USING EQUIVALENCY THEORY IN EXPLAINING THE LEARNING EXPERIENCE BETWEEN ORIGINATING AND REMOTE SITE STUDENTS TAKING AN INTERACTIVE TELEVISION (ITV) COURSE

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Chapter I

INTRODUCTION

Teaching technologies now provide the delivery of instruction from any location thereby changing the learning experience of students. Distance education enables more students' access to more courses and learning resources. Many colleges and universities now consider options for offering students at remote campuses access to courses using these technologies. Bisciqulia and Turner (2002) reported that 55 % of all four-year colleges and universities in the United States offer remote site courses. According to Seay, Rudolph, and Chamberlain (2001), educational leaders acknowledged that distance education made significant changes in how education was organized and implemented.

Distance education provides new opportunities for students. More rural and inner-city students enjoy the opportunity of enrolling in courses previously unavailable (Moore, & Kearsley, 1996). Students in one area of the state can now learn from teachers and students in another. The U.S. Department of Education reported that the numbers of distance education programs increased by 72 % from 1995 to 1998, enrolling 1.5 million students, thus impacting 10% of all students in the U.S. colleges and universities (Carnevale, 2000).

Anderson and Kent (2002) stated that interactive televised courses (ITV) have been part of many college and university programs for quite some time. During this time,

the technology used as a medium of instruction has changed considerably. The first ITV classes allowed, at best, one-way audio/video. As technology changed, an increasing emphasis on improving communication between ITV professors and their students, as well as the ITV students and their peers at other locations prevailed (Anderson, Banks, & Leary, 2002). The current use of two-way interactive television as a medium of instruction in both graduate and undergraduate coursework has become a common method of instruction in distance education at many institutions (Anderson, Banks, & Leary, 2002). The use of technology and equipment, such as fiber optics, co-axial cables, and microwave transmissions provides instruction for students enrolled in courses at multiple sites and separated by hundreds of miles (Anderson, Banks, & Leary, 2002). Since the inception of one-way audio/video, interactive televised courses now allow students despite their location, the ability to see and hear each other through real time audio and video technology (Geary, 1998).

The educational system and student body will no longer have geographical boundaries (Moore & Kearsley, 1996). No longer will the student body be defined geographically with students living or coming from the local area. ITV makes it possible to teach students anywhere in the country. Because of unrestricted boundaries, colleges and universities will continue to compete with each other on additional levels (Moore & Kearsley, 1996).

In the context of ITV, the roles and methods of instructors and administrators have been reviewed and revised. For example, ITV requires instructors to prepare for class without being directly involved with students, or to use unfamiliar communication technologies to interact with students (Moore & Kearsley, 1996). Administrators focus

their concern for classroom availability and scheduling to ensure that the various resources are brought together for the design and delivery of courses as well as for student support (Moore, & Kearsley, 1996).

Distance education brings new emphasis on quality and accountability of educational offerings (Moore, & Kearsley, 1996). As a result of increased availability and accessibility, the quality of distance education has continued to come under scrutiny. Foster (2006) stated that Vernon J. Ehlers, a former physics professor at Calvin College in Grand Rapids, and a member of the U.S. House of Representatives Committee on Education and the Workforce, is skeptical about the value of distance education. Mr. Ehlers introduced an amendment to the College Access and Opportunity Act, HR 609, requiring accrediting agencies to check whether a distance-education institution that experiences significant growth has the capacity to serve its students effectively (Foster, 2006). As the use of ITV increases, it becomes important for colleges and universities to assess their mode of instructional delivery to determine its impact on the students (Seay, Rudolph, & Chamberlain, 2001).

Problem Statement

Many forms of distance education exist; for the purpose of this study the researcher will examine a two way audio, video lecture format ITV course that is not considered a blended or hybrid use of technologies at a small regional university. With the growth of distance education in recent years, it is important to examine student values regarding ITV educational delivery. Studies have shown that the ways students' value distance education varies in accordance to where students are located physically

(Bisciglia & Turner, 2002). By understanding student values, universities will be better informed to make adjustments to ITV course delivery that will afford students more equivalent learning experiences. Distance education should be constructed on the concept of learning experience equivalency. The more equivalent the learning experience is for originating and remote site students, the more equivalent outcomes will be for those learners (Simonson, Schlosser, & Hanson, 1999). Students using ITV distance education are quick to share their experiences with others. Informal networks quickly form and students rely on these networks to determine where they go to school and which courses to take or avoid. How student's value distance education programs is very important to the success or failure of those programs. The evaluation and response of students could mean success or failure of a distance education program. Students values are important and will determine which courses students recognize to be effective and which ones are ineffective (Johnson, 1999).

ITV studies about student values and attitudes provide conflicting results (Anderson, 2000). The following research, even though dated, provides pertinent information and relates purposefully to this study. For example, Silvernail & Johnson (1990) reported that student values did not differ significantly between ITV students and traditional classroom based students. However, in other studies, students in ITV courses were less satisfied than were their on-campus counterparts (Egan, Welch, Page, & Sebastian, 1992; Kochman, 1998; Wheeler & Batchelder, 1996). Distance education programs are designed to meet the needs of offsite students. Further research into student values helps explain how both originating and remote site students view equivalency of learning with ITV as a medium of instruction. This type of research addresses what is

being sacrificed to capture more students (Bisciblia & Turner, 2002). Additional research is needed for determining what effect the type of instructional delivery has on student values (Anderson, Banks, & Leary, 2002), and specifically for ITV as a method of instructional delivery (Seay, Rudolph, & Chamberlain, 2001).

Providers of distance education need to be conscious that they are working with students who value their education and are more than ready to criticize courses which they believe are a waste of their time and money (Gilroy & Knutton, 1996). Whether ITV is an acceptable means of delivering instruction requires the research to determine, in part, whether students view it as an equivalent learning experience. Student' values regarding college courses are important because college students will return to programs where they perceive their instruction to be effective and will not return to or remain at colleges they perceive to have ineffective instruction (Johnson, 1999). Greater illumination of what each student values in his or her learning experience will help to determine the effectiveness of ITV for student learning. Thus, it becomes important to more clearly ascertain ITV's equivalency between originating and remote site locations, and more precisely what the students value in an ITV learning experience.

