correspondence, April 16, 2004). Keating commented, however, that the luxury of release time is contingent on other faculty being available to cover the existing course load. Release time is not an “automatic resource” and simply may not be an option.

While the de facto standard of one course release time to one online course development time is practical in a postsecondary environment because it assumes a standard unit of measurement, it does nothing to recognize the wide variation in course types. There may be profound differences including academic discipline and level, instructional content, student interaction expectations, design and technical support services available, and other variables that impact the level of difficulty of developing online materials (Black, 1992).

In the commercial arena, business models such as described by Kapp (2003) are prevalent. N.C. Cheski (personal communication, April 13, 2004) described the estimation formula for a major US Department of Defense contractor as being 40 person hours for 1 hour of completed online courseware. These person hours, however, included

subject matter experts, programmers, and quality control staff. She also acknowledged that there can be a great deal of variation in actual time spent according to the content and the skills of the persons involved in the tasks. In both academia and in the commercial instructional sector, if the faculty and/or subject matter expert time is underestimated, the person hours and dollars must be made up from some other aspect of the project or the departmental budget.

The problem of the increased demand on faculty time related to online course development can also be viewed from an institutional strategic planning and budgeting perspective. If administrators and managers knew which support services and environmental variables could increase productivity of online faculty, they could analyze the cost/benefit of making those support services and environmental variables available. Paulson (2002) suggested the idea of “unbundling” faculty roles so faculty members, expert in their content area, do not spend inordinate amounts of time on technology and design issues that could actually be done more efficiently by other professional support staff.

Providing support that actually increases productivity, however, requires careful planning. Lee (2001, 2002) found that when either the type or the proximity of technical support did not match faculty perception of their specific needs, faculty assumed the support was not there for them. Administrators could invest in technical support and yet it was rendered “unavailable” because of mismatches between faculty and administrators’ perception of need. Balance is also critical to successful technical support planning. Kapp (2003) reminds us that there is a point at which too many individuals on a project can actually inhibit efficiency.

One of the confounding problems when using business models in academia is that the product (in this case, a well designed postsecondary online course) is essentially based on the knowledge and skill of the faculty member. However, if one can identify which variables have a positive impact on the output of the faculty member, those variables can be categorized. For example, which variables are under the control of the faculty member (adaptable); which are under the control of administrators (adaptable); and which must be accepted as outside of the control of either group (givens). This knowledge provides an argument for supporting adaptable factors that increase productivity, or in this case, facilitate the development of postsecondary online course materials.

The Value Added Component of Online Teaching

In addition to meeting the need for faculty to participate in postsecondary online teaching to meet the growing demand of online students, there are several more subtle benefits to faculty investing their time in online instruction. These unanticipated benefits (value added components) can be considered from a human resource standpoint when making an argument for supporting the adaptable variables that can facilitate the development of online courseware.

Alley (1996) described his own transformation into a student centered instructor as he moved onto the online instructional environment. His campus had identified three specific needs relating to improved student satisfaction: (a) course scheduling including more frequent and shorter class meetings; (b) more modeling and visual aids instructional technology support; and (c) the use of distance education technology.

The course Alley was asked to redesign was a physics course that he had taught in the traditional classroom for several years. He realized that as he redeveloped the online materials, his entire approach had to change. Interestingly enough, his wife, who was a K-12 teacher, identified the difference in their classroom roles. He quoted her as observing, “I am a teacher, whereas you are a scientist who teaches.” The concept of *student centered learning*, long familiar in K-12 education, is not a common concept in postsecondary physics. But when he applied this concept to his course redesign process, he believed “things began to fall into place.” He applied two major strategies to his design: (a) seeking areas where instruction was interactive rather than teacher-led; and (b) redesigning exercises where making errors was not only acceptable but was also supported with reflection. He now applies and strongly endorses both strategies for online and face-to-face instruction.

Hassenplug and Harnish (1998) reported that online instruction created more opportunities for faculty/student interaction by necessity because all questions and replies had to be organized via e-mail or the discussion board. Their reasoning was similar to Alley’s argument, that the formatted environment of online teaching and learning imposed *organization* on all situations. Dziuban and Moskal (2004) reported that faculty at the University of Central Florida remained optimistic and engaged in web-based instruction for a similar reason. “Despite the increased workload, instructors express a high degree of satisfaction and a strong willingness to continue teaching on the web-based mode.” They found the highest degrees of instructor satisfaction among instructors who spent the greatest amount of time in web-based student interaction.

Witt (2003) reported a kind of crossover effect from teaching online. Instructors who taught courses online also tended to use web sites to support their traditional face-to-face courses. The idea of web-enhanced traditional courses is growing in popularity. At the University of Louisville, for example, each course whether face-to-face or online, has a Blackboard^(R) electronic learning platform site available and faculty are free to choose if they want to use it to post materials and foster discussion. L.K. Leake (personal communication April 14, 2004) reported that the use of web-enhancement for traditional courses has doubled at the University of Louisville in the past two years.

The Research Problem and Purpose of this Study

The research problem and purpose of this study are grounded in the need for valid data about which variables facilitate the development of postsecondary online course development. Faculty and administrators need this data not only to make informed estimates of the time necessary to develop online postsecondary course materials, but also to know which variables should be supported at the department and institutional level.

The Research Problem

As previously stated, the research problem addressed in this study is grounded on three phenomena: (a) the demand for online postsecondary instruction is growing at an increasing rate; (b) there is an approximate three-to-one ratio when comparing the time needed to develop online course materials to the time needed to develop traditional classroom materials; and (c) faculty time is already committed to more than 45 hours of work per week. The combination of these three components causes a tension that has already been identified as a barrier to faculty wanting to participate in online instruction

(Betts, 1998). Because there is no current valid instrument to investigate the variables related to the facilitation of online postsecondary course development, there is only anecdotal data upon which faculty and administrators can base their work time estimations or support service allocations.

The Purpose of This Study

The purpose of this study was to develop and validate an instrument that identifies which variables contribute most to the facilitation of online postsecondary course development. Knowing which variables contribute most has two applications: (a) to help faculty members estimate the time needed to develop particular courses by considering which variables apply to their situation; and (b) to help administrators make informed decisions about support for variables that facilitate online course development. The research questions were developed to address the problem and support the purpose of this study.

The Research Question(s)

The research questions addressed in this study are:

- (1) Which variables have been researched in connection with online postsecondary instruction?
- (2) Which of those variables are most relevant to facilitating the development of online postsecondary course materials?

Online postsecondary instruction is defined by the Kentucky Virtual University (KYVU) as courses that have 70% or more of their instructional content on the Internet; and facilitate is defined by Merriam-Webster Online (2004) as “to make easier or to help bring about.”

The Scope and Limitations of this Study

The scope and limitations of this study draw on the work of Lee (2001, 2002) and Easton (2003), both of whom researched faculty attitudes and perceptions related to online postsecondary instruction.

The Scope of This Study

Because research in the area of online postsecondary instruction is fairly new, there is currently no valid instrument available to measure faculty perception of which variables facilitate the development of online postsecondary course materials. The scope of this study is to develop and validate such a survey instrument using a diverse but representative population of postsecondary faculty who have developed and taught at least one online course.

The population used to validate the pilot instrument was postsecondary faculty members teaching in Kentucky institutions of higher education. All institutions were affiliated with the Kentucky Council on Postsecondary Education (CPE) and many courses were offered through a statewide consortium. All participants had developed at least one totally online or web-enhanced course by the spring 2005 term. Using members of a consortium to validate an instrument is an approach similar to Lee (2001, 2002) who focused her two-part study on faculty members teaching within the Western Cooperative for Educational Telecommunications (WCET), an affiliate of the Western Interstate Commission on Higher Education (WICHE). Like Lee's, applied Cronbach's alpha (coefficient alpha) to validate the instrument, and delivered the instrument via the Internet.

The University of Louisville Delphi Center for Teaching and Learning provided access to Zoomerang®, the University's designated web survey tool, for the study. Zoomerang® was selected because it allows a great deal of control over the survey design. Babbie (1998, 2003) recommend that surveys include an initial letter of invitation to participate, a reminder letter after a week or so, and a final reminder after three weeks or so to increase the response rate. Zoomerang® allows the reissue of a survey at specific intervals with updated letters (e-mails) of invitation to participate.

The Limitations of This Study

The major limitation of this study was that it used faculty members from a single state as the population. Although single-state validation limits the generalizability of the instrument, there was some diversity on this faculty population. More than 50% of the online faculty worked as members of a consortium and thus had a common frame of reference and a common electronic learning course portal. The consortium provides 24/7 technical support for faculty and students, listserves and professional development conferences to share expertise, and online information via the course portal. The population also included faculty members teaching online courses available in other electronic learning platforms as supported by their own institutions. Those courses were not uniformly available to students through the consortium, but many of the faculty support resources such as the newsletter and annual professional development conference were available to all online faculty statewide.

Conclusions Chapter I

Because research on online postsecondary instruction is fairly recent, there is currently no valid instrument that measures which variables contribute most to the

facilitation of online postsecondary course development. However, the work of several previous researchers provided useful models for instrument development. The work of Lee (2001, 2002), in particular, showed the value of combining quantitative and qualitative techniques when dealing with attitudes and perceptions. The work of Easton (2003) also showed the value of allowing faculty respondents to express their perceptions using both quantitative and qualitative techniques.

Faculty work time is a valuable but limited resource. As distance education, specifically online instruction, grows in popularity, demands on faculty work time will also increase. It is critical for faculty, administrators, and institutions to consider the impact of distance education on the faculty work load so they can address it in an equitable and constructive way. Although there is general agreement that developing online teaching materials is far more time consuming than developing face-to-face teaching materials, there is very little research about the impact of this problem or how to deal with it in an effective way. This study builds on previous research by developing and validating an instrument that measures faculty perceptions about which variables contribute most to the facilitation of online postsecondary course development.

CHAPTER II

LITERATURE REVIEW

The issue of faculty time committed to the design and development of online courses is worthy of investigation because of the growing demand for online postsecondary instruction, the three-to-one ratio of faculty time necessary to develop online materials as compared to traditional classroom materials, and the fact that faculty time already is already committed to work weeks averaging more than 45 hours. These three factors contribute to a tension that Betts (1998) identified as a barrier to faculty wanting to participate in online postsecondary instruction.

If faculty and administrators had a more information about the variables that facilitate the development on online postsecondary instruction, they would be able to make more accurate estimates of the time needed to develop course materials. Administrators would be able to make more informed decisions about what support and which incentives to provide within their institutions. At this point, however, there is no valid instrument designed to measure the role of specific variables that facilitate online course development. Therefore, the purpose of this study is to develop and validate an instrument that will identify faculty perceptions of which variables have an impact on facilitation and the rank order of those variables. The scope of this study is to develop and validate the measurement instrument.

The first step in developing the survey instrument was a review of literature to research the variables that have already been studied in the context of online instruction. There are two objectives of this review of the literature: (a) to identify those variables and organize them in logical categories; and (b) to identify the research methods used most often in investigating those variables. The variables are shown in Table 1 and the methodologies are shown in Table 2, both located in Appendix A.

To provide context for this review of literature, this chapter begins with reviews of six major studies published between 1999 and 2003 that specifically addressed the issues of faculty workload and time management in the context of online course development and delivery. The remainder of the chapter addresses the literature in the following sequence: (a) the efficacy of distance and online education; (b) attitudes of administrators and faculty towards distance education; (b) support issues for distance education faculty; (c) faculty roles, competencies and professional development; (d) faculty collaboration in online course development and delivery; and (e) instructional design and instructional strategies. Each section is introduced with an overview of the research questions and variables of the studies reviewed in that section. The reviews within each section are presented in chronological order in an attempt to present the actual sequence in which the issues, practices, variables and findings emerged.

Faculty Workload and Time Management Related to Online

Course Development and Delivery

The issue of faculty workload and time management related to online instruction is a very new area of research. Although the issue of compensation for the extra time needed to develop and teach online has been investigated in terms of faculty satisfaction

and faculty support, researchers are just now beginning to explore the problem of how to facilitate the development and delivery of web-based instruction. The six studies and reports in this section describe several attempts to differentiate between time spent in development and time spent in delivery of web-based instruction, and to identify methodologies that can be used in professional work time studies. Although the sample sizes are small, the findings provide a basis for future work.

Incentives and Workload

Butner, Smith and Murray (1999) sought to update the data from a 1996 study by Brown and Wright that focused on higher education faculty utilization and incentives used to encourage the use of technology in the delivery of instruction. The purpose of their study was to update the earlier HEP (higher education program) information and expand it to include the types of delivery methods used, workloads for those who taught higher education distance courses, sources of funding for distance courses and the level of faculty who taught those courses. The study used a survey research design. An 18 item instrument was developed to gather data on the basic demographics of the institution, participation in and funding of distance education, and methods of delivery for distance courses. In May, 1998, 148 surveys were mailed to the program directors or coordinators of the Higher Education Programs (HEPs) in the US. The source of this list was the Association for the Study of Higher Education (ASHE) Council for the Advancement of Standards (CAHEP.) The instruments were coded to insure anonymity. A second mailing was sent in June to all non-respondents. Of the 148 surveys sent, 86 were returned for a response rate of 58%.

Institutions were first sorted by their Carnegie classification. HEPs that were Research I institutions had the highest percentage of respondents (34.9%). This 1998 survey showed that interactive TV was the most used delivery mechanism and that Research I institutions were the most frequent users. (This finding would be considerably different today as the Internet replaces interactive television as the most used delivery system.) Across all institutions, the majority of faculty teaching via distance education were full time tenure track academicians.

The 1998 study confirmed the 1996 findings that the overwhelming majority of all faculty who taught via distance did so as a part of their regular work load and were given no additional compensation or clerical support. For these individuals the choice of teaching via distance was a personal choice based on meeting student needs or an interest in the new technologies. The conclusions of this study echoed the conclusions of the 1996 study that while there is complete agreement that the distance education is a reasonable and cost efficient way of offering higher education instructional programming to more students, it does pose an increased demand on faculty time. A major cause for concern identified by these researchers was that there was no unified effort to develop more cost effective ways of developing and delivering distance education.

Hislop and Atwood (2000) investigated the issue of online teaching as a regular part of faculty workload. Their study focused specifically on faculty in the Master of Science in Information Systems (M.S.I.S.) program at Drexel University. Although their potential sample included only 26 faculty members, they considered this an important case to research because of the high level of internal interest in the outcomes. Their reasoning was: (a) the M.S.I.S. could be taken as a totally online degree program; (b) the

program was an innovation of the college rather than the university; (c) faculty who taught online also had experience teaching the courses face-to-face; and (d) almost 35% of all students in this program are totally online students and new online programs are being considered. Although faculty in this program did receive additional compensation for teaching online, they did not receive any release time or reduction in their workload.

Hislop and Atwood used a survey instrument of their own design focused specifically on faculty reactions to the M.S.I.S. Online program thus far. Faculty were asked to express agreement or disagreement on a 1 through 7 Likert type scale, or to assign a percentage of time. They were also asked to add their own comments as open ended responses. Nineteen out of 26 faculty members responded to the survey. Although no information is given about the survey delivery method or follow-up strategies, it is likely, considering the question and response samples in the article, that the survey was administered online. The article includes the full text of each question and the frequency of response that corresponded to each point on the scale. Only descriptive statistics were used to analyze and display the data. To encourage participation, especially from non-tenured faculty, responses were anonymous.

Qualitative results were displayed immediately after quantitative results so comments typical of the mean of responses were available to further define the responses. For example, in response to the question “Online education can produce learning outcomes as good as or better than traditional face-to-face education,” 10 respondents agreed at level 1 or 2 while only 1 respondent disagreed at level 6 or 7. In general, comments were thoughtful and related specifically to the question. A typical comment for the question above was, “In my experience, I think the outcomes were as good, but this is

a function of the communication skills of the instructor and the motivation of the students.”

The two crucial issues for this study each had two areas for response designed to further differentiate faculty opinions. The *sense of obligation* to teach online offered two options on a scale of 1 through 7; “All full-time faculty members should be expected to teach online as needed as part of their regular teaching load,” and “Given the Colleges’ commitment to online education, I feel obliged to teach online.” The sense of time commitment asked two questions with response options of between 10% and 100%, “Given the College commitment to an online education, I am agreeable to teaching ____ % of my classes online,” and “Based strictly on personal consideration, I would choose to teach ____ % of my class sections online.” Ninety-five percent of faculty members said they felt obliged to teach online. The mean response for how many sections would be taught online because of college considerations was 66%, while the percentage of courses that would be taught online because of personal considerations was 50%.

Accepting the fact that teaching online is far more time consuming than face-to-face instruction as a *given*, the question of efficiency was addressed by asking faculty respondents their reaction to sharing course materials with other faculty so they did not have to redevelop each course for themselves. Hislop and Atwood describe the faculty reaction as “cautiously optimistic.” Because faculty in this program often work in teams, they were used to sharing materials; however several respondents warned about the potential problem of turning faculty into messengers of prefabricated materials and disregarding their ability to share real education and wisdom.

Measuring Distance Faculty Time

University of Western Michigan professor James A. Visser conducted the first published person-hour study involving faculty hours and web-based instruction in 1999. Visser (2000) argued that although the common wisdom was that developing and teaching distance courses was more labor intensive than traditional teaching, there was virtually no empirical evidence to support this claim. Visser cited Dillon and Walsh's 1992 benchmark literature review that found only 25 out of 225 published research studies that addressed faculty issues. Visser also cited the work of Clark (1993) and Landstrom (1995) who found that the majority of research was widely focused on faculty attitudes toward distance education pedagogy and tended to condense the workload issue to a single variable. As discussed in Chapter I, Visser was among the first researchers to identify time and energy issues related to distance education design and delivery as worthy of research because of their importance to faculty, administrators, and policy makers.

Visser used his assignment to develop and teach a graduate level course in public administration online as the setting for this study. His research design was self-study because he was the developer and the instructor in question; was experimental because he was comparing web-based development time to traditional development time; and was both quantitative and qualitative in data analysis methodologies. The course included in the study was in the instructor's area of expertise, the instructor had not taught any course via distance before this study, and the instructor had access to a grant-supported graduate assistant. The course delivery methodology was essentially web delivery although some sessions were supported by interactive television.

The design methodology was time-and-task data collection using a journal for the web-based course development. This data was then compared to cumulative mean time-and-task data from the instructor's estimations and records related to developing three other traditional courses in the same general content area. Visser used this mean score to avoid three data collection problems including: (a) development time can vary even when the same instructor is working in the same content area; (b) delivery time data presented for traditional courses were adjusted to accommodate variations in class size; and (c) all data were drawn from two sources including the instructor's planning calendar and the instructor's experience with the amount of time customarily expended to accomplish the major course development and delivery tasks. The researcher acknowledged that while data error and researcher bias were validity considerations, the use of a planning calendar, the averaging of the three scores, and the class-size adjustment for estimating delivery time, helped present a reasonably accurate comparison of traditional course development data to the daily journal and time logs used for web-based course development data.

Visser presented his findings in three major categories; (a) course content development; (b) course adaptation for distance education; and (c) course delivery. Course content development included seven factors common to both distance and traditional courses: (a) select text/ readings, (b) prepare syllabus/ course calendar, (c) write course lectures/ presentations, (d) prepare readings study questions, (e) prepare tests/ exams, (f) prepare term paper assignments, and (g) prepare study materials. The total hours relating to the course content development area were 234.25 for *web-based* and 127 for *traditional*. The largest percentage differences in time were related to write

course lecture/presentations (127.25 to 70) and prepare tests/ exams (20 to 6). Course adaptation for distance education was not a comparative figure because these technology-related tasks did not apply to the traditional course, but they were included in the final reported ratio. Total adaptation hours were 96.25. Surprisingly, course delivery hours were slightly less for the *web-based* when compared to *traditional*, 84.75 to 96. The total hours expended, not including approximately 220 hours expended by the graduate assistant, were 415.25 *web-based* to 223 *traditional*, or 1.86 times as long. When the graduate assistant hours were added to account for total person-hours, it became 2.84 times as long.

Visser (2000) concluded that his first common wisdom issue, that web-based instruction took longer than traditional instruction, was clearly shown to be accurate. Mitigating factors to consider, however, included the instructor's lack of experience with distance education and the blended delivery mode including web-based and interactive television. The unexpected finding was that the web-based course required slightly less delivery time than the traditional course. Visser stated that while this single study is not generalizable to other distance situations, it does suggest possibilities for future research. These were stated as a general hypothesis and two corollaries: H_0 , Development and delivery of new courses using distance education modalities commands more of a faculty member's time than traditionally taught courses; H_1 , Course content development in new distance education courses takes more time and effort, even with technical staff assistance, than required for traditionally taught courses; and H_2 , Delivery of distance education courses will take either about the same time amount of time, or significantly

more time, than traditional courses, depending on the availability of institutional support and especially technical staff assistance.

The fall of 2003 saw three studies that focused specifically on faculty time and distance education. The studies by Kapp, Pachnowski and Jurczyk, and Lazarus were published almost simultaneously in different journals, so the authors did not have the benefit of building on each other's work. However, both the Pachnowski and Jurczyk study and the Lazarus study included references to the two 2000 studies done by Schifter.

While Visser used a self-study approach to examining the issue of faculty time and Online course development, Kapp (2003) used a combination of literature review and experience within his own academic support unit, the Institute of Interactive Technologies (IIT) at Bloomsburg, University, to describe four models that could be used to estimate development time for online courseware. In his dual roles as associate professor of instructional technology and assistant director of the Institute, Kapp was in a unique position to explore the problem from both a management and a faculty point of view. Kapp's study was not research per se but rather a descriptive analysis of how four major time estimation models were operationalized. The models included: (a) the similar projects model; (b) Russell's parametric modeling; (c) the bottom-up calculation; and (d) the industry standard model.

Kapp stated that the simplest model for estimating the time needed to develop an online course was the similar projects model. This model uses the process known in management language as *analogous estimating*. The underlying principle is that the more similar one project is to another, the more likely it is that they will take the same time to complete. The problem Kapp identified in using this model was that in e-learning,

although projects may appear to be similar to each other on a superficial level, they may actually be very dissimilar when one enters into the development process. When the developer and the content expert (or faculty member) were not one in the same person, it could be difficult to estimate the time needed to build rapport and build a good working relationship. This point echoes Brigham's (1992) conclusion that the working relationship between the faculty member and the developer is a critical factor in efficiency and success.

Russell's parametric model considered three variables; expertise, project-related work, and environmental factors. Each variable was assigned a weight and the numbers are multiplied to develop an estimation of time needed to complete the task. In relating this to the development of online courseware, Russell considered two components of the expertise variable; instructional design and content knowledge. Weights were assigned to these factors and then multiplied by the original time estimate. Kapp operationalized Russell's model by creating an example. If a rough time estimate for an activity was 27 hours, and the instructional design expertise was 1.2 (rated on a scale from .5 to 1.5), the product of that multiplication would be 32.4 hours. Kapp then multiplied the *content expertise* variable of 3 (rated on a scale of .75 to 4) by the 32.4 hours for a total time based on expertise factors of 97.2 hours. Russell believed that the more people needed to produce a product, the greater the level of complexity. Therefore the next step in his equation was called *project-related factors* and included the size of the team. The scale used for this project-related factor was 0.1 for few people to 0.2 for many people with a two-person team reflected as .16. In Kapp's example, he multiplied the 97.2 hours by .16 then added an estimated additional 15.5 project related hours for a total of 112.7. The

third variable in Russell's model was called *environmental factors* and included typical interruptions in the work flow such as meetings, phone calls, and employee absenteeism. His *environmental factor* scale ranged from .25 to .35. In Kapp's example, he estimated an environmental factor of .3, and then multiplied .3 by 112.7. He then added 33.8 additional environmental factor hours for a total of 146.5 total project hours.

Kapp argued that Russell's model gave a false sense of precision, especially when used for the first time. Organizations with more experience using the model were in a better position to see how to accurately rate factors on these various scales. Kapp also argued that the *level of interactivity* should be included in the model. In e-learning, the greater the interactivity between the learner and the screen, the greater the development time needed to create those interactive learning situations. Kapp also warned that, as in the similar projects model, it is very difficult to conceptualize all of the variables that will come into play as the instructional design is developed.

The bottom-up calculation, sometime called the work breakdown structure (WBS) model, is another time-honored project management strategy. In this model, the entire is broken down or decomposed into individual tasks and times estimated on a task by task basis. Kapp reminded us that the smaller and more tangible a task is, for example creating a page template in HTML, the more accurate the time estimation will be. He stated that the bottom-up calculation was probably the most accurate model although the model itself was time consuming to develop. Overall accuracy was dependent on the accuracy of the detailed task analysis, the recognition that some tasks can be done in parallel, and the realities of the project calendar. Kapp's recommendation for using this model was to keep

the scale small, for example develop a time estimate for one lesson, then to multiply that estimate times the total number of lessons.

The final model that Kapp analyzed was the industry standard model. In this process, the manager takes the low and high estimates for industry standards of time for individual tasks as measured in several closely related projects and estimates where the current project might fall given the levels of technical expertise, design expertise, content knowledge, and the technical complexity of the courseware. Kapp concluded that each model had strengths and weaknesses and the selection and utilization of a model was a highly individualized choice. What the models had in common, however, was that the more often a model was used by an individual or organization, the more adept they became at applying it to their own situation.

One of the most valuable outcomes from Kapp's analysis was the recognition that different variables in the time management equation for distance education carry different weights. The differentiation of technical, environmental, and human variables can assist distance educators and distance education researchers develop separate constructs for time management rather than trying to analyze a complex situation as an unwieldy whole.

Pachnowski and Jurczyk's (2003) longitudinal study collected data over the span of three semesters on one large mid-western metropolitan campus in order to measure faculty perception of the impact of distance education on their time and workload. The need for the study was based on faculty comments that the increased time needed for the development and delivery of distance education courses must be acknowledged and dealt with if the university was to maintain a healthy growth in their distance education efforts.

The Coordinator for Distance Education created a survey that was distributed to all distance education faculty at the end of three consecutive semesters to provide data to assist in administrative decision making. The university where this study was conducted supported three distance learning systems: (a) web-based; (b) a newer interactive television system; and (c) an older, more simplified interactive video system. The survey instrument included three scales: (a) the perception of faculty member toward instructional technology and the support personnel, (b) the perception of the faculty member of the effect of the distance learning environment on his or her preparation time and preparation techniques, and (c) the perception of the faculty member toward the effect that the distance learning environment had on the teaching/learning process. The Distance Education Coordinator enlisted the help of the institutional assessment leader and a former distance instructor to assess the instrument for content validity.

The final instrument contained six items related to faculty attitudes toward instructional technology and technical support personnel; nine items related to faculty perception of the effect of the distance learning environment on their preparation time and preparation techniques; and six items relating to the perception of faculty on the effect of distance education on the teaching/learning environment. Only the results of the second section relating to faculty time are presented in this article. The survey was sent by mail at the end of each of the three semesters, and a graduate student was assigned to follow-up unreturned surveys. The response rates were 65.6% for the first semester ($N = 21$); 65% for the second semester ($N = 17$); and 24% for the third semester ($N = 13$). The researchers concluded that the same faculty were responding to the survey each semester with similar results, so no surveys were sent after the third semester.

Pachnowski and Jurczyk first reported faculty time by semester without differentiating by delivery mode. In the first semester, 50% of the faculty reported working more than 30 additional hours to prepare distance education materials. In the second semester the distribution was far more even, with 39% reporting that they worked an additional 10 to 20 hours to prepare. By the third semester, 69% reported that they needed only 5 hours of additional preparation time. When the findings were reported by delivery mode, however, it became clear that the web-based delivery was far more time consuming than interactive video. For example, after the first semester 30% of video faculty reported using more than 30 additional hours while 100% of web-based faculty reported using more than 30 additional hours.

When asked if they were to teach the same course using the same delivery mode next semester, how much additional preparation time would they need, the percentage of faculty who believed they would need only five additional hours increased from 38% after the first semester, to 44% after the second semester, to 65% after the third semester. Clearly the up-front development time regardless of delivery mode paid off in subsequent semesters if. A practical application of this finding would be to amortize the value of faculty time spent in development over the course of several semesters. With this said, however, the researchers remind us that even after several semesters, faculty need some additional development time to keep courseware current. For example, after the third semester, although 67% reported taking only five additional hours, there were still 33% who reported taking between 10 and 20 hours.

One of the more interesting findings in the Pachnowski and Jurczyk study related to the number of self-selected hours faculty dedicated to technology training. Although

their research found the anticipated steady decrease over time as faculty became more knowledgeable with technology, there were still 33% of faculty who reported taking more than 10 hours of training. Considering the small sample size, it is possible that this enthusiastic 33% may have been the same individuals who spent more than 10 to 20 additional hours in courseware development, but unfortunately these findings were not correlated by subject. Faculty reported a steady decrease in encouragement to teach via distance by both administrators and chairs over time, probably a result of the distance teaching becoming integrated into the overall process. There was also a small increase over the three semesters in faculty who reported no additional financial support for teaching via distance. Pachnowski and Jurczyk recommended that even though the time burden of distance education seems to decrease over time, faculty should still be offered administrative encouragement, additional stipends and support, and access to instructional technology training. It is not realistic to expect that faculty support for distance education will simply continue on its own momentum. New faculty entering the system will look at the existing model and see only the lack of support. The model for managing distance education should be dynamic and able to accommodate growth and new participants.

Lazarus (2003) also acknowledged that there were few longitudinal studies that addressed the issue of faculty time commitment for distance education. Her study took place between the winter 1999 and winter 2000 terms at the University of Michigan-Dearborn, and focused on three online courses. Each course included 25 students, and each was offered by the college of education. Like Visser (2000), she used herself as her subject, and like Visser used several techniques to avoid reporter bias. She established

parameters to define each type of behavior so there would be no variations in how time was recorded, and she set aside scheduled time to manage the tasks so multi-tasking would not produce error in measurement. Lazarus' study focused exclusively on the teaching of rather than the development of the web-based courses. She used an exacting self-reporting time measurement system to record faculty time dedicated to the following activities: (a) reading and responding to e-mails; (b) reading, participating in and grading 10 online discussions; and (c) grading 15 assignments. Her three research questions were: (a) how much time does it take the instructor to send, read, and responds to e-mails, participate in and grade the discussions, and grade the assignments each week; (b) how many e-mails, discussion messages, and assignments are receive each week, and (c) what is the level and type of student participation in the course across the semester?

Lazarus research design began with a 1998 pilot study that helped her refine her data collection methods. She decided on frequency counts related to specific activities and reported weekly as the most accurate process. She used word counts on individual messages, culled out duplicate messages, and culled out "frame" words from the count in order to refine the data collection process. Duration recording was used to measure the amount of time that the instructor spent during one hour each morning and each evening for six days a week for the entire semester. The instructor used a stopwatch to measure time and stopped the watch when any unavoidable interruption occurred.

Lazarus used line graphs to depict trends, frequencies, and the count of time related to each activity and reported these findings for each of the three courses in the study. For the winter 1999 course on Teaching the Exceptional Child, she found he weekly time commitment to vary between 231 and 337 minutes per week. For the fall 1999 section of

the same course, her time commitment varied between 229 and 384 minutes per week. For the winter 2000 course, Assessment of the Learner, her time commitment varied between 206 and 414 minutes per week. The pattern of student activity remained consistent among the three courses with a gradual increase in discussion during the first half of the course that decreased as students became more involved with their assignments. E-mail communication remained fairly constant as did assignments.

Because she had taught these courses in the traditional face-to-face environment for several years before teaching them online, Lazarus believed she was in a reasonable position to compare the time commitment across the board. She concluded that the time commitment to teaching these courses online was actually comparable to the time commitment of teaching them live. This conclusion is identical to that of Visser who recognized that there is a real time difference between traditional and web-based instruction but that difference is found in the development and not the delivery of the instructional material. Lazarus called for additional research in the area of faculty time commitment and distance education that explored the numerous and complex variables involved such as differences in disciplines, differences in students, the effect of course design, and factors involved in course preparation.

These six studies, although each somewhat limited in scope, provide an interesting set of conclusions: (a) that web-based instruction is becoming a routine and/or expected faculty obligation, (b) that there are several tools from business and industry that can be adapted to estimate the time needed to develop web-based instructional materials (although each has specific limitation); and (c) that the differences in faculty time commitment for web-based instruction centers on development time rather than the

delivery time. Although the concept of efficiency is not typically used to evaluate faculty performance, efficiency is an issue that must be addressed by both faculty and administrators as demands on their time increase in the increasingly competitive area of post-secondary distance education.

The Efficacy of Distance and Online Education

Given that the development of distance and online instruction does make greater demands on faculty time, it is fair to ask if this medium of instruction is effective at the postsecondary level. After more than a decade of application, this is still a very relevant question. Even though the demand for online courses is growing and they are profitable for institutions of higher education, the issue remains, is web-based instruction pedagogically sound?

Clark and Mayer (2003) responded to this by challenging a group of instructional designers and faculty members developing the online courseware. Their findings were that “Part of the answer depends on the quality of the instruction delivered in the e-learning products you are designing, building, and delivering today.” (p. 13.) They make it clear throughout their writing that is it not the delivery mechanism that makes teaching and learning effective or ineffective, it is the instructional material itself.