Purpose of the Study

Many forms of distance education are now available to students. An excellent reputation and high appeal of distance education is, or should be, a goal for every educational institution. Being able to compete with a growing number of educational providers for selected groups of students and resources, as well as to retain existing students under pressures of time and resources, are factors that affect the quality of the

learning experience. Meeting the values and needs of students is of paramount importance and ensures the reputation and appeal in the field of distance education (Tricker, Rangecroft, Long, & Gilroy, 2001). With the various delivery methods, it becomes important to examine student values. In other words, by investigating students' values, educators may better plan distance education, how it is applied, and thereby approach equivalent learning experiences.

The purpose of this study is to determine if differences exist in student perceived value of ITV course content and delivery. The research is based on whether the student is on-site versus a remote site located at a specific small regional university. This study will examine how the students value the instructor's ability to effectively use ITV electronic delivery of course material. In addition, this study will examine how the students value the instructor's ability to include equivalent learning experiences at all sites of delivery in classroom discussion and presentation. The ITV instruction used in this study was taken from a lecture format and was not considered a hybrid or blended method with the use of other technologies.

Null Hypotheses

The following null hypotheses guided the present study:

Ho1 There is no statistical difference in the perceived value of experience for students at originating and remote site locations.

Ho2 There is no statistical difference in the perceived equivalency of the learning experience for students at originating and remote site locations.

Ho3 There is no statistical difference in the perceived equivalency in appropriate applications for students at originating and remote site locations.

Ho4 There is no statistical difference in the perceived equivalency in outcomes for students at originating and remote site locations.

Research Questions

The following research questions guide this study and will be used to focus data collection.

1. Do originating and remote ITV students perceive equivalent value in the sum of their experiences ?
2. Do originating and remote ITV students perceive equivalency in the learning experience ?
3. Do originating and remote ITV students perceive equivalency in appropriate application ?
4. Do originating and remote ITV students perceive equivalency in outcomes ?

Theoretical Framework

Equivalency Theory was used as a theoretical framework to guide this study because it emerged as a result of ITV technology. Equivalency Theory suggests that the experience at a remote site versus onsite ITV should be gauged in relation to the concept of learning equivalency (Simonson, Schlosser, & Hanson, 1999). Simonson, Schlosser, and Hanson (1999) suggest that the more equivalent the learning experiences of remote learners are to those of onsite learners, the more equivalent the outcomes of the educational experience for all learners. The Equivalency Theory advocates that remote and on-site learners, even though environmentally different for students, should have a

collection of equivalent learning experiences. The instructional designer of ITV distance education should provide for proper and equivalent learning experiences for all students. In other words, such experiences may be judged as equivalent even though they are not the same experience. The learning experiences of students should be modified to the environment and situation in which they find themselves. If library resources are necessary for the course, then accommodations for library resources should be provided. This does not mean that remote students need access to a research library; rather, they should have resources available equivalent to those at the onsite location. Regardless of how students are linked to resources or instruction, distance education systems should make every effort for equivalency in the learning experience (Simonson, Schlosser, & Hanson, 1999). Table 1 provides a quick reference and explanation of each component of the Equivalency Theory.

Table 1: Equivalency Theory Components

Component/Concept	Detail
Equivalency Central Concept	The sum of the experiences should have equivalent value for learners even though environmentally different at both locations (host & remote sites)
Component 1. Learning Experience	Equivalency in what is observed, felt, heard, or done at both locations (host & remote sites)
Component 2. Appropriate Application	Equivalency in the delivery of instructional ideals that fit the expectations and facilities of students at both locations (host & remote sites)
Component 3. Students	Students should feel equivalent enrollment identification in the course, and not identified by their location (host and remote sites)
Component 4. Outcomes	Equivalency in the obvious, measurable, and significant changes that occur cognitively and affectively in learners because of their participation in the course at both locations (host & remote sites)

The central concept of the Equivalency Theory is equivalency, or equivalent value for learners, which suggests that the learning environment of students located onsite and those located at a remote site encounter different environments. The design of the learning environment should provide experiences of equal value for students. Even

though the experience at an onsite location may not be an exact model to that at a remote site, both should have equivalent value. Simonson, Schlosser, and Hanson (1999) used the analogy of geometrical shapes. A triangle and a square may have different shapes; however, their area also, can be equal in value. In other words, students at remote and onsite locations, even though environmentally different, can have equivalency in the value of their experience.

The first component of Equivalency Theory is learning experiences. A learning experience can be described as any situation that promotes learning, which includes what is observed, felt, heard, or done (Simonson, Schlosser, & Hanson, 1999). Similar to learners in the same classroom, the learners at different locations may prefer differences in their learning experiences. For example, some students may prefer more dialogue and observation while others may prefer more structure and time on task. The objective is to make the instructional planning and experiences for all students equivalent. This is not limited to but should include equivalent resources. Whatever resources are important to the course should be available to onsite and remote site students.

A second component of the Equivalency Theory is appropriate application. Appropriate application includes learning experiences that are made available to distant and onsite learners that are both available and timely. The application of learning experience should be appropriate to the needs of the learner and the condition as well as fit the expectations and facilities available to the students (Simonson, Schlosser, & Hanson, 1999). For example, one would not assign a group project to a student in isolation of others without the proper technology to connect the students. Appropriate

instructional strategies should be used based on the facilities and technologies available to all students.

Students are the third component in the Equivalency Theory. Students are defined by Simonson, Schlosser, and Hanson (1999) as those involved in the learning activity or course. The students in the course should be defined by their enrollment in the course not by their location. Rather than differentiating students by location, one should consider them as students in a single course to help ensure equivalency.

The final component of the Equivalency Theory is outcomes: “the outcomes of a learning experience are those obvious, measurable, and significant changes that occur cognitively and affectively in the learners because of their participation in the course or unit” (Simonson, Schlosser, & Hanson, 1999, p. 8). Simonson, Schlosser, Hanson, (1999) discuss two kinds of outcomes, instructor-determined and learner-determined. Instructor-determined outcomes are the skills students should be able to achieve as a result of taking the course. Instructor-determined outcomes come in the form of course goals and objectives. Learner-determined outcomes are more personal, less specific, and relate to what a learner hopes to achieve as a result of taking and completing the course. Equivalent learner-determined outcomes result from the students enrolling in additional courses or actively applying the newly learned skills.

If the students of the remote classroom or distance learning site acknowledged their experience to be equivalent to the onsite or experience, then ITV should theoretically be more widely accepted and have a chance of becoming part of the normal educational experience (Simonson, Schlosser, & Hanson, 1999).

Equivalency Theory offers a framework for examining the equivalency of the ITV experience. This theory is particularly important for this study because ITV will be used as the medium of instruction for comparison of student values between onsite and remote locations. The remote location students are able to view and hear the instructor located at the onsite campus where comparisons can be made regarding whether or not the students are receiving equivalent value in the learning experience.

Equivalency Theory is based on the American system of education. It places emphasis on local control, classroom teachers, small classes, student and teacher rapport, and personalized instruction. With the advancement of communications technologies, such as the telecommunications many educators have begun to advocate the need for structured distance education that employ traditional aspects of American education (Simonson, Schlosser, & Hanson, 1999). Equivalency Theory provides a framework to design and examine the learning experience through ITV technology communications and instructional delivery.

Significance of the Study

The importance of this study is the addition to the knowledge base regarding ITV as a medium of instructional delivery. The study discovered some of the important variables to understanding the distance education experience from the student point of view, where research is limited (Anderson, 2000).

In addition, the importance of this study was to discover how the variables (learning experience, appropriate applications, students and outcomes) interact as a total experience. The data collected and analyzed in this study can assist distance education

faculty to understand the differences in student value between classroom locations and their respective environment. The study will indicate how students perceive differences in location, and it could assist administrators and faculty in decision making processes regarding interactive television technology and its level of utilization in their programs and institutions. In addition, the study will assist Northwestern Oklahoma State University's Assessment Committee to determine the student perception of ITV course offerings and help to discover variables that may improve student value and ultimately lead to increased student success.

Limitations

Study results should be considered with the following limitations in mind: At this early juncture, this study recognizes that the learners' values about the relationship between communication technology and interaction may be limited to their experiences with Northwestern Oklahoma State University faculty in two-way, video-audio, interactive television lecture format without the use of other technologies.

Definition of Terms

The study the following definitions are provided to ensure uniformity and consistent understanding of the terms used throughout the study. All definitions not accompanied by a citation were developed by the researcher and drawn from distance learning literature.

Classroom Environment – There are many definitions in the literature for this term. For the purpose of this study this term referenced the two classroom locations to be studied, the ITV originating site and the ITV remote site.

Compressed Video – The transmission of the video images in digital form. The amount of compression determines the quality of the picture (Moore & Kearsley, 1996).

Distance Education – Distance education is formal, institutionally-based educational activities where the learner and the teacher are separated from one another, and where voice, video, and data interaction occurs using telecommunication systems (Simonson, Schlosser, & Hanson, 1999).

Facilitator – An individual located at a television downlink-receiving site that assures that the equipment is operating properly prior to the broadcast. A facilitator monitors the classroom during a satellite broadcast and performs administrative tasks (e.g., takes attendance, distributes course materials, facilities course exercise, mails course examinations and class evaluations back to the course instructor for grading, etc.).

Fiber Optic - The transmission of audio, video, and computer information in digital form using pulses of light through glass fibers (Moore & Kearsley, 1996).

Instructional Television (ITV) – The instructional medium used for broadcast over satellite. It originates in a studio or classroom and, in some cases, has a television director who coordinates participants' efforts with those of camera, teleprompter, sound console, and video graphics operators who assist the instructors. In an instructor-controlled environment, the instructor controls the above mentioned equipment which may or may not include a teleprompter. Comprised of one way or two way video, similar to that used by the commercial television networks, the medium also employs two way

audio, using telephones lines to deliver the return audio signal to and form the broadcast location. Students communicate with their instructors by using push-to-talk microphones or by phone lines located at the students' desk or near by. The audio loop is fully interactive; meaning that instructors and students can converse over the network in real time. In addition, students located anywhere else in the network in real time. In addition, students at any given location may hear questions and comments from students located anywhere else in the network at the same instant as the instructors (Moore & Kearsley, 1996).

Instructor Performance – This pertains to a faculty member's performance as an instructor in the television mode of the instruction. Performance encompasses the full range of educational activities such as job and task analysis, instructional design, development, instruction, and evaluation.

Interactive Television – A two-way, interactive full-motion, compressed video and audio network that allows participants to see and hear each other from remote locations at real-time speeds (Comeaux, 1995).

Onsite/ Originating Site – The classroom location where the instructor is typically physically present and uses interactive television technology, to send to the broadcast site (s).

Remote Site – The classroom(s) located where the instructor is typically not present and receives the interactive television technology from the originating site.

Traditional Classroom – A classroom that uses the traditional teaching methods of instructor-centered presentations in standardized rooms including podiums, student desks,

audio- visual equipment, and internet with no external delivery. Advanced technology such as interactive television, computer assisted presentations, etc. are not used.

Overview of the Dissertation

A traditional organizational structure frames this study. Presented in chapter One are the introduction, background of the problem, problem statement, research questions, theoretical framework, significance of the study, definition of terms, limitations of the study, and overview of the dissertation. Contained in chapter Two is the review of selected literature and research related to the problem being investigated. The methodology and procedures used to gather data for the study are described and discussed in Chapter Three. The results of analysis and findings discovered through the study are contained in Chapter Four. Chapter Five contains a summary of the study's, findings, conclusions, discussion, and recommendations for future studies, practice, and policy.

Chapter II

REVIEW OF SELECTED LITERATURE

This chapter provides a review of the selected literature and research related to student value of two different classroom environments using ITV as a medium of instruction. This chapter is divided into the following sections: (1) Introduction and History of Distance Education, (2) Principles and Practices for Effective Distance Education (3) Advantages versus Disadvantages to Interactive Television, (4) Theories of Distance Education, and (5) Summary.

To many individuals and educators, distance education appears to be a new idea. However, the concepts that develop the basics of distance education date back more than a century (Simonson, Smaldino, Albright, & Zvacek, 2000). Recently there has been a dramatic growth and change in distance education; however, its long roots from the past continue to provide direction for the future. The U.S. Department of Education reported the number of distance education programs increased by 72 percent from 1995 to 1998, enrolling 1.5 million students (10 percent of all students). In 1998, a full 56 percent of all U.S. colleges and universities offered ITV classes (Carnevale, 2000). The following section offers a brief history of distance education, from correspondence study, to synchronous telecourses.