As early as 1992, Black recognized the division of university faculty in their acceptance of the credibility of distance education courses. Her study combined interpretive, qualitative, and quantitative methods in a two-phase approach to examining this issue. Phase one included two steps. The first was a mail survey that addressed four questions including to what extent are faculty familiar with distance education, how does faculty familiarly with distance education differ according to selected professional

characteristics, to what extent do faculty support distance education, and how does faculty support for distance education differ according to faculty familiarity with distance education and according to selected professional characteristics. The survey was pre-tested for the study and included Likert-type responses. The response rate for the survey was 73% ($N = 487$), including 200 female and 287 male faculty members. The second step of phase one was to subdivide the survey sample into gender and then into specific academic subgroups (based on Becher, 1989) including hard, pure (natural sciences); hard, applied (professional sciences e.g. engineering), soft, pure (arts and humanities) and soft, applied (professional groups, e.g. education and law). The hard/soft dimension refers to the degree to which a clearly delineated research paradigm exists and the pure/applied dimension refers to the extent or concern with the practical application of subject matter. Phase two of the study used the survey findings to select faculty ($n = 50$) for semi-structured face-to-face interviews to askers the following research questions: “How do faculty who are supportive of distance education understand the compatibility and feasibility of distance education?” and “What are the differences in faculty understandings of the compatibility and feasibility of distance education amongst those faculty who are supportive of, apposed to, or divided in their support for distance education?”

Black (1992) conducted her study at one major Canadian university, the University of British Columbia. The advantages of this setting were that faculty perceptions were critical to the success of distance education because all academic decisions were made by the faculty, and all faculty in the study were working in the same reference. The limitation of the study was that it was limited to a single setting. Black found that few

faculty members actually had familiarity with distance education and only 20% had actually been involved; 18% had prepared distance educational materials; and 15% had been involved by assisting, advising, or tutoring. Six percent of faculty had actually been distance education students themselves. These levels of participation were consistent with other studies around 1992. Faculty were cautiously optimistic about distance education with 78% reporting that they would probably be in favor of supporting individual distance education courses at the undergraduate level, but the support dropped to 40% for a complete undergraduate program, and to 16% for graduate programs. When this information was seen in the context of individual interview data, Black interpreted this as faculty seeing potential in distance education but not having confidence in its ability to support instruction at higher academic levels. Faculty in hard and pure disciplines were less supportive than those in soft and applied disciplines. There were significant differences in gender with more women supporting distance education (even at the graduate level) than men. In summary, 19% of faculty was supportive, 31% were divided or mixed, and 23% were opposed. In the interviews, Black found that the faculty support for distance education was largely determined by the perceived compatibility of distance education with their beliefs and values about university education in general. Feasibility was of little concern and faculty assumed that the technology would develop to support different delivery modes and course designs. Faculty that supported distance education in general saw accessibility as the major asset. Faculty who opposed distance education believed that quality would suffer as the result of this growth. Women were much more supportive of “flexible teaching methods” than men (43% vs. 7%); and were more aware of their students’ special needs. The majority of faculty stated that the university system

avored research over teaching, and therefore the extra effort involved in distance education might not be a wise use of their time. Although this study was conducted more than 10 years ago when distance education technology was far more cumbersome than it is today, the author was able to identify several themes that continue to immerge in current research including; (a) support and lack of support for distance education is closely linked to faculty beliefs about teaching; (b) faculty perceive that distance education is a greater time commitment than face-to-face instruction; and (c) there is more faculty reluctance to support distance education in the hard, pure academic disciplines.

Golladay, Copeland, and Wu (1998) sought to present the current state of distance education by mail surveying the directors of online academic programs at the 153 degree-granting institutions listed in the 1997 *Peterson's Guides, Inc.* published in cooperation with the National University Continuing Education Association (NUCEA). They received only 58 usable questionnaires for a response rate of 37.9%. They admitted the limitation of this sample size but argued that although the return was less than 50%, it was representative by geographical distribution across the US. They presented a table showing the locations of respondents by geographic area to support this argument.

Golladay et al. identified their methodology as behavioral research and used a questionnaire of their own design based on one used in a previous study by two of the authors. The questionnaire included specific response questions and also allowed open-ended responses. The responses were based on the current state of distance education for the 1994-1995 academic years. The questionnaire addressed four areas of interest: (a) distance education applications, (b) distance education faculty, (c) administration of

distance education, and (d) distance education students. Data were presented in tables that listed responses in rank order from highest to lowest. Respondents' comments were described the text of the article.

Golladay, et al. (1998) found that 36 of the 58 programs (62%) offered between one and 50 distance education sections; 14 of the programs (24%) offered between 51 and 100 sections; and 14 (24%) offered more than 100 sections. All programs indicated that they would offer either the same number of sections or more for the coming (1995-1996) academic year. The academic disciplines were presented in order of frequency with science and engineering (45%), economics and business (36%), and education (33%) at the high end; and law at the low end with only 4%. They found the technologies of choice were videoconferencing (68%), videotape (36%) and Internet (26%), but the Internet was the emerging technology of choice. Fifty of the 58 programs (86%) reported that they used regular faculty members to teach their distance courses, and 79% reported that their distance faculty had received special training in pedagogical techniques. Seventy-one percent of institutions reported that the evaluation of distance education courses was the same as that for campus based courses. In regard to student assessment, 54 of the 58 programs (95%) reported that the standard testing procedure was for students to take tests in monitored (proctored) groups. This finding is consistent with the fact that videoconferencing was the primary medium of delivery. The authors concluded that distance education faculty generally received a stipend for distance teaching, that distance students seemed to come from the same population as campus based students, and that administrators were optimistic about the growth of distance education for their institution. Although this study had a limited sample size, it does provide a useful snapshot of

postsecondary distance education in the mid 1990s. The most relevant findings were that the Internet was the emerging technology of choice for delivery, and that as early as 1994-1995, some faculty were receiving additional compensation for the increased workload involved in distance education.

Shale and Gomes (1998) looked at performance indicators for university distance education providers in a comparative qualitative case study to investigate the claim of university administrators that the performance indicators for campus based instruction are *not* necessarily appropriate in the distance education model. The authors identified the research problem that education performance indicators are often set by governmental entities that do not understand the differences in traditional and distance education models. They acknowledged three views of educational/ instructional performance indicators: (a) the business/ industrial model that performance indicators should be linked to specific processes to insure the process is done correctly; (b) the summative view of performance indicators that takes a more global view of value added and organizational context; and (c) the political view of performance indicators as measures of accountability and funding priority. This study is grounded in the third view, accountability, because political support and funding continue to be two of the most critical issues in public postsecondary education. This Canadian study looked at two provincially initiated performance measurement exercises at Athabasca University in Alberta and the Open University/ Open College of the Open Learning Agency in British Columbia. The case descriptions were grounded in document research that reviewed policy and procedures at the two institutions and in detailed descriptions of the types of indicators being applied to the two institutions' distance learning programs. The

researchers expressed the findings in behavioral terms. The authors found that in both case studies, performance indicators formerly used to evaluate traditional courses had simply been transferred to distance education courses regardless of fit. They proposed that although “benchmarking” (a system where numerical evaluation data was combined with other more contextual data) was a good next step; it was also being used without regard to the context of distance education.

Shale and Gomes (1998) identified seven administrative features that differentiated distance education from traditional offerings. They hypothesized that the difference between traditional and distance education performance indicators may be found in these administrative differences. They described the two parallel processes taking place at the two institutions in 1997 and created a table that showed 10 current performance indicators and how administrators perceived their appropriateness. For example, they identified a problem in the measurement of FTE’s (full time equivalents) because distant students may take extended full-year distance courses rather than traditional semester-long courses. Completion/retention presented a similar problem because although distant students often took longer to complete degrees, they were still on the road to completion. The authors identified 10 institutional performance indicators in need of modification for distance education including: (a) participation/access, (b) completion/retention, (c) transfer student performance, (d) financial indicators, (e) space utilization, (f) student satisfaction, (g) employment, (h) employer satisfaction, (i) research indicators, and (j) community service and economic impact.

Both institutions in the Shale and Gomes (1998) study recognized that the faculty workload was greater with distance courses than with traditional courses, and that the

current performance measure of linking faculty workload to FTE (full time equivalent students) gave a misleading picture of the faculty (man power) support need. They proposed a new system of acknowledging student contact hours (SCH) to better reflect the real time needed to support distance instruction. The authors concluded with the call for continuing modification of the performance indicators with an emphasis on specializing the indicators and applying a wider scope to accommodate newly arising situations and effects.

Wentling (2000) applied a business analytical model as he conducted a case study of the cost efficiency of online instruction within a department of the University of Illinois' Urbana-Champaign campus. The case was focused on the effort of the Human Resource Education (HRE) department to develop a new master's degree program in Global Human Resource Development. The findings were critical to the strategic planning of the department because the online master's program could increase the master's degree production of the department by 75% and the semester hour generation by 50%. The initial expectations for online learning in the department were increasing enrollments (or instructional units - the instructional productivity measure used by the University of Illinois) while still controlling costs. The startup costs were significant and were supported by \$100,000 from the vice president for academic affairs and \$47,000 from the department itself.

Wentling (2000) described the course design process used to divide courses into modules and then into learning cycles. Not only was this consistency in design beneficial for distant students, it also supported efficiency in development. The online course evaluation plan included six factor clusters similar to those described by Shale and

Gomes (1998): (a) program demand; (b) student satisfaction; (c) faculty; (d) student retention; (e) student learning, and (6) financial outcomes. Students went through the program in cohorts and took four terms to complete the course. The department planned to run three cohorts simultaneously when the program was established. The courses were evaluated for rigor using the same admissions standards for distant students as for on campus students. The study described several unique features at Urbana-Champaign: (a) the provost requested that all new online programs submit a business plan before approval; (b) the HRE department had the ability to set the cost of tuition for the programs based on supply and demand; and (c) the HRE department was able to retain much of the tuition generated by the program.

Wentling (2000) examined the cost drivers of the online program by identifying fixed costs and variable costs, and then created a pro forma income statement to project anticipated revenue. Of the variable costs, faculty salary was at the top of this list. In this case study, faculty were not paid for course development but were provided our course release time for course development. (At the time of this study, the university and campus administration had already acknowledged the distance education workload issue and were involved in a study of faculty compensation.) It became apparent that the student-as-customer model would drive the success of the program. For example, the loss of three students from a cohort created a loss in revenue of \$2,700 while the fixed costs remained the same. Faculty time invested in course development had already been supported as a sunk cost. In his discussion, the author stated that the value of the business model was greater than just monitoring costs because the findings showed the real value of student recruitment and retention to the program. He also stated that the findings could be seen in

terms other than financial because a successful master's program was a pipeline of potential doctoral program students. Because cohorts can become too large for effective teaching, Wentling is planning future studies on the ideal class size. He also plans to investigate the number of teaching assist hours and research assist hours necessary to support the program.

Carey (2001) compared face-to-face and online sections of the same course in an attempt to put to rest the well-investigated issue of the effectiveness of online instruction when compared to face-to-face instruction. He hoped to expand the literature in four new areas including: (a) student satisfaction; (b) student learning styles; (c) student retention; and (d) predicting student success in online courses. He proposed five hypothesis: (a) no significant differences between learning outcomes of students receiving online and face-to-face instruction; (b) no significant difference in student satisfaction between online and face-to-face learners; (c) an interaction effect between the course delivery mode and Kolb's Adaptive Learning Style (Kolb 1984); (d) the drop-out rates will be higher for online than for face-to-face students; and (e) and it is possible to predict student success in online courses. The prediction model based on the a model developed by Bostrom, Olfman and Sein (1988) was used to predict success in learning new software and included such factors as motivation to learn, learning style, prior knowledge of the course content, demographic characteristics, and intelligence.

Carey used a two-by-four factorial design. The treatment variables were course delivery mode and Kolb's Adaptive Learning Style. The assignment of subjects was not randomized since students were encouraged to enroll in the course where they were most lively to success, and the author acknowledged this limitation to the study. There were

103 students in the face-to-face groups and 60 online. He identified three dependent variables including: (a) performance measures or gain score (the difference between pretest and posttest measures); (b) final course grade (expressed as a percentage); and (c) student self-reported satisfaction. He tested the first hypothesis by running a *t*-test for independent samples and found no statistically significant difference in learning outcomes between the two groups. He tested the second hypothesis relating to student satisfaction by running a *t*-test for independent samples on the scores of the Likert-type questionnaire of student satisfaction and again found no statistically significant difference. To test for the interaction between course delivery mode and Kolb's Learning Styles, he ran an ANOVA on each of the performance variables to determine if mode or learning style had any effect on the performance variable; $\text{Performance} = f(\text{mode} + \text{learning style})$. Mode of delivery had a statistically significant effect on the satisfaction variable ($p = .023$). Students who took the course face-to-face being were satisfied. In regard to learning styles, Active Experimentation style had a slightly significant effect on the grade variable ($p = .053$) and students with an Active Experimentation style did better in *both* modes of delivery. Since the impact of learning styles was seen in both modes of delivery, hypothesis 3 was rejected.

To test the fourth hypothesis relating to the comparative dropout rates of face-to-face to online students, Carey used a *t*-test to check for statistically significant differences. He found the online dropout rates were significantly higher. Because there were several possible causes, the author suggested several ways this could be researched. Hypothesis five dealing with a prediction model of student success for online courses had

interesting but inconclusive results, so again the author suggests specific areas for future research. He believed that:

The deep understanding of the complex relationship between course content and course delivery mode could only be confirmed by conducting a meta-analysis using many varied courses. (p. 8)

Also, because student learning style had an impact on outcomes in both delivery modes, the research would need to be refined to look at the components of online learning that related to student learning.

One of the most useful outcomes of Carey's study was a discussion of the confounding variables that impact much of the current research in distance education. In postsecondary education, students may have such a high motivation to succeed (because of the time and money already invested) that they will succeed in online courses *regardless* of their learning style, the design of the course, the relationship between student and faculty, or other mitigating factors. They simply *make it work*. This approach is commendable, but is neither efficient nor effective. Future research findings could add greatly to the knowledge about how to improve online instruction. Carey made the point that the research in online instruction is so new that we have yet to develop a good theoretical framework. We are simply borrowing what we know about face-to-face postsecondary instruction and trying to make it apply.

Studies on the efficacy of distance and online education show that it is certainly effective and that students can succeed, but there is still a need for research on *why* they succeed. In general, if the materials are well developed, faculty have confidence in the students, and interactions are frequent, the instruction is successful *regardless* of the medium of instruction. One of the confounding variables is that researchers continue to

measure the success of online instruction in terms of traditional or face-to-face instruction, the area where we have the most data, rather than looking at it as a unique instructional environment. As the number of online students increases, the environment becomes less unique.

Faculty and Administrator Attitudes

Regarding Online Instruction

Administrators' attitudes regarding online instruction tend to focus on the larger, institutional picture and include such areas as accreditation, institutional reputation, institutional growth, and program profitability; whereas faculty attitudes tend to focus on specific issues of instruction such as communication with and assessment of students, and issues of professional growth such as tenure and promotion. There are often profound differences between the two groups in terms of the perception of goals, objectives, and support. As administrators focus on the issues of the increasing demand for online instruction and the potential profitability to the institution, they must also acknowledge that they cannot reach those goals without faculty support. But faculty who support distance education, or who hope to be supported in their online instructional efforts, must also help administrators make good decisions by providing real data. This section addresses the question; what are the similarities and differences in faculty and administrator attitudes regarding online instruction?

Identifying Administrators' Attitudes and Concerns

Shea, Motiwalla, and Lewis (2001) investigated postsecondary administrators' perceptions of online education in a 2000 study that involved 68 higher education institutions. During the 1997-98 academic year in the United States alone, there were

more than 1.4 million students enrolled in Internet based college courses. According to the National Center for Education Statistics, this represents an increase of over 100% since the 1994-95 academic year. Administrators are seeing Internet instruction as a low cost, flexible option for expanding their student bodies and even reaching across borders into the international community. Studies in distance education have shown that there is no significant difference in learner outcomes between face-to-face and distance education courses; and that these outcomes are maintained regardless of the distance delivery mode. In addition, Internet courses have by far the lowest technology support cost (excluding the very real factors of faculty and professional support costs). These authors believe that although this current research provides a good framework for distance education faculty and instructional designers, it does not provide support for higher education policy makers or administrators to use in planning.

Shea et al. (2001) believed research should address the questions:

- (1) To whom should distance education programs be directed?
- (2) What is the profile of the typical distance education student?
- (3) What resources are necessary to support programs?
- (4) How should these programs be evaluated for quality and accreditation purposes.

The purpose of their exploratory study was to determine the current status of problems and issues in distance education in higher education and to compare them to the claims made in the literature by distance education coordinators. The authors used a questionnaire of their own design based on constructs from the literature. The survey instrument was validated by review from distance education coordinators from the authors' three respective institutions. The surveys were sent by mail to a random list of

250 institutions generated from the 1999 *Peterson's Guide, Inc. Distance Education Programs*. Although the return rate was a low 28% ($N = 68$), the authors felt some confidence because 44.1% of responses were from institutions with large programs serving 500 or more students. As expected, a high percentage of students enrolled in these programs were seen as “nontraditional students who cannot make it to on-campus classes” (96%). Since respondents were allowed to check all categories that applied, the totals were greater than 100 %. Other frequent descriptors of students were: students from across the country (62%); and students enrolled in an online degree program at your institution (62%). The most popular delivery mode was asynchronous with interactive video (a synchronous mode) being used by only 24% of respondents. Student profiles showed the vast majority of students (83%) had at least one year or more of computer experience; 78.3% were currently employed; and only 14.1% were over the age of 45. A slight majority (55.6%) were female.

Shea et al. divided the issues relating to the administration of distance education into four categories: (a) administrative support; (b) outcomes and program assessment; (c) student requirements; and (d) faculty requirements. These issues were measured by responses to specific questions using 5-point or 7-point Likert-type scales with the low anchor being the most positive. In the category of administrative issues, the top four problems were adequate staff, program promotion, and faculty release time. Student outcomes (measured in grades by 90% of the institutions) were either the same as (66.1%) or generally better (24.2%) than face-to-face courses. Eighty-five percent of institutions also reported using student surveys at the end of the courses to evaluate programs. For both students and faculty, one of the major factors in their supporting

distance education was the control of time and place. The most frequent request from students was quicker feedback from professors, while the most frequent request from professors was more technical support (followed closely by more pay for teaching via distance).

Shea et al. concluded that as faculty and administrators look to the future, they may be anticipating that improved technology will resolve some of the support issues. As platforms such as WebCT ®, Courseinfo ® and Blackboard ® become more sophisticated and self-explanatory, perhaps less technical support will be needed. While these improvements may address some of the technical support issues, they do not address the issue of pedagogical improvement. The authors recognized the limitations of this exploratory survey because of the limited samples size and because this area of research is so new, there is little baseline information with which to compare findings. Their conclusions include several recommendations relating to faculty and student support including the issue of more pay and/or release time for faculty preparing and teaching distance education courses, the fact the students seems to want more interaction with faculty rather than more multi-media, and that evaluation and assessment of programs is not keeping up with the rapid growth or the evolution of distance education as a delivery mode that is essentially different from face-to-face instruction.

Kambutu (2002) also looked at administrators' attitudes toward distance education. In a 2002 survey of 134 land grant institutions, he found that 81% believed that distance education was critical to the future of their institution. He used a self-designed questionnaire sent to 134 land grant institutions, and his response rate of 75% provided an *N* of 67. No information was given relating to instrument design or validation. He

presented data in a frequency of response table that showed how available support services were clustered more around *support for students* than *support for faculty*. For example, although over 70% of institutions reported support for distant student registration, distant student advising, and instructor training with new technology, the response rate fell to 40-49% on clerical support, and to 30-39% on graduate assistant support for distance education faculty.

Kambutu (2002) drew three specific conclusions from his study: (a) that although a variety of delivery modes are available, administrators prefer the use of technology (computers) to deliver distant courses; (b) an overwhelming majority of administrators believe distance education is critical to their institutions; and (c) institutions of higher learning are increasingly providing support to distant students and faculty. However, although administrators realize the critical role of distance education to their institution, they are somewhat “at sea” as to how to support faculty members.

Identifying Faculty Motivators and Concerns

Wilson (1998) prioritized the concerns of instructors who were asked to support an ever-growing collection of courses and programs online. She presented three research questions:

- (1) What are the concerns of instructors who have already developed web-based courses?
- (2) Will instructors in different disciplines have different concerns?
- (3) Will instructors at different institutions have different concerns?

She developed a survey instrument grounded in the literature of distance education and pre-tested with assistance from several of her colleagues. The survey included structured

Likert-type responses and several open-ended responses. The survey was sent to 71 instructors who had courses listed on the Southern Regional Electronic Campus (SREC) for the spring 1998 term. She received 36 responses (50.7%), but since five were from instructors whose courses were not offered during that term, her final N was 31. Although the sample was small, it did represent a good cross section of faculty and course characteristics.

Wilson's (1998) questions centered on the attributes of the courses; support for instructors; incentives for teaching; classroom (i.e. student) management techniques; and online testing. She used SPSS to generate frequencies and central tendencies for each of the quantitative fields. Because she hypothesized instructors from different fields would have different concerns, she applied chi-square tests to see if there was a difference in instructors' concerns based on their discipline or type of institution (large university, regional university, community college, technical school, or correspondence school). The chi-square tests indicated that almost all differences were not statistically significant and that the faculty concerns about distance education were fairly universal. The concerns displayed in order of frequency showed that sufficient time to develop and maintain course material was the top concern with a mean of 4.133 (with 5 being maximum) and with 68% of respondents choosing 4 or 5 at their ranking. The next issues in order of frequency were technical support (3.710), administrative support (3.613) and sufficient time to interact with students (3.355).

Institutions did seem to recognize that distance education was a time consuming task and offered assistance and incentives for faculty. Thirty five percent reported that they had received a graduate assistant, course-load reduction, or lump-sum incentive pay.

Six faculty members reported that their incentive was based on student count or lesson graded. Technical support and training were among the top five concerns, and 67% of instructors reported that there was technical assistance available on their campus. Only two instructors, however, reported that their support was “excellent” or that there was technical support for “any need.” Comments regarding training were not positive and many faculty believed that they had trained themselves. The author posed the question that since there is such wide spread acknowledgement that technical support and training are problems, why is more training and support made available to faculty?

Administrative support was also among the top five issues of concern, and “capping student enrollment” was a frequent comment. Statements that “administrators were only interested in increasing profit from online instruction but did not realize the impact on faculty” were fairly common. Faculty also were concerned that developing and teaching online courses did not count toward either tenure or other measures of faculty productivity. The issue of the lack of sufficient time to interact with students was also a concern identified by this researcher. There is a realization that time spent developing online courses takes away from time available to support students. This issue, combined with the lack of technical support and the lack of administrators’ recognition of work loads, are real causes for concern. The author maintains that the faculty in her survey should be considered “early adopters” and it is possible that their concerns may be different from the next generation of adopters. She also suggests that in future research, there be a control group of face-to-face faculty in order to provide comparison of concerns among online and face-to-face instructors.

Betts (1998) pursued a set of questions similar to those of Wilson as she investigated why faculty agreed to participate in distance education. In 1998, the George Washington University conducted an institutional study to identify factors that influence faculty members to participate in distance education. Specifically, the purpose of the study was to identify: (a) factors that have motivated faculty to participate in distance education; (b) factors that would motivate faculty who have never participated in distance education to participate; (c) factors that would inhibit continued participation by those now participating; (d) factors that would inhibit participation by those not now participating; (e) factors that would motivate continued or increased participation by those who have participated; and (f) any significant differences between what faculty identify as motivating or inhibiting factors and what deans perceive as motivating or inhibiting factors.

The research population for this study was faculty members and deans contracted in 1998. The selected sample of 1,001 individuals included 993 full-time regular and/or visiting faculty members and eight deans of academic schools. A total of 532 faculty and seven deans responded for a return rate of 53.8%. Three self-designed surveys were used in this study to examine four relationships: (a) faculty participation and demographics; (b) faculty participation and intrinsic motivation; (c) faculty participation and extrinsic motivation; and (d) faculty participation and inhibiting factors. Betts pilot tested the survey instrument at George Mason University prior to use, and used SPSS to analyze data. Pearson chi-square (crosstabs), ANOVAs including a Scheffe' post hoc analysis, and dependent paired *t*-tests identified significant relationships. The independent variable was faculty participation in distance education and the dependent variables were intrinsic

motivators, extrinsic motivators, and inhibiting factors as measured on an interval scale. All tests used a .05 level of significance.

Betts (1998) found that the majority of distance education participants taught a combination of distance education and traditional classes. In addition, they usually designed and taught their distance education classes rather than co-taught. Computer based technology was the primary delivery mode with videotape and two-way video and the second and third most frequent. Of the 86 distance education participants, 44% reported that they no longer participated in distance education. The five most prevalent reasons for no longer participating were: (a) career and job changes; (b) course contracts ended (either at GWU or outside of GWU); (c) too much time was required; (d) the program was closed; and (e) lack of opportunity. In summary, 65% of faculty said they would participate in faculty development regarding distance education if it were offered at GWU. The top five areas of interest were: (a) computer based technologies; (b) two-way online computer conferencing i.e. CU-See ME and IRC; (c) two-way audio/visual interactive conferencing; (d) two-way audio and one-way video conferencing; and (e) one-way live video. Faculty participants had three basic recommendations regarding distance education: (a) faculty would like support for course development; (b) faculty were interested in seminars and workshops that focus on skill development, i.e. the use of new technologies, designing courses, teaching strategies; and (c) faculty would like release time for training. Although 71% believed there were no career advantages to participating in distance education, more than half believed that career advantages would encourage their participation in distance education.

Betts' (1998) findings mirrored several previous studies in identifying the selection of online instruction as the technology of choice; the realization that distance education was much more time consuming than traditional instruction, and that there was often little or no career or professional advantage to being active in distance education. Her findings also foreshadowed more recent studies that recognize faculty concerns regarding the professionalism and quality of their technical training. Because of the timeliness of her research questions and her exacting methodology, Betts' work is often cited by other distance education researchers.

Ross and Klug (1999) investigated the attitudes of business college faculty towards distance education in a national survey that addressed two research questions:

- (1) What are the factors that influence attitudes toward distance education at the baccalaureate and master's levels of instruction?
- (2) What are the similarities and differences in the relationships of attitudes towards distance education between the baccalaureate and postgraduate levels of instruction?

Ross and Klug framed their study with previous research that confirmed that although faculty are most motivated to participate in distance education by intrinsic rather than by extrinsic rewards, the lack of extrinsic rewards can inhibit new faculty members from attempting distance education, can cause current participants to lose interest, and can cause faculty to feel removed from administrative and from institutional concerns. This study attempted to look at both faculty and administrators' concerns but segregates these concerns by academic level rather than by academic role.

The researchers used survey questionnaire based on the work of Johnson (1984), Clark (1993), and Black (1993). The population of this study was faculty and administrators in four-year schools and colleges of business in the United States. The investigators selected a stratified sample of 1,045 full time business faculty and administrators from a stratified random sample from a database compiled by Dr. James Hasselback of Florida State University. The stratification was by academic sub-discipline including marketing, management, economics, accounting, and finance. Stratification also included considering participants' affiliations with schools accredited by the American Assembly of Collegiate Schools of Business (AACSB), the Association of Collegiate business Schools and Program (ACBSP), and those not accredited by either group. Three hundred and thirty-four people responded to the survey for a response rate of 32%. The authors acknowledged that discarding responses with missing data would further reduce this sample size and chose to apply imputation (based on Raykov and Widaman, 1995) where there were few missing variables or where there was no pattern to the missing variables.

Ross and Klug (1999) summed certain questions to create five composite dependent variables: (a) receptivity, (b) support, (c) fit, (d) difficulties, and (e) objectivity. Each composite variable was constructed at each of the three levels of instruction: (a) baccalaureate, (b) master's, and (c) doctoral. The *receptivity* dependent variable was the sum of three scores on a five-point Likert-type scale intended to measure respondents' attitudes toward distance education. The *support* composite score was a sum of five responses designed to measure respondents' willingness to teach distance education courses. The *fit* variable was intended to measure respondents' attitudes toward

the appropriateness of distance education in relation to their institution's goals and their academic field. There were seven questions included in the *objectives* composite variable relating to the importance respondents placed on various academic objectives such as faculty/student communications and providing scholarly judgment and professionalism in students. The *difficulties* score was developed from the degree of difficulty reported in relation to realizing the educational objectives from distance education teaching. The demographic variables used in this study included age, gender, academic rank, academic position, tenure statuses, number of years in current position, and institution type (Carnegie classification).

In analyzing their data, Ross and Klug (1999) dropped the few responses that answered fewer than 60% of the questions, but performed imputations on the remaining missing values using EQS (Benter & Wu 1995). Missing data were replaced by sample mean of questions that had less than 20% of their values missing. Regression imputation was used for the remaining questions that had more than 20% missing values. Three to five predictor variables were used for the regression imputation including fit, difficulties, accreditation impact, years in position, and distance education experience. A simultaneous equations design was used to describe the causal paths between variables for both the baccalaureate and the master's model. There was no causal path model developed for the doctoral level and no explanation offered. Judging from other similar studies, however, it is likely they found no significant difference between master's and doctoral levels. The models were developed individually although both began from the same base and considered both the direct and indirect effect variables on *receptivity* and *support*. The simultaneous equations model had three levels including demographic,

attitude, and final dependent. The demographic variables considered were distance education experience, age, years in position, rank, and institution type. These variables were used as predictors for the four attitude variables: (a) fit, (b) difficulties, (c) objectivity, and (d) accreditation. The authors displayed the correlations for respondents as the baccalaureate level and the master's level individually, and then displayed the descriptive statistics for the variables used in analysis at both the baccalaureate and the master's levels. The final models for both academic levels showed several similarities but also a few significant differences.

Ross and Klug (1999) found that at both the baccalaureate and the master's level, business school faculty and administrators who believed distance education was a good fit with their personal and institutional goals showed a high degree of receptivity to distance education. Individuals who perceived more difficulties with distance education were less receptive. Individuals at both levels who had more experience with distance education were more receptive to distance education and perceived a better fit. In the area of differences, however, the authors found that age was a significant factor at the baccalaureate level with older faculty being more receptive and perceiving better fit. At the master's level, however younger faculty were more receptive and perceived better fit. The authors speculated that this may have been because at the older faculty at the baccalaureate level were primarily interested in new ways of teaching and connecting with students where older faculty at the master's level were more concerned with research projects and graduate students than with new technologies. One of the major contributions of this article was the construct *fit* that encompassed the ideas of fit within the goals of faculty, administrators, and institutions.

Schifter (2000a) saw the growth of postsecondary distance education and the related need for active participation by faculty as problem of change. She framed her study on Rogers' (1983) five factors that influenced the adoption of innovation and on Kahn's (1995) ten obstacles to institutional change. The purpose of the study was to relate the level of adoption of instructional technology to teaching activities; and to specifically examine the use of technology in teaching and learning activities. Teaching and learning activities included motivating and inhibiting factors for participating in distance education, and attitudes toward policies on distance education. Schifter modified Betts' (1998) survey instrument described above and set her study at a Research 1 university in the northeast. The researchers distributed the survey in the spring of 1999 to all full-time faculty and 25 senior administrators for a total target population of 1,312. The final sample size was 263 for a response rate of 20%, which the author admitted limited the external validity of the study. The author used SPSS-PC. She first ranked the 29 motivating and 17 inhibiting factors according to mean scores and then used a factor analysis on all 46 factors to see how they grouped.

Although her sample size was small, Schifter (2000) found that her sample was representative of the faculty at large with 63.9% of her respondents were male and 35.7% female. With regard to rank, 47.9% were full professors, 28.1% were associate professors, 17.9% were assistant professors, and 6.1% were instructors. Thirty-eight faculty members (14.4%) said they were active participants in distance education. In the ranking phase of data analysis, Schifter found some differences among motivating and inhibiting factors between participating and nonparticipating faculty members although those differences usually began to occur in relation to the less frequently mentioned

factors. Factor analysis revealed four distinct scales including: intrinsic motivations with an alpha coefficient of .9123; personal needs with an alpha coefficient of .8956; inhibitors with an alpha coefficient of .8878, and extrinsic motivators with an alpha coefficient of .8440. The top three intrinsic motivators were intellectual challenge, opportunity to diversity program offerings and opportunity to develop new ideas. The top three personal needs were release time, credit toward promotion and tenure, and merit pay. The top three inhibiting factors were lack of release time, lack of support or encouragement from institution's administrators, and lack of merit pay. And, the top three extrinsic motivators were expectation of the university that faculty participate, requirement by department, and support and encouragement from the dean or chair. Schifter considered her findings in light of Roger's theory of adopting innovation and concluded that faculty skepticism about instructional technology might be understood in light of how technology makes faculty dependent on others (technicians) for success. In relation to Kahn's ten obstacles to institutional change, Schifter concluded that the lack of time (or support or reward for time spent) was clearly an obstacle. Lack of communication and understanding between faculty and administrators may also serve as an obstacle for faculty participating in distance education. Lee's (2002) study, discussed below, also focuses on this issue.

In an expansion of this same study, Schifter (2000b) used AVOVA to identify significant mean score differences between participating faculty, non-participating faculty, and administrators views of motivating and inhibiting factors to participation in distance education. The results revealed highly significant differences among the three group ratings on the 29 motivating factors (see above.) Highly significant differences ($p <$

.001) were found for monetary support for participation; where administrators rated this factor 2nd participating faculty rated it 23rd and non-participating faculty rated it 10th. Very significant differences ($p < .01$) were found for personal motivation to use technology, reduced teaching load, credit toward promotion and tenure, and release time. In relation to the 17 inhibiting factors, the results of ANOVA found no significant differences relating to the lack of release time as an inhibiting factor, indicating that administrators were aware that it was an issue. Schifter used this study to expand her conclusions from her study described above including the idea that it is easier to identify the factors that deter participation to identify those that motivate. She makes the important point that:

New skills are required for this new environment. Attending to these concerns helps minimize the inhibiting factors but does not address motivating factors. While not all the inhibiting factors can be eliminated, recognition of these issues by all parties involved may help in gaining support and participation. (p. 20)

Ellis (2000) focused specifically on the barriers to success in faculty participation in online instruction. Her study was based at the Pennsylvania State University World Campus, an electronic degree granting campus. The purpose of the study was to investigate the barriers would slow the growth of the (electronic) campus including faculty participation, the incentives would assist it's growth, and the concerns faculty members and administrators have surrounding Penn State's efforts to teach worldwide. Ellis described her setting as a new (founded in 1998) electronic campus based within a large, traditional, research based land grant university. A portion of the underwriting for this project was from the Alfred P. Sloan Foundation (working though the Sloan-C Consortium). Using a qualitative design, Ellis employed a cross-sectional design that

involved one form of inquiry, one-on-one interviews with four groups of subjects; college deans, college associate deans, department heads, and faculty members ($N = 21$). She stated specifically that no attempt was made to have equal representation among the groups because this study was not designed for quantitative evaluation. The interviews followed a pre-determined protocol of 10 standard questions- one set of questions for each of the four groups of participants. The faculty members' questions varied by status and by whether they were participating or non-participating faculty. The investigator audio taped the interviews also took notes. The audiotapes were professionally transcribed. Ellis patterned her analysis on the Lincoln and Guba (1985) method. Data were sorted to see if major themes existed then a second sorting was performed to determine smaller units and to help identify repetitive themes and determined patterns. There were three major areas of discussion: key barriers to faculty participation, major concerns about the development and growth of the World Campus, and the top incentives for faculty members who are devising whether or not to participate in World Campus teaching.

Ellis (2000) found four major barriers to faculty participation: (a) release time needed to develop courses; (b) lack of promotion and tenure to reward the additional teaching load; (c) money to pay for time and equipment needed for the up-front development of the World Campus; and (d) lack of incentives or rewards for participating in the World Campus. In regard to the release time, both faculty and administrators realized this was a problem. She shared a typical faculty comment, "You just can't pile it on top of everything else... this is not just business as usual." (p. 236).

Although funding for the World Campus had supported loaned faculty to assist the effort, there appeared to be no uniform understanding across the campus as to how release time was handled. Administrators in general tended to look at faculty time as a commodity rather than as an individual faculty issue. One administrator said specifically that he would not recommend non-tenured faculty attempt World Campus teaching because of the expanded workload. Administrators were not totally oblivious to the problems of time, support, and motivators. Several administrators realized that faculty were making conscious decisions whether or not to participate and asking themselves such questions as “Why should I be doing this? Am I going to be advanced professionally in any way by this?” In response to these questions, Ellis found that several faculty members had identified an opportunity to advance their careers relating to distance education by focusing on it as a subject of their own research. Deans and department chairs were also faced with a time allocation issue related to faculty assignments. Ellis concluded that priorities are not easily determined in a place as innovative and intellectually active as Penn State. Like Schifter (2000a and 2000b), Ellis concluded that a primary determiner of success would be the ability to deal with the implementation of the World Campus in terms of *cultural change*.

In another study of a Sloan-C supported distance education effort, Fredericksen, Pickett, Shea, Pelz, and Swan (2000) investigated factors influencing faculty satisfaction with asynchronous teaching and learning in the State University of New York (SUNY) Learning Network. The presentation of the study is interesting in that the first half of the article is detailed project report including such issues and types and levels of faculty support, the development of the learning platform and SLN course template, faculty

competencies, student competencies, and the establishment of the Multimedia Instructional Design (MID) designer role. The second section is a qualitative study that describes the research methods and findings.

The quantitative study was based on a spring, 1999 faculty satisfaction survey. At the time of publication, 105 instructors had completed the study for a return rate of 40% ($N = 105$). However, new data was added as the surveys returned, and the authors planned to reissue the survey in 2000 to assess differences in the responses. The survey instrument was original and included questions on topics reflecting the areas of reporting in the first section of the article. The survey included structured responses using a Likert-type scale with 1 representing a very high of satisfaction and 4 a very low level of satisfaction. Other questions allowed the selection of set responses from a menu of choices. The researchers first presented data as descriptive statistics showing the mean, N , and standard deviation. ANOVAs were run to investigate the significance of between groups and among groups relationships for each variable compared to satisfaction with teaching. For example, *satisfaction with teaching* was compared to *satisfaction with student performance*. That relationship was significant at the .002 level.

The ANOVA results comparing satisfaction with interaction with students online and interaction with students in the traditional classroom when compared to satisfaction with teaching showed a relationship significant at the .001 level. Instructors satisfied with teaching online were also satisfied with their online interaction with students. When instructors were asked why they chose to teach online, 69% responded that they had an interest in online teaching and learning or that they had an interest in technology and the Internet. Only three of the 105 faculty replied that they feared being “left behind”, and

only two of the 105 faculty replied that they wished to telecommute. In all, faculty satisfaction with teaching online was positively correlated with such factors as student performance, interaction with students, a positive perception of technology, few technical difficulties, and how well faculty got to know their students. The authors acknowledged that a limitation of this study was the self-selected nature of both the teaching faculty and the online student group, i.e. “They are motivated and willing to try something new.” The issues of self-selection and motivation should always be considered in studies of online teaching and learning since many students and faculty involved have chosen to participate in online instruction over traditional opportunities.

The second section the Fredericksen et al. (2000) study also included several in-depth case studies at individual campuses within the SUNY Learning Network where individual analyses were completed with sub populations. For example, an individual analysis of the SUNY Albany master’s program in instructional technology described their faculty support system as: (a) the use of a laptop computer; (b) course reductions; (c) an additional teaching stipend; and (d) a budget of \$1,000 to assist in creating course materials. Seven of the 12 faculty members in this program volunteered to create and teach courses online. Because several courses were offered in both face-to-face and online sections, comparisons were possible between the course sections. For three courses, the online enrollment exceeded the traditional enrollment. Student evaluations of these same three courses showed that the online students gave the course a more positive rating than the face-to-face section. The researchers speculated that this could be a result of the self-selection and motivation issues that can bias results. They concluded that the overall program results were extremely positive and credit a great deal of that success to

the support received from the Alfred P. Sloan Foundation that allowed extra support for faculty such as release time and teaching stipends. (Author's note: this article evaluating the results of this Alfred P. Sloan Foundation supported project was published in the ALN Journal, a publication of the Sloan-C Consortium. This is noted not to imply bias, but to provide full disclosure of the context of this study's publication.)

Wilson (2001) also investigated faculty attitudes toward distance education and set her study within the KYVU, the same consortium proposed as a setting to validate the survey instrument for this study. The Kentucky Postsecondary Improvement Act of 1998 supported the establishment of the Kentucky Virtual University (KYVU). KYVU is not a degree granting institution, but rather a clearinghouse for distance education courses offered by Kentucky institutions. It also supports faculty development events and distance education conferences and workshops. The purpose of the Wilson's study was to investigate distance learning in Kentucky with a focus on four phenomena: (a) the policy context for distance education; (b) attitudes about faculty and distance education issues; (c) faculty proficiency in instructional technology skills; and (d) institutional barriers and support for distance education.

Wilson (2001) drew data from three sources including document mining; a faculty development needs assessment, and a survey. She developed a needs assessment based on the guiding principles and ongoing recommendations of the Faculty Development Workgroup of the (KY) Council on Postsecondary Education. The instrument was developed, refined, field tested, and pilot tested. The survey contained more than 100 five-point Likert-scale questions with additional space for open-ended responses. Statewide data analysis drew from a stratified, random sample of 1,500 of full time

instructional faculty members at the nine state institutions of higher education. The return of 687 surveys gave an acceptable response rate of 46%. Two additional techniques were used in the interview phase of data collection; semi-structured interviews were conducted with 4 state policy makers, 11 administrators, and 14 faculty members; and focus groups were conducted with an additional 33 faculty members and administrators. Descriptive statistics of the survey data included means and standard deviations. Respondents had a generally positive feeling about distance education in general (mean = 3.54; standard deviation = 1.06) but were somewhat less positive about personal involvement in distance education ($M = 3.02$, $sd = 1.13$). Respondents were moderately comfortable with operating a computer and using the peripherals ($m = 4$); but were uncomfortable with any of the instructional techniques associated with distance education or instructional technology ($m = 3$). Faculty rated intrinsic factors (such as facilitating student learning) consistently higher (m between 3.64 and 3.17) than extrinsic factors (m between 2.80 and 2.46). And, although technology was not rewarded in yearly reviews, promotion, or tenure, instructional technology was somewhat valued (m between 3.13 and 3.55).

One of the issues addressed in Wilson's (2001) study was that while the Kentucky Postsecondary Improvement Act supported the KYVU, state institutions became responsible for developing the courses offered in the KYVU catalog. State institutions were also responsible for training and supporting faculty engaged in distance education with no additional incentive from KYVU other than a potentially expanded study base. Individual faculty members became responsible for creating and teaching online. Wilson hypothesized that faculty felt unwilling, unprepared, un-rewarded, and unsupported by the university administration and infrastructure.

Data analysis showed that respondents ranked *time* as the primary barrier to participation in distance education. Wilson stated that although her findings were not statistically significant at the 0.05 level, she believed that the categories and patterns of response were important to consider. (Author's note: The article did not specify during which academic year the survey and interviews were conducted. Between 1998 and 2000, most Kentucky universities were moving from the Eduprize^(R) electronic learning platform to the far more user-friendly Blackboard^(R) platform. Data gathered before this migration could show more strongly negative results because the early technology was so unwieldy.)

Lee (2001) recognized that although faculty realized the importance of distance education to their institutions and were generally supportive, many were still reluctant to participate. In her review of the literature she found several strong indicators that the lack of instructional support may be the primary contributor to this reluctance. Lee cited studies that showed that in general, organizational support is positively correlated with job satisfaction, motivation, and commitment. She noted, however, that few studies have examined this relationship in regard to postsecondary institutions and the challenge of online teaching. Her study explored this relationship. She applied survey research using a cross-sectional design with subjects who were faculty who taught online or administrators who managed online instruction in colleges and universities in the Western Cooperative for Educational Telecommunications (WCET), an affiliate of the Western Interstate Commission on higher Education (WICHE) that supported this study. She sent individual e-mails to faculty and administrators at each member institution asking for their cooperation and linking them to the Internet survey. The final response

rate was 72% with 237 faculty members and 25 institutions represented. Although Lee did not analyze administrator data in this study, it was used as a critical part of her 2002 study described later in this chapter.

Lee (2001) used a survey of her own design that asked faculty to rate 35 variables related to administrative support on a 5-point Likert type scale with (a) as *not supportive* and (e) as *very supportive*. Lee applied Cronbach's alpha on all items to check the internal consistency. The value for coefficient alpha was .93. To measure faculty commitment, motivation, and satisfaction with their own teaching, a single item for each construct was created with a 5-point Likert scale ranging from (a) *none* to (e) *very strong*. She used SPSS to analyze the data.

Lee (2001) found that mean scores for the two criterion variables, faculty commitment ($M = 4.08$) and motivation ($M = 4.15$) were remarkably high on the 5 point scale. The mean score for satisfaction, although not that high ($M = 3.46$), was still higher than any of the nine predictor variables. In other words, faculty were still committed and motivated in spite of their relatively low level of satisfaction. To explore this issue further, she divided the faculty respondents into two groups, high perception (of support) group and low perception (of support), to examine whether the two groups' perceptions of instructional support made a difference on their commitment, motivation, and satisfaction. The results of a one-way MANOVA showed statistically significant differences in faculty members who believe they had a high level of instructional support and those who perceived it as low. The post hoc test to the MANOVA was an independent t -test on each dependent variable.

Lee (2001) found that there were more than twice the number of faculty members in the low perception group ($n = 168$) as the high perception group ($n = 69$). Statistically significant results were found for all dependent variables. The high effect size was found on faculty commitment $p < .001$, $t(235) = 4.35$, $d = 0.68$, meaning that the average score of the high perception group's commitment was .068 standard deviations higher than for the low commitment group. The effect size for faculty motivation was $p < .01$, $t(235) = 3.48$, $d = 0.54$. All three effect measures could be categorized as "medium to large" using Cohen's designations.

Lee concluded, as had Betts (1998a) and Schifter (2000a and 2000b), that faculty seemed to be succeeding in distance education in spite of a lack of support for their instruction. Lee posits the question for future research, "How much more could they succeed if instructional support were available?" Lee believed there are indications that faculty motivation, commitment, and satisfaction may increase in proportion to the amount of support they receive.

Perreault, Waldman, Alexander, and Zhao (2002) expanded the research of postsecondary distance education issues by including students' concerns and comparing them to faculty concerns. They expressed the need for such research by citing Shea and Boser's (2001) projection that by 2005, 90% of American universities will have at least some of their course offerings online. The transition from a traditional to a virtual classroom is not easy, however, and many factors impact both the students' and the instructors' ability to function well. The purpose of this study was to determine the perceptions of faculty and students toward the components of the issue related to distance learning. The specific research areas examined were: (a) identifying the types of

problems or issues associated with distance learning from both a teaching and a learning perspective; and (b) establishing the degree of importance to students and educators placed on factors associated with distance learning courses.

The survey was of their own design and included clusters of questions on a 5-point Likert-type scale (*strongly agree to strongly disagree*); and clusters of questions on a 5-point Likert-type scale (*very important to very unimportant*). The questions were derived from issues found in their own research. A 12-member panel of experts reviewed the survey for content validity. The population for this study included faculty and students at institutions that were members of the AACBS accrediting body for business school in the US. All 335 business schools were contacted, and 61 institutions provided names and addresses for likely online faculty participants. One hundred and eight four professors were contacted and 81 replied for a response rate of 48.5%. Those faculty, in turn, were asked to select likely online student participants. Of the 153 selected, 100% replied. (Faculty N = 81, Student N = 153). The surveys were returned in preaddressed envelopes. Replies were confidential and participation had no effect on students' grades. They used descriptive statistics including percentages and frequencies to analyze the data.

Perreault et al. (2002) presented their findings in five major areas: (a) demographics of respondents; (b) student perceptions of taking distance education courses; (c) faculty perceptions of teaching distance education courses; (d) student concerns with distance education courses; (e) faculty concerns with distance education courses; (6) student perceptions of important distance education course factors; and (7) faculty perceptions of important distance education course factors. Among the more interesting student demographics were that 92% were graduate students, only 15% were

not currently employed, and close to half (45.6%) were over 30 years of age. Of interest in faculty demographics were that 43.3% were teaching on the web, 33.3% were teaching via interactive television, and 21% used both technologies. Almost eighty percent of students (79.9%) agreed or strongly agreed that they enjoyed taking distance education courses but only 49% believed they were receiving good technical support. Over seventy percent (72.9%) agreed or strongly agreed that they enjoyed teaching distance education courses but less than half (46.9%) agreed that they were receiving good administrative support. The highest student concerns were team projects (65.4%), technology reliability (56.4%), and student/teacher communication (44.4%). Students identified the important issues as time/place flexibility (66.7%), the faculty's role as a facilitator (63.2%), and new teaching/learning approaches (62.0%). The three greatest faculty concerns were technology reliability (80.1%), student access to resources (65.2%), and student technology competencies (62.3%). Faculty perceptions of important issues mirrored students' perceptions as they rated time/place flexibility (90.1%) as important, with the faculty role as facilitator (86.0%) and new teaching approaches (73.1%) also highly rated. In general, both students and faculty were enthusiastic about distance education and saw time/place flexibility and the new approaches to teaching as positive attributes. Both groups had concerns about the reliability of technical support. In spite of this general enthusiasm, faculty believed there was low administrative support and that distance education would do little for their own careers.

Perreault et al. (2002) concluded that because faculty were showing a high level of enthusiasm for distance education and their concerns were essentially student-centered, they would be even more successful if good training opportunities were available.

Training could be focused on both technical and pedagogical issues such as instructor/student communication and the problems with team based distance learning assignments.

O'Quinn and Corry (2002) built their study on Betts (1998) and used her survey instrument. Betts looked at all factors the impact faculty participation in distance education while O'Quinn and Corry focused specifically on factors that deterred participation. The researchers used Betts' and Kubalas' argument that the faculty are the "internal center" of the college or university and that faculty attitudes are critical to success. The literature reviewed by these researchers and also by Betts and Kubala supported the ideas that not only is teaching via distance far more time consuming than teaching face-to-face, but also the pedagogical differences actually alter the task of teaching. The researchers cited respected experts in the field of distance education including Gunawardena, Dillon and Walsh, and Wolcott to build their argument that the technical and pedagogical challenges of distance education are real rather than simply perceptions. They also cited literature that described how faculty who have taught via distance have seen a difference in their approach to face-to-face instruction. Specifically, faculty realized the need for more structured instructional design and the need to accommodate students who do not learn in a linear fashion. In addition, although there is an increasing need for qualified postsecondary faculty to teach via distance, not all faculty are willing to participate in distance education.

This study focused on factors that affect community college faculty's participation in distance education. Specifically, "the study analyzed the degree to which a set of thirty factors may have inhibited faculty's participation in distance education" (p. 3). The study

was unique because it is focused on community college faculty rather than four-year or research institutions. This descriptive study employed survey research using both qualitative and quantitative data analysis. The sample for this study included division chairs and faculty at a community college in the Southeastern US whose teaching loads consisted of (a) distance education courses and classroom courses, (b) solely distance courses, or (c) solely classroom courses. The survey included all division chairs ($N=15$) and all faculty ($N=572$). Thirteen division chairs ($n=13$) and 185 faculty ($n=185$) replied for response rates of 86.66% and 32.86% respectively. Response rates by group, however, varied widely with 78.46% of combination faculty and 100% of distance only faculty responding. The college consisted of five campuses serving a total of 39,138 students and employed four methods of distance education delivery including written correspondence, web-based via Blackboard, tele-courses via cable TV, and audio-visual via the asynchronous learning network.

O'Quinn and Corry (2002) stated that "survey methodology was deemed the most appropriate means of data collection for this study as it is meant as a foundation for future data collection at other community colleges" (p. 5). The first section focused on demographic questions. Additional questions focused on faculty support, rewards, and the changing roles of the faculty members in distance education including how faculty and division chairs perceived distance education as relating to the community colleges' mission. Data analysis was both qualitative (categorizing responses to short answer questions) and quantitative (presenting means, standard deviations, frequency distributions, and percentages).

The mail survey was done in the fall of 2001. All members of this community college faculty and all division chairs received a cover letter that provided an overview of the survey and a copy of the survey instrument. No discussion was provided on survey follow-up. The lack of follow-up as recommended by Babbie (1990, 2003) may account for the fairly low response rate, especially among classroom faculty. Participants were given a list of thirty factors which they were asked to rank on a 5-point Likert scale on the extent to which the factors inhibited or would inhibit their participation in distance education. The scale was anchored by 1 (*strongly disagree*) and 5 (*strongly agree*). The results were measured in the means of responses. Means averaging between 1.0 and 2.0 were noted as strongly disagreeing; means averaging between 2.0 and 3.0 were noted as disagreeing; means between 3.0 and 4.0 were noted as neutral; means averaging between 4.0 and 5.0 were noted as agreeing; and means greater than 5 were noted as strongly agreeing. Specific open-ended questions were also included on the instrument.

The statistical analysis in this study was descriptive rather than inferential. Vogt (1999) defines descriptive research as describing phenomena as they exist; in contrast to experimental research that exposes subjects to various treatments. There are two reasons these researchers may have elected to use only descriptive statistics; the study is both qualitative and quantitative and descriptive statistics are most often associated with qualitative research, and the sample size for the third group (teaching distance courses only) was too small to support the claim of statistical significance. The quantitative results were expressed in tables of descriptive statistics and interpreted through discussion. Classroom faculty taught in a range of seven disciplines from liberal arts to the sciences and social science; combination faculty taught across five disciplines, distance only

faculty represented three disciplines, and the 13 division chairs represented six disciplines. Almost all faculty worked on a contract basis. Combination delivery faculty appeared to have heavier course loads than did classroom only or distance only faculty. Distance only faculty had significantly more experience in distance teaching than did combination delivery faculty with 44% having more than 10 years' experience and could be considered early adopters. Although the distance only faculty had significantly more experience, they also had the highest percentage of interest (43%) in getting additional distance education training. The factors are presented in rank order considering both the mean and standard deviation.

O'Quinn and Corry provided an analysis of the findings from each participant group by discussing the top eight to ten inhibiting factors and making comparisons among the participant groups where appropriate. Although there were stronger and more frequent similarities between combination delivery faculty and distance only faculty than between either group and classroom only faculty, no single inhibiting factor generated means above 4.0. In other words, no single factor provided a notable deterrent (strongly agree) to faculty participating in distance education. With all due respect to the researchers, this author does not agree with their interpretations that "no factors strongly deterred their participation in distance education (p. 13) or that "...their (faculty) decision to participate in distance education was not influenced by the factors listed in the survey" (p. 16). What their data actually showed was that no specific, single factors stood out as major deterrents. Human decision making is a complex process. What if it is actually a combination of factors that deter participation in distance education? Future researchers should not discard these 30 factors studied by Betts (1998) and by O'Quinn and Corry

just because they were not significant when considered in isolation. Possibilities for future research include not only looking at which combinations of factors deter participation in distance education but also how to overcome these deterrents.

In the comparison of responses, the researchers provided discussion of: (a) factors that elicited a neutral response; (b) factors that elicited mixed responses; and (c) factors that elicited unison responses of disagreement. Distance only faculty were neutral about those factors relating to monetary rewards, although distance only and combination delivery faculty disagreed that merit pay would inhibit their participation. Technical support issues were also neutral among combination and distance faculty. In regard to factors that elicited mixed response, there was frequent agreement between combination faculty and distance faculty. For example these groups did not believe that the lack of merit pay, lack of recognition, or lack of royalties were major deterrents to participation. Classroom only faculty were generally neutral on these issues. In regard to pedagogical factors, distance only and combination faculty did not believe that distance education made them feel as if they had lost control of their classes. Again, classroom only faculty were neutral on this issue. The researchers found it meaningful that “when means of responses were listed in descending order, the factor of ‘faculty workload’ was ranked as the number one concern by combination faculty and by division chairs. It was ranked second by distance only and by classroom faculty” (p. 19).

In discussing the open-ended responses, O’Quinn and Corry stated that classroom only faculty comments centered on pedagogical issues including the quality of student interaction, the relationship of the college to the surrounding community, and that distance education was not conducive to their academic discipline. Ninety-six percent of

combination faculty replied that they would continue to teach via distance, but they also expressed concerns about the college's need to upgrade servers and to correct other unreliable technology. Other classroom only faculty concerns related to the heavy workload, lack of ownership of materials developed, concerns about student quality, and concerns about student honesty. The researchers acknowledged that because classroom only faculty had not experienced the increased workload related to distance education, it would be an interesting follow-up to revisit this issue. If classroom only faculty had the opportunity to teach via distance, would their priorities change?

The researchers cite Shea (2001) who quotes a Merrill Lynch associate as projecting in 2000 that by 2003, higher education Internet courses would generate \$7 billion annually. Higher education can not afford to ignore the factors that inhibit faculty's distance education participation. Issues such as faculty workload must be addressed. They discuss their community college's policy of *rolling admissions* where students may begin a distance education course at any time during the semester thus swelling course enrolment after the work assignments have been made. The researchers recommend that to insure the quality of distance education courses, faculty should be given either release time or a development stipend to create the courseware. The faculty who develop courses should teach them or be available to the faculty who teach them.

The value of this study is that it built on Betts' (1998) findings and refined them by concentrating on factors that deter participation, it focused on community college faculty, and it included open-ended qualitative responses that expanded the knowledge base relating to doubts and concerns about distance education. The disproportionate number of faculty in the three teaching categories, however, made it difficult to apply inferential

statistics. If this study were duplicated, it would be wise to either employ a stratified sampling technique or to combine the combination faculty and distance only faculty into a single group to support more sophisticated statistical comparisons between the two groups. It would also be interesting to explore the idea of how factors combine to deter participation. Is it the number of deterrents or is it the combination of the most potent deterrents that inhibit faculty participation in distance education? And finally, what can colleges and universities do to overcome these deterrents?

Witt (2003) also examined faculty concerns and issues with web-based instruction but focused specifically on issues relating to the development of sites that supported traditional (face-to-face) classroom courses. This study provided an interesting contrast to studies of focused solely on distance education because it isolated the issues of planning and developing web materials *without* having to deal with the factor of physical separation of faculty and students. His research question was whether supplemental web sites for classroom courses accomplish important course objectives compensatory with the outlay of time, effort, and sometimes funds required to develop and maintain such a site. Specifically, Witt sought to address three questions:

- (1) What goals and objectives guide the development of supplemental web sites associated with classroom course?
- (2) How much time and money are required to develop and maintain course web sites?
- (3) Once the course site is in use, how important are they to the overall success of the course?

The author developed the web-based questionnaire with two demographic and seven content questions that supported either scaled (selected) or open-ended responses that included questions such as why was the course site built; who built the original site and how long did it take; and what is the instructional usefulness of the site? The researcher did not discuss the reliability or validity of the instrument, but that is not uncommon in a qualitative study.

The study took place on an urban southern campus. The campus web master assisted in identifying all faculty who had established course content web sites within the university's domain, and administrative assistants within academic departments helped identify course sites that resided outside of the university's domain. E-mails were sent to the 36 instructors associated with the 43 identified sites with a response rate was 67% for an *N* of 24. Those twenty-four instructors represented 30 course sites.

In regard to his first research question, Witt (2003) found that the web sites had been created for several reasons including to provide access to course information (87%, *n* = 26); to promote communication between students and faculty (37%, *n* = 11); and to help students learn online (20%, *n* = 6). (The *n* in this article represented sites rather than individuals.) In regard to time and money spent, Witt found that most respondents (77%) had built the web site themselves with only 13% using student assistants. Most had spent no money but had spent an average of 13.6 hours in construction. They then spent an average of 10.6 hours during the semester on maintenance.

In regard to the third issue, Witt found that the majority of instructors (60%) felt that the objectives of the site were "entirely" or "largely" accomplished and 60% considered the site "essential" to the course. On the practical side, establishing a course

site reduced the need to students to contact the teacher in class or during office hours for such procedural issues as copies of the syllabus, handouts, or announcements. Students who had no access to the Internet could still receive these materials directly from the instructor. Faculty also noted that they used personal e-mail to contact students with messages of a personal nature or to contact small groups of students. Several faculty comments revolved around the issue of fewer but more meaningful student contacts; in other words instructor/student contact time was spent on more meaningful issues than handouts. Witt (2003) concluded that like critical thinking skills and effective communication skills, the ability to learn online has now become an essential skill to support lifelong learning. The use of a web site to support a traditional classroom course is a practical way to ease students into this frame of reference.

Parker (2003) provided a thorough and insightful overview of motivations and incentives for distance education faculty in her literature based qualitative study. She stated two reasons for the study: (a) to establish a profile of today's distance educator; and (b) to identify motivators that entice faculty to teach at a distance. Parker noted that because the success of distance education is hinged on willing faculty participants, it is critical to understand what motivated that participation. More than 100 articles were reviewed and the conclusions combined and synthesized. As themes emerged, they were noted in order of frequency (rank order). She cited Betts and others who found that on campus (traditional) faculty are motivated primarily by intrinsic rewards such as personal satisfaction, watching students succeed, and a sense of accomplishment. She posited the question; will these motivators will still be effective in the changed environment of distance education?

Parker (2003) cited statistics from the US Department of Education that 52% of distance education faculty are male, 38% are senior faculty, 54% are tenured, and 82% teach full time. The academic disciplines most involved in distance education are business, commerce, agriculture, and education. These identifiers, while important, gave little information about what motivates faculty to participate.

Parker (2003) used studies by Miller and Husman (1999) and by McKenzie, Mims, Bennett and Waugh (1999) to identify intrinsic motivators that were most lively positively associated with faculty motivation and distance education. She then recorded how frequently these motivators were mentioned in the 102 studies. Three motivators including self-satisfaction ($f = 90$), flexible scheduling ($f = 81$) and wider audience ($f = 79$) were seen as significant. Intellectual challenge appeared in 51 articles. The remainder of the motivators appeared in fewer than 50. Given that the research supported specific motivating factors, Parker suggested that administrators consider ways to provide and/or support those motivators. For example, forums in which faculty excellence in distance education are recognized could provide self-satisfaction to those recognized and perhaps provide a model for those considering distance education.

Parker (2003) then considered extrinsic motivators for distance faculty as identified by Brown (1999) and Betts (1998). The motivators most often mentioned were: (a) stipends; (b) less rigorous workloads; (c) limited class size; and (d) release time for course development. The NEA reports that 63% of America's college faculty develop and teach distance courses with no financial remuneration. Although the development time is "greatly increased" most colleges see it as a part of the normal workload. The NEA report further states that 84% of today's higher education faculty have similar

teaching loads regardless of delivery mechanism. Workload was also addressed in relation to class size. Numerous studies show that administration is hesitant to limit class size but faculty question the quality of instruction in classes of more than 25 students. Parker recommended that this concept of limiting class size be linked to distance education to provide an incentive to teach. She also identified new technology as an extrinsic incentive. Laptops with Internet connections, PDA's, and other portable technologies make distance education easier to manage. One caveat, however, is that the faculty members with the most advanced technical skills may not be the faculty with the best pedagogical skills to attempt distance education. Faculty development is a critical factor. Parker concluded that in examining over 100 articles, there was evidence that faculty generally teach at a distance for the same intrinsic rewards that motivate them to teach face-to-face, but that self-satisfaction, flexible scheduling, and a wider audience may be the intrinsic rewards best supported by distance education. Stipends, decreased workloads and release time, and new technology were the most frequently considered extrinsic motivators.

Comparing Faculty and Administrator Attitudes and Concerns

Many of the researchers cited above agree that there is a faculty perception of a lack of administrative support for distance education. Studies also show, however, that administrators agree on the need for distance education in order to expand their range of services and their student bodies. So how can it be that administrators in general support the concept of distance education but do so little to support faculty? Lee (2002) proposed that the answer to the paradox was a difference in perception of support. She expanded

the application of the data from her 2001 study as she compared faculty and administrators' perceptions of instructional support for distance education.

Lee (2002) described the need for the study in terms of 2001 distance education trends. Although 33% of colleges and universities in the US offered distance education courses and 20% more planned to offer them in the near future, there was a lack of faculty training in distance education techniques and technology. Further, there was little or no recognition of the additional workload required by distance education. Few studies had been done to measure the difference in perception between faculty and administration in the area of support for distance education. Lee's review of the literature found only two comprehensive reviews of related studies: Dillon and Walsh (1992); and Moore, Thompson, Quigley, Clark, and Goff (1990). There were four major conclusions from her review of literature: (a) faculty perceive a lack of instructional support but wish to receive it; (b) higher education provides only limited faculty support; (c) faculty members are concerned about the lack of faculty support; and (d) administrators believe that support is being offered. Most studies focused on faculty and only a few studies measured administrators' perception of the support they were offering.

Lee (2002) applied a survey research instrument of her own design to a cross section of faculty and administrators in higher education. Participants must have either taught courses by distance education or have been in an administrative role to provide support for distance education. The object was to collect and analyze both quantitative and qualitative data. Two hundred thirty-seven faculty members and 38 administrators from 35 institutions responded ($N = 275$). The first stage of collection had a response rate of 65% of subjects that increased to 72% after 2 weeks using a follow-up e-mail. The

survey consisted of 35 items on a 5-point Likert- type scale ranging from (a) *not supportive* to (e) *very supportive*. Nine areas of Instructional Support were identified as the dependent variables including: course redesign (9 items); course facilitation (5 items); use and application of distance education technologies (3 items); teaching methods (3 items); evaluation (2 items); technology needs (4 items); rewards (4 items); incentives (5 items); and personnel (7 items). Each item was followed by an open-ended comments section in which respondents were asked to describe specifics related to their institutions. Although it was optional, 45% of the respondents commented on their experiences and offered their perceptions of instructional support for distance education. In order to establish the internal reliability of the instrument, Cronbach's alpha was computed on all items. The value of the coefficient alpha was .93 indicating satisfactory reliability. The article did not address sample size.

To measure quantitative data, Lee (2002) used multivariate analysis of variance and multivariate regression analysis. To analyze qualitative data, the Glaser and Strauss Constant Comparison method was used to group written comments. To address the question of the differences in perceptions, an independent *t*-test was conducted on each dependent variable. Statistically significant results were found for all dependent variables. Faculty mean scores on all variables were *less than supportive* with rewards and incentives being the lowest, while for administrators the exact opposite was true with the mean of only one variable (rewards) shown as *less than supportive*. For a measure of effect size, Cohen's standardized mean effect sizes were calculated with pooled standard deviations. Three out of the nine effect-size measures could be categorized as large; and the rest of the measures as medium to large. Her qualitative data was collected from two

types of questions: (a) describe instructional support other than that listed in the survey; and (b) provide an open-ended response describing instructional support at their institution in general. Lee found that the results of the open-ended (qualitative) data provided additional clarification of the quantitative data. The utility of this study could be seen as quantitative and qualitative data was analyzed together to deduce some possible causes for the differences in perceptions between faculty and administrators in regard to instructional support. Where administrators focus on the variety of support services, faculty focused on the amount and the quality of support services. Frequent, open communications was seen as a possible remedy for the mismatch in support planning. Other items that surfaced as dividing issues were the equity of support services across campuses; the consistency of support across mediums of instruction; and the tendency to support traditional technologies such as satellite as opposed to web-based technology. Although it seemed to be common knowledge that distance education was more demanding on faculty time, there were no rewards or incentives for dedicating this time to development and delivery.