The history of distance education shows that it readily accepts innovative ways of instructional delivery. It also shows that it is at least 160 years old (Simonson, Smaldino, Albright, & Zvacek, 2000). While there is some debate as to when the first distance education course was offered, whether it was the 1728 Boston Gazette advertisement for shorthand lessons by mail order or the 1833 Swedish newspaper for composition. Regardless of the debate there is agreement that Isaac Pittman was the first modern distance educator, (Distance Education, 2006). Starting with the first generation of distance education, England's Penny Post permitted Isaac Pittman to offer shorthand instruction via correspondence and three years later there was formalized instruction with the founding of the Phonographic Correspondence Society, a precursor of the Sir Isaac Pittman's Correspondence College, (Simonson, Smaldino, Albright, & Zvacek, 2000).

The correspondence study form of distance education was established in Germany by Charles Toussaint and Gustar Langenscheidt, who taught language in Berlin (Simonson Smaldino, Albright, & Zvacek, 2000). Correspondence study moved to the United States in 1873 when Anna Eliot Ticknor founded a Boston Society to encourage at home study (Simonson, Smaldino, Albright, & Zvacek, 2000). In 1883 thru 1891, academic degrees were authorized by the State of New York through the Chautauqua College of Liberal Arts to students who completed the required correspondence courses (Simonson, Smaldino, Albright, & Zvacek, 2000).

Correspondence study continued to emerge in Brittan with a number of correspondence institutions, i.e.: 1878 the Skerry's College in Edinburgh and also in 1878 the University Correspondence College in London. During that time, the university extension movement in the United States promoted the correspondence method. Some of

the pioneer universities were Illinois Wesleyan in 1877 and the University Extension Department of the University of Chicago in 1892 (Simonson, Smaldino, Albright, & Zvacek, 2000).

Correspondence teaching by 1930 was offered by 39 American universities. As time passed, additional universities and schools began to offer correspondence instruction. In 1926, for-profit schools organized the National Home Study Council. By 1994 the National Home Study Council changed its name to the Distance Education and Training Council. In 1968, university correspondence educators, working to distinguish themselves from home study schools, called their instruction "independent study" (Moore and Kearsley, 1996). Universities became the Independent Study Division of the National University Extension Association, then later the National University Continuing Education Association (NUCEA). Then, later, in 1992 a new organization, the American Association for Collegiate Independent Study (AACIS) was developed to increase the interests of Independent Study Professionals (Moore & Kearsley, 1996).

The second generation of distance education began with development of the first Open University in the early 1970s (Moore & Kearsley, 1996). The universities applied the total systems approach to the design and implementation of distance education. The new open universities still relied on correspondence study; however they also implemented broadcast and recorded media. Programs were distributed by radio and television, as well as audiotapes (Moore & Kearsley, 1996).

Advances in electronic communication technology in the United States determined the dominant medium of distance education. At least 176 radio stations in the 1920s were developed at educational institutions. Experimental television instruction

programs in the 1930s were produced at the University of Iowa, Purdue University, and Kansas State College (Simonson, Smaldino, Albright, & Zvacek, 2000). In spite of the experimental programs, it was not until the 1950s that college credit courses were offered via broadcast television (Simonson, Smaldino, Albright, & Zvacek, 2000). The second generation of the total systems approach laid the ground work for the third generation, the delivery of course materials by broadcast television or video-taped, with interaction by telephone, or both delivery and interaction by telephone, satellite, cable or ISDN (Integrated Service Digital Network) lines (Moore & Kearsley, 1996). Satellite technology was developed in the 1960s which was made more cost effective in the 1980s enabling the wide spread of instructional television (Simonson, Smaldino, Albright, & Zvacek, 2000).

In the late 1980s and early 1990s the development of fiber-optic communication systems allowed for the growth of live, two-way, audio and video systems in education (Simonson, Smaldion, Albright, & Zvacek, 2000).

In summary, the historical view of distance education shows us that the field of new ideas and technologies often faced with a resistance to change. Distance education sometimes places technology in the light of promising more than it has delivered (Jeffries, 2006). History showed traditional and nontraditional education trying to blend in order to meet the challenge of constantly changing technologies and evolving learning theories.

Guiding Principles and Practices

Innovations in Distance Education (IDE) was formed in 1995 with support from the AT&T Foundation. IDE's goal was to develop greater understanding of issues presented by distance education, create new approaches to teaching and learning, and assist faculty to become effective users of distance education. The Principles are grouped into six categories: Learner Outcomes; Interaction; Instructional Media and Tools; Social Relationships; Assessment and Measurement; and Support Systems and Services. A brief overview of each principle is discussed as well as an example of how the principle might be implemented.

Learner Outcomes: Learning outcomes of any educational experience should guide the design of an effective instructional model for that experience. Learning outcomes describe what skills or knowledge the learning activity will enable the learner to acquire and what educational experiences will be provided as a result of instruction. It is essential that the instructor effectively communicate these expectations and that the learner understand them, in order for the learner to have an effective learning experience. Principle one applies to face-to-face interactions, as well as to distance education instructional models. The explanation of learning goals and objectives between instructor and student serves as the contract, defining what is to be taught and learned. Learning outcomes should be part of the instructional design plan and made available and communicated to the student in whatever manner suits the distance education technology. Principle two states that the instructional strategies designed should be similar with the planned learning outcomes. Specific assignments or activities should be directed toward providing learners with the necessary skills, knowledge, or experience to meet the

objectives of the course. Course content should be designed to enable students to achieve the goals explained in the learning outcomes. It is advisable to use the planned learning outcomes to help shape the design of the instructional activities for the distance education experience. Principle three explains that, just as learning outcomes provide the basis for the selection and application of instructional learning strategies, so must evaluation of student performance be directed toward measurement and assessment of those learning outcomes. It is recommended that assessment for distance learners be more frequent and varied than for learners in residence.