Lee concluded with five recommendations for higher education: (a) administrators should carefully evaluate the effectiveness of distance education and instructional support; (b) faculty perceptions should be considered when designing support services; (c) professional development in support services should be a formal part of faculty career development; (d) distance education faculty members should be encouraged to share their experiences; and (e) timely and well-designed evaluations of distance education courses should help in the design of support services.

The studies reviewed above confirm the common wisdom that faculty and administrators perceptions and concerns can vary widely. Specifically, even when both faculty and administrators support distance education, their perceptions of the issues are different. The studies above agree that faculty want input into support issues relating to distance education rather than having support decisions made for them. But faculty must also be willing to see their role in the wider context of the institution.

Specific Support Issues for Distance Education Faculty

Recent research on faculty support necessary for successful distance education has found that there are both extrinsic and intrinsic variables that have an impact. However, like studies about the efficacy of distance education, this research tends to use face-to-face or traditional instruction as the status quo and distance education as the exception. Because distance education, especially online instruction, is growing in popularity, the number of participating faculty is also growing. While intrinsic rewards are often enough to motivate early adopters, extrinsic rewards have more importance to the next tier of adopters who have other interests competing for their time (Landis, Squires, and Leach, 1999). This section reviews studies that attempted to identify both intrinsic and extrinsic support issues for distance education.

Extrinsic Faculty Support

Wolcott (1997) examined the issues of tenure and promotion in relation to distance teaching in 45 Research I institutions. She used a qualitative approach applying the Constant Comparison method (based on Glaser and Strauss) that included semi-structured interviews with 34 individuals including faculty, distance education program administrators, and chief academic officers. The goal of her study was to define the

culture of rewards and incentives to participate in distance education. She first examined the data in broad terms including instructional context. She defined instructional context as including the priority and commitment to distance education, the value and reward structure, and policies and guidelines. She then examined reward dynamics including the weight of credit for distance education, the support for distance education, and the risks involved in making the commitment to distance education.

Wolcott's (1997) findings in relation to priority and commitment reflected the same administrative ambiguity found in other studies. Administrators felt that distance education could play a role in helping them meet the institutional goals of teaching, research, service but it was a somewhat low priority. "It's one voice among many." and "We have bigger fish to fry." were telling comments. Distance education was not seen as "attention getting." In most universities, the faculty reward system was directly linked to the tenure related activities of teaching, research, and service. She noted that when an activity did not have an obvious and direct connection to those concepts, it became marginalized. To add to that dilemma, teaching, the concept *most* related to distance education, was the lowest priority among the three. Wolcott reported that there was interest in several of the universities to place a great emphasis on teaching, which just served to confirm the lower status to which it had slipped. Another interesting finding was that although distance education was not perceived as a "scholarly activity" at the institutional level, it was more highly regarded at the departmental level. Wolcott speculated that this might be a result of individual departments being on the front line for productivity accountability.

Wolcott (1997) worked from the premise that a university's policies and procedures serve to codify their values and reward process. Therefore, she considered it important that she found so few policies and procedures in her sample that related to distance education. She did, however, find behavioral language relating to goals that could be met by distance education such as "outreach" and "extended education."

Wolcott also found that although participation in distance education was rarely singled out as a component of teaching, it was occasionally considered a component of service. She also found that when there was a strong connection between distance education and the research agenda of a college or department, distance education research was addressed as an area for research. She found these connections to be discipline specific, for example finding them in schools of nursing and of education, but not in schools of business.

Wolcott (1997) also found differences in who among the faculty were encouraged to participate in distance education. Older tenured faculty who had more choice in their endeavors were more likely to become involved in distance education than younger faculty still working toward tenure. Again, this was a consequence of so little professional credit being given to this pursuit. She cited the mantra of "Get through the tenure process first." as advice frequently given to young faculty. She concluded that the faculty success in distance education relies on "them finding something in it for themselves." Although the primary rewards may be intrinsic, there can be extrinsic rewards if faculty members are willing to explore the possibilities. The realization of differences between departmental and institutional support are also an important finding of this study.

Dickinson, Agnew, and Gorman (1999) sought to address the question, “Are distance education teacher training and compensation keeping up with institutional demand?” The specific purposes of their study were to determine: (a) how teachers used distance education methods in their course delivery; (b) how they viewed the strengths and weaknesses of the method; (c) whether they felt they had been sufficiently trained in adjusting their curriculum to distance education and their instructional design to meet the needs of the distance learner; and (d) what were the effects of the work load and compensation at their university. The study was based at the University of Arkansas and was supported by the Arkansas State University Distance Education Committee. Arkansas State was then using exclusively interactive compressed video as their distance education delivery mode. This study is included among studies on online or mixed mode distance education because of the similarities in findings in regard to faculty needs and perceptions of preparation time. The authors used a survey instrument of their own design that was based on the literature and then reviewed and critiqued by the Distance Education Committee. The survey included all 60 faculty at Arkansas State who had taught at least one course by compressed video. After the first mailing and a follow up reminder, the response rate was 73.33% ($N = 44$). The questionnaire included fifty-four questions divided into two sections. Section I on demographics focused on information such as academic rank, college or department, number of courses taught, and time of day courses were offered. Section II used a three-point Likert-type scale with *less* and *more* as the anchors. Section II questions focused in teacher preparation, methods of instruction, student response, and academic rigor with each category divided into

subsections. In each subsection, questions asked how respondents would compare the compressed video course with the traditional course.

Dickinson et al. (1999) analyzed their data by first using descriptive statistics and then the chi-square procedure to explore the differences in the frequency distributions among variables. Means and standard deviations were calculated for each question with a Likert-type score. The researchers used ANOVA to determine the extent to which faculty members differed in their training, teaching methods, preparation, and perceptions. Faculty identified “discussion” as the major weakness in teaching via compressed video (63.64%). “Testing” was the second most frequently mentioned weakness (43.18%). Forty of the 44 respondents (90.91%) indicated that more preparation time was needed to prepare for compressed video courses, but 75% said that other than their initial introduction to the equipment, no additional training or development opportunities related to distance education were offered. Eight-eight percent reported that no extra compensation or course release time was offered for teaching via distance. The researchers used their findings to support the argument that better faculty training might be part of the solution to the problem presented by the extra time needed to develop distance instruction. Faculty development might also address strategies for improving classroom discussion and testing since both of these instructional issues were identified as weaknesses. They specifically called for further research into how professional development effects course preparation time.

Rockwell, Schauer, Fritz, and Marx (2000) expanded the research on the specific support needs of distance education faculty in a survey-based quantitative study that included a large Midwestern land-grant university and two associated colleges. Their

study was important because it began to segregate support factors into specific areas such as professional development, technical assistance, administrative issues (such as student registration), and faculty/student communication. These factors were based on previous research by these authors and studies by Miller and Carr (1997) and by Olcott, Jr. and Wright (1995). The research setting was selected because the university and two colleges were actively expanding their distance education programs and had made a commitment to their success. The authors first interviewed 16 administrators to identify concerns about faculty training. They added these concerns to several others found in their previous work and in the literature. Thirty-nine items were listed that could be classified as training or support needs. The instrument was then reviewed by a panel of five faculty experts, revised, and then pre-tested by a group of 20 faculty members. The group critiqued the instrument for readability, structure, and form. The researchers revised the instrument for a final time and sent it to all 207 faculty teaching academic courses at the three institutions and to 30 administrators. A self-addressed envelope was included. A reminder postcard was sent ten days after the initial mailing and a reminder letter along with another copy of the instrument and another envelope was sent 20 days after the initial mailing. Code numbers were used to track responders to avoid annoying duplications. This three-step process was rewarded with a 67% response rate from faculty and a 77% response rate from administrators ($N = 163$; faculty $n = 139$, and administrator $n = 23$).

Rockwell et al. (2000) used SAS to calculate the means for all variables and to group them the proximity of the means. The Wilcoxon test was used to identify differences between: (a) teaching faculty and administrators; (b) tenured and non-tenured

faculty; and (c) faculty teaching only undergraduate classes and faculty teaching only graduate classes. The Kruskal-Wallis test was used to determine differences among: (a) teaching faculty who have taught or who teaching via distance, expecting to teach via distance in the next three to five years, and never expecting to teach via distance; and (b) faculty who have taught 10 years or less, 11 to 20 years, and more than 20 years. The significance level was set at $p = .05$. The 39 items on the survey were rated on a four point scale where 1 = *very important* and 4 = *very unimportant*. On the basis of overall mean score, 13 of the items were classified as *very important* while 26 were classified as *somewhat important*. None of the items were classified as *unimportant*. In the *very important* category, several items individual items grouped together. These groupings were: (a) developing interaction; (b) developing instructional materials; and (c) applying selected technologies. Respondents also valued “assistance with marketing the course,” an item that did not fit with others. Faculty who ranked “instructor to student interaction” higher in importance were those who had taught for 10 years or less ($X^2 = 7.80$; $df = 2$; $p = 0.02$) and those teaching only undergraduate courses ($z = 2.38$; $p = 0.02$). Those who ranked “student interaction with the instructional content” higher in importance were those teaching only undergraduate courses ($z = 2.55$; $p = 0.01$) and non-tenured faculty ($z = 2.57$; $p = 0.01$). Faculty who ranked “providing a local contact point for students” higher in importance were those teaching only undergraduate courses ($z = 2.59$; $p = 0.01$). In the category “developing instructional materials,” the researchers found that faculty who ranked “developing an instructional design” higher in importance were those who taught undergraduate courses ($z = 2.19$; $p = 0.03$). Faculty who had taught 10 years or less also viewed “developing an instructional design” as more important than did the

faculty with more than 20 years' teaching experience ($X^2 = 7.05$; $df = 2$; $p = 0.03$). The data also revealed that faculty who had taught 10 years or less ranked "mixing technologies" higher in importance than did faculty with 11 to 20 years' experience ($X^2 = 7.02$; $df = 2$; $p = 0.03$).

Rockwell et al. (2000) noted that the relegation of extrinsic rewards such as additional compensation to "somewhat important" was similar to what other researchers had found. In their conclusion, they discussed the significant differences among categories of faculty, especially younger non tenured faculty. In light of the growing demand for distance education, colleges and universities need to target faculty with less than 10 years' experience for professional development and support. They must ensure that support relating to distance education corresponds to what faculty identify as important needs. If distance education remains in the realm of tenured faculty, there will be a large unmet need as they retire. The need for distance educators is growing faster than the preparation of faculty to fill those roles and institutions will not be able to meet their goals unless specific action is taken to address faculty needs.

Schifter published three studies in 2000. Her third focused specifically on compensation models for distance educators at the postsecondary level (Schifter 2000c). Temple University and the National University Telecommunications Network (NUTN) endorsed her study. She took the unusual step of seeking respondents by sending queries to eight major telecommunications listserves asking for participants under the NUTN endorsement. A total of 212 individuals from 160 institutions responded. Although there is no way to calculate the response rate with this technique, she was able to analyze the returns in terms of their diversity. The respondents represented a good cross section of

higher education in North America and came from 45 states, Puerto Rico, Mexico, and Canada. Fifty-four were from two-year institutions, 120 from four-year institutions, 21 from primary graduate education institutions, 168 from public institutions, 20 from private institutions, 44 from state institutions, and 27 from both public and state related institutions. Eighty-three percent (39%) said their institution had been offering distance education for less than five years, 20% for between 5 and 10 years, and 39% for more than 10 years. Schifter sought to investigate seven variables in this study: (a) distance education administrative models; (b) distance education delivery methods used; (c) distance education learning course management tools (i.e. electronic learning platforms); (d) expenses paid for developing a distance education course; (e) special funding opportunities for distance education faculty; (6) expenses paid for teaching a distance education course; and (7) special funding opportunities for distance education faculty. Faculty respondents seemed confused by the questions regarding distance education administrative models since several responded in more than one way. Even with this working problem, there were still indications that most distance education courses were offered as regular departmental offerings, with only around 33% being managed by a separate administration for distance education (such as distance and/or continuing education).

Schifter (2000c) reported that the most used technology was the Internet (94%) with ITV ranked second (81%) and videotape ranked third at 64%. It was not uncommon for institutions to use more than one mode of delivery. WebCT^(R) was the most used electronic learning platform (50%), with FrontPage^(R) ranked second at 27% and Blackboard^(R) third at 24%. Again, institutions were found to use more than one learning

platform. In regard to faculty compensation for distance education, Schifter found that the most common compensation for teaching via distance was that ISP (Internet service provider) costs were covered. The least common forms of compensation were graduate or teaching assistants and faculty overload pay. Faculty travel was the most often mentioned special funding opportunity for faculty. She concluded that while no standards for compensation exist, two models seem to be emerging. In institutions where development and teaching a distance education course is expected as a part of the culture, compensation is the regular pay and no incentives are considered and faculty participation becomes a regular part of their professional career. In institutions where distance education is encouraged and supported by administration but is *not expected*, campus culture and precedence may provide the key to faculty participation. Schifter concludes with the argument that if mainstream faculty are going to accept the time consuming challenge of developing and teaching online courses, they must be compensated and given adequate support, and that support must be aligned with their perceived needs.

Berg (2000) also examined faculty compensation for developing and teaching distance education courses but approached it as a study in economics. He used existing data from multiple sources including the National Center for Education Statistics, the NEA, the Primary Research Group, and the British Open University. He also considered research findings from other studies focused on distance education economics. He found conclusive evidence that although distance education is on the increase, more institutions are using distance education, and the workload involved in distance education is greater than for face-to-face instruction; very few institutions offered additional compensation

for this increased workload. He argued that these findings, when seen in the light of the increasing profit margins for distance learning programs, provided a foundation for labor/management issues to arise. He cited the Primary Research Group findings that only 13.04% of distance education programs operate at a loss while 28.26% operate at a less than 10% profit; 32.61% at from 11% to 30% profit; and 13.04% at a greater than 50% profit.

Berg cites Daniel's (1998) study that showed while the cost of traditional classroom instruction increased at a steady pace as the number of students increase, the cost of distance education increased much more slowly after the initial investment in infrastructure was met (the break-even point.). That small incremental increase was faculty salary and after the initial investment, salary represented an estimated 70% to 80% of total cost. This finding confirmed what Wentling (2000) observed, that after fixed costs, faculty salary is the primary cost of web-based distance education. Since the initial investment in Internet based courses is lower than any other delivery mode, the profit margin is higher. Berg also found a significant difference in distance education compensation models between faculty who worked under administrative contracts and those whose salary was determined through collective bargaining. While 83% of contract faculty received no additional compensation for distance teaching, 82% of those in collective bargaining situations were paid an additional stipend.

Berg (2000) expressed concerns that the economic potential of distance education might inspire administrators to consider one of two risky models to increase the overall profitability of their institution. They might consider replacing labor with capital or replacing labor with less expensive labor. The *labor with capital* model considers the use

of pre-packaged courseware and the *labor with less expensive labor* model considers the use of junior or part-time faculty to teach already developed distance courses. Either model may also include the ideas of adding additional students to existing courses or otherwise making instruction more efficient. Both models are risky in terms of the overall quality of instruction. Another factor to consider when looking at the economics of distance education is the value of the intellectual property of the courseware developed. He cited an Instructional Telecommunications Council (ITC) 1998 survey that showed 45% of institutions retained intellectual property rights for distance education materials, 24% shared the right with faculty, 20% allowed faculty to retain right, and 11% had other models. The issue of intellectual property is relevant because the potential long-term income from well-produced materials is a form of compensation.

Berg's (2000) study presented some alarming potential problems for distance education faculty. Not only were they rarely compensated for their additional work, they also ran the risk of losing the rights to well developed courseware with income potential. On the optimistic side, however, because distance education is a profitable enterprise for most institution, resources were there to support faculty development needs, to maintain a higher quality teaching staff, and to honor the intellectual property rights. From an economic standpoint, the critical issue was the appropriate reinvestment of distance education profits. Berg saw the need for faculty to become aware of these issues so they did not become lost in the economics of the enterprise.

Intrinsic Faculty Support

Jones, Lindner, Murphy, and Dooley (2002) sought to examine faculty intrinsic supports to participate in distance education, and were the first to use the construct

philosophical position toward distance education. Specifically, the objectives of their study were to describe and examine: (a) teaching faculty by philosophical position towards distance education; (b) differences in distance education competency score by philosophical position to distance education; (c) differences in distance education value score by philosophical position toward distance education; and (d) differences in distance education information technology and support score by philosophical position towards distance education. The population for this study was all teaching faculty in a College of Agriculture at a land grant institution. Department heads were asked to identify all teaching faculty, and a list of 331 was produced. Sixteen of these names were later removed because they were not considered as holding a teaching appointment. Of the 315 survey instruments mailed, 196 were returned in two weeks for an effective response rate of 62.2%. Reminder notes and a final mailing boosted the response rate to 80% ($N = 252$). Jones et al. cite Dillman for their methodology. The survey instrument of the authors' design was a four-page auto-scan document that allowed data to be input into a digital file via an optical character reader (OCR). Survey question content was based on the literature, and was reviewed by a panel of five college experts in instructional technology. Selected faculty members for the College of Education and Liberal Arts pilot tested the instrument and minor alterations were made. Part I of the survey asked for demographic information and Part II consisted of 28 statements designed to measure distance education concepts of competence, value, and information technology and support. *Competence* referred to 11 items on the questionnaire relating to the use of electronic technologies, and *value* referred to nine items used to measure the importance of the role of technology in teaching. Information technology and support referred to

eight items used to measure the perceived availability of equipment, facilities, and training.

Jones et al. (2002) analyzed their data by first summing scores in specific related areas then finding the means and standard deviations. They performed *t*-tests to identify differences in those philosophically opposed to and those philosophically in support of distance education. Most faculty were not philosophically opposed to distance education (85%). Interestingly, the distance education competency score was *not* related to the philosophical position towards distance education ($t_{250} = .52$). This dampens the argument that faculty who do not support distance education are less technically competent. There was a statistically significant relationship, however, between faculty who were not philosophically opposed to distance education and how they valued distance education ($t = 4.31$, significant at $p < .05$). Those who supported distance education also valued it. The authors cite Linder, Murphy and Dooley's (2001) finding of gender differences among faculty who support distance education, and call for additional research on the philosophical differences related to faculty member's gender and their attitudes toward and association with distance education.

The studies reviewed above show that both intrinsic and extrinsic motivators play a role in faculty willingness to participate in distance education. Motivators will become increasingly important as the need for online postsecondary faculty grows. Because we have gone beyond the time of the early adopters who were motivated by a love of technology, institutions of higher education must begin to consider how to reward faculty for the additional time and effort needed to deliver instructional content online.

Faculty Roles, Competencies, and Professional Development

Research on faculty roles in distance education falls into three categories: (a) defining faculty roles; (b) identifying competencies for successful teaching performance; and (c) identifying professional development needs. Because so many decisions relating to online programs are driven by administration, it is often pure chance that faculty in a program slated for online delivery are actually prepared to play the role. This section reviews studies that address the issues; what faculty roles and competencies are needed to develop and teach postsecondary courses online, and what is the role of professional development in preparing faculty for this task.

Online Faculty Roles and Competencies

Meyen, Tangen, and Lian (1999) examined the issue of online faculty roles in the context of partnerships between faculty and online technical developers. They based this study on their own 1995 study that proposed a model for faculty and technical collaboration for online course development. In their 1999 study, they reiterated the development model including specific details of roles of the instructional developer (the faculty member) and the technical developer. They expressed the two roles in terms of responsibilities, and evaluated the success of their development model by evaluating the success of two specific courses developed using the model. The researchers used both formative and performance (summative) evaluations, and used both qualitative and quantitative methods of analysis.

Meyen et al. (1999) conceptualized role identification for online faculty and technical developers in terms of responsibilities and expressed those responsibilities in terms of mutual tasks, specific faculty tasks, and specific technical developer tasks. An

interesting confounding issue was that for most faculty members, the idea of working in collaboration for course development was new, but for technical developers, it was the usual process. In addition to role identification, their model included five basic goals for successful course design and delivery that helped focus the collaborative teams. The five goals were: (a) to produce instructional content that was effectively designed; (b) to achieve a functional delivery system, (c) to produce a program with stable content and stable technology, (c) to develop a supportive relationship between the instructional developer and the technical developer, and (d) to create residual conditions that contribute to future instructional development.

Meyen et al. described three approaches to implementing the formative evaluation: (a) they conducted a pilot study of the navigation system; (b) the courses were offered as a regular part and under the normal conditions of graduate online offerings and therefore were included in the university wide course evaluation progress; and (c) a series of focus group sessions were held to seek feedback from students enrolled in the courses.

The pilot study of the course site navigation system included 14 students from disciplines outside of special education and focused on navigation issues only, not content. The researchers believed that it was important to evaluate the navigation system separately from course content so any problems discovered with course site navigation did not have a negative “spill over” effect on course content evaluation. In fact, several major navigation issues were identified and corrected before the general field test.

The course field tests involved 31 graduate students in the two courses. The focus groups were held as a part of a master’s degree project and were held during the second half of the semester after all students had completed at least half of the lessons. The

instructional developer (faculty member) did not participate in the focus group session. Course was revised based on the feedback from the focus group. Comments centered on 14 specific issues: (a) students valued the flexibility of the format; (b) students varied in progress but most completed the course on time; (c) students valued interaction with the instructor; (d) students were very conscious of course design; (e) the technical skills of students was not an issue; (f) students valued the ability to review materials on the course site; (g) students valued the privacy of electronic communication with the instructor; (h) collaboration could be effectively achieved online; (i) students did neater work when products were required; (j) response time tended to increase as students progressed; (k) students wanted the ability to print out hard copy of all course materials; (l) students wanted access to the outlines and notes in advance of completing the lectures; (m) students wanted flexibility in when they had to complete embedded activities; and (n) students wanted more frequent images of the instructor during web cast portions of the course.

The formative evaluation used two instruments: a survey form and the Curriculum and Instruction Survey (C & I Survey), the internal university evaluation tool. At the end of each lesson, students were required to complete a lesson-specific formative evaluation focused on instructional design, content, and technical difficulties. Because those findings were lesson specific, they were not included in this in this article. The C & I Survey was a university wide evaluation procedure administered by a third party. Those results were shared with the faculty, chairs, and deans. For the two online courses, the

C & I was administered and scored electronically. The survey focused on the principles of effective teaching. For this study, the 10 general items were used and 10 out of the 28 optional items that were appropriate for online instruction were also included.

The results of the student evaluations were expressed in terms of means comparisons for online courses, web supported (enhanced) courses, C & I department courses, Sped (Special Education) courses, and university wide. Perhaps because of the small sample number, no additional statistical analysis was provided. It is interesting, however, that for the online sample courses for the 10 general items on the C& I Survey, the scores are slightly higher in *every category*. The researchers concluded that this indicated a high level of student satisfaction with the courses produced using the collaborative model.

Another extremely useful finding from Meyer et al. (1999) was a report of instructional development time and technical development time by hours per lesson and hours per course. This is one of the first analyses of person hours related to postsecondary online instructional development. The researchers found that 40 hours of instructional development time and 16 hours of technical development time were needed for every lesson, totaling 896 person hours per course. Assuming an FTE as 1960 hours, the development of one online course would be 45.71% of an FTE. This significant time commitment assumes a collaborative model with one-on-one technical assistance, so a faculty member working alone or with technical support at a distance might expect to dedicate an even greater percentage of their time to the task.

Schoenfeld-Tacher and Persichitte (2000) used six in-depth interview/surveys to explore the differential skills and competencies required of teaching faculty teaching

online. Their study took place at a Doctoral I institution in Northeastern Colorado.

Although all six faculty taught on the Internet, there were differences in how they used synchronous and asynchronous tools, and in their level on input and control in the course design. Two faculty members were using courses that had been designed by others while four had developed and were using course sites of their own design.

The researchers introduced their study with a review of the literature focused on the skills and differential demands of online faculty members. They paid particular attention to the four-level typology developed by Moore and Kearsley (1996) that identified and classified levels of distance education according to the scope and administrative complexity of each, and the three-types of interaction including: (a) learner-content; (b) learner-instructor; and (c) learner-learner. They used Moore and Kearsley's language to build their constructs. The researchers classified their study as a "critical analysis" and conducted both Phase I and Phase II by first by mail and then with brief individual interviews to clarify and confirm the data.

Six faculty members agreed in advance to support the study. They received a letter of thanks that described the study and included 10 open-ended questions about their experiences and perceptions. When this data had been analyzed, the researchers developed three follow-up questions designed to add focus to the overall findings. The research design was qualitative but structured. Both of the letters and sets of questions are included as appendices to the article that makes the study more replicable than is sometimes the case in qualitative investigations (Northcutt and McCoy, 2004).

All six faculty participants in this study were able to express their experiences teaching on line in terms of comparison to teaching face-to-face, thus providing a

common frame of reference. Two participants were working from sites developed by others and four had total responsibility for site development and implementation.

Although there were variations among the faculty participants, all participants agreed that the time commitment to develop courses and teach online was the major concern. The second most critical finding was that the instructors' familiarity with instructional design principles was strongly linked to their overall satisfaction with teaching online. Although all participants had above average technical skills, their computer experience before teaching online varied widely. All participants reported a lack of technical support from their college and that they had gone elsewhere (to professional association or to colleagues) for assistance.

When asked about the major pedagogical difference between teaching face-to-face and teaching online, almost all participations expressed differences in student motivation and student interaction. All participants realized the need to develop new ways of communicating with students. This change in communication was reflected as "experiencing more communication over time" as faculty and students got to know each other, and also in "different forms of communication." A chemistry instructor described how he and his students developed "short hand" code because of the difficulty in sending documents including superscripts and subscripts of chemical formulas over the Internet. (Author's note: this same issue appears as a barrier to teaching statistics online. Documents must often be covered to pdfs and treated as graphics for accurate downloading and printing.)

Two of the six participants were very frank about their need to develop new pedagogical skills. Their comments were reminiscent of Gunawardena (1992) whose

experiences were discussed in the literature review section of the article. Faculty members realized that their role had shifted from teacher to facilitator and that the language in e-mails and other documents had to make up for the loss of eye contact and body language. Several faculty members also mentioned the need to help students overcome this communication limitation and encourage them to use active, descriptive language.

Schoenfeld-Tacher and Persichitte's (2000) follow-up survey focused on three issues including faculty satisfaction after teaching online, their interest or intent to teach online again, and what they had learned as a result of teaching online. In their conclusions, the researchers listed 10 specific skills and competencies that had emerged related to faculty success and satisfaction. These included familiarity with research on distance learning, competency in instructional design, and a deep knowledge of their subject area. They also listed the ability to develop constructivist learning activities and strategies that promote interaction among the instructor and learner, the instructor and the class, and learner to learner as valuable skills. Two of the advantages of identifying skills and competencies needed for online instruction are that faculty can be better prepared before they begin teaching and administrators have a better frame of reference when supporting faculty training and development.

Paulson (2002) investigated the concept of reconfiguring faculty roles in virtual settings as a qualitative case study. She grounded her work in a detailed literature review on the problem of faculty roles and responsibilities in distance education; a progress report on how the Western Governors' University (WGU) was dealing with the issue of faculty roles; and several very specific recommendations on defining faculty roles and

responsibilities. She also relied on comments from several well experienced staff members from the National Center for Higher Education Management Systems (NCHEMS), and the Western Cooperative for Educational Telecommunications (WCET).

Paulson reported that the current studies (as of 2002) on faculty roles and responsibilities in distance education agreed that faculty were often left to define their roles and responsibilities themselves; to seek out professional development and technical assistance for themselves; and to adjust their own approach to distance education pedagogy either in isolation or in small informal groups that they, themselves, had sought out. Although there was some planning at the college and university level on distance education, the planning tended to focus on the administrative and accreditation issues that, while critical to the institution, did little to support the faculty. Technology issues, also, were dealt with at the institutional or sometimes even the higher educational consortium level and were of little assistance to individual faculty members. Like Lee (2000), Paulson identified a real disconnect between distance education policy and distance education faculty.

The WGU approach to solving this problem was the “unbundling” of faculty roles. Paulson sites Wang (1981) who traced the unbundling concept in higher education back to the 1970s when a law professor explained overall faculty roles as a violation of the Sherman Antitrust Act. In other words, in most university settings, faculty were given a huge responsibility of developing courses, delivering courses, assessing students, and reporting back on the success of courses with little intervention, support, or balance. No intervention, support, or balance was offered unless something went badly wrong, in

which case faculty were held responsible. The concept of unbundling the faculty role was suggested not to reduce the workload, but rather to define which roles and responsibilities should be given to faculty and which were more rightly administrative or support tasks. This concept seemed to Paulson particularly relevant in the context of distance education where so many varied roles and responsibilities are involved in making courses successful.

Paulson (2002) stated that the most flexible asset at institutions of higher education was faculty time and effort. The labor/capital ratio was unusually high in postsecondary education where the “quality of the educational experience” was often defined by students as “access to faculty members.” Faculty members also had a great deal of control over their own use of time. But when distance education (a highly labor intensive process) was introduced, institutions tended to look at improving their bottom line by increasing the productivity of distance education. Although they wanted to see greater productivity, they did not allow for the fact that the access of students to faculty, a primary measurement of quality, was in jeopardy because faculty time was being spent in distance education courseware development and delivery.

The traditional three-part assessment of faculty productivity; teaching, research, and service, did not easily accommodate instructional technology or instructional materials production. Paulson believed that there was already considerable de facto unbundling evident as part-time faculty members (who teach approximately 40% of college courses in the US) took a greater part of the teaching load so faculty could focus on research and service. But when faculty role unbundling was done with the aim of improving student satisfaction, the result was a more focused faculty workload. Paulson

stated that the unbundling model was more easily understood when it was expressed in terms of traditional education and then applied to virtual education. She provided the example of a large, freshmen lecture course where the subject matter was defined by the department chair; committees of faculty selected the text books; a senior faculty member took charge of the course and delivery the majority of lectures, and teaching assistants worked with students in small groups to insure they master the content.

Paulson presented a matrix that showed the WGU approach to unbundling roles by identifying five specific tasks and the levels of personnel (instructional agents) who could successfully perform those tasks. Tasks included: (a) designing the course or curriculum; (b) developing the course or curriculum; (c) delivering the subject matter; (d) mediating or tutoring; and (e) assessing individual student learning. Examples of instructional agents included full-time tenured faculty, junior faculty, and graduate or teaching assistants. In addition, by identifying technical support tasks could be done by professionals other than instructional agents, administrators were also able to develop a better model of how to allocate resources.

Paulson used the University of Phoenix Online as an example of an institution of higher education that applies a business model to course development and delivery. In that example, courses are designed and developed by an instructional design team working with content experts. Faculty members are trained on how to deliver that specific course. Faculty time is spent specifically on student contact including mentoring and assessment. The University of Phoenix model is useful because it provides such a large scale application of this content. A limitation, however is that unlike most private and

state universities, a great majority of their faculty is part time and non-tenure, track. The teaching, research, service triad does *not* impact their approach to workload.

Paulson's recommendations include a call for university administrators to reexamine faculty workloads in regard to distance education from the point of view of cost efficiency and cost effectiveness while still considering the issue of quality:

Academic leaders should view unbundling and technology as cost-effective ways to enhance student learning productivity. Improving access and learning are the desired outcomes, not eliminating faculty positions, as some might perceive. (p. 139)

Williams (2003) investigated the concept of faculty competencies for online instruction. Specifically, his study had two major purposes: to identify the roles and competencies needed in distance education in higher education, and to rate the importance of those competencies. He applied the Delphi technique to this fall, 1999 study, and used Ziglio's (1996) description of a Delphi study including a small group of participants, anonymity of participants, multiple rounds of surveys, and reporting the results back to participants. The participants never met face-to-face. It was not necessary because they were expected to identify critical factors individually rather than to work towards compromise. Williams also cited Isaac and Michael's (1995) recommendation to not allow face-to-face meetings of Delphi participants because stronger participant's opinions can sway others away from their original intent.

Williams (2003) selected the expert participants for this Delphi study according to four criteria including that they: (a) must have made a noteworthy contribution to the field through writing; (b) must have at least three years' experience in the field; (c) must be nominated by at least two peers independent of each other; and (d) they must be

willing to participate. The final panel included 15 individuals who participated in all four rounds. Grouped by profession, the panel included seven directors, five professors teaching via distance, two deans, two instructional designers, one coordinator, and one manager.

The Round One survey consisted of descriptions of twelve professional roles in distance education and descriptions of their accompanying roles and outputs. Panelists were asked to accept or reject those roles and to make modifications of the roles and outputs if they wished. Panelists were also invited to suggest additional professional roles needed to produce and deliver successful distance education. In Round Two, the panelists dealt with a questionnaire that synthesized the Round one input and presented a menu of 57 professional competencies that they could either select or reject as being relevant. They could also add their own competencies if they wished. In Round three, the panelists were instructed to rate the competencies on two scales: criticality and frequency. In Round Four, panelists were asked to review their responses in relation to the group median. Williams argued that because of the small sample size, the median was more appropriate than the mean because the median and corresponding interquartile range was less sensitive to extreme score.