Interactions: Distance education has the potential to create a variety of interactive learning experiences. Learners that interact with one another and an instructor are able to acquire meaningful interpreted new information. Interactions are crucial to the learning process. Technology, instructors, students, and materials are all components to consider in establishing interaction for a meaningful learning experience. Principle one reminds us that effective learning environments involve multiple interactions. Educational technologies used in distance education expand the three traditional interactions, learner-instructor, learner-learner, and learner content to include a fourth: the interaction between learner and technologies. It is recommended to provide time for learners and instructors to practice the technologies needed to interact with other learners, instructors, and resources. Principle two explains to facilitate interaction in distance education, it is important to provide an adequate infrastructure and sufficient resources to support the development of course content, access to appropriate technology, achieve course goals, and communication among participants. It is recommended to build alternative activities into the course design and arrange for support staff to be available in case of technical

failure. Principle three states that distance education requires developing and implementing new communication strategies and protocols different from those used in the traditional, self-contained classroom. Alternative strategies can offset the obstacles to social interaction that sometime occurs from separation of learners. It is recommended to use multiple levels of electronic communication like e-mail or audio-video conferencing to provide them instructor with the ability to assess student understanding. Principle four of interactions reminds us that various teaching technologies have both advantages and disadvantages that must be considered in the design of the learning environment. Principle five, states that expectations of the instructor authority and student responsibility vary, according to the learners' history, experiences, and cultural background. It is recommended that sensitivity is required in order to understand the impact of planned or unplanned interactions in a distance education environment.

Instructional Media and Tools: This category suggest that to design an instructional experience for any learning environment requires careful consideration of the available tools and media that could be utilized by students within that environment. Careful consideration should be given so that the technology itself does not become the driving force in decision making and diverts attention from the most fundamental considerations in the design and implementation of successful programs. Principle one states that the selection and use of instructional media and tools should be based upon their ability to support the pre-determined instructional goals and objectives of the learning program. It is advisable to first define the goals and objectives, and then select specific tools and media that will facilitate those desired outcomes. Principle two explains that the selection of instructional media and tools should reflect their

accessibility by learners. We are reminded that a distant learning program should incorporate a technology base that is appropriate for the widest range of students within that program. Principle three states that users of a distance learning system must be adequately prepared and supported in order to benefit from the capabilities of the instructional media and tools. It is recommended that faculty ensure that learners have a fundamental level of understanding with any media that might be used, or offer training and practice to gain functional competence with the selected media. Principle four states that adult learners bring varied social and cultural backgrounds and diverse experiences to a distance learning program. The way learners live and work could influence the way they think about and use instructional media and tools. It is recommended that instructors consider the age and maturity of learners when considering the selection and use of instructional media and tools. Principle five states that a wide range of technologies may be used to deliver content, support interaction, and provide student access to instructional resources in a distance learning program. Instructors are reminded to carefully match desired instructional strategies with appropriate supporting technologies. Principle six states that when the instructional design model relies on some component of electronic technology for delivery, contingency strategies need to be considered that will enable a quick recovery from technology-related interruptions. It is recommended to build reasonable provisions for backup, technical oversight, and maintenance of the delivery system into the design of any distance education program.

Social Relationships: Social relationships form the foundation for a community of learners. Systematic instruction, whether face-to-face or conducted at a distance, is enhanced by informal conversations and interaction among participants. When students

feel they are part of a community of learners, they are more apt to be motivated to succeed. Distant educators need to design into instructional environment strategies and techniques for establishing “learning communities” among students separated by space and/or time. Principle one states that the instructional design of any learning situation must incorporate methods to reduce real or perceived barriers to establishing the learning community. Principle two states that defining the establishment and maintenance of social relationships as an instructional goal of the distance learning experience can enhance the learning experience for learner and instructor. Instructors are advised when ever possible to maintain a personal connection with learners throughout the program through such means as group or individual visits, personal e-mail, or telephone calls. Principle three states that the participants’ confidence and competence with the distance education paradigm and supporting technologies can help reduce barriers to establishing social relationships. Educators are advised to provide training for all learners that address issues in learning at a distance. Principle four states that participants in an instructional experience are best able to identify positive and constructive strategies for improving the social relationships within the program. A safe and comfortable atmosphere supports this exchange of ideals. Educators are recommended to design formative and summative evaluation activities that enable participants to provide anonymous feedback, as well as participate in open class discussions about the distance education experience.

Assessment and Measurement: Assessment and measurement serve several important purposes for both instructors and students. Formal assessment of student’s performance such as assignments and test provide instructors with information on student achievement and understanding. Informal assessments, such as open discussion or

question and answer session during class time also provide feedback from students. This feedback can help instructors adjust instruction to better meet the needs of students. Principle one states that assessment should be used for three distinct purposes: 1) as a basis for making modifications while the course is in progress: 2) as verification that individual students have gained knowledge; and 3) as an indicator of the extent to which the course has effectively met its goals. Principle two states that feedback from assessment is a key component in the learning cycle and must be preserved in distance education. Instructors' are encouraged to create on-line quizzes that evaluate student comprehension and provide corrective feedback when an answer is incorrect. Principle three states that effective assessment complements the desired learning outcomes defined in the course and lesson objective. Principle four states that assessment and evaluation should include student review and feedback on their interactions with course materials, instructors, and the distance education delivery system. Principle five states that careful consideration for the nature of the learning outcomes for applicability to assessment via distance education methodologies. Instructors are advised where appropriate use on-site or other assessment or evaluation strategies.

Support Systems and Services: The support systems and services for distance learners must be as complete and effective as those provided for the on-campus learner. Alternative support methods must be employed to ensure that no student is significantly inconvenienced. It is recommended that the overall support system should address the following areas: technical support, instructional resources, faculty development, instructional design and development, and policy changes aimed at creating an environment conducive to distance education. Principle one states that a comprehensive

system of support services must be in place to ensure the effective use of instructional technologies in distance education programming for learners, instructors, and staff. It is recommended that learners understand the equipment requirements and technology skills necessary to effectively participate in a program prior to their enrollment. Principle two states that supporting services must be provided to ensure adequate faculty development in the areas of applied instructional technology and effective distance education. Principle three states that the design of distance education programs should include specific support strategies to create and maintain learning communities that are available on a schedule as convenient as possible. Principle four states that learners and instructors must have immediate and effective technical support. It is recommended to provide help desk services for answering questions and solving problems for learners and instructors. Principle five states that extending the distance education mission of the institution requires policy adjustments and accommodations for supporting the distance education instructor and learners. It is advisable for institutions to create new institutional policies to account for potential increases in the design, development, and delivery expenses for distance education programs.

Interactive Television Advantages and Disadvantages

Hardware and software innovations in communications, distance education technology emerged rapidly and became a major topic in education all over the world. Currently, there are many different technologies used in distance education. This research will focus on ITV technology.