Williams (2003) described the limitations of his study as including only higher education (including both two year and four year institutions), and assuming a certain level of technology such as Internet access. The study was limited to English speaking experts in distance education who were primarily from the United States. The results were expressed in terms of the three research questions. In summary, the roles and competencies necessary in distance education in higher education were expanded to

thirteen with a specific split between the original role concept of "administrator" into administrator/manager and leader/change agent. Experts also suggested that the role of web publisher be expanded to include all media thus describing the role as media editor/publisher.

In Round Two, the panelists defined more than 50 competencies, 30 of which were found in common. These competencies were presented as a table delineated by rank, competency name, and category including communication/interaction, technical, management/administrative, and miscellaneous. The top ten competencies were collaboration/teamwork skills, basic technology skills, interpersonal communication skills, English proficiency, knowledge of distance education, writing skills, questioning skills, skills in development of collaborative student focused learning activities, adult learning theory, and knowledge of support services.

In regard to research question two, Williams (2003) divided the competencies into two categories, *general* and *role specific*, and asked panelists to attach the competencies to the roles. The roles with the greatest number of competencies attached to them were instructional designer, instructor/facilitator, trainer, and leader/change agent. On the low end of the spectrum was support staff and evaluation specialist. In regard to research question three that asked how the resulting roles and competencies differed from those identified by Thatch (1994), Williams found that the differentiation of the administrator role into two roles (leader/change agent and administrator/manager) and the increasing importance of basic technology skills both emerged as significant differences.

Williams (2003) concluded that the emergence of collaboration/teamwork as the primary competence related to distance education contained a real message for higher

education. This type of competency, along with the role identity of leader/change agent on the administrative side and instructor/facilitator on the instructional side, means that as distance education matures, better defined and more sophisticated roles and competencies will immerge. Identifying roles and competencies not only helps in decision making about professional development, but also helps individuals decide if their own personal skills and abilities are appropriate for distance education.

Easton (2003) sought to clarify the instructor's role in online distance education by focusing on their perceptions of their roles as online instructors including: (a) how they organized their tasks; (b) how they managed their time; and (c) how they refined their skills. Because it was a qualitative study, it was also open to new issues that arose and was not limited to these three factors. The communication process was central to the investigation. In her words, "The role of the online distance learning (ODL) instructor is ambiguous and often ill defined. This ethnographic case study explores communications processes that affect the roles of the ODL instructor." (p. 87)

To establish her needs statement, Easton (2003) cited seven recent articles that identified weakness in distance education research. Most studies focused on technology rather than pedagogy. Thus, they were helpful to technology planners but of limited use to first-time online instructors. She chose to examine the dynamics of a distance education model at a large state university in the southeast that paired lead faculty and mentors to deliver each course. The mentors served as the primary student interface. The purpose of the study was to observe and activities and behaviors that mentors (M) and lead faculty (LF) used to define their roles and the communication process they used to manage the dynamics of online teaching. The problem was that because the demand for

online instruction continues to grow, faculty are often given little lead time to build courses or to conceptualize their online role. In this model, the use of mentors was thought to be a practical solution to the workload issue. The author believed that the presence of both lead faculty and mentors would prove to be an interesting dynamic as students and teachers defined and navigated the “lead faculty” and “mentor” roles.

Easton’s (2003) research question was, specifically, what new roles, if any, are emerging in the instructional delivery of online distance learning (ODL). Because this was a qualitative study, the variables were implied in the purpose and had the potential to be clarified as the study progressed. In this study, the independent variable was predetermined because the actual professional roles of the instructors was set (lead faculty or mentor), but the ways in which their emerging role definitions were operationalized was fluid; that is it was one of the issues being explored. The participants in this study included 18 mentors and six lead faculty. All lead faculty were full-time professors at the university and were also teaching face-to-face classes. Five of the six were non-tenured. All mentors held graduate degrees and 12 worked full-time (in addition to their mentoring roles) and of those, nine were teaching at community colleges. Six were full time graduate students. The sampling procedure was purposive as subjects were selected because of their professional roles in ODL at this university.

Easton followed the six basic techniques for trustworthiness of qualitative research that include triangulation, member checks, long-term observations, peer examinations, participative or collaborative modes, and clarifying researcher bias. At first, during the design meetings and discussion, researcher was a non-active participant. She then became a student participant-observer in three ODL courses; and finally, as she assumed the

professional role of Mentor Coordinator, she became an active participant observer. She noted this not only to define her participant observer role but also to identify this as a possible source of bias since she had a vested interest in overall success. Mentors and lead faculty in this study consented to participate. Students moved through this program in cohorts. The implementation was gradual but “grew exponentially.” During the fall 1999 semester, approximately 211 students participated, and in the spring of 2000, 140 were enrolled. In the first semester, many students enrolled in two or three courses but by the second semester, many had reduced their course load.

Easton (2003) described her data collection was a nonlinear process including collecting data, recording notes, member checking, and creating memos. Several methods were used for organization including utilizing a variety of interpretive tools. Thematic outlines were color-coded based on combining similar themes of a specific pattern. The data was sorted and reorganized as computer documents. She applied Glaser and Strauss (1967) grounded theory to analyze data and construct meaning. Data analysis relied on the use of open coding and theoretical memos. She framed her study in time beginning just prior to the fall 1999 semester and ending at the conclusion of the spring, 2000 semester. The methods used for data collection occurred in two phases and were triangulated to include: (a) participant observation; (b) historical documentation; (c) focus group meetings with mentors; (d) in-depth interviews with mentors, lead faculty, administrators and students; and (e) secondary data developed for evaluation purposes by the university. Data was collected from both lead faculty and mentors, using the telephone and the Internet. Phone conversations were taped (with the consent of the subjects) and e-mail was saved as documents to provide records for analysis. She

summarized information and then presented to participants for validation (member checking).

Easton presented her findings by subject groups and by themes. Faculty began their experience with online teaching as both unsure of what problems might arise from both mentors and students but also confident that their prior teaching experience would enable them to cope with these issues. However, by the sixth or seventh week of the first semester, differences began to occur. Faculty who had prior experience teaching online maintained their confidence and expressed their communications with their mentors in proactive terms. Faculty new to online teaching were less confident and “seemed to be waiting for direction and articulated a reactive rather than a proactive communication strategy.” About nine months into the program, lead faculty had taken a number of contrasting positions regarding the proper role for mentors, and those roles were based on roles with which they were already familiar. Role perceptions ranged from mentors “doing leg work” to mentors “really facilitating learning and supporting students.”

Easton reported that lead faculty also were observant of how mentors organized information and communication to help them in teaching, for example, one mentor established an “Ask the Teacher” section on the course site. Although lead faculty were divided in their perception of mentor roles, they were far more consistent in their perceptions of their own roles. “The lead faculty develops the course and supervisors the mentors” was a typical respondent statement.

Mentor themes during start up were optimism, confidence because of prior teaching experience, and differences in confidence and communication working with various faculty members. For both lead faculty and for mentors, the workload with online

teaching was greater than they expected. At the end of the second semester, time and workload were still major issues for mentors. They reported working 12-15 hours per week during Semester 1 and approximately 10 hours a week in Semester 2, because, as one said, “I learned to work smarter.” An interesting issue that arose between lead faculty and mentors was that when lead faculty changed the course content during the course to accommodate students’ needs or to provide remediation, it was critical that they remembered to communicate with the mentor that these changes were about to occur.

Easton stated her conclusion this way:

At the basic level, three important themes emerged for both mentors and lead faculty that suggest challenges for the virtual instructor:
Incorporating alternative course management practices, addressing specific issues in virtual communication, and considering new paradigms for thinking about time and space for teaching. (p.101)

Teaching online seemed to trigger an opportunity for some to reassess teaching philosophies. For many instructors, teaching successfully online led them to question their taken-for-granted assumptions regarding control, student learning, and evaluation. (p. 102-103)

Professional Development for Distance Education

Research on professional development for college faculty in the areas of technology and distance education, while not plentiful, is becoming more available as administrators and researches recognize that the lack of professional development opportunities can serve as a barrier to successful distance education participation (Betts, 1998, and O’Quinn and Corry, 2002).

Kubala (2000) reported on a project centered on advancing the academic and technical skills of community college faculty by offering two doctoral level distance education courses through the University of Central Florida College of Education in

1997. His case study described how two doctoral level courses were offered to community college faculty. The two desired outcomes were advancing the academic education of the community college faculty members, and exposing community college faculty members to well designed web-based instruction. The web-based design structure offered to faculty members was Kubala's own (1998) "11 Canons for Distance Learners." The researcher believed that if online course design included frequent professional level communications with faculty, students would apply higher order thinking skills and a feel sense of empowerment. Faculty would be challenged to explore the academic content in real depth. Kubala's premise was that web-based instruction provided a greater sense on anonymity than does the traditional classroom environment so professional level students could ask question or respond to questions without fear of being wrong and loosing face with their peers.

Kubala's overall faculty development plan was an immersive instructional design. That is, community college faculty members became students and were immersed in both course content (for their own academic advancement) and course design and delivery as professional development. Kubala's strategy was to first involve all faculty members in an orientation session at the University of Central Florida for a lecture/discussion session including exploring the course syllabus, the papers to be written, timeline, and grading policies. Kubala also used that time to explore faculty members' technical skills including general computer use, web research skills, and e-mail and web communication skills. Faculty-students, as Kubala called his participants, took time to develop their own student homepages on the course site not only to share personal and professional information with other students but also as a practical exercise in posting text and photos

to the site while still in the face-to-face environment with immediate technical support at hand. The concepts of “Netiquette”, the protocols for professional and constructive web communication, were also included in the orientation session.

Kubala (2000) reported that from this case and from previous web course delivery experiences, he found that technical support personnel were critical to faculty success. Not only was faculty time not well spent when dealing with technical issues, but also faculty tended to underestimate their own abilities to employ innovative techniques when technical support was not readily available. Teaching faculty-students how to manage their time in the distance environment was also critical to success. Without face-to-face class meetings to keep them on track, it was easy for busy professionals to let the coursework slide. The course was developed using several milestones for performance and participation so faculty-students would be reinforced as they interacted and responded to the timeline. Kubala also made the deliberate decision to not include synchronous chats in the course because of the difficulty in scheduling. He described this as a trade-off between the value of the synchronous comments and feedback and the cost of forcing students to participate at a predetermined time.

Kubala (2000) reported the results of the faculty-student course evaluation as qualitative data but rank ordered similar responses by frequency. For example, he reported that all respondents said that web-based courses met their learning needs, and all responded said they would recommend these types of distance learning courses to their friends and colleagues. Ninety-four percent of faculty-students reported that they felt adequately connected to the instructor; eighty-one percent reported that they now preferred web-based courses to traditional courses, and nineteen percent reported that

they would like to try a combination of traditional and web-based teaching. *Flexibility* and *convenience* were words most often used to describe what students liked best.

Kubala's (2000) case study included both positive and negative comments in order to present a realistic impression of faculty-students' attitude and opinions. For example, students appreciated not having to waste time driving to campus, the individual attention they received from the instructors, and the flexibility to organize their own time. On the other hand, faculty-students were concerned about missing interaction with classmates, managing their own time, and technical considerations such as the limitations of their own Internet providers. Unfortunately, the number of faculty-students involved in this case study was not mentioned, which makes the generalization of findings somewhat difficult.

Kubala (2000) presented practical and realistic methods to help designers and faculty members convert traditional instruction into the web-based instruction. He stated that "almost any course can be taught at a distance using the Internet." Because he is such a strong advocate of web-based instruction, there is an obvious researcher bias. But, since this case study includes so many practical suggestions, it has value. The suggestions, techniques, and guidelines are presented in the context of an actual case and applications are described in light of the faculty-students evaluations and reactions.

Gold (2001) described a two-week faculty development pedagogical training course aimed at training teachers to operate effectively in an online educational environment. The researcher described the professional development strategy as both constructivist and immersive because it placed the faculty learners in the position of online students so they could experience first-hand what advanced level learning was like

in the online asynchronous environment. He provided brief explanations of both objectivist and constructivist learning/design theory to help clarify his instructional approach. Because the terms used to differentiate learning theories vary among experts, these explanations were especially pertinent to understanding his approach. Gold defined constructivism in this way:

Constructivism is less content oriented but more learner centered [than is objectivism]; the designer goal is to create an information-rich, and socially meaningful (i.e. communication and collaboration filled) learning environment. The facilitator aides the learner through the creation of authentic tasks and helps the student integrate other understandings of multiple perspectives through reflection. (p. 36)

Forty-four practicing teachers participated in the February 1999 course which was the sixth version of the program offered at a public college in the state of New York. The course employed a discussion-centric structure and used a constructivist methodology to prepare teachers for the pedagogical and personal changes they would experience when teaching online.

Gold (2001) tested seven hypotheses in this case study: (a) the extent to which respondents rethought their teaching practice was related to the increase in exposure to the course; (b) the extent to which attitudes toward various aspect of online teaching and learning was related to the increase exposure to the course; (c) the extent to which factual knowledge increase was related to increase exposure to the course; (d) the number of respondents who indicate that online distance learning courses should be a part of regular faculty work was related to increase exposure to the course; (e) the amount of additional monetary compensation respondents required to teach online will decrease was related to increase exposure to the course; (f) the number of respondents who apply for grants (or monies) to take teacher training programs for teaching online distance education course

was related to increase exposure to the course; and (g) the number of respondents who indicate that online distance learning training course like this one should be required of all current and future teachers was related to increase exposure to the course.

The sample of 44 teachers in the class represented the total population of participants. Gold compared their demographics to the populations in other similar teacher training studies and found that his sample was fairly representative, although their technical skills may have been slightly (but not significantly) higher. He recognized that the small, self-selected sample made it difficult to generalize to other populations.

The research design included a pre- and post-test for all participants taken online with total anonymity. The survey included questions that directly reflected the consents of the seven hypotheses but also included other questions that were not included in this study. The seven hypotheses were examined to investigate changes in participant attitudes and behaviors. The dependent variables were determined by the pre- and post-course surveys and how they differed. The independent variables were the exposure to the course measurements. These measurements were: (a) the number of self-reported hours in and outside related to the courses; (b) the number of times logging into the course; and (c) the number of postings made to the discussion forum. The relationship of the dependent to the independent variables was evaluated using linear regression and chi-square. The linear regression was used to measure the pre- and post-course means to see if the *exposure to the course* variable had any effect. The chi-square was used to check the change in the distribution frequency. Both were measured at the .05 level.

Gold (2001) described his findings related to each hypothesis. The extent to which teachers reported “rethinking their teaching practices” was significantly related to

the exposure (the time spent) to the course. He also reported that the content of the discussion forums provided qualitative evidence that teachers were rethinking their teaching practices in preparation for the demands of online instruction. The extent to which attitudes toward various aspects of online teaching and learning was related to course exposure was also found to be significant. Specifically three questions provided strong results: Online distance learning courses encourage more student participation than traditional face-to-face courses ($p = .005$); Online distance learning teachers and students can produce learning outcomes better than traditional face-to-face teacher and students ($p = .013$); and Online distance learning courses have more student-to-student interaction than traditional face-to-face courses ($p = .014$).

Hypothesis Three, the extent to which factual knowledge was related, did not show any statistical significance until Gold used a paired samples t-test to examine whether the frequency of the distribution of pre-and post-course scores differed significantly. The result was highly significant ($p = .000$). Gold speculated that that his original test measurement, the difference in scores on a 15 item multiple choice quiz on online teaching and learning, was not an actually measuring newly constructed factual knowledge because he was not teaching to that test.

Hypothesis Four relating to the number of respondents who believed that distance teaching should be a regular part of the faculty workload was tested with one question: Should teaching online distance learning course be a regular part of faculty work? Significant results were found using a chi-square test ($\chi^2 = .036$). Hypotheses Five relating to the belief that teachers should be given extra compensation for teaching online was tested by asking teachers pre-and post-course, how much they thought they should be

paid for teaching online (providing choices in \$500 increments). The mean response went down significantly in the post-course survey (*Chi Square* = .046) indicating that when online teaching was “demystified,” teachers felt less need to ask for higher compensation. Gold commented that this finding should be taken seriously to administrators who might be able to relieve the demand for additional compensation by providing training for distance educators. Hypothesis six related to seeking grant money for additional training and Hypothesis Seven relating to the attitude that all teachers should have a course in distance education teaching were not supported with significant findings.

Gold’s major conclusions were that well designed training on how to design and deliver online instruction was critical to teachers’ short-term and long-term success in distance education. Teachers who had learned the basics of online teaching, had seen some of the pedagogical strengths and weakness, and who had reflected on how their teaching style could be adapted to distance education, felt more confidence and felt less need to demand additional compensation. Gold also believed that a constructivist training strategy was the most effective approach to sharing this knowledge with teachers who were well educated, enthusiastic professionals. The concept of using online instruction as professional development for online instruction is not new, but Gold’s learner centered constructivist approach provides a well documented model.

Like Gold, Irani and Telg (2002) believed that the careful design and delivery of faculty professional development in distance education had a great deal to do with success. Unlike Gold, however, their study involved university training specialists rather than faculty members. Irani and Telg surveyed training and development specialists in 14 land grant colleges in order to explore how universities with active agricultural programs

were conducting distance education training for their faculty. They based the need for their study on several studies (Roberts and Ferris, 1994; Stamen, 1990, and Wetzel, 1995) that identified the lack of faculty training and support as a major barrier to the unitization of distance education. If professional development could not only train faculty and but also increase their perception of support, possible outcomes might include increased faculty participation in distance education.

Although Irani and Telg used both quantitative and qualitative methods in their study, the emphasis was on qualitative techniques including small sample size, the treatment of the four open-ended response questions, and the case study approach to describing results from individual institutions. The quantitative statistical techniques were descriptive and served to describe the population and to identify frequency of response. The 14 subjects were selected from the listserve of the Agricultural Communications in Education (ACIE) Distance Education Instructional Design Interest Group. One training and design specialist was selected from each of the 14 institutions who were members. All 14 subjects responded to the questionnaire and only a few demographic questions were left unanswered.

The 37 item electronic questionnaire included dichotomous answer, multiple choice, and fill-in-the blank items specifically designed to assess the structural detail and components of training and development programs at these institutions. In addition, the survey included four open-ended questions at the end of the survey focused on respondent perceptions of benefits, potential issues and problems, and suggestions for developing improved faculty training for distance education. The questionnaire was reviewed by a panel of faculty experts in distance education in order to establish face and

content validity. Quantitative responses were analyzed electronically, and qualitative responses were categorized using the Constant Comparative technique developed by Glaser and Strauss.

None of the faculty training described by the respondents was self paced. It all took the form of brown bag sessions, formal and informal meetings and workshops, and regularly scheduled professional development courses or mini-courses. The program content across all universities included instructional design methods, training in the use of specific methods of delivery, and technology training such as computer multi-media, digital photography, and videoconferencing. Software training focused on web page development tools such as FrontPage and Netscape Composer and on electronic learning management systems such as WebCT.

All respondents reported that when a faculty member was assigned to a distance education course, they were not required to take any special training. All faculty development in this area was self selected. Of the 13 respondents who had specific distance education training programs at their universities, seven said their university had a specific distance education coordinator and five reported that they did not. Eleven noted that faculty could request one-on-one assistance in distance education at any time during a course. The cost of this assistance was not charged to the departments. Respondents reported that in their opinion this training resulted in improved teaching methods and better interaction with students being taught at a distance. When asked what was the primary benefit of distance education training to their institution, respondents reported higher quality teaching, motivated faculty, value added to courses and increased competitiveness with other courses at other institutions. Respondent comments also

included mentions of faculty motivation and “buy in” to distance education. The more faculty understood about distance education, the more control they realized they had, and the more supportive they were of the overall idea.

Irani and Telg confirmed what Telg (1995) had found in previous study, that many of the training and design specialists were somewhat self taught or believed they had learned most of their skills on-the-job. This is an area of concern because being self taught is not always the most efficient approach to technical professional development. In most cases, being self taught was seen not as a positive trait but as a way to deal with scarce resources. Overall recommendations resulting from this study included increasing technical development staff, increasing training and development resources, and developing stronger strategic plans to support distance education in the future. An additional recommendation was that universities work together to pool resources to develop improved faculty development for distance education rather than each creating their own curriculum for faculty training.

Feist (2003) also investigated the types of professional development offered to online instructors, but focused her study on the barriers that inhibit faculty from taking advantage of professional development opportunities. The population for this qualitative descriptive study was faculty teaching in the area of health and community studies at one institution, Grant MacEwan College in Alberta, Canada. Feist used a case study approach and conducted 10 scripted, in-depth interviews with faculty members who volunteered their time. Specifically, she identified eight professional development criteria articulated by faculty including: (a) immediacy of application, (b) built-in follow-up procedure, (c) fit into their busy schedule, (d) matched their learning styles, (e) focused on curriculum,

(f) included leadership and direction from program chair, and (g) included a technology support person available afterwards for quick consultation.

After identifying the criteria for good professional development, Feist reassessed her interview findings and matched them with mainstream training and development literature. This not only verified that what faculty members was saying was consistent with what is known about good training, but also provided specific situational examples where the current training was not meeting the special needs of faculty at this institution. For example, faculty wanted “just-in-time” training that provided answers to questions they were dealing with at the current time rather than the “just-in-case” approach that spent too much time on the background and other uses of technical applications. (As mentioned above, Meyen, Tangen, and Lian, 1999 also identified faculty preference for just-in-time training.) Feist linked this finding to the writings of Brookfield and Knowles, both of whom stressed the need for timeliness and relevancy in adult training.

Faculty expressed the need for automatic follow-up for training sessions that was designed so the responsibility for follow-up rested with trainers rather than faculty members themselves. They did not like having to seek out trainers for additional information. Faculty also mentioned the benefits of attending technical training with others in their own academic disciplines so the applications of the technology (including examples used in training) were similar.

Time was cited as the major barrier to attending professional development. This included both the time needed to attend the professional development session and the time needed to practice the new skills to build proficiency. There was the general belief that full-time instructors had more time to attend professional development session than

did part-time instructors, possibly because part-time instructors held down more than one job. Several faculty members mentioned that the time needed for training should be compensated as a part of the compensation for teaching online. There was also concern about the amount of time needed to seek out professional development opportunities and identify which were the most appropriate. And, in regard to an issue relating both to time and to instructional content, several faculty members expressed a preference for professional development in their content area rather than professional development in technology and distance education. Feist (2003) found that instructors were specific about their preference for professional development that matched their own learning style. Several were not pleased with the “workshop” format because that was not their preferred method of learning. Rather, they preferred tutorials, one-on-one tutoring, online sessions, or books and printed guides.

Instructors stated that the emphasis should be on curriculum first and technology second. Lee (2002) and Easton (2003) both identified this as a recurring theme in post-secondary professional development, perhaps because it is usually delivered by technical support professionals rather than by fellow academicians. The faculty in this study believed that professional development for distance education should play a specific and well planned role in the overall development and delivery on online instruction. They were looking for leadership and the Chair's and Dean's level for guidance in the policies and procedures for distance education. Specifically they wanted leadership in the following areas: (a) expectations and the role of the instructor (again, this is an issue identified by Easton, 2003); (b) workload and compensation; (c) notification of resources and support; (d) manuals or guides on how to teach online; (e) guidelines for what online

courses should look like; and (f) suggestions for professional development related to online course development.

Feist (2003) stated her conclusions as a five-stage collaborative model based on her findings and on current literature on training and development. Stage One, planning, included identifying stakeholders, tasks, roles and responsibilities, and a statement of procedures and activities. Stage Two included course and instructor assignment so a facilitator (trainer) could assist a faculty member with course development that integrated the use of technology with the needs of that specific discipline and content. Stage Three, course development, included professional development specifically geared to meet the needs of the faculty member in developing that course. Stage Four, course review, allowed the faculty member to look at the completed course and reflect on where improvements could be made and what type of technical support and training would be needed to facilitate those improvements. Stage Five, preparation for teaching, included one-on-one work with a technology facilitator so the faculty member was ready to communicate effectively with students online. This final stage also recognized that faculty members may teach a course they have not developed, so adapting others' materials was also included. Feist stated that there is an even greater need for focused professional development for online and distance education faculty today than formerly because we are past the time of the distance education early adopters who, by nature, liked to figure it out for themselves. Training should be well planned and make effective use of scarce instructor time so it is viewed as an asset rather than as a burden.

The studies reviewed above show an interrelationship among faculty roles, competencies, and professional development. Because postsecondary faculty are on the

front line of web-based course development and delivery, they believe they should be one of the ones making decisions about the type of support and professional development they need to accomplish the task. Some researchers argue that faculty are, in fact, being asked to do too much and that it would be more efficient and effective to unbundle the faculty role so they could focus their attention on pedagogy rather than technology. Researchers have offered several good models for support and professional development; all of which focus on faculty needs rather than administrative or institutional needs.

Instructional Design and Instructional Strategies

As early as 1992, research on strategies for distance education design and instruction recognized the importance of the relationships between faculty and course developers and faculty and students. The classic components of course design were re-explored in terms of a virtual environment. By the year 2000, this discussion seemed to focus on the issue of communication including the types and frequencies of instructor/student interaction relating to instruction and assessment, and technology and communication style. As discussed in Chapter I, one of the value added components of online instruction is that it cannot be accomplished without faculty adapting more sophisticated instructional designs than they apply to face-to-face instruction. The content must be sorted and organized into interlinking “pages” and the system for student/faculty communication must be formalized. The following section reviews studies that explore the question, which instructional designs and instructional strategies have been shown to be effective on online postsecondary instruction.

Course Design Factors for Distance Education

Brigham (1992) explored the factors affecting the development of distance education courses by investigating the issues of timeliness, smoothness, and satisfaction with the development process. His study was grounded in Smith's (1980) and Mason and Goodenough's (1981) five course development models. Between 1981 and 1992, however, several researchers had condensed the five models into three, and those three were specifically used in this study. The three course development models were: (a) the course/team model such as used by the British Open University, (b) the author/team model such as used by most American universities, and (c) the intuition model where faculty work alone to create a course.

The purpose of Brigham's study was to continue the research in educational design by investigating the course design process in the context of distance education. The researcher described it as an exploratory study that sought to identify factors associated with successful course development and to suggest relationships between the factors. Brigham did not claim to produce generally applicable guidelines, but rather to provide a basis on which other research could be built. He also recognized the limitations of the study because of his unusual sample. This qualitative case study focused on distance education faculty and developers at Syracuse University during the fall of 1990 as they developed courseware for the Front Line Series for US Marines deployed in Saudi Arabia. Brigham described this as a convenience sample because he was actively involved in the project. He also explained that the case provided a concentration of distance education activity in a somewhat controlled environment. An unexpected turn in this case study was that the course materials ultimately were delivered in print or on

audio tape because of the continuing movement of the soldier-students and the need for secrecy regarding their locations. Internet delivery was ruled out as a reasonable option. (Author's note: In 2004, more than 10 years after this study, the problem of connectivity for online military instruction is still an issue. Two new online US Army courses, the Army Captain's Career Course (AC3) and the Basic Noncommissioned Officer's Course (BNCOC) are limited to media that can be delivered over a 56k modem.)

Brigham's study sought to answer four questions:

- (1) What factors are associated with the success of the course development process?
- (2) How are the factors associated with the success of course development process related?
- (3) What patterns of factors facilitate the success of the course development process?
- (4) What patterns of factors impede the success of the course development process?

Brigham identified nine factors in the literature that he believed had a direct impact on course development. Those nine factors were: (a) the level at which course must be approved; (b) course production deadlines; (c) varying views of what constitutes respectable materials; (d) shortage of available working time; (e) availability of instructional support services; (e) faculty expertise with distance education; (f) adaptability of faculty to the course development environment; (g) interpersonal relationships between faculty and developers; and (h) course development organization.

Data came from multiple sources between February and May of 1991. Most data were collected from faculty and developers through interviews with additional data

gathered through documentation and physical artifacts. The participants included six faculty members, seven course developers, and a distance education administrator. Each participant completed an initial 40 to 45 minute semi-structured interview in a campus setting that included open-ended questions designed to identify specific issues. Subsequent interviews built on these issues by adding more focus although participants always had the opportunity to bring up issues of concern to them at that time.

Interview data was used to position the seven completed courses in a table that compared order of course completion, timeliness, and smoothness with course satisfaction. Content analysis of the transcript revealed 61 contextual factors that supported course classification. Courses A and B, the 2nd and 3rd to be finished, were significantly higher in all ratings than the other four courses. Courses identified by participants as *moderate* to *rough* in smoothness had a low to moderate level of *satisfaction*. In every case, the more successful courses were developed with a high level of faculty/developer agreement on course content, a high level of agreement on text book selection, a high level of agreement on learner characteristics, and low levels of faculty/developer conflict. The reverse pattern was found in the less successful courses.

Brigham concluded that the primary construct that predicted success in course development was the relationship between the faculty member and the designer. Other issues seemed reliant on that relationship. Flexibility, mutual respect, adaptability, and a willingness to collaborate emerged as significant factors in defining the relationships. Finally, Brigham compared his findings to nine factors for success identified in the literature. He found only two were supported: (a) adaptability of faculty to course development environment; and (b) interpersonal relationship between faculty and

developer. Factors that common wisdom would tell us were significant such as the level at which courses were approved or differences on what constitutes respectable materials were not supported. Brigham made three specific conclusions for this study including: (a) decisions made early in the course development process relating to flexibility and a interdisciplinary approach were critical to success; (b) the selection of text books and other design decisions needed to be mutual between the faculty and the course developer; and (c) the relationship between the faculty and the developer was the single most critical element to predicting a good product.

Hassenplug and Harnish (1998) examined the importance of faculty/student interaction as a design factor in relation to distance education. Unlike Brigham who addressed course satisfaction from the faculty/developer point of view, they addressed course satisfaction from the faculty/student point of view. Their study was based literature that identified the faculty/student interface as a critical to success regardless of delivery style (face-to-face or distance education). The majority of studies they cited supported the premise that the greater the faculty/student interaction in distance education, the more successful the learning outcomes. The purpose of this exploratory study was to determine the nature and importance of faculty/student interaction in an interactive video distance education environment.

The study took place in 1995 and involved five of the 32 technical institutions within the state of Georgia that offered courses over the GSAMS interactive video network. These five institutions offered six different credit courses that involved students at the host site and students located in at least one distance site. The participants included the faculty members and 57 students taking courses in economics, math, management,

and fire science. (The implication was that this was a convenience sample although the nature of the relationship between researchers and institutions was not described.)

Data collection methods from students and from faculty differed slightly. Information was collected from students at both the host and remote sites using a survey questionnaire of the researchers' own design. The survey instrument was pilot tested with GSAMS students at the University of Georgia and revised according to their feedback. The questionnaire used a four point Likert type scale with responses ranging from *very good* to *very bad* or *always* to *never*. Information was collected from faculty by several means including a short questionnaire prior the start of the course focusing on faculty attitudes toward teaching; and a longer version of the questionnaire toward the end of the course designed to capture more detail and changes in attitudes. Researchers also visited each host and remote site one time during the academic quarter to administer the student questionnaire in person and to observe any differences between host and remote site student behavior not captured in the questionnaire data.

Hassenplug and Harnish (1998) used SPSS to analyze the student data. They first looked at descriptive statistics. Cross break tables produced patterns of responses and relationships among variables. Chi-square tests for significance of difference were not run due to the low number in the cross break cells for many responses. The researchers sought to differentiate student responses into four categories. They based this on Moore's (1998) three categories of student interaction but added one additional category needed in this study to differentiate between students at host sites and students at remote sites. The four categories studied were: (a) student interaction at their own site and with students at different sites; (b) student and faculty interaction with each other; (c) student and faculty

interaction with the technology (equipment); and (d) student and faculty interaction with course content.

Students at remote sites reported slightly less interaction with each other than students at host sites where the instructor was present. Although all students agreed that the instructor encouraged them to interact with each other, host site students perceived a higher level of encouragement than did remote students. For example, 84% of host site students reported good student-to-student interaction while 69% of remote site students reported that interaction between students was good. Faculty/student interactions however reflected the opposite effect. Students at remote sites rated the frequency of instructor-to-student contact behaviors such as calling them by name or looking directly at them (via the camera) as slightly higher. The researchers believe this reflected a conscious attempt by faculty to overcome the barriers of distance learning. Interaction with technology showed no differences between host site and remote site students; although there were differences in how students felt the technology had impacted their learning. Students who helped operate the technology reported no barriers; 73% said it had no effect on their learning; and 23% said it enhanced their learning. The researchers commented that although 23% is low, it is a possible indicator that increased interaction with the technology can enhance learning among some learners.

The final measurement of student and faculty interaction with course content showed that while both student groups ranked satisfaction with course content as fairly high, students at the remote site rated it slightly higher on both content and organization. For example, 92% of students at remote sites ranked course materials as *very good* while only 58% of host site students ranked the materials as *very good*.

The implications for practice offered by these researchers include the suggestion that course design be constructed to support as “integrated and equal approach to student contact” as possible in a virtual interactive environment. Faculty/student interaction was critical to success, but students in the remote environment were both more aware of the interactions and also more appreciative of the interactions. Remote students in general tended to rate the overall course higher than did host site students. This is the same phenomenon as found in comparisons of web-based to face-to-face instruction. Distance students are simply more forgiving of technology, content, and design issues. Some researchers speculate that this self selected group of distance learners is more grateful to have access to the learning. It is also possible that they are more highly motivated, but this area of research is still evolving.

By 2000, several researchers had focused specifically on the nature and frequency of faculty/student interaction as the design factor most critical to the success of web-based postsecondary instruction, but the results were not what they anticipated. Robert H. Woods Jr. has presented his findings in several articles and at several national conferences. Woods writing with Keeler (2001) described a study that looked at the impact instructor initiated audio e-mail attachments. Woods writing alone (2002) described data from this same study but focused on the impact of traditional e-mail communication.