Two opposing sides emerge when examining ITV technology. There are those proponents that quickly embrace the ITV technology as a quality means of instruction, especially to isolated rural areas (Anagal, Dobrowolski, Francis, Minner, Parish, Prater, & Minsett, 1996). ITV instruction through an infrastructure of cable broadcasting provided educational opportunities beyond the traditional classroom setting (Johnson& Silvernail, 1994). Many rural colleges and universities have used ITV instruction to reach students which helped to increase enrollments and fill classes in spite of low enrollment in their local level (Smith, 1996).

In addition to access for students in rural area locations, ITV courses also increased access for smaller colleges and universities to an abundant amount of information from metropolitan areas. More resources, such as current research and knowledge of professionals in specialized fields, became available to those outside the metropolitan areas. With ITV, partnering and collaboration made resources more available and also cost effective (Grishman-Brown, Knoll, Collins, & Baird, 1997). ITV technology provided students the access to the same quality of education as the large metropolitan universities.

A published list by Thoms (1996) cited many reasons to employ ITV as a method of instruction. The reasons include:

- To increase accessibility to higher education
- To offer a more comprehensive selection of upper division classes to meet the needs of transfer and non-traditional students
- To enhance the offering of continuing education courses, workshops, and seminars

- To increase class size in vital and essential courses
- To broaden students' backgrounds by exposing them to culturally diverse populations at other sites
- To more effectively use time and travel money
- To increase visibility and cohesiveness and reduce the cost of sharing invited campus speakers that may otherwise be cost prohibitive
- To meet people's needs for convenience and quality in education
- To enhance and expand learning by accommodating different learning styles
- To provide on-going education in rural areas

From an instructors view, Seay, Rudolph, and Chamberlain (2001) suggest the major strength of ITV instruction is that students have better access to instruction. Research identified 355 studies in which a comparison of distance learners and traditional students showed no significant differences in classroom outcomes measured (Russell, 1999). Russell (1999) noted that it is generally accepted that ITV courses, when compared to traditional on- campus courses, demonstrated an equal level of student achievement.

Those who opposed the abundant use of ITV in education did not argue the fact that this use of technology offered better access to rural students. The main issue for the opponents was that ITV technology limited the level of interaction in the classroom. Many instructors learned using ITV compressed audio/video limits spontaneity and vital interaction important to student learning (Cuttman & MacRae, 1996).

McHenry & Bozik (1995), study revealed that students at one remote site rarely interact. At a second remote site, only a few interacted. During the study only one

interaction was observed between students at separate locations. In this observation the researchers concluded that there was no indication of classroom community being developed between sites. Other observations concerned the instructor. During observations, the instructor displayed the originating site to all sites only once and never displayed the remote site on the monitors. There were no techniques observed showing the instructor trying to encourage discussion between sites or between students within a site. The instructor usually referred to the sites by the name of a town and was not observed calling any students in the onsite by name. This no doubt contributed to the lack of interaction.

From an instructor's perspective the weaknesses related to ITV instruction included increased class sizes, adapting to a new technology that was not always consistent among sites, and reduced levels of interaction among students and between instructors and students (Seay, Rudolph, & Chamberlain, 2001).Traditional faculty who used instructor-centered designs and lecture methods believed that all personal contact with students was lost using ITV. The instructors were perceived as "talking heads" (Hinton & Oleka, 1996). This type of curricular presentation produced minimal participation by students giving those opposed documented proof as to the limitations of ITV in interaction (Comeaux, 1995).

Those in favor of ITV countered these limitations by advocating faculty training and course design. Instructors were encouraged to design their ITV courses beyond the tele-lecture format. The potential of ITV technology could make a course more interactive and interesting to students (Larson & Burning, 1996). Grisham-Brown, Knoll, Collings, and Baird (1997) believed that ITV instruction is ideal for use in advanced

courses in teaching methods or other disciplines that require ongoing interaction between instructor and student. They believed that interaction could be purposefully designed into all aspects of the course. Interaction prevented the students from passive television viewing.

McHenry & Bozik, (1995) address another concern of ITV, the issue of equipment breakdowns, disconnections, and technical problems. Instructors were apprehensive about using ITV technology because they were unfamiliar with handling technical system breakdowns. Video and/or audio technology became distorted, disrupted, and disconnected entirely.

An additional equipment-related concern is that students were intimidated by the cameras, monitors, and microphone. Comeaux (1995) points out that students have described the ITV classroom and viewing themselves on the monitor as “very uncomfortable” or “intimidating”. The audio/video compressed technology required students to speak for three to five seconds before the other sites receive their picture and voice transmission. Due to the technical requirements, students indicated they were hesitant to engage in class discussion. Classroom interaction was hindered by the cameras, monitors, and microphones. However, students could be oriented and trained to alleviate some of the anxiety associated with the technology. It is recommended that as technology advances, classroom technology designs for the future be more conducive to communications and help bridge the “psychological distance” the equipment inadvertently creates (Comeaux, (1995).

Another disadvantage to the remote location students of ITV technology experience is the lack of availability to student support services, such as tutoring services

or student advisement and counseling (Minich, 1996). Support for remote location students is advised and should include access to program information, library resources, and technology services. On-site location students should have access to a full range of services that are not always available at the remote location sites (Sparks, 1995). Distance learners that do not receive equivalent access to services are disadvantaged, which is a claim of ITV opponents (Thomas, 1996).

Anagal et al. (1996) in an attempt to summarize the most common opponents' viewpoint for disadvantages in ITV technology list the following:

- The students are unable to interact directly with the professors
- The lack of resources available in the rural areas for course work
- Technology problems, information is not always received when it is supposed to from the originating site
- Expectations are not always clearly defined – course structure and evaluation of student work

From a student's point of view, the following comments were given in regard to ITV technology:

- ITV is less personal due to the distance
- The on-campus class is more challenging
- Expectations are greater in on-campus courses
- Students receive less guidance in remote locations which creates more confusion
- There are communication problems under time constraints
- The teacher has less control over the class

ITV technology opponents, faculty, and students shared a fear of the unknown and new technological change. Fears of the unknown were experienced when people were asked to change and use new technology. Those fears are enhanced when we hear that traditional schools will become obsolete (Smith, 1996), non-traditional programs are taking students from traditional ones (Minich, 1996), teamwork and cooperative learning cannot be taught at a distance (Smith, 1996), ITV is a means for the administration to reduce departmental budgets (Smith, 1996), and students will suffer from lower self-confidence and forced autonomy when they are compelled into separation from the instructor (Gibson, 1996).

When examining research advantages and disadvantages of ITV one can also examine students' views of remote-sites versus originating-sites. The originating, are the main campus of live audience students of an ITV course. The remote-site students are those who receive instruction located at off-campus locations. Zarghami, (1998) found, when looking at site-based comparisons, the remote-site students valued and found more advantages than the originating-site students. Wheeler & Batchelder (1996) found that originating-site students perceived the technical and logistical problems associated with ITV as unnecessary, unproductive, and burdensome. Mainly because the originating-site was taking the classes located at the main campus, students felt no need for all the extra technology, cameras, television, and microphones. However, this technology made the class possible for the remote-site students (Wheeler & Batchelder, 1996). It should be noted that traveling expenses, leaving work or family were certainly advantages for the remote-site students.

Clow (1999) questioned the finding that remote-site students value ITV more than originating-site students. Clow (1999) hypothesized that remote-site students may, in an attempt to keep ITV courses available, inflate their responses. Due to this proposed belief, Clow used standardized end-of-semester classroom evaluations to assess student value of their ITV experience and to eliminate student bias. The evaluation forms used in Clow's (1999) study were identical to those used in a traditional classroom evaluation.

Remote-site students reported by Clow (1999) showed significantly less value than originating-site students in their responses on classroom evaluations dealing with classroom interaction and instructional presentation. ITV students located at the remote-site found that instructors were not as enthusiastic or as aware of students who struggled or failed to understand content as traditional classroom students.

With technology training for both students and faculty many of those fears were relieved. Faculty, as well as students, can relieve anxiety and fear with adequate training. Thomas, (1996) suggested that, after training, faculty comfort levels will be emulated by students. A higher comfort level in teaching ITV will allow instructors to use a more casual style in course presentations and allow both instructors and students to handle technology issues more easily and become less intimidated (Comeaux, 1995).

In closing, distance education continued to be a viable alternative form of education and opened doors to a vast number of resources and allowed students to learn from one another at many sites. When conducted with quality, ITV courses can result in positive evaluations from its distance students (Johnson & Silvernail, 1994). ITV technology can best be summarized by McHenry & Bozik (1995).

Further advances are inevitable, resulting in greater ‘transparency’ of distance education technology and offering greater similarity with traditional classroom instruction. It is known that good distance education pedagogy is good pedagogy in any classroom. In the future, if indeed not now, it may be that good education theory and good distance education theory will be one and the same (p. 370).

Theories of Distance Education

Due to the rapidly changing and diverse environment in which distance education is practiced, many questions remain unanswered. With this current environment it is difficult to arrive at one approach to guide the practice of distance education, (Simonson, 1999). The purpose and value of a theory is that it assists in helping to explain and describe a phenomenon (Moore & Kearsley, 1996). Theories guide the practice and research of distance education (Simonson, Schlosser, & Hanson, 1999).

Throughout the history of distance education, theoretical approaches reflected the progression in understanding the relevant variables and relationships that exist to explain the practices in distance education. In the landmark work of Keegan (1986), The Foundation of Distance Education classified theories of distance education into three groups:

- Theories of independence and autonomy
- Theories of industrialization of teaching
- Theories of interaction and communication

Theory of Independence and Autonomy

Charles Wedemeyer considered the independence of the student as the essence of distance education (Keegan, 1986). He was interested in teaching and learning and the focus was on the individual student as opposed to the group. This was reflected in Wedemeyer's preference for the term "independent study" for distance education (Simonson, Smaldino, Albright, Zvacek, 2000). Wedemeyer identified the characteristics and advantages of independent learning. He set fourth a system of distance education that included 10 characteristics that emphasize learner independence and the adoption of technology as a way of implementing it. The distance education system according to Wedemeyer should:

- Be capable of operating any place where there are students, even only one student whether or not there are teachers at the same place, at the same time
- Place greater responsibility for learning on the student
- Free faculty members from custodial-type duties so that more time can be given to educational task
- Be able to offer students and adults wider choices and more opportunities in courses, formats, and methodologies
- Use, as appropriate, all the teaching media and methods proven effective
- Mix and combine media and methods so that each subject or unit within a subject is taught in the best way known
- Preserve and enhance opportunities for adaptation to individual differences
- Cause the redesign and development of courses to fit into an articulated media program

- Evaluate student achievement simply, not by raising barriers regarding the place, rate, method, or sequence of student study; and
- Permit students to start, stop, and learn at their own pace.

Wedemeyer went on to propose six characteristics of an independent study system (Simonson, Smaldino, Albright, & Zvacek, 2000).

- The student and teacher are separated
- The normal processes of teaching and learning are carried out in writing or through some other medium
- Teaching is individualized
- Learning takes place through the student's activity
- Learning is made convenient for the student in the student's own environment.
- The learner takes responsibility for the pace of learning, with freedom to start and stop at any time

Wedemeyer believed that the development of the student-teacher relationship was key to the success of distance education.

Formulated in the 1970s, Moore's theory contributed to the development of distance education by analyzing distance education on two dimensions, "distance" and "student autonomy" (Simonson, Smaldino, Albright, & Zvacek, 2000). Distance was understood as the effect of the interaction between the structure of the course and dialogue. Although distance in most situations meant physical separation of student and teacher, in Moore's terminology, distance was to be understood psychologically as an effect of the interaction between two aspects of the teaching medium, dialogue, and

structure. The two dimensions, distance and autonomy, were used both for describing and analyzing distance learning programs and for planning and teaching.

Moore advocates that distance teaching programs can be classified according to the distance between learner and instructor. Distance education programs should be classified by two-way communication (dialogue) and by the extent to which a program can be responsive to a student's individual needs (structure) (Simonson, Smaldino, Albright, & Zvacek, 2000).

In part two of his theory, Moore advocated for learner autonomy in the setting of objectives, methods of study, and evaluation. The basis for learner autonomy as a necessary theoretical component of distance education is based on Moore's analysis of the separation between teacher and learner in distance education (Simonson, Smaldino, Albright, & Zvacek, 2000). With the learner being alone, he/she accepted a high degree of self responsibility and control over his or her learning. A teacher's role for an autonomous learner was that of respondent rather than director, while the institution became a helping organization.