Woods and Keller (2001) examined the effect of instructor’s use of audio e-mail messages in student participation in and perceptions of online learning. This exploratory case study was designed to consider several communications factors and this article addressed the question of whether the systematic use of instructor-initiated audio

e-mails as a supplement to regular textual e-mails would increase students' participation in group discussions and would result in their having a greater sense of online community and overall satisfaction with the course.

Woods and Keeler (2001) cited several studies that suggested one of the reasons for course non-completion in web-based instruction was a feeling of student isolation. Non-completion is both an academic and an administrative concern. The researchers also cited other communications research that suggested the human voice was a more personal form of communication than text and seemed more *real* to the recipient. They proposed the use of RealAudio (a web-based digital voice compression and delivery system) as a means to attach audio messages to e-mail communications and to the course web site. The study was conducted at Regent University in Virginia and focused on a six credit-hour doctoral level course titled Leadership, Values, Policy and Culture. The course was offered in the spring of 1999 and included 40 students. This course was selected for the study because the course design designated that 25% of the student performance (overall course grade) was dialog. Students were encouraged to interact not only with faculty but also with other students. The course was team taught by two faculty members.

Woods and Keeler (2001) used a randomized control-group post-test only design for educational settings as first described by Isaac and Michael (1995). At the beginning of the course, students were randomly assigned to one of seven online discussion groups in this configuration of four case-study treatments:

(1) *Treatment 1* (12 students: Group A = 6, Group B = 6). Groups A and B received an audio message at the end of each week for a total of 15 messages throughout the course

(2) *Treatment 2* (11 students: Group C = 6, Group D = 5). Groups C and D received an audio message at the end of each month for a total of four messages throughout the semester.

(3) *Treatment 3* (11 students: Group E = 5, Group F = 6). Groups E and F received an audio message at the end of every other month for a total of two messages throughout the course.

(4) *Treatment 4* (Control Group) (6 students; Group G = 6). Group G received zero audio messages in addition to the regular textual messages throughout the course. (p. 270)

The content of the audio messages contained no instructional content that was not included in the text but rather added encouragement and offers of support such as “Let me know if you have any questions.”

The frequency of student participation was assessed by counting the total number of initial posts and the number of replies to others’ posting over the 15 week course. The length of interaction was measured by counting the words in each posting. An e-mail survey with five questions was sent to all students at the end of the semester. The survey used a Likert type scale anchored by 5, *strongly agree* and 1, *strongly disagree*. Scores between groups on the frequency and perceptual measures were calculated using SPSSX statistical software. The researchers used one-way Analysis of Variance (ANOVA) to examine the differences between treatment groups. Because this was an exploratory study, researchers also considered data from the open-ended comments at the end of the survey and unsolicited phone calls and e-mails from students over the duration of the course. Mid-term and final course evaluations were also considered.

Contrary to expectations, there were no significant differences between any treatment groups. The audio communications made no discernable difference in student performance or satisfaction. Several open-ended comments and e-mail comments mentioned that it was nice to hear the professors' voices, but there was no measurable impact. The researchers concluded that it would be premature to dismiss the benefits of using audio to supplement text communications in web-based instruction but that perhaps we are placing too much emphasis on "bells and whistles" in our course designs. Because these course enhancements take both faculty time and institutional resources, more research is needed on how the enhancements impact student learning.

Woods and Keeler's unexpected findings begin to make more sense if we consider them in the context of other student satisfaction studies that concluded that course design and quality seemed to have little impact on course completion. Student motivation may well be the determiner of course completion. In other words, students are so focused on course and program completion that the niceties of course design may have little impact. If educators were interested *only* in course completion, this finding would be significant. But because the goals of postsecondary instruction go far beyond course completion, the design and delivery of successful instruction are still issues worth exploring.

Woods (2002) revisited the data from this study in another article focused exclusively on the frequency of regular e-mails. By focusing only on regular e-mail he was able to make more generalized connections to other web-based research since regular e-mail was the most common form of faculty/student interaction. He found a consensus in the literature that students did react well to frequent e-mails from their instructors and often commented that this made the instructor and the content more real to them. But in

Woods study and in others, there is rarely a significant difference in performance or satisfaction. Perhaps we are measuring the wrong thing at the wrong time. A possibility for future research would be the long term benefits of web-based instruction that featured more personalized communication with the instructor.

Kanuka (2002) considered multiple forms of faculty/student interaction as she examined the factors (instructional strategies) that supported higher level thinking in web-based courses for postsecondary education. Specifically, she investigated what she termed the Essential Principles that facilitated higher levels of learning and then sought expert consensus on how these principles could be applied to web-based instruction. The need for the study was expressed in terms of a lack of information on how higher order thinking skills could be applied to web-based instruction. In other works, faculty should work to insure that instruction delivered over a distance was not reliant on simplified instructional methods and did not support reduced expectations for learner performance. Her original qualitative study, the development of the Essential Principles, was grounded in literature review, observation, reflection, and then on the input of a panel of experts. In moving this set of principles to web-based instruction, she was able to call upon the same panel of experts for an additional survey.

Her potential respondents included 78 scholars in Canada and the United States. Twenty-six responded to the survey ($n = 26$; 8 Canadians and 18 Americans) for a response rate of 33%. No information was given about the survey delivery methods or follow-up. All respondents had experience in facilitating learning activities on the Internet with an average of 5.5 years' experience, all had taught courses where the Internet was used in some ways to facilitate learning activities, and 77% had taught

courses where the Internet was the only means of communications with students. Respondents were selected for the expert panel because all had published in the area of Internet instruction including 40% having published in books, 83% in referred journals, 67% in non-referred journals, and 75% in other areas such as conference proceedings. Although most participants were able to provide examples of teaching and learning activities that supported the Essential Principles, there were a few requests for clarification about the principles before questions were answered. The outcome of her study was presented in two elegantly designed text tables. Table 1 included two columns with the *Principles* on the left and the related *Constructs* on the right. For example, the Essential Principle, Active and purposeful engagement with abstract phenomenon was related to the Constructs of Complex problems, Interactive and Repertoire. In all, each of the seven essential principles was related to three constructs. Table 2 mirrored Table 1 but in this case the *Constructs* were replaced by *Strategies appropriate* for distance education. For example, the Essential Principle of Active and purposeful engagement with abstract phenomenon could be taught using the strategies of case studies, group work, and chat or conference functions.

Kanuka (2002) concluded that her Essential Principles model was validated by the fact that all respondents were able to relate the principles to instructional strategies and then to provide strategies that they had either applied themselves or knew of from their professional experience. Although not stated by the researcher, it became obvious that Kanuka was approaching the issues of higher levels of learning and web-based strategies from the constructivist point of view. The emphasis on students' meaning making and the references to the work of constructivists Jonassen and Jacobsen clearly placed her in that

realm. Interestingly enough, none of the instructional strategies suggested in Kanuka's model rely on technology other than that related to a basic electronic course management system. It is the instructional design skill of the designer and/or instructor that supports activities that lead to higher order thinking.

Research on which instructional designs and instructional strategies work best online is often confounded by the problem that, in general, the population of online postsecondary students are self selected, highly motivated, and will tolerate even poorly designed courses. If we simply use course completion as our measure of success, we may find the same anomaly as did Woods, that the design had no impact on course completion. But if we look more closely at student satisfaction and future success, we see that course design is very relevant.

Conclusions Chapter II

The literature relating to the development of postsecondary distance education including effectiveness, faculty and administrators expectations and attitudes, and the time and effort needed for course development, revealed 45 major variables that relate to online postsecondary course development. These variables are listed by general descriptive category in Table 1 (see Appendix A). The categories are demographics, experience, attitude, reward, and support. An additional objective of this review of literature was to identify the research methodologies used most often to investigate faculty perceptions of issues related to online postsecondary instruction. These findings are shown in Table 2 (see Appendix A). This information guided the research design discussed in Chapter III.

One of the unexpected findings in analyzing the research methodologies was how frequently researchers used of both quantitative measurement and qualitative measurement in the same study, especially in the area of faculty perceptions. For example, Lee (2001, 2002) used qualitative data from open-ended survey questions to explain or clarify the quantitative data. Her studies provided an especially good rationale for including open-ended questions in studies based on faculty perceptions. She explained that she would not have understood the differences in faculty and administrator attitudes without seeing faculty comments.

The methodologies described in Chapter III are grounded in the studies reviewed in this chapter. They support the steps for this study that include: (a) identify and refine the independent variables; (b) make use of an expert panel to identify the most relevant independent variables; and (c) design and validate a survey instrument that intends to measure faculty perceptions of the variables that facilitate the development of online postsecondary courses.

CHAPTER III

METHODOLOGY

The methodologies applied to this study drew on the work of Lee (2001, 2002), Easton (2003), and others who investigated faculty attitudes and perceptions of distance education and online postsecondary instruction. Table 2 in Appendix A summarizes the procedures other researchers applied to studies similar to this and provides an overview of possible methodologies.

This study developed and validated a survey instrument that measured faculty perceptions of the importance of 24 independent variables that facilitate the development of online postsecondary courses. As in Lee's model, instrument development relied on an expert panel to review variables and establish face validity; the survey instrument used web-based delivery and reply; and data included both quantitative responses using a Likert-type scale and qualitative responses using open-ended questions. This chapter describes the four-step process used to develop and validate the survey instrument including:

- (1) Using a literature search to identify independent variables connected with online postsecondary instruction.
- (2) Using an expert panel to identify which variables were most relevant to facilitating online course development and to establish face validity.
- (3) Developing an online survey instrument that measures faculty perceptions of the importance of 24 independent variables that facilitate the development of

online postsecondary courses.

(4) Validating the survey instrument.

Step 4 applied factor analysis to identify the latent structure (dimensions) of the 24 independent variables (Garson, 2004), and Cronbach's alpha to estimate the reliability of data since the instrument provides a set of scores for each respondent (Shifflett, 2004). In situations where options for research methodology existed, this study applied the most conservative approach. For example, although the data collected included both quantitative and qualitative information, the validation considered only the quantitative data. Future research will use both quantitative and qualitative data collected from the 176 respondents.

Identifying the Variables

In some studies, the research questions emerge from a review of literature. In this study, however, the research questions resulted from professional, practical needs and the review of literature analyzed previous studies to identify potentially relevant variables and methodologies.

The Independent Variables

The review of literature provided 48 distinct variables associated with the development of online postsecondary courseware. The 48 variables shown in Table 1 (see Appendix A) were grouped into five convenience categories including: (a) demographics, (b) experience, (c) attitude, (d) reward, and (e) support. These five categories also appeared in the final instrument design, but were open to reconsideration if the factor analysis suggested groupings that were more accurate. The logic of grouping variables by content was based on Merriam's (1998) suggestion to continue organizing and refining

data as one works in order to maintain focus. She included the admonition, however, that this organization is *tentative* and should be changed if the data suggests change.

In this study, grouping the original 48 independent variables by category provided an effective way to identify and remove duplicate issues. For example, Rockwell et al. (2000) identified the issue of converting a course from face-to-face to online instruction, while Easton (2003), Lazarus (2003), and Visser (2000), each addressed the issue of having taught the course before. The basic issue of faculty experience with the course was the same, so it became a single independent variable. After duplicate variables were combined, 35 independent variables remained for expert panel evaluation.

These 35 independent variables were restated in parallel language on a worksheet for review by an expert panel. The NCS Pearson group (1995) emphasized the need for consistent language throughout a survey instrument and recommended that both the questions and the measurement scale remain consistent to avoid confusing respondents. Survey Instrument Development Worksheet 1 (see Appendix B) shows the original construct or variable as expressed in the literature; comments related to the variable (i.e. duplicate); and the new wording in parallel grammatical structure. For example, the variable related to having taught the course before became: *If I have previously taught the course....*

An expert panel of 11 distance educators reviewed the 35 independent variables and scored them each 1, 2, or 3 as to relevance to this study. The 24 variables with the highest cumulative scores were included in the survey instrument. Several panelists and faculty advisors also reviewed drafts of the survey instrument. In the open-ended comments, reviewers concerns centered on two issues: (a) that *efficiency* and *inefficiency*

(the anchors on the original scale) were actually two constructs rather than a continuum; and (b) that language specific to the discipline of *education* be modified to more general terms. On the advice of expert panel members and reviewers, the revised survey instrument expressed the variables in terms of efficiency only, measured on a 4-point scale anchored by *strongly disagree* and *strongly agree*. The new language reduced the level of abstraction in the construction of the questions, and more closely approximated what Dillman termed “straight forward language” (2000).

The Dependent Variable

The dependent variable in this study was *facilitation of online postsecondary course development*. Online postsecondary instruction is defined by the Kentucky Council on Postsecondary Education (CPE) as courses that have 70% or more of their instructional content on the Internet; and facilitate is defined by Merriam-Webster Online (2004) as “to make easier or to help bring about.” Most questions on the survey instrument included the word “easier”, but to keep the language from becoming too complex, statements that did not read well with the word “easier” were written to say “more acceptable.”

Validity and Reliability

Babbie (1998, 2003), Merriam (1998), and Presser et al. (2004) emphasized the benefits of working with an expert panel in either developing a new survey instrument or making revisions to an existing instrument. Researchers should seek what Merriam (1998, p. 79) calls a “ruthless review” of questions before ever reaching the pilot test or field test stage of any questionnaire, survey, or interview script. In this study, two issues spoke to the need for expert panel participation. The first and most obvious issue was the

scope of the study, to develop and validate a new survey instrument. The second more subtle issue was that although all variables were well grounded in previous research, they been reworded from their original expression by previous researchers into grammatically parallel expressions appropriate for the new instrument design. It would have been unsound to proceed without the “ruthless review.”

Establishing Face Validity

This study used an expert panel to establish the face validity of the survey instrument. The expert panel for this study included 11 professional educators, all of whom had previously developed online postsecondary instruction. Several had received awards and/or grants for their online courseware development. Several panelists were also experienced as trainers and developers and had assisted other postsecondary faculty members in their courseware development. Although panelists represented four universities and one community college, they all had the common experience of using Blackboard ® as a learning management system. The research protocol of using an expert panel as human subjects was approved by the University of Louisville’s Human Subject Protection Program Committee on August 26, 2004 and assigned Research Project Number 444.04.

The expert panel worksheet was developed as a Word ® template and sent as an electronic attachment to an e-mail letter of invitation that provided an overview of the study and instructions on how to use the template. Panelists responded in two ways. The first response was to assign a relevance score of 1, 2, or 3 to each of the 35 variables. With 11 participating panelists, each variable had a possible maximum score of 33. Cumulative relevance scores ranged from 16 to 31 (*mean* = 22.914) and fell on a

reasonably normal distribution curve considering the small number of participants (see Appendix B, Tables 3 and 4). The 24 variables with the highest cumulative relevance scores were included in the survey.

The second type of expert panel response was open-ended comments relating to the relevance or wording of the variables and/or comments regarding the survey design. Panelists were encouraged to make open-ended comments, and more than 50% of panelists provided comments regarding at least three variables on the form. Several also shared constructive comments by e-mail. All comments were analyzed using the Glaser and Strauss (1967) Constant Comparison method. This provided a structured way to track the frequency of comments related to specific variables and also the more general comments relating to wording and presentation. This expert panel review guided the development of the survey instrument including 24 questions on a 4-point Likert scale and opportunities for open-ended comments after each section.

Reliability

This study applied a sequence of methodologies including expert panel review of variables to establish face validity, Cronbach's alpha to establish reliability and internal consistency, factor analysis to establish construct validity, and a retrospective test of sample size for confidence level and margin of error. Alpha rather than Standardized Item Alpha was used because all items were rated on the same 4-point scale. The goal was a coefficient alpha of .85 or higher, based on Ward's (2004) recommendation of using an Alpha of between .8000 and .9000 for research. The goal for the factor analysis was a result that produced easily defined underlying constructs, and few if any variables that did not load on specific factors. The object of factor analysis was organization rather than

data reduction since the expert panel had already performed the data reduction task.

Goodfellow, Valentine, and Holt (1999) used a similar sequence of analysis for development and validation of a survey instrument, and Lee (2001, 2002) also used an expert panel and Cronbach's alpha in instrument design and validation.

The Study Population and Setting

This study used postsecondary faculty in the state of Kentucky who had either developed and taught at least one totally online course, or developed and taught at least one web enhanced course that included at least 70% of the content online (the current CPE criteria for an online postsecondary course) by the spring 2005 term. The Kentucky Council on Postsecondary Education (CPE) and the Kentucky Virtual University (KYVU) provided 2004 and 2005 faculty e-mail rosters to support this study.

The KYVU

The KYVU is a statewide consortium that operates under the Kentucky Council on Postsecondary Education (CPE). It includes public and private postsecondary institutions as well as state agencies. The original mission of the KYVU was to provide access to postsecondary courses for all Kentucky citizens. Many of the KYVU's academic providers make online courses available (space permitting) to students enrolled at other member institutions. Most of the individual courses offered via the KYVU combine to create several totally online degree programs offered by KYVU provider institutions, and the majority of KYVU online course are provided by KCTCS and use the Angel ® electronic learning platform. Other online courses offered by Kentucky colleges and universities use electronic learning platforms and technical support systems provided by the individual institutions, with Blackboard ® being the most common platform. Those

courses may or may not be available to a student requesting enrollment via the KYVU depending on institutional review of the requesting student's credentials and space available in the specific class. Appendix D includes a detailed overview provided by KYVU that defines its mission and member institutions.

Regardless the platform on which their courses are presented, all postsecondary faculty in Kentucky may take advantage of the Council on Postsecondary Education's annual professional development conference and award programs. All KYVU academic institutional providers are accredited by the Southern Association of Colleges and Schools (SACS), so postsecondary faculty and curriculum are evaluated under a common standard. Finally, there are several cooperative degree programs among KYVU member institutions, so communication among these online faculty members is not uncommon.

Population Identification

With approval of their legal council, the CPE and the KYVU each provided faculty e-mail rosters from the 2004 and 2005 academic years. The KYVU roster included all Kentucky Community and Technical College System (KCTCS) instructors but did not distinguish between online and traditional faculty. The CPE e-mail roster, however, was exclusively faculty who taught at least one online course in 2004 or 2005. This mixed listing meant that the stated *N* for the study was an approximation because some non-online faculty members were included in the KCTCS roster.

Two strategies compensated for this irregularity. The first question on the instrument became a yes/no demographic question asking respondents if they had developed and taught at least one online course so ineligible respondents could be excluded. *Rate of return* was not used as a validation measurement because the *N* was an

approximation, and *recommended sample size* (discussed in Chapter IV) was adopted as a more appropriate measure of validity.

After combining the two e-mail rosters and culling out duplicate or missing e-mail addresses, the approximate $N = 1155$. One of the several advantages of using e-mail to send the invitations to participate was that the number of undelivered e-mails was known immediately. In spite of the e-mail letters of invitation to participate being sent in batches of 99 or less to avoid being caught in bulk mail filters, 42 letters did not reach recipients because of a webshield feature (bulk mail handler) in the KCTCS system. An additional 26 were returned because the recipient was no longer at the listed address. This information on discards provided an approximate $N = 1087$ (see Figure 1).

Figure 1. Process for estimating population size

Instrument Design

The survey instrument developed and validated in this study applied what Dillman (2000) called “tailored design.” That is, the instrument used traditional, reliable components but was customized to capture specific types of data but require the least amount of respondents’ time online. The traditional components included: (a) a letter of introduction and explanation; (b) dropdown menu selections for demographic data; (c) agree/disagree statements on a four-point Likert type scale, and (d) several areas for open-ended replies. The tailored design included dividing questions into five categories by content and including open-ended questions at the end of each category asking respondents to further evaluate the variables above. They were directed to comment in their own words which variables contributed most to facilitating in online postsecondary course development, which contributed least, and why.

Question Design

The online survey instrument included:

- (1) One *yes/no* question to confirm that respondents had primary responsibility for developing and teaching at least one online postsecondary course
- (2) Three demographic questions using drop down menus asking participants to identify their institution, their academic discipline, and their electronic learning platform
- (3) Six Likert scale questions relating to *experience*
- (4) Six Likert scale questions relating to *attitude*
- (5) Six Likert scale questions relating to *reward*
- (6) Six Likert scale questions relating to *support*

(7) Nine open-ended questions

The nine open-ended questions were configured as follows: (a) two open-ended questions at the end of each of four non-demographic categories asking which variable in that section contributed most to facilitating online course development and which contributed least; (b) an open-ended question at the conclusion of the survey that asked participants to comment in their own words which *two* of the 24 variables above contributed most to facilitating online course development; and (c) a final open-ended question at the conclusion of the survey that invited any additional comments about what contributed to facilitating online course development. (See Appendix B, Survey Development Worksheet 3.)

Data from the three demographic questions regarding institutional affiliation, academic discipline, and electronic learning platform and all qualitative data will be used in future studies. Quantitative data from the 24 Likert scale questions provided data to perform the factor analysis and Cronbach's alpha.

Zoomerang ® proved to be an efficient and attractive formatting tool for online survey development. The only limitation that affected this study was a default setting related to question numbering. When the questions were grouped into sections, Zoomerang ® automatically numbered the questions 1 through __ within that section. Therefore, the survey had as many questions numbered "1" as there were sections in the survey. There was no override to this design feature. The solution was to ask the open-ended questions in such a way that respondents used both words and numbers to identify variables that contributed most or least to facilitating online course development.

Online Survey Technique

With the exception of the numbering issue above, the Zoomerang ® web survey tool allowed a great deal of control over the survey design making it possible to apply many of Babbie's (1998, 2003) general recommendations. Babbie recommended writing a detailed letter of invitation to participants and sending at least two follow-up communications to increase the overall response rate. At least one of the follow-up communications should include an additional copy of the survey instrument. His approach was to respect the respondent's time and make it as easy as possible to participate. Babbie (2003) and Dillman (2000) both recommend considering the skill levels and attitudes of a population when considering if a survey should be designed for online delivery. In this case, an online survey was appropriate for postsecondary faculty who were comfortable working in the online environment.

The survey instrument was developed as a Word ® document; reviewed by the University of Louisville IRB and CPE/KYVU staff; converted to Zoomerang ®; and launched as an active survey tool at the Zoomerang ® web site. Each survey in Zoomerang ® has a specific Internet uniform resource locator (URL) so there is no chance of participants entering the wrong survey or data appearing on the wrong spreadsheet. Faculty participants received an e-mail letter of invitation in the form of a preamble as approved by the University's IRB. The letter of invitation (see Appendix B, Survey Development Worksheet 4) included an explanation of the study and an active link (hyperlink) to the web survey site. As Babbie suggested, one week after the survey was launched, another reminder e-mail with the active link was sent to encourage participation. Two weeks after that, a final reminder letter with a link to the survey was

issued. Because the Zoomerang ® online format is totally anonymous, there was no way to track who had submitted their survey, so the reminder letter reflected that situation and also thanked those who had completed the survey for their participation. Because the letter of invitation to participate included an active link to e-mail return, it was easy for any KCTCS faculty members who did not teach online to contact researchers and ask that their names removed from the “reminder letter” e-mailing list. Researchers also received a few e-mails from faculty interested in similar research asking to be informed on the results of the study.

Data Analysis

The scope of this study was to develop and validate the survey instrument, so only quantitative data were used in that analysis. The qualitative data collected from the open-ended responses can be used in a future study that addresses a related research question, what is the rank order of importance of the variables. Responses to several demographic questions were coded, but no responses on the Likert-type scale questions required reverse coding.

Statistical Processes

The Zoomerang ® web survey tool provided results not only as a chart of response numbers and percentages, and also as an Excel ® spreadsheet. Excel can be transferred directly into SPSS for statistical analysis. The two SPSS procedures used to validate the instrument were Cronbach’s alpha and factor analysis.

Factor analysis was applied to see how the 24 independent variables loaded onto categories. The two goals of factor analysis were to identify the underlying constructs measured by the instrument and any variables that did not attach to any category and

should possibly be discarded. The Information Systems & Services team of the University of Newcastle on Tyne (2002) online tutorial on factor analysis recommends using factor analysis to find latent variables or factors among the observed variables. Identifying latent or underlying variables does not demean the value of the variables being investigated, but rather can give them new definition by showing to which larger construct they are related. Swenson (1998) also recommends the combination of Cronbach's alpha and factor analysis in validating a new measurement scale.

Sample size was also a relevant issue in instrument validation and several approaches to setting a desired sample size were considered. The informal *Rule of 10* states that when 24 variables are studied, a good sample size for validation would be 240. Tinsley & Tinsley (1987) suggested that 5 to 10 respondents per item up to a maximum of 300 is valid, while Comrey (1988) suggested that a sample size of 200 is usually acceptable for any scale of fewer than 40 items. The goal sample size was set at 200 following the Comrey suggestion, and a retrospective sample size analysis was calculated using an online sample size calculation tool developed by Creative Research Systems ®. This online tool provided the confidence level and margin of error for the exact sample size.

Conclusions Chapter III

In this study, researchers selected the most traditional and conservative methodologies available to strengthen the argument that this original survey instrument is valid and reliable. The methodologies included a four-step process: (a) conducting a literature search to identify independent variables related on online postsecondary instruction; (b) using an expert panel to identify which variables were most relevant to

the issue of facilitating online postsecondary course development and to establish face validity; (c) developing an online survey instrument; and (d) validating the survey instrument using factor analysis to identify the latent structure (dimensions) of 24 variables, and Cronbach's alpha to estimate the reliability of data. The software used to analyze the quantitative data included Excel ® and SPSS ®. An online sample size calculator provided a retrospective confidence level or margin of error.

The web-based survey design and delivery strategies applied Babbie's (1998, 2003) recommendations and Dillman's (2003) tailored design. The research strategies in general also built on the work of Lee (2001, 2002) who included both quantitative and qualitative response modes in her research on faculty attitude and perceptions related to online instruction.

CHAPTER IV

FINDINGS

The purpose of this study was to develop and validate an instrument that could identify which variables contribute most to the facilitation of online postsecondary course development. Knowing which variables contribute most to the facilitation of developing online postsecondary instruction has two major applications: (a) to help faculty members estimate the time needed to develop particular courses by considering which variables apply to their situation; and (b) to help administrators make informed decisions about support for variables that facilitate online course development. The research questions were: (a) which variables have been researched in connection with online postsecondary instruction; and (b) which of those variables are most relevant to facilitating the development of online postsecondary course materials?

As seen in Figure 2, the instrument development and validation process included seven steps: (a) using a literature search to identify independent variables connected with online postsecondary instruction; (b) using an expert panel to identify which variables were most relevant to the issue of facilitating online postsecondary course development and to establish face validity; (c) using expert panel comments to refine the language of the instrument; (d) developing the online survey instrument; (e) computing coefficient alpha to establish instrument reliability; (f) performing factor analysis to establish construct validity; and (g) performing a retrospective sample size analysis for confidence level and margin of error.

Figure 2. Process for survey instrument design and validation

The two research questions addressed in this study, although closely related, required different protocols to gather data. The protocols were selected by considering methodologies of previous researchers investigating similar issues and developing similar instruments. This chapter discusses findings relating to the two research questions, findings from the statistical analysis validating the instrument, and a brief conclusion.

Findings for Research Question 1

The first research question was the most straight forward but also the most labor intensive to address. There were some efficiencies, however, as much of the literature on

distance education and online learning was available in electronic (online) journals and therefore easily accessible.

Independent Variables Identified in Research Literature

The review of literature on online and distance education at the postsecondary level revealed seven areas of research: (a) faculty workload and time management in the context of online course development and delivery; (b) the efficacy of distance and online education; (c) attitudes of administrators and faculty towards distance education; (d) support issues for distance education faculty; (e) faculty roles, competencies and professional development; (e) faculty collaboration in online course development and delivery; and (g) instructional design and instructional strategies. These categories provided an organizational structure for Chapter II.

The review of literature focused on publications after 1990. There were two rationales for that limitation: (a) online education was both rare and somewhat experimental prior to 1990, and (b) distance education technologies have changed so dramatically that the variables studied before 1990 may no longer be relevant.

The review of literature revealed a perceptible shift in the focus of research on online postsecondary distance education during the past 14 years. The emphasis has shifted from general questions about efficacy to more focused questions about instructional strategies and techniques, models for developing distance education programs, and the changing roles of faculty and administrators.

Many researchers agree with Shoemaker (2005), that the question of efficacy, while critical, has been fairly well answered. An increasing number of institutions are offering online programs, an increasing number of students are participating and

graduating, and there is no perceptible decline in student outcomes. Shoemaker argued that, in retrospect, efficacy never was a very broad area for research. Instead, program accessibility, characteristics of successful online instruction, and the changing role of faculty and administrators were issues that truly influenced the postsecondary world. Betts (1998) argued that the issue of efficacy has become a “faculty code” for resistance to participating in web-based instruction. When faculty resist participation there are actually many complex issues behind their decisions, but feigning doubt about efficacy is a “quick way out.” The problem resulting from this “quick way out” is that the real causes of faculty resistance to online instruction are not identified or remediated.

This study did not ignore the issue of efficacy but, as Shoemaker recommended, considered it a single variable. The variable was addressed as a question relating to faculty perceptions of the “potential for student success” in their online courses.

Findings for Research Question 2

The review of literature revealed 48 previously researched variables that had potential relevance to this study. After culling out duplicate constructs, 35 variables remained. This study used an expert panel of 11 postsecondary distance educators to establish the face validity of the survey instrument by asking them to select the most relevant variables out of the possible 35.

Findings from the Expert Panel

The relevance scores from the expert panel review of the 35 variables ranged from 16 to 31 (*mean* = 22.914), and fell on a fairly normal distribution curve considering the small sample (*n* = 11). These results are shown in Appendix B, Tables 3 and 4. The 24 variables with the highest cumulative relevance scores were included in the survey.

Open-ended comments from the expert panel provided critical information that would have been lost if only quantitative data was collected. For example, even though the variables were based on previous research, there were a few terms such as “student centered” that had very specific meaning to those in the field of education but were somewhat ambiguous to those in other disciplines. Such terms were modified to avoid ambiguity.

The variable about *retaining rights to online course materials* generated the most detailed and diverse comments from the expert panel. Panel members who frequently worked in a collaborative environment tended to rank this as only marginally relevant to the study. One panelist stated specifically that it was “counterproductive” to online course development when faculty focused on “who had contributed what to a course.” Another panel member who almost always worked alone on course development and teaching commented, however, that the issue of retaining rights to online materials was the “single most important” of the original 35 variables listed. This diversity of opinion on instructional materials ownership became even more interesting later in the study after the statewide survey had been administered. This evidence is presented in this chapter in the discussion of the Cronbach’s alpha analysis.

Categorizing Variables

Expert panel comments also guided the process of placing the variables in categories by topic. Organizing the variables into categories had two useful outcomes. During the initial variable identification based on the literature review, categorizing variables helped to identify duplicate constructs to cull. Later, developing descriptive names for the categories helped in designing the final survey instrument because it

provided context for the variables. For example, it removed the ambiguity about attitude-based variables being included in the study. Respondents did not have to question the motive, but rather just share their level of agreement with specific statements. The categories used to cluster the final independent variables were: (a) demographics, (b) experience, (c) attitude, (d) reward, and (d) support.

The final instrument design placed six variables in each category. This strategy of using an equal number in each set made it more efficient to ask participants open-ended questions about “which one of the six issues above” This is another example of Dillman’s (2000) tailored design concept that emphasizes the importance of relating survey design to ease of use. The underlying principle is that participants should focus their attention on their response rather than figuring out how to respond. Although the descriptive categories used on the survey instrument were intended to assist participants, findings from the factor analysis discussed below showed that several of the categories were very close matches for the underlying constructs.

Findings on Instrument Validity and Reliability

Babbie (1998) pointed out that there was often a tension between the criteria for validity and reliability. He described the situation in this way:

....science needs to be specific in order to generate reliable measurements. Very often, then, the specifications of reliable operational definitions and measurement seems to rob such concepts of their richness and meaning. The goal is to measure concepts in ways that help us understand the world around us. (p. 135)

This study used two survey design techniques to balance the needs for retaining the richness and meaning of concepts while still developing a valid and reliable instrument. The first was to use a Likert-type agreement scale rather than the abstract *more to less*

scale, and the second was to follow Lee's (2001, 2002) strategy of combined response formats (quantitative and qualitative). The four-point Likert scale anchored with *strongly disagree* and *strongly agree* asked for a first-person response with no ambivalent (neutral) response provided. Because this survey population had real experience with the variables and was in a position to know how they felt about each issue, the neutral response option could weaken rather than enrich the findings.

Lee (2001, 2002) solved the "richness of meaning" problem by including open-ended questions that invited participants to make comments in their own words. She proved the value of this strategy when it revealed subtleties such as the difference between "available technical support" and "the proximity of technical support." Like Lee's survey instrument, this instrument included open-ended questions that asked participants to confirm and clarify their responses to the quantitative questions. Although the qualitative data was not used in instrument validation, it will be applied in future studies (described in Chapter V).

The two methodologies used to establish instrument reliability in this study were Cronbach's alpha and factor analysis. Ward (2004) recommended the use of Cronbach's alpha as the single most critical test of reliability of any survey instrument. When scores come from divisions of a test (or question) administered once, as in this study, it is a measure of internal consistency. This study used a combination of expert panel review to establish face validity, Cronbach's alpha to establish reliability and internal consistency, and factor analysis to establish construct validity. This same sequence for development and validation of a survey instrument was used by Goodfellow, Valentine, and Holt (1999). Lee (2001, 2002) also made use of an expert panel and Cronbach's alpha in her

instrument development and validation, and Swenson (1998) recommended the combination of Cronbach's alpha and factor analysis to validate a new measurement scale.