Distance education programs were classified by Moore as "autonomous" learner-determined or "non-autonomous" teacher-determined. Moore gauged this level of autonomy according to the learner by answers to the following three questions:

- Is the learning objective selected in the program the responsibility of the learner or teacher (autonomy in setting of objectives)?
- Is the selection and use of resource personnel and other media, the decision of the teacher or learner (autonomy in methods of study)?

- Are the decisions about evaluation and criteria to be used made by the learner, or the teacher (autonomy in evaluation)?

The answers to these questions for Moore help determine the type of distance learning program and can be used to categorize the program, as well as provide direction as to how the program functions (Simonson, Smaldino, Albright, & Zvacek, 2000).

Theory of Industrialization of Teaching

Otto Peters of Germany developed a view of distance education as an industrialized form of teaching and learning, (Simonson, Smaldino, Albright, & Zvacek, 2000). Peters examined a research base that included an extensive analysis of the distance teaching organizations of the 1960s. Peters proposed that distance education could be analyzed by comparison with the industrialized production of goods. He stated that from many points of view, conventional, oral, group-based education was a pre-industrial form of education. This implied that distance education could not have existed before the industrial era. Peters, using the economic and industrial theory, proposed the following new categories for the analysis of distance education:

- Rationalization: the use of methodical measures to reduce the required amount of input of power, time, and money.
- Division of labor: the division of a task into simpler components or subtasks.
- Mechanization: the use of machines in a work process, without distance education would be impossible.
- Assembly line: methods of work in which workers remain stationary while objects they are working on move past them.

- Preparatory work: determining how workers, machines, and materials can usefully relate to each other during each phase of the production process.
- Planning: the system of decisions that determines an operation prior to its being carried out.
- Organization: creating general or permanent arrangements for purpose-oriented activity.
- Scientific control methods: methods by which work processes are analyzed systematically, particularly by time studies, and in accordance with the results obtained from measurements and empirical data.
- Formalization: the predetermination of the phases of the manufacturing process.
- Standardization: the limitations of manufacture to a restricted number of types of one product to make these more suitable for their purpose, cheaper to produce, and easier to replace.
- Change of function: the change of the role or job of the worker in the production process. The original role of knowledge provider as lecturer is divided into those of study unit author or marker.
- Objectification: the loss, in the production process, of the subjective element that had previously determined work to a considerable degree. In distance education most teaching functions are objectified.
- Concentration and centralization: because of the large amount of capital required for mass production and the division of labor, there has been a movement toward large industrial concerns with a concentration of capitol, or centralized administration, and a market that is monopolized.

For distance education to be effective, Peters believes that the principle of division of labor is critical. With his theory of industrialization, the instruction process is gradually restructured through increased mechanization and automation (Simonson, Smaldino, Albright, & Zvacek, 2000). Peters noted the following:

- The development of distance study courses is just as important as the preparatory work that takes place prior to the production process.
- The effectiveness of the teaching process is particularly dependent on planning and organization.
- Courses must be formalized and expectations from students standardized.
- The teaching process is largely objectified.
- The function of academics teaching at a distance has changed considerably (university teachers in conventional teaching).
- Distance study can only be economical with a concentration of the available resources and centralized administration.

According to Peters, when decisions about the process of teaching and learning are made, the industrial structures characteristics of distance teaching should be taken into account (Simonson, Smaldino, Albright, & Zvacek, 2000).

Theories of Interaction and Communication

The authors Simonson, Smaldino, Albright, & Zvacek (2000) described Holmberg's theory of distance education called "guided didactic conversations", as a communication theory. The didactic conversations took place at two levels, simulated through the pre-produced learning material and through the real two-way communication

taking place during the learning process. The authors noted that Holmberg's theory had explanatory value in relating teaching effectiveness to the impact of feelings of belonging and cooperation as well as to the actual exchange of questions, answers, and arguments in mediated communication. Holmberg offers seven assumptions of his theory:

- The core of teaching consists of interaction between the teaching and learning parties. Simulated interaction is assumed through subject matter presentation in pre-produced courses can reproduce some of the interaction by causing students to consider different views, approaches, and solutions and generally interact with a course.
- Emotional involvement in the study and feelings of personal relation between the teaching and learning parties is likely to contribute to learning pleasure.
- Learning pleasure supports student motivation.
- Strong student motivation facilitates learning.
- A friendly, personal tone and easy access to the subject matter contributes to learning pleasure, supports student motivation, and thus, facilitates learning.
- The effectiveness of teaching is demonstrated by students' learning of what has been taught.

Holmberg believed that these assumptions were the basis of the essential teaching principles of distance education. From these assumptions Holmberg formed his theory: "Distance teaching will support student motivation, promote learning pleasure and make the study relevant to the individual learner and his/her needs, creating feelings of rapport between the learner and the distance-education institution (its tutors, counselors, etc.), facilitating access to course content, engaging the learner in activities, discussions and

decisions and generally catering to helpful real and simulated communication to and from the learner" (Simonson, Smaldino, Albright, & Zvacek, 2000, p.33).

According to Simonson, Smaldino, Albright, & Zvacek (2000), Holmberg admittedly notes it is a leaky theory, but it does indicate essential characteristics of effective distance education.

In 1995, Holmberg broadened his theory and divided it into a number of parts that included his previously stated theory and the belief that distance education served diverse individuals who did not have the opportunity or wish to make use of traditional face-to-face teaching. Distance education thus promoted students' independence and freedom of choice.

According to Holmberg, distance education was characterized by the following statements:

- All learning concerned with the acquisition of cognitive knowledge and cognitive skills, as well as affective learning and some psychomotor learning is effectively provided for by distance education.
- Distance education is based on learning as an individual activity. Learning is guided and supported by noncontiguous means.
- Distance education is open to behaviorists, cognitive constructivist, and other modes of learning.
- Personal relations, study pleasure, and empathy between students and those supporting them (tutors, counselors) are central to learning in distance education. Feelings of empathy and belonging promote students' motivation to learn favorably.

- While it is an effective mode of training, distance education runs the risk of leading to mere fact learning and reproduction of accepted “truths”. However, it can be organized and carried out in such a way that students are encouraged to search, criticize, and identify positions of their own.

Holmberg’s expanded theory on one level represents a description of distance education and, on another level, a theory from which hypotheses are generated for explanatory power to identify a favorable approach to learning