Cronbach's Alpha

The result of the Cronbach's alpha analysis for the survey instrument was .8898, exceeding the researchers' original goal of .85 (see Table 5). Ward (2004, p. 2) described Cronbach's alpha as "an estimate of the average of all split half estimates of reliability." The strategy behind the calculation is the mathematical process of creating all possible split halves to determine the average correlation among all survey items. The object of analyzing split halves is to look for exceptions to consistency. The greater the consistency, the higher the reliability. Gliem and Gliem (2003) described it in a similar way and emphasized the value of using the technique to test for reliability for a test given only once to participants such as in a pilot study to validate an instrument.

Table 5 shows both the *squared multiple correlation* and the alpha if item deleted. Gliem and Gliem described the *squared multiple correlation* as the predicted multiple correlation coefficient squared by regressing the identified individual item on all remaining items. In this case, each of the 24 variables were regressed on the other 23. The more clearly read statistic, however, is the *alpha if item deleted*. In this study, the *alpha if item deleted* statistic ranged from a low of .8809 (on the variable *being rewarded with new technology*) to a high of .8902 (on the variables *having previously used a website to enhance a course* and *retaining rights to online course materials*).

In other words, the variable *being rewarded with new technology* was the least divisive of the 24 variables while *having previously used a website to enhance a course*

Table 5**Reliability Analysis (Using Cronbach's Alpha)**

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	3.2914	2.5260	3.6299	1.1039	1.4370	.0867

Variable (Name and Number)	Squared multiple correlation	Alpha if Item Deleted
1. Having previously taught the course	.3461	.8881
2. Having previously used a website to enhance a course	.3875	** .8902
3. Having clear vision of role as instructor	.4206	.8878
4. Seeing role as facilitator	.3823	.8869
5. Having good understanding of online course design	.4568	.8866
6. Having good understanding of how to use online teaching tools	.4171	.8861
7. Philosophically supporting distance education	.4478	.8862
8. Having confidence in level of technical support staff	.6376	.8815
9. Believing online instruction supports one's own professional goals	.5479	.8833
10. Believing students can succeed online	.5184	.8847
11. Believing online instruction is related to one's own research agenda	.4316	.8871
12. Seeing oneself as a skilled computer user	.4213	.8860
13. Receiving release time for online course development	.4898	.8844
14. Having control of work time	.5600	.8850
15. Department or college supports online insertion	.6038	.8818
16. Being rewarded with new technology	.5447	* .8809
17. Being offered professional development in instructional technology	.7398	.8816
18. Being offered professional development in instructional design	.6578	.8846
19. Having technical support is close at hand	.6693	.8832
20. Having good relationship with technical support staff	.6970	.8816
21. Department or college has online course template	.4092	.8876
22. Having access to knowledgeable graduate assistants	.4307	.8897
23. Retaining rights to online course materials	.3961	** .8902
24. Having access to models of similar courses	.4422	.8874
		Alpha .8898

Reliability coefficients, 24 items; Number of Cases = 154

* = lowest, ** = highest

and *retaining rights to online course materials* were the most divisive and would result in a higher alpha for the instrument if they were removed.

A typical research protocol would be to remove the variables that lower the alpha. In this case, however, there were several reasons why it would be unwise to remove those variables. Even with these variables in place, the alpha for the instrument was a highly respectable .8898. Moreover, in the factor analysis described below, both of these variables loaded on specific factors; control and experience. But, the most intriguing reason to retain the variables is they may indicate distinct differences in faculty opinions that could be related to their discipline and/or work environment. In other words, the survey population showed the same divided opinion as did the expert panel. More research is needed on this question because it has serious implications. It is not a question of “right or wrong,” but rather an issue of faculty beliefs and expectations matching the policies and procedures of their institutions. For faculty who believe their online instructional materials should be their own intellectual property, being made to relinquish rights to those materials would work against the dependent variable in this study: facilitating online course development.

Because the population for this study included Kentucky postsecondary faculty ranging from community college instructors to research university professors, it will be possible to use the existing data test the hypothesis that “type of institution” influences perceptions on the *ownership* variable. Ross & Klug (1999), Rockwell et al. (2000) and Butner, Smith, & Murray, (1999) all found institutional type to be an issue in measuring faculty attitudes, and this investigation could further describe that phenomenon.

Factor Analysis

There are usually two objectives for factor analysis: (a) to identify the underlying constructs measured by the instrument (data classification); and (b) to identify variables that do not load on any of the constructs and should possibly be discarded (data reduction). Because the expert panel had already performed a type of data reduction by eliminating variables they believed were less relevant to the study, the expected outcome of factor analysis in this study was that more useable information would come from data classification than from data reduction. As seen in Tables 6a and 6b, this proved to be true.

The methodology for factor analysis in this instrument development validation study was to use the most standard (conservative) approach. The settings for the SPSS calculation were principal components, Varimax (orthogonal) rotation with Kaiser Normalization. Input data included the 176 valid respondents, but 22 respondents were excluded in the calculation, most likely because of missing data. Abdi (2003, p. 3) noted that Varimax, developed by Kaiser in 1958, was by far the most popular choice among researchers. It provides highly useful information because “after a Varimax rotation, each variable tends to be associated with one (or a small number) of factors and each factor represents only a small number of variables.” That was exactly the finding in this study. Of the 24 independent variables, 21 loaded on six factors. The three remaining independent variables loaded on multiple factors and none of the variables fell out as related to no factor.

The six factors resulting from the factor analysis were easy to label. The factors were: (a) experience, (b) examples, (c) support, (d) attitude, (e) control, and (f) career.

Table 6a

Factor Analysis Matrix (Verimax Orthogonal Rotation)

Variable, Original Name and Number	Factor 1 Experience	Factor 2 Examples	Factor 3 Support	Factor 4 Attitude	Factor 5 Control	Factor 6 Career
3. Having clear vision of role as instructor	.76044					
5. Having good understanding of online course design	.72729					
6. Having good understanding of how to use online teaching tools	.62961					
1. Having previously taught the course	.62688					
4. Seeing role as facilitator	.60877					
2. Having previously used a website to enhance a course	.59059					
18. Being offered professional development in ID		.81853				
17. Being offered professional development in IT		.79136				
24. Having access to models of similar courses		.64954				
22. Having access to knowledgeable graduate assistants			.74896			
19. Having technical support is close at hand			.72993			
20. Having good relationship with technical support staff			.68642			
21. Department or college has online course template			.58964			
7. Philosophically supporting distance education				.78957		
10. Believing students can succeed online				.69945		
15. Department or college supports online instruction				.53135		
23. Retaining rights to online course materials					.76911	
14. Having control of work time					.69496	
13. Receiving release time for online course development					.68106	
11. Believing online instruction is related to one's own research agenda						.76028
9. Believing online instruction supports one's own Professional goals						.58061

Table 6b

Factor Constructs

Factor Number and Construct Name	Variable Categories	Variables Accounted for
Factor 1, Experience	All 6 from Experience	6
Factor 2, Examples	2 from Reward, 1 from Support	3
Factor 3, Support	All 4 from Support	4
Factor 4, Attitude	2 from Attitude, 1 from Reward	3
Factor 5, Control	2 from Reward, 1 from Support	3
Factor 6, Career	Both from Attitude	2
		Total 21 (out of 24)
		3 variables loaded on multiple factors. *

* Variables loading on multiple factors were:

- 8. Having confidence in level of technical support staff.
- 12. Seeing oneself as a skilled computer user.
- 16. Being rewarded with new technology.

There was also a strong relationship between the organizational categories on the survey instrument and the factors resulting from data analysis. As seen in Table 6b, all six variables presented in the survey instrument category *Experience* loaded on the factor *Experience*. All four variables from the survey instrument category *Support* loaded on the factor *Support*. In addition, both variables in the factor *Career* appeared on the survey instrument under *Attitude*. Independent variables that appeared on the survey instrument under the categories *Reward* and *Support* loaded on factors *Examples*, *Attitude*, and *Control*. Identifying *Attitude* as a factor also addressed the concerns of the expert panel members who questioned the relationship of attitude or belief to facilitating a task such as online course development.

The most unexpected findings were in Factors 5 and 6, Control and Career. Control included the three survey items, *retaining the right to course materials*, *having control of work time*, and *receiving release time for online course development*. Career included two survey items, *believing online instruction is related to one's own research agenda*, and *believing online instruction supports one's own professional goals*. These Career and Control factors provide a rich area for future research and will be discussed in Chapter V.

Confidence Level and Margin of Error

As discussed in Chapter III, the *N* for this study was only an approximation because of the mixed nature of the faculty e-mail lists available. The CPE list included only online faculty email addresses while KYVU provided all faculty email addresses. Therefore, using the *rate of return* percentage as an indicator of validity was not appropriate. The strategy, rather, was to use 200 to 286 as the desired *n*, discard any ineligible cases, and then apply a retrospective test for confidence level and margin of

error using the true n . Of the 200 respondents, 176 were eligible (having developed and taught at least one postsecondary course online). As shown in Table 7, the true n of 176 supported a confidence level of 95% with a margin of error of 6.75%. That is, researchers can be 95% confident that the score on any given question was accurate plus or minus 6.75% of that score. Confident, in this case, means that if researchers asked the same question 100 times, in 95 cases the results would be the same.

The calculation was done using an online applet (a web supported form or calculator designed for a specific function) provided by Creative Research Systems ®. Creative Research Systems maintains a web site that provides several no-cost calculation tools that provide almost instantaneous results. An advantage of this type of fast, no-cost tool is that researchers can take readings as they collect data

A word of caution about using confidence level and margin of error in survey research is that they represent the *potential* for confidence assuming that the survey questions were well written and the population was representative. In this study, these statistics were used *only* to ensure that the sample size was sufficient to support the findings of the Cronbach's alpha and the factor analysis to validate the instrument. In future studies using the data collected with this survey instrument, they can be applied in a more typical fashion, that is to provide a measure of confidence in the data itself.

Summary of Findings

The findings in this study included results for Research Questions 1 and 2, and the statistical results of analyzing data to validate the survey instrument. A review of literature since 1992 revealed 48 variables related to online and distance postsecondary education. Culling duplicates left 35 variables, and a panel of 11 expert distance

Table 7

Confidence Level and Margin of Error

Web based sample size calculator applet	Population size* <i>N = 1063</i>	Sample size Response of 200 – 24** = 176	Confidence level	Margin of error
Creative Research Systems ®	<i>N = 1063</i>	<i>n = 176</i>	95%	6.75%

* *N* is inflated as the KCTCS faculty roster included both traditional and online instructors. The university lists included online only online faculty.

** 24 respondents reported they had *not* been directly responsible for developing an online postsecondary course so their data was excluded.

educators selected the 24 most relevant to this study. Those 24 variables became questions in an online survey administered to Kentucky postsecondary online faculty members. Out of 200 replies, 176 were useable cases. Statistical analysis of the data revealed an alpha of .8898, and six underlying factors. Twenty-one of the 24 variables loaded on six factors while three loaded on several factors equally. The six factors were easily identified with descriptive labels with no ambiguity. The survey instrument can be considered valid.

While it was gratifying to see that the instrument was valid, the most unexpected and interesting finding was that the survey population so closely mirrored attitudes and opinions expressed by the expert panel. The expert panel identified 24 relevant variables and factor analysis showed them to all be related to specific factors. Moreover, the expert panel recommendation that constructs specific to the discipline of education be identified

with more universal language seemed justified since five of the seven factor names either mirrored or closely approximated variable category names on the instrument. The issue of ownership of online materials that divided the expert panel also divided the survey population. This presents one of several topics for future research discussed in Chapter V.

CHAPTER V

IMPLICATIONS AND CONCLUSIONS

The purpose of this study was to develop and validate an instrument to identify which variables contribute most to the facilitation of online postsecondary course development. The two research questions were: (a) which variables have been researched in connection with online postsecondary instruction?; and (b) which of those variables are most relevant to facilitating the development of online postsecondary course materials? This chapter presents the implications of survey design and validation findings for the two research questions and a proposal for additional research. Because the survey instrument validated in this study is web-based, this chapter also includes a brief discussion of e-mail and web delivery as an appropriate delivery mechanism.

Implications: Research Question 1

As distance education technology has become more wide spread and more sophisticated, research on distance education has also become more sophisticated. The early research questions about efficacy have given way to more specific research questions about design, delivery, and support for distance education. In the area of online postsecondary education, there are an increasing number of studies focused on effective instructional design, faculty attitudes, and the need for support in design and technology.

Faculty time associated with developing and delivering online postsecondary instruction is also an emerging area of research, and provides the foundation for this study.

The issue of faculty time is critical because faculty time is a limited commodity in an environment with ever-increasing demands. Visser (2000) summarized research confirming that technology has done nothing to lighten the workload in the academic environment; but has simply changed the methods and expectations for productivity. Specific to this study, research showed that although delivering postsecondary instruction online took about the same amount of time as face-to-face instruction, the development of online course materials took at least three times as long for the same instructional content. Although some of these course materials can be “recycled,” the demand for online courses and programs is increasing at an exponential rate so faculty are developing many of these courses for the first time. This study attempted to apply the business adage of “work smarter not harder” to the problem by developing and validating a survey instrument that measured faculty perceptions of 24 variables that could facilitate the development of postsecondary online instruction.

The fact that there are an increasing number of studies and professional writings (such as AAUP policy statements) addressing the issue of faculty time and online instruction helps to confirm the importance of the problem. The designs employed in these studies also reveal that there are a number of approaches to the problem. Betts (1998), for example, looked at barriers that kept faculty members from participating in online education. The types of barriers included attitudinal, technical, content, and even policy issues. Almost none were insurmountable, but they could be perceived as

insurmountable if faculty chose not to participate. The issue of faculty attitude also emerges in several other studies such as Lee (2001, 2002) and Easton (2003).

Easton considered faculty attitude in relation to how they perceived their role in online instruction. This is a more complex issue than it might seem at first glance. For example, if faculty saw their role as a collaborator with their technical support person or graduate teaching assistant, the teaching experience went more smoothly. If faculty saw their role as a mentor and facilitator in teaching online, communications with students went well. When faculty felt some ambiguity about their role, however, they also expressed less overall confidence in the online teaching experience. Both Betts' and Easton's studies illustrated the critical role that faculty attitudes and perceptions play in addressing problems related to online instruction. Attitude, confidence, and success are inextricably linked.

Lee (2001, 2002) also looked at attitudes and perceptions associated with postsecondary online instruction but compared faculty to administrators. Her work helped bridge the gap between the reward and support needs of faculty who teach online to the reward and support administrators thought they were providing. One important outcome of Lee's work was possible because she used both quantitative measurement (a Likert-type scale) and qualitative measurement. Therefore, she was able not only to measure the differences in attitudes and perceptions but also to develop a strong sense of why these differences occurred. For example, the variable *having technical assistance close at hand* was important to both faculty and administrators. However, on several campuses, although administrators thought they were providing technical assistance, faculty perceived it as "inaccessible." In other words, if technical assistance was not close at

hand, it was of no real use. Again, attitude and confidence were issues. If faculty perceived that support was there, they were more confident in the process.

Visser (2000) also considered the issue of faculty time and online instruction. His study was one of the first to investigate the problem by separating the different tasks associated with developing and delivering online instruction. Visser's conclusion was that development rather than delivery of online course materials demanded the additional faculty time. That conclusion helped identify the problem addressed in this study.

Implications: Research Question 2

The use of an expert panel had several positive outcomes: (a) guidance in the selection of independent variables including several that at first seemed less relevant, and (b) suggestions about the language used to present and describe variables.

Panel Guidance on Selecting Independent Variables

Had this study considered only the expert panel relevance scores to select the independent variables, it is likely that the variable *retaining rights to one's online materials* would have been excluded. The relevance score for this variable was just slightly below the mean. That would have been a mistake because this variable was connected to some of the more interesting outcomes of the statistical analysis. The *retaining rights* variable was included, however, because the expert panel provided both quantitative and qualitative feedback, and the qualitative feedback revealed how strong faculty reactions were to this issue. For example, while one expert panelist commented that this was the "single most important variable", another said the variable should *not* be included in the survey because retaining rights to course materials worked against cooperative faculty efforts within programs. This strong division of expert panel opinion

was the rationale for including this variable on the survey instrument, and the relevance score for that variable served as the criterion (cut off) score for selection of the final 24. Both the factor analysis and the Cronbach's alpha results showed the wisdom of including this variable on the survey instrument.

The *retaining rights* variable loaded on Factor 5 along with having *control of work time* and *receiving release time for online course development*. Factor 5, named Control, appears to be a good topic for future study. One hypothesis is that there is a statistically significant positive correlation between the need for faculty to retain control over their professional time and products and the organizational structure of their department or college. This is not to say that working alone does more to facilitate course development than cooperative efforts, but if the faculty member's *beliefs* are contrary to the department or college working environment, it is likely he or she will perceive the environment as not facilitating online course development. These results may echo Lee's findings that faculty and administrator understandings and beliefs must be aligned to maximize efficiency (and perhaps effectiveness) in online instruction.

In looking at the Cronbach's alpha result, the *retaining rights* variable (along with the variable *having previously used a website to enhance a course*) generated the highest *alpha if item deleted* scores. The implication is that these variables are divisive and faculty have a split rather than unified view of their impact on facilitating online course development.

The Panel Guidance on Language

The expert panel comments also identified the need to include descriptive language in the survey instrument that acknowledged the connection between attitudes (and/or

beliefs) and variables that facilitates online course development. Several panelists commented that variables such as believing students can succeed online spoke more to faculty attitude than to facilitation, and expressed concern about including variables that were obviously attitudinal. Other panelists however gave these attitudes and belief variables high scores, so they “made the cut” so to speak. The response to these concerns was to create categories with descriptive labels (experience, attitude, support, and reward) so respondents knew without question that the researchers accepted the connection of attitudes to efficiency. Without using these descriptive labels to categorize variables, it is possible that respondents will have had the same reservation that some panelists had; that these intrapersonal variables were not relevant to a study examining variables that facilitated a complex professional task. As mentioned above, the results of the factor analysis confirmed that attitude was an underlying construct.

There may be a lesson here that could generalize to other research using interdisciplinary experts. When working with an expert panel that represents several academic disciplines, it is essential to stay aware of differences in language and constructs and try for the most universal understanding as possible. In this case, panelists in higher education, human resource education, and the humanities had no reservations about including attitudinal or belief variables in an instrument focused on facilitation of a complex task. Panelists from clinical or laboratory sciences, however, were much less comfortable with the connection, perhaps because this connection was not typically a part of their research. Because the population for the study included faculty from all academic disciplines, it would have been a grave error not to address this concern.

Implications of Using an E-mail and Web-based Survey Instrument

From the inception of this study, a web-based survey instrument was seen as the most appropriate and practical approach to data collection. That decision was based on the research problem (efficiency in developing online postsecondary instruction) and the research population (postsecondary faculty in Kentucky who have developed and taught at least one online course). The assumption was that if faculty members used web technology to perform a task as complex as developing and teaching online college courses, they would be comfortable communicating in this virtual environment. Unlike a general population (or even a traditional postsecondary faculty population), this group had enough confidence in technology to accept the legitimacy of web-based communication and the keyboard skills to express themselves easily on the open-ended questions. (Author's note: More than 90% of respondents replied to at least one of the open-ended questions for each of the four categories, and most replies were in the form of well-written complete sentences. The qualitative data collected are a rich resource for further study.)

The majority of research on web-based survey technique was published since 1998, is focused on market research, and takes a pragmatic approach to the advantages and disadvantages of collecting data online. There is, however, an emerging body of research on using the Internet to support academic research. As this research becomes more sophisticated, new distinctions are made such as the difference between e-mail surveys and general web-based surveys. The conclusion that the Internet *was* the best way to

deliver this survey takes into consideration issues raised by several researchers in this field.

Ilieva, Baron, and Healey (2002) examined what they called the “pros and cons” of choosing to collect survey data online. Because they framed their investigation with the well-known work of Dillman (2000) and Schaefer and Dillman (1998), they were able to make distinct comparisons between traditional mail techniques and electronic survey techniques. For example, the traditional research idea of “equal access to the survey for the entire population”, is applied to electronic surveys as the principle that “all participants have easy access and equal access to the web site.” In this study, because the contact was by personal e-mail including an active link to the Zoomerang ® web survey site, the study met the criteria “equal and easy access.” (Author’s note: Between the completion of this study and the approval of this dissertation, the University of Louisville discontinued the use of Zoomerang ® and adopted a newer product SNAP ®. The reasoning provided by the Delphi Center for Teaching and Learning was that there had been a dramatic increase in scholarly data collection online, and SNAP ® provided a direct conversion of data to SPSS as apposed to Zoomerang ® that collected data as Excel and required conversion.)

Ilieva et al. discussed the advantages of e-mail surveys over general web-based surveys. The distinction is that e-mail provides what Dillman called “a personal, detailed letter delivered to each prospective participant”, while a survey simply embedded in a web site depends on participants to find that site independently and reply of their own volition. A personal e-mail letter introduced this survey and provided a clear and valid reason for faculty to participate in this study. From an academic standpoint, using a

personal e-mail to introduce the survey met the requirement of the University of Louisville Human Subjects Protection Committee for full disclosure to participants.

An additional advantage of using a personal e-mail letter was that although survey responses were anonymous, participants knew exactly who was conducting this study and could easily contact the researchers. The letter of invitation included an active e-mail link. In fact, this happened three times during the three weeks the survey was available on the web site. In each case, the participant contacting the researchers wanted more information about the study because they worked in similar areas. In one case, the respondent also shared a draft article on a related topic. This professional networking was an unanticipated positive consequence of working online.

Ilieva et al. and Griffis, Goldsby, and Cooper (2003) all discussed the economy and speed of delivering surveys online. These are unarguable advantages. Concerning economy, if the original N of 1155 had been contacted three times using traditional mail, the cost of postage alone for this study would have been over \$1300. Working online, there were no postage or printing costs associated with this study. Concerning speed, in this study researchers knew within three minutes of the first e-mail launch how many of the original 1155 e-mail addresses were either no longer valid or were unavailable because of a webshield in some institutional e-mail systems. The research implication was that the N was reduced from 1155 to 1087 to reflect the loss of 68 potential respondents. This measure of precision would not have been possible with traditional mail.

Best and Krueger (2002) discussed the increased accuracy of electronic measurement. Gathering data through an electronic website reduces human error in data

entry. Zoomerang ® and several other web survey tools collect the data in several formats. Data can be downloaded as an Excel ® spreadsheet and transferred to SPSS ® without re-keying, the point at which most errors occur. (See author's note above.) Best and Krueger also admired the clean, professional graphic presentation that web survey tools provide. In this study, the web survey tool had only one limitation that caused a design change. The automatic numbering system could not be overridden so each group of six questions in each of the four groups were numbered 1 through 6. The overall look and feel of the survey, however, was more attractive and professional than a document done with traditional word processing.

All three teams of researchers above agreed that in general, the response rate for Internet surveys is usually lower than for traditional mail surveys. This may or may not have any implication for this study, however, because the letter of invitation to participate was a personal e-mail letter with an active link to the survey imbedded in the letter. It took less participant time to respond online than it would to produce a paper and pen reply.

The essential implication of findings for using e-mail contact and developing a web-based survey instrument for this study was that these were the appropriate communication formats for this population and this research question.

Applications to Future Studies

The statistical analysis showed this original survey instrument to be both valid and reliable. This has two implications: (a) that the data collected using the instrument can be analyzed to address several research questions, and (b) that the instrument may be used with confidence with other postsecondary faculty populations.

Addressing a Related Research Question

Finding the rank order of importance of the 24 independent variables is a logical follow-up question to Research Questions 1 and 2 in this study. The rank order could be calculated in two ways; using quantitative data only (the objective approach as was taken to validate the instrument), or using a broader approach where both quantitative and qualitative data is considered. The lessons learned from Lee's (2001, 2002) research and the implications from the expert panel findings in this study show the value of using qualitative data to support or help further define quantitative data. One possible approach to using the data already collected to address this related question would be to first calculate the rank order of variables based on cumulative quantitative scores, then enhance the scores using qualitative data. A point could be added each time a variable was mentioned as adding the most to efficiency and subtracted each time it was mentioned as adding the least. Cronbach's alpha could be used to test the validity of this enhanced score. The result of this "rank order" would provide data for both faculty and administrators to support their decision-making about the distribution of resources, policymaking, and even personal time management.

Existing data could also be used to explore the new question that emerged during the study: is there a correlation between faculty demographics such as academic discipline and type of institution and their position on the *retaining rights* variable.

Using the Instrument with New Populations

As exemplified by the variable *retaining rights* and the *previously used a course website* variables, there seem to be several variables that are divisive and will not have the same results when asked of different faculty groups. This does not diminish the value

of the survey instrument, but rather shows that the instrument can be used to measure faculty perceptions that are specific to different demographic groups. For example, it would be possible to test for correlation between the *retain rights* variable, the type of institution for which the faculty respondents teach, and administrators' attitudes. As Lee (2001, 2002) found, differences in perception on specific issues between faculty and administrators translate into a general perception of "lack of support."

If the instrument were used multiple times with different faculty populations, the results could be analyzed for individual studies but also looked at in the aggregate. This aggregate data would address the original problem by showing the overall rank order of importance of variables but could also confirm predictable variations because of institution type or academic discipline.

The essential finding for this study is that the instrument is both valid and reliable and the data collected could be used with confidence to address several related research questions. In addition, because the instrument is valid and reliable, it could also be used to identify differences in perception relating to several specific variables where the department or college work environment is strongly related to faculty control of work time and products.

Researching Newly Identified Factors

An additional possibility for future research is to explore the underlying constructs revealed by factor analysis. Factors 5 and 6, Control and Career, were not constructs identified in the four original variable categories. Control included the three independent variables *retaining the right to course materials*, *having control of work time*, and *receiving release time for online course development*. Career included two independent

variables, *believing online instruction is related to one's own research agenda*, and *believing online instruction supports one own professionals goals*. It is possible that the issues of career and control have a great deal to do with faculty perceptions of what makes the development of online postsecondary course materials more efficient. It is a reasonable assumption that if faculty members believe they have more control over the situation and it is compatible with their career goals, they will perceive greater efficiency. However, when issues of control and career put faculty at odds with the policies or environment of their department or college, it is likely they will perceive greater inefficiency. This effect is similar to what Betts (1998) found in examining faculty barriers to distance education.

Conclusions

The literature search demonstrated that a rich collection of variables with potential relevance to this study was available. In addition, there was information in the literature on the research methodologies most often applied to specific research questions similar to those in this study. The expert panel selected the most relevant 24 variables, and also provided guidance about the language and presentation of the variables to help participants understand the survey instrument. The panel also identified several variables that were potentially divisive.

The expert panel guidance on both the selection of relevant variables and the presentation of variables in the survey instrument were supported by the statistical analysis of data after the survey was administered to a statewide Kentucky postsecondary online teaching population. Factor analysis revealed that all variables loaded on at least one factor and the factor *Attitude* was clearly identified. Cronbach's alpha not only

provided a high overall alpha score for the instrument but also confirmed that faculty populations could have relevant but divergent perceptions on several variables. This may possibly be linked to demographic issues such as academic discipline and institution type. More study is needed in this area.

In conclusion, the use of an e-mail contact and a web-based survey tool was appropriate for this population; the final sample size supported an acceptable confidence level and margin of error; and statistical analysis indicated that the survey instrument is both valid and reliable. Therefore, the data collected may be used with confidence to address related research questions, and the instrument may be used to measure the perceptions of other postsecondary faculty populations.

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APPENDIX A:

Variables and Methodologies Found in Previous Research

Table 1

Knowledge Base to Support Potential Variables		
Variable(s)	Source(s)	Comments
Demographics:		
Academic level of postsecondary instruction;	Ross & Klug (1999),	Baccalaureate, masters, and
Institutional type	Rockwell et al. (2000)	doctoral.
	Butner, Smith, & Murray, 1999.	Carnegie classification
Academic content area (by type)	Black (1992) (see also Becher, 1989)	Hard pure, hard applied, soft pure, soft applied
Type of learning platform	Shea, Motiwalla, & Lewis (2001)	WebCT ®, Courseinfo ®, Blackboard ®, Angel ®, etc.
Academic rank	Wolcott (1997), Rockwell et al. (2000)	Rank and tenured or non-tenured
Age	Wolcott (1997), Rockwell et al. (2000)	Linked to stage of career?
Gender	Black (1992), Jones et al. (2002) citing Lindner et al. (2000)	
Experience:		
Course content “converted” or original	Rockwell et al. (2000)	Course adapted from one previously taught in the traditional face-to-face environment?
Has taught online before	Carey (2001), Easton (2003), Pachnowski & Jurczyk (2003)	Has benefit of knowledge of online student learning issues
Has taken course online before	Kubala (2000)	
Has taught this course before	Easton (2003), Visser (2000), Lazarus (2003), Pachnowski & Jurczyk (2003)	

Has used web site to support face-to-face instruction	Witt (2003)	
Has benefit of previous online course evaluations	Shale & Gomes (1998)	
Has clear vision of role or identity in OLI	Easton (2003) Williams, (2003).	
Sees roles as a “facilitator”	Perreault et al. (2002), O’Quinn & Corry(2002)	
Attitude:		
Philosophically supports distance education	Jones et al. (2002)	
Perception of online instructional as fitting into ones’ professional goals	Ross and Klug (1999), Lee (2002)	
Seeing students succeed	Parker (2003)	Believes student can succeed in DL
DL fulfills research agenda	Wolcott (1997), Ellis (2000)	
Sees oneself as “early adopter”	Black (1992)	
DL Supports higher order learning	Kanuka (2002)	Constructivist model (using Kanuka’s Essential Principles)
DL Linked to teaching, research, or service	Wolcott (1997)	Which area credited for distance teaching?
Level of technical skill	Wilson (2000)	Confidence in word processing, materials development, HTML, Internet
Reward:		
New technology	Schifter (2000c), Fredrickson (2000)	Personal laptops, PDAs etc.
Release time to develop courses	Schifter (2000a), Schifter (2000c), Pachnowski & Jurczyk (2003)	

Control of work time	Lazarus (2003)	Able to control multitasking
Credit toward promotion and tenure	Schifter (2000a)	
Merit pay	Schifter (2000a) and (2000c), Wolcott (1997),	
Overload pay	Schifter (2000c)	
Stipend for course development	Wentling (2000), Pachnowski & Jurczyk (2003)	
Professional advancement	Ellis (2000, Wolcott (1997)	Specific or implied?
Credit toward tenure	Ellis (2000), Wolcott (1997)	Specific or implied?
Credit toward supporting institutional mission	Wolcott (1997)	Specific or implied?
Support at institutional OR departmental level	Wolcott (1997)	Value or weight of support?
Perceives administrative support	Kambutu (2002), Pachnowski & Jurczyk (2003)	Support decreasing over time (attrition)
PD in instructional technology	Dickinson et al. (1999), Lee (2001)	Focus of PD and value and or credibility of PD (differentiates between DP in ID and in technology)
PD in instructional design	Dickinson et al. (1999), Lee (2001)	Focus of PD and value and or credibility of PD(differentiates between DP in ID and in technology)
Support:		
Retain rights to course materials	Berg (2000)	Well developed course materials have long-term economic value
Support with technical issues	Rockwell et al. (2000)	
Support with administrative issues	Rockwell et al. (2000)	

Graduate or teaching assistants	Schifter (2000c), Easton (2003), Visser (2000)	Dedicated to DL faculty
Support to attend national conferences	Schifter (2000c)	Financial and/or release time
Has knowledge of or control of class size	Wentling (2000)	Can limit DL course enrollment
Course Design Model(s)	Brigham (1992)	Three models (Based on Smith 1980 and Mason and Goodenough (1981)
Proximity of technical support	Kubala (2000), Lee (2001)	
Relationship with technical and design developers	Brigham (1992)	Brigham found this the single most critical factor
Level and specificity of technical support	Lee (2001), Paulson (2002), Feist (2003)	Paulson's "unbundling" roles concept
College or department course template already established?	Wentling (2000)	
Student centered or technology centered PD	Perreault et al. (2002)	Approach to the DP (technical or instructional?)
Professional development courses or tutorials	Rockwell et al. (2000), Lee (2002), Schifter (2000c), Feist (2003)	Does DP match the content area and learning style of the faculty member?

Table 2

Frequently Used Research Designs Relating to Distance Learning (DL) and Faculty Support, Attitudes, and Workloads			
Research Design	Data Analysis	Research Question(s)	Source(s)
Faculty survey (quantitative only)	Descriptive statistics to rank order, <i>Chi-square</i> (to correlate by discipline), Multiple regression, Factor analysis, ANOVA, Independent samples <i>t-test</i>	Current state of DL, Faculty attitudes and concerns, Faculty motivators, Factors that deter participation, Use of web sites for DL <i>and</i> traditional courses, Compensation for DL, Faculty attitudes related to intrinsic support for DL, Faculty perception of time needed for DL	Golladay et al. (1998), Wilson (1998), Betts (1998), Ross and Klug (1999), Schifter (2000a), Schifter (2000b), Fredericksen et al. (2000), Wilson (2001), O'Quinn and Corry (2002), Witt (2003), Dickinson et al. (1999), Jones et al. (2002), Butner et al. (1999), Pachnowski & Jurczyk (2003)
Faculty survey including open-ended responses	Descriptive statistics, qualitative review of open-ended responses	Efficacy of DL, Faculty competencies for DL, DL as a part of faculty workload	Black (1992), Schoenfeld-Tacher et al. (2000), Hislop and Atwood (2000)
Student survey	ANOVA, 2 x 4 factorial analysis	Effectiveness of DL	Carey (2001)
Administrator survey	Descriptive statistics to rank order	Administrators attitudes and concerns	Shea et al. (2001), Kambutu (2002)
Faculty and administrator survey including open-ended responses	MANOVA, plus grounded theory	Compare faculty and administrator attitudes and concerns	Lee (2001), Lee (2002)

Faculty and student survey	Descriptive statistics, Posttest survey of four treatment groups then ANOVA	Compare faculty and student concerns, Compare levels of faculty/student interaction with satisfaction	Perreault et al. (2002), Hassenplug & Harnish (1998), Woods & Keller (2001)
Technical developer survey including open-ended questions	Descriptive statistics and grounded theory	Faculty development and support needs	Irani and Telg (2002)
Quantitative self-study	Pre-test/Post-test survey with linear regression and <i>Chi-square</i> , paired samples <i>t-test</i>	Relationship of faculty attitudes to skill and success in DL	Gold (2000)
Qualitative/quantitative case-study	Review of course sites, results in institutional evaluation survey, focus groups	Effectiveness of faculty/developer partnerships, Faculty preparation for DL	Meyen et al. (1999), Kubala (2000)
Qualitative case-study	One-on-one semi-structured interview then grounded theory, Document mining and interview then grounded theory, Delphi study in 4 Rounds, Observation, document mining, interview then grounded theory	Barriers to DL success, DL impact on promotion and tenure, Factors affecting course development, Faculty competencies, Faculty roles in DL, Barriers to faculty participation in DL, Relation of design model to course success, How faculty incorporated higher order thinking into DL	Ellis (2000), Wolcott (1997), Brigham (1992), Williams (2003), Easton (2003), Feist (2003), Brigham (2003), Kanuka (2002)

Quantitative/ Qualitative self - study	Time and task data collection journal, comparison to previous personal calendars (person-hour study technique), Observation, Student survey, and faculty interviews	Compare web-based to traditional courseware development time, Faculty training for DL	Visser (2000), Kubala (2000), Lazarus (2003)
Qualitative Lit. Review	Literature review (frequency of issues studied)	Areas of faculty concern in DL	Parker (2003)
Qualitative comparative case- study	Document mining	Administrative differences between traditional and DL	Shale and Gomes (1998)
Business analytical models	Cost comparisons, compensation compared to DL income, cost effectiveness of providing DL faculty with support, Descriptive analysis	Cost effectiveness of DL, Are DL faculty adequately compensated, “Unbundling” faculty roles in DE development, Comparison of four development time estimation models for DE	Wentling (2000), Berg (2000), Paulson (2002), Kapp (2003)

APPENDIX B:

Survey Instrument Development Tables and Worksheets

Table 3**Expert Panel Relevance Scores**

Question(Variable) Number	Relevance Score	Rank Order of Scores
1	31	1
2	23	9
3	29	3
4	20	12
5	18	14
6	27	5
7	27	5
8	27	5
9	25	7
10	26	6
11	23	9
12	22	10
13	20	12
14	19	13
15	21	11
16	21	11
17	30	2
18	23	9
19	23	9
20	21	11
21	22	9
22	27	5
23	28	4
24	23	9
25	16	16
26	15	17
27	24	8
28	17	15
29	22	10
30	26	6
31	23	9
32	23	9
33	21	11
34	16	18
35	23	9

Mean = 22.91429

Table 4

Expert Panel Score Distribution

Survey Instrument Development Worksheet 1

Variables Considered for this Study

Original Variable (See Table 1)	Comments:	Expressed as Survey Statement. <u>Example: If I have previously taught the course, it makes online course development easier.</u>
Demographics:		
Academic level of postsecondary instruction and Institutional type	Institution name	Drop down menu selection of institutions
Academic content area (by type)	School or college within the institution	Drop down menu selection of academic disciplines: technical, humanities, mathematics, science, engineering, education, business, law, or medicine.
Type of learning platform		Drop down menu: Blackboard ®, WebCT ®, Angel ®
Experience:		
Course content “converted” or original	Measured as “previously taught”	If I have previously taught the course,
Has taught online before	Duplicated	
Has taken a course online before	Duplicated	
Has taught the course before	Duplicated	
Has used web site to support face-to-face instruction	Yes	If I have previously used a course site to enhance a face-to-face course,
Has benefit of previous online course evaluations	Yes	If I have received students evaluations of my previous online instruction,
Has clear vision of his/her own role or identity in OLI	Yes	If I have a clear vision of my role as an online instructor,
Sees role as a “facilitator”	Yes	If I can act as a course facilitator,

Attitude:		
Philosophically supports distance education	Yes	If I philosophically support distance education,
Perception of online instruction fitting into ones' professional goals	Yes	If I believe online instruction supports my own professional goals,
Seeing students succeed	Yes	If I believe students can succeed using online instruction,
Fulfilling research agenda	Yes	If I believe online instruction is related to my own research agenda,
Sees oneself as "early adopter"	Yes	If I see myself as an early adopter of online instruction,
Supports higher order learning	Yes	If the course contains advanced materials,
Linked to teaching, research, or service	Duplicate	
Level of technical skill	Yes	If I see myself as a frequent computer user,
Reward:		
New technology	Yes	If I am rewarded with new technology for teaching online,
Release time to develop courses	Yes	If I receive release time to develop the course,
Control of work time	Yes	If I have control of my work time,
Credit toward promotion and tenure	Yes	If I receive credit toward promotion and/or tenure for teaching online,
Merit pay	Yes	If I receive merit pay for teaching online,
Overload pay	Yes	If I receive overload pay for teaching online,
Stipend for course development	Yes	If I receive a stipend for online course development,

Professional advancement	Duplicate	
Credit toward tenure	Duplicate	
Professional development courses or tutorials	Duplicate	
PD in instructional technology	Yes	If I am offered professional development in instructional technology,
PD in instructional design	Yes	If I am offered professional development in instructional design,
Support:		
Retain rights to course materials	Yes	If I can retain the rights to my online course materials,
Support at institutional OR departmental level	Yes	If my department or college supports online instruction,
Perceives administrative support	Yes	If I perceive university administration support of online instruction,
Graduate or teaching assistants	Yes	If I have ready access to graduate and/or teaching assistants,
Support to attend national conferences	Yes	If I receive support to attended national conferences on distance education,
Has knowledge of or control of class size	Yes	If can limit the number of students in my online classes,
Proximity of technical support	Yes	If I feel technical support is close at hand,
Relationship with technical and design developers	Yes	If I have a good relationship with technical and design support staff,
Level and specificity of technical support	Yes	If I have confidence in the level of technical support staff,
Support with technical issues	Duplicate	
College or department course template established?	Yes	If my department or college has an online course template already established,

Course Design Model	Yes	If I can access models of similar course designs,
Student centered or technology centered PD	Yes- but divide for clarity.	If I perceive professional development for online instructor is student centered.

Survey Development Worksheet 2

**Variables Found Relevant to this Study
Based on Expert Panel Cumulative Score
(Expressed with New and Original Number, then by category)**

Original Number and Factor (Expert Panel Review)	New Category and Number
1. If I have previously taught the course,	Experience 1.
3. If I have previously used a course website to enhance face-to-face instruction,	Experience 2.
6. If I have a clear vision of my role as an online instructor,	Experience 3.
7. If I see my role as a facilitator,	Experience 4.
8. If I philosophically support distance education,	Attitude 1.
9. If I receive release time to develop the course,	Reward 1.
10. If I have control of my work time,	Reward 2.
16. If my department or college supports online instruction,	Reward 3.
18. If technical support is close at hand,	Support 1.
19. If I have a good relationship with technical and design support staff,	Support 2
20. If I have confidence in the level of technical support staff,	Attitude 2.
21. If I am rewarded with new technology for teaching online,	Reward 4.
22. If my department or college has an online course template already established,	Support 3.
23. If I am offered professional development in instructional technology,	Reward 4.
24. If I am offered professional development in instructional design,	Reward 5.

27. If I have ready access to knowledgeable graduate and/or teaching assistants,	Support 4.
29. If I can retain the rights to my online course materials,	Support 5.
30. If I can access models of similar course designs,	Support 6.
31. If I believe online instruction supports my own professional goals,	Attitude 3.
32. If I believe students can succeed using online instruction,	Attitude 4.
33. If I believe online instruction is related to my own research agenda,	Attitude 5.
35. If I see myself as a frequent computer user,	Attitude 6.
If I have a good understanding of course and lesson design.*	Experience 5.
If I have a good understanding of how to use online teaching tools. *	Experience 6.

* Issues added by U of L distance education faculty/administrators.

Survey Development Worksheet 3

Text of Survey Instrument

Issues Effecting Online College Course Development

This survey is asking you to consider 24 statements concerning online college course development and state your level of agreement or disagreement.

The statements are presented in four sections. At the end of each section, you will be asked to comment in your own words.

Thank you again for your valuable opinions.

Demographics:

Have you had primary responsibility for developing at least one online college course?

(Yes/No)

Which electronic learning platform do you most often use?

(Drop down menu)

Which category best describes your academic discipline?

(Drop down menu.)

For which institution or system do you teach?

(Drop down menu.)

1. Experience:

Response key:

Strongly Disagree
1

Disagree
2

Agree
3

Strongly Agree
4

1. If I have previously taught the course, it makes online course development easier.
2. If I have previously used a course website to enhance face-to-face instruction, it makes online course development easier.
3. If I have a clear vision of my role as an instructor, it makes online course development easier.
4. If I see my role as a facilitator, it makes online course development easier.

5. If I have a good understanding of online course design, it makes online course development easier.

6. If I have a good understanding of how to use online teaching tools such as chat rooms, it makes online course development easier.

7. Which one of the six issues above contributes most to facilitating online course development? Please comment.

8. Which one of the six issues above contributes least to facilitating online course development? Please comment.

2. Attitude:

Response key:

Strongly Disagree
1

Disagree
2

Agree
3

Strongly Agree
4

1. If I philosophically support distance education, it makes online course development easier.

2. If I have confidence in the level of technical support staff, it makes online course development easier.

3. If I believe online instruction supports my own professional goals, it makes online course development easier.

4. If I believe students can succeed using online instruction, it makes online course development more acceptable to me.

5. If I believe online instruction is related to my own research agenda, it makes online course development easier.

6. If I see myself as a skilled computer user, it makes online course development easier.

7. Which one of the six issues above contributes most to facilitating online course development? Please comment.

8. Which one of the six issues above contributes least to facilitating online course development? Please comment.

3. Reward:

Response key:

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

1. If I receive release time to develop the course, it makes online course development more acceptable to me.
2. If I have control of my work time, it makes online course development more acceptable to me.
3. If my department or college supports online instruction, it makes online course development more acceptable to me.
4. If I am rewarded with new technology for teaching a course online, it makes online course development more acceptable to me.
5. If I am offered professional development in instructional technology, it makes online course development more acceptable to me.
6. If I am offered professional development in course and lesson design, it makes online course development more acceptable to me.

7. Which one of the six issues above contributes most to facilitating online course development? Please comment.
--

8. Which one of the six issues above contributes least to facilitating online course development? Please comment.

4. Support:

Response key:

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

1. If technical support is close at hand, it makes online course development easier.
2. If I have a good relationship with technical and design support staff, it makes online course development easier.

3. If my department or college has an online course template already established, it makes online course development easier.

4. If I have ready access to knowledgeable graduate and/or teaching assistant, it makes online course development easier.

5. If I can retain the rights to my online course materials, it makes online course development more acceptable to me.

6. If I can access models of similar courses, it makes online course development easier.

7. Which one of the six issues above contributes most to facilitating online course development? Please comment.
--

8. Which of the six issues above contribute least to facilitating online course development? Please comment.
--

5. Comments:

1. In your own words, which <u>two</u> of the 24 issues above contribute most to facilitating online course development and why?
--

2. Do you have any other comments about issues that facilitate online course development?

Survey Development Worksheet 4

Sample Letter of Invitation to Participate

Dear Kentucky Postsecondary Faculty Member,

You are invited to participate in a study being conducted by the College of Education and Human Development at the University of Louisville by Dr. Carolyn Rude-Parkins and Karen Hughes Miller.

The survey is designed to measure faculty perceptions about which factors contribute most to efficiency in online course development. It will take approximately 20 minutes to complete. Our request is that you review the six factors in each of the four sections of this web-based survey and rank them on a 4-point Likert scale. You are also welcome to comment on your own words in several areas of the survey. We would appreciate your reply within 5 working days.

<http://www.zoomerang.com/survey.zgi?p=WEB2245BEVTN3C>

It is not clear that you will benefit directly from this study, but it is hoped that your participation will help others in the future. As with any research there is always the possibility of unforeseen risks. Although absolute confidentiality cannot be guaranteed, confidentiality will be protected to the extent permitted by law. The data will be kept under lock and key. The sponsor and the Human Subjects Protection Program Office (HSPPO), and the Institutional Review Board (IRB), may inspect the research records for this study. Should the data be published, you will not be identified by name.

Your participation in this study is voluntary. You may refuse or discontinue participation at any time without losing any benefits to which you are otherwise entitled. Should you have any questions you may call the investigator at (502) 852-0610 or contact by email at karen.miller@louisville.edu. If you have any questions about your rights as a research subject, concerns or complaints about the research or research staff, you may call the HSPPO (502) 852-5188, and they will put you in touch with the appropriate chair of the Institutional Review Board to discuss the matter. The IRB is an independent committee composed of members of the University community, staff of the institution, as well as lay members off the community not connected with these institutions. The IRB has reviewed this study.

By returning the web-based questionnaire, you are indicating your willingness to participate freely in this research study. You are further indicating that all your present questions have been answered in language you understand and that you understand that all future questions will be answered in the same manner.

Thank you very much for considering our invitation to participate in this study.

Sincerely,

Carolyn Rude-Parkins

Karen Hughes Miller

Carolyn Rude-Parkins, Ph.D.

Karen Hughes Miller

Survey Development Worksheet 5

First Reminder Letter

Dear Kentucky Postsecondary Faculty Member,

If you have already responded to online survey in support of the study being conducted by the College of Education and Human Development at the University of Louisville by Dr. Carolyn Rude-Parkins and Karen Hughes Miller, we thank you again for your time. If not, we would sincerely appreciate your participation.

The survey is designed to measure faculty perceptions about which factors contribute most to efficiency in online course development. It will take approximately 20 minutes to complete. Our request is that you review the six factors in each of the four sections of this web-based survey and rank them on a 4-point Likert scale. You are also welcome to comment in your own words in several areas of the survey. We would appreciate your reply within 5 working days.

<http://www.zoomerang.com/survey.zgi?p=WEB2245BEVTN3C>

It is not clear that you will benefit directly from this study, but it is hoped that your participation will help others in the future. As with any research, there is always the possibility of unforeseen risks. Although absolute confidentiality cannot be guaranteed, confidentiality will be protected to the extent permitted by law. The data will be kept under lock and key. The sponsor and the Human Subjects Protection Program Office (HSPPO), and the Institutional Review Board (IRB), may inspect the research records for this study. Should the data be published, you will not be identified by name.

Your participation in this study is voluntary. You may refuse or discontinue participation at any time without losing any benefits to which you are otherwise entitled. Should you have any questions you may call the investigator at (502) 852-0610 or contact by email at karen.miller@louisville.edu. If you have any questions about your rights as a research subject, concerns, or complaints about the research or research staff, you may call the HSPPO (502) 852-5188, and they will put you in touch with the appropriate chair of the Institutional Review Board to discuss the matter. The IRB is an independent committee composed of members of the University community, staff of the institution, as well as lay members off the community not connected with these institutions. The IRB has reviewed this study.

By returning the web-based questionnaire, you are indicating your willingness to participate freely in this research study. You are further indicating that all your present questions have been answered in language you understand and that you understand that all future questions will be answered in the same manner.

Thank you very much for considering our invitation to participate in this study.

Sincerely,

Carolyn Rude-Parkins

Karen Hughes Miller

Carolyn Rude-Parkins, Ph.D.

Karen Hughes Miller

Survey Development Worksheet 6

Second Reminder Letter

Dear Kentucky Postsecondary Faculty Member,

If you have already responded to the online survey being conducted by the College of Education and Human Development at the University of Louisville by Dr. Carolyn Rude-Parkins and Karen Hughes Miller, we sincerely thank you. If not, please consider this final request to add your valuable opinions to the data we are collecting.

The survey is designed to measure faculty perceptions about which factors contribute most to efficiency in online course development. It should take no more than 20 minutes to complete. Our request is that you review the six factors in each of the four sections and rank them on a 4-point Likert scale. You are also welcome to comment in your own words on several areas of the survey. We would appreciate your reply within 5 working days.

<http://www.zoomerang.com/survey.zgi?p=WEB2245BEVTN3C>

It is not clear that you will benefit directly from this study, but it is hoped that your participation will help others in the future. As with any research, there is always the possibility of unforeseen risks. Although absolute confidentiality cannot be guaranteed, confidentiality will be protected to the extent permitted by law. The data will be kept under lock and key. The sponsor and the Human Subjects Protection Program Office (HSPPO), and the Institutional Review Board (IRB), may inspect the research records for this study. Should the data be published, you will not be identified by name.

Your participation in this study is voluntary. You may refuse or discontinue participation at any time without losing any benefits to which you are otherwise entitled. Should you have any questions you may call the investigator at (502) 852-0610 or contact by email at karen.miller@louisville.edu. If you have any questions about your rights as a research subject, concerns, or complaints about the research or research staff, you may call the HSPPO (502) 852-5188, and they will put you in touch with the appropriate chair of the Institutional Review Board to discuss the matter. The IRB is an independent committee composed of members of the University community, staff of the institution, as well as lay members off the community not connected with these institutions. The IRB has reviewed this study.

By returning the web-based questionnaire, you are indicating your willingness to participate freely in this research study. You are further indicating that all your present questions have been answered in language you understand and that you understand that all future questions will be answered in the same manner.

Sincerely,

Carolyn Rude-Parkins

Karen Hughes Miller

Carolyn Rude-Parkins, Ph.D.

Karen Hughes Miller

APPENDIX C

Population and Setting

OVERVIEW:

Kentucky Virtual University (KYVU) is an innovation of the Commonwealth of Kentucky and the Council on Postsecondary Education. The KYVU does not offer degrees. Its credit-bearing academic programs come from accredited postsecondary institutions or the K-12 schools utilizing the KYVU infrastructure. The state's official virtual campus opened its doors to students in the fall of 1999. Since that time, KYVU has provided one-stop access to affordable for-credit courses and professional development programs offered online from colleges, universities, K-12 schools and state agencies. For its postsecondary and state agency partners, the KYVU acts as clearinghouse, consultant, and project manager, provides the electronic infrastructure, and acts as the registration and virtual student services arm. The KYVU's students are 34 years old on average; about 70% of them are female, and over 75% are from a rural county.

Currently the KYVU hosts four websites:

- www.kyvuu.org
- www.kyvuae.org
- www.KyEducators.org
- www.kyvuu4k12.org

KYVU Milestones

2004

January

The Kentucky Virtual Adult Education website and portal, designed and maintained by the KYVU under the direction of the staff of Kentucky Adult Education, captured first place in the "Innovative Use of Technology" category in the 2003 NASCIO Recognition Awards. Twelve states competed in that category. The National Association of State Chief Information Officer's annual awards program recognizes technology initiatives which "best assist government officials in innovatively executing their duties and providing cost-effective service to citizens."

The KYVAE.org was featured in the February issue of EDUCAUSE Online (released to more than 10,000 subscribers) and on the EDUCAUSE home page for the week of February 16th showcased in the EDUCAUSE Effective Practices and Solutions database.

May

The KYVU partnered with the University of Kentucky (UK) on behalf of the Education Professional Standards Board (EPSB), the state's teacher certification agency. The UK staff had created electronic learning materials for K-12 teacher professional development in physics and wished to offer these materials via the KYVU.org website for

academic degree credit and the KyEducators.org website for professional development credit.

The KYVU was featured in the Minnesota K-20 eLearning Conference as a Best Practices model. Norma Northern and Randolph Hollingsworth presented a session highlighting the seamless integration across multiple systems, the student support services and consultation services for KYVU partners.

June

The KYVU collaborated with the Kentucky Adult Education to allow Kentucky adult educators to login to the KYVAE.org portal and access a professional development course and resources from Pennsylvania State World Campus (PSWC). The PSWC is an operating unit of the Pennsylvania State University and first offered online courses in 1998. In a partnership agreement with the National Institute for Family Literacy (NIFL), the PSWC created an online course, "Introduction to Family Literacy." PSWC worked with the KYVU and KYAE to grant access and delivery of this course to selected Kentucky-based practitioners via the KYVAE.org website.

Also, the KYVU completed the negotiations for a new partnership with Indiana University (IU) also on behalf of the EPSB. IU uses a course management system known as the Learning to Teach with Technology Studio (LTTS) to deliver courses designed to teach K-12 teachers and pre-service teachers how best to integrate technology in the classroom. The KYVU and IU began work to provide single-sign-on access to the educational courses listed in the LTTS for KyEducators registrants. These new programs and courses will be offered via KyEducators by the fall of 2004.

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<http://www.kyvu.org/kyvu/ourstory.asp>

KYVU Postsecondary Academic Providers:

Universities and Colleges:

[Eastern Kentucky University](#)

[Kentucky State University](#)

[Morehead State University](#)

[Murray State University](#)

[Northern Kentucky University](#)

[Sullivan University](#)

[University of Kentucky](#)

[University of Louisville](#)

[Western Kentucky University](#)

Kentucky Community and Technical College System:

[Ashland Community and Technical College](#)

[Big Sandy Community and Technical College](#)

[Bowling Green Technical College](#)

[Bluegrass Community and Technical College District](#)

[Central Kentucky Technical College](#)

[Lexington Community College](#)

[Elizabethtown Community and Technical College](#)

[Gateway Community and Technical College](#)

[Hazard Community and Technical College](#)

[Henderson Community College](#)

[Hopkinsville Community College](#)

Jefferson Community and Technical College District

Jefferson Community College

Jefferson Technical College

Madisonville Community College

Maysville Community and Technical College

Owensboro Community and Technical College

Somerset Community College

Southeast Community and Technical College

West Kentucky Community and Technical College

KYVU Facts and Figures

Kentucky Virtual University is the commonwealth's official virtual campus. The university's Web site at www.kyvu.org serves as a one-stop point of access for learners of all ages seeking convenient, accessible and affordable college credit and professional development programs.

KYVU Mission

Kentucky Virtual University was established to make Kentucky's postsecondary education system more accessible, efficient and responsive to Kentucky's citizens and businesses. The virtual university is dedicated to playing a major role in fulfilling the Council on Postsecondary's goal of adding 80,000 more students to the college ranks by the Year 2020.

History

The Kentucky Virtual University was created in 1997 with passage of the Kentucky Postsecondary Education Improvement Act. Opening its doors to 235 students in the inaugural Fall 1999 term, the virtual university grew quickly to over 3,200 students by Spring 2001.

Kentucky is a leader in online learning. It was the first state in the United States to have a virtual university, a virtual library (www.kyvl.org) and a virtual high school (www.kvhs.org).

How It Works

The Kentucky Virtual University does not grant degrees. Students enroll in courses and programs offered online by 27 accredited Kentucky colleges and universities and accredited professional development providers. Degrees are awarded by the institution where the student is enrolled. Students pay tuition directly to the college.

Our Services

Kentucky Virtual University serves as a clearinghouse for a growing list of online learning opportunities. With a clear vision to meet learner needs, the Kentucky Virtual University offers essential academic and support services to help students be successful. These include a 24 x 7 virtual library, research help from reference librarians, friendly call center specialists, 24 x 7 technical support and an online bookstore. The university will soon add a 24 x 7 online writing lab with real tutors and provide 24 x 7 tutorial support in other disciplines.

Our Students

Over 50 percent of our students are over the age of 23. Most are female. Students come from all 120 Kentucky counties, 33 states and 10 foreign countries. While the demographics differ, these learners all share one thing in common—the desire to learn at their convenience.

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<http://www.kyvu.org/news/facts.asp#students>

CURRICULUM VITAE

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DOB: Warner Robins, Georgia - May 25, 1945

EDUCATION &

TRAINING: B.A., 1967, University of Alabama, Tuscaloosa, Alabama
Major in journalism with minors in psychology and commercial
art.

M.Ed., 1990, University of Louisville, School of Education,
Louisville, Kentucky
Master of Education in Instructional Technology.

AWARDS:

2004- University of Louisville Education Graduate Student Association President's
Award in recognition of outstanding service to the Graduate Student
Association.

2003- University of Louisville Future Professors program.

2002- University of Louisville College of Education and Human
Development Technology MiniGrant for research into the use of voice
recognition software in preparing online course materials (with Strope, J. and
Rude-Parkins, C.)

1996- KTLN recognized as the most improved multi-way video network by Tele-Com
International.

1993- Edgar Dale Award for Excellence in Instructional Technology. The Kentucky
Chapter of the Association for Educational Communications and Technology
(AECT).

1990- Sponsored participation, C-SPAN Seminar for Professors, Washington, DC.

1988- Iota Lambda Sigma; Professional Honorary Society for Professionals in Occupational Training and Development.

PROFESSIONAL SOCIETIES:

Association for the Advancement of Computing in Education (AACE).

Association for Educational Communications and Technology (AECT), Media Design and production Division (MD&PD). Served as MD&PD President, 1992-1993.

The Kentucky Chapter of the Association for Education Communications and Technology (KY/AECT). Served as President, 1991-1992.

PUBLICATIONS:

Opening More Than Doors. Tennessee State Museum, Nashville TN, contracted through the University of Tennessee and George Peabody College of Vanderbilt University, 1980. A training manual for volunteer docents on how best to assist handicapped museum visitors.

The Stone Window. National Clearing House for Rehabilitation Training Materials, University of Oklahoma, Stillwater, OK, 1980. A five-module training curriculum for teaching television viewing skills to severely behaviorally disordered students for education and recreation. Also presented at the third annual meeting of the Tennessee Behavioral Therapy Association, 1980, Nashville, TN.

A Change for the Better: Practical Ideas for Adapting Home and School Equipment. National Clearing House for Rehabilitation Training Materials, University of Oklahoma, Stillwater, OK, 1981. A parent/teacher manual of low cost ideas for adapting equipment for severely handicapped students.

Quick and Dirty Production Tips. *Viewfinder, the Newsletter of the Association for Educational Communication and Technology (AECT) Media Design and Production Division (MD&PD)*, August 1988.

How to Survive Remote Television Productions. *Viewfinder, the Newsletter of the Association for Educational Communications and Technology (AECT) Media Design and Production Division (MD&PD)*, December 1989.

Accountability for Production Units. *Viewfinder, the Newsletter of the Association for Educational Communications and Technology (AECT) Media Design and Production Division (MD&PD)*, January 1990.

Strategies for classroom management of exceptional children and youth: The University of Louisville's first interactive distance learning center, 1993. University of Louisville

Ekstrom Library, LC 40822.M45. Prepared by Karen Hughes Miller; Denzil Edge, Project Director.

Instructional Design for Distance Education. A 25-minute broadcast quality videotaped panel discussion produced jointly with Iowa Communications Network, (ICN) Star Schools Interactive Video Network of Mississippi, and the Kentucky TeleLinking Network (KTLN), 1997.

Guiding and Assessing Teacher Effectiveness: A Handbook for Kentucky Teacher Internship Participants (5th ed.). Office of Teacher Education and Certification, Education Professional Standards Board, Frankfort, KY, June 1998 (with Brennan, S., Roberts, R., and Thames, W.).

Preparing Educators for KTIP Committees: A Guide for Trainers. Office of Teacher Education and Certification, Education Professional Standards Board, Frankfort, KY, June 1999 (with Brennan, S., Roberts, D., and Thames, B.).

Guiding and Assessing Teacher Effectiveness: A Handbook for Kentucky Teacher Internship Participants (6th ed.). Office of Teacher Education and Certification, Education Professional Standards Board, Frankfort, KY, June 2000 (with Brennan, S., Roberts, R. and Thames, W.).

Towards Best Practice: Tips for Mentoring Kentucky's Intern Teachers. Office of Teacher Education and Certification, Education Professional Standards Board, Frankfort KY, 2000 (with Brennan, S.)

Keys to Survival (and Success) for Early Career Teachers. Kentucky Educational Television (KET). Professional Development Seminars 2000-2001. (Subject matter expert and executive producer.)

Guiding and Assessing Teacher Effectiveness: A Resource Guide for KTIP Participants (7th ed.). The Commonwealth of Kentucky Education Professionals Standards Board, Frankfort KY, June 2001 (with Brennan, S., Jones, D. B., Robert, D. and Lowe V.).

NATIONAL/ INTERNATIONAL MEETING PRESENTATIONS:

COMTEX/NAVA/AECT/ASET International Instructional Media Conference, New Orleans, LA, 1982. Me, Myself, and Eye: A Low-cost and Low-tech Method for Producing Interactive Instructional Videotapes.

INFOCOMM/ AECT International Instructional Technology and Communications Conference, New Orleans, LA, 1993. ITFS Applications and Demonstration and Student Production Showcase (two presentations).

AECT Bridging the Distance: National Conference on Distance Education, Ames, IO, 1995. KTLN: Kentucky's Newest On-ramp to the Information Super Highway (with Firquin, B.).

AECT National Conference: Indianapolis, IN, 1996. Utilizing Physical Systems and Logical systems in Network Planning (with Firquin. B.).

US DOE/ OERI Technology Conference, Washington DC October 6-10, 1996.
Infrastructure: What are sustainable models for best practice?

AACE Ed-Media/ED-Telecom '97 conference, Calgary, Canada. Instructional Design for Distance Education, How to Maximize Your Effectiveness Over Distance (with Kolloff, M.A. and Rude-Parkins. C.).

AACE International Conference on E-Learning, Washington DC, November 1-5, 2005.
"Army" as a Second Language: The Critical Nature of Communicating with Clients (with Rude-Parkins, C.).

AACE International Conference on E-Learning, Washington DC, November 1-5, 2004.
War is a "Messy and Ill-Structured" Situation (with Rude-Parkins, C., Kerrick, S., and Bauer R. K.).

REFEREED JOURNALS:

An interdisciplinary approach to instructional media production. *American Annals of the Deaf*, September 1981 (with McLean, B.).

Adapting audio/visual games for handicapped learners. *Teaching Exceptional Children*, Part I, November 1981; Part II, December 1981.

Exploring direct use media for severely handicapped learners. *Media Management Journal*, fall, 1981.

Cheap shots: Teachers can now produce their own instructional videotapes. *Media & Methods*, February 1983 (with Smith, D.).

Why logical systems and physical systems are both critical when paving the information super highway. *ED Journal*, 10(4), April 1996 (with Firquin B.).

The law catches up with distance education: Voice recognition software makes online legal instruction more efficient, effective. *T.H.E. Journal*, February, 2004.

Applying Gaming and Simulation to Distance Education. *INNOVATE*. (In press, August, 2005). With Rude-Parkins, C., Wormley, K., and Bauer R. K.

BOOKS:

Using video-based algebra instruction to address teacher shortage at the middle-school level: An evaluation of the Algebra I program developed by the Catholic Archdiocese of Louisville Office of Catholic Schools and the University of Louisville Instructional Communication Center. Masters Thesis. University of Louisville Ekstrom Library, 1990, M648.

Instructional Communications. An entry in *Education and Technology: An Encyclopedia*, edited by Ann Kovalchick and Kara Dawson, ABC-CLIO publishers, 2004.

COURSES DEVELOPED BY CONTRACT:

MSLA 613, Quality Assurance and Laboratory Regulation (online). Bellarmine University School of Nursing and Health Sciences, 2000-2001. Developed with M. Zady. Ed.D. Project underwritten by US HRSA contract # 7037 HP00850.

MSLA 614, Human Resource Management for Clinical Laboratory Managers (online). Bellarmine University School of Nursing and Health Sciences, 2002. Project underwritten by US HRSA contract # 7037 HP00850.

MSLA 616, Marketing Laboratory Services (online). Bellarmine University School of Nursing and Health Sciences, 2003. Developed with M. Draper, M.B.A. Project underwritten by US HRSA contract # 7037 HP00850.

INVITED PRESENTATIONS:

Kentucky Association of Volunteer Administrators, 1985 Conference, Louisville, KY. Getting the Most from Your Media Productions: How Non-profit Groups Can Use Low-cost Media For Education and Training.

University of Louisville Instructional Technology Faculty Development Seminar Series, 1991 and 1992. Co-sponsored by the Office of Information Technology and the Office of the Provost. Series designer and facilitator.

Why Consider Distance Education for Professional Development? An in-service presentation to Nelson County (KY) teachers, December 2, 2003.

Variables that Facilitate the Development of Online Postsecondary Courses. The Kentucky Conference on the Scholarship of Teaching and Learning: Engaging Students for Success, May 22-23, 2005, Marriott Griffin Gate, Lexington, KY.

Four Steps to Good College Teaching. University of Louisville Graduate Teaching Assistant Orientation, sponsored by the University Graduate School, August 5 and 18, 2005. (With Larson, A.)

E-evaluating Your Own E-learning Courses. The University of Louisville Delphi Center Celebration of Teaching and Learning, October 21, 2005. With Rude-Parkins, C., Ferguson, K. Kratzer, D., and Nichols, M.

Revised September 28, 2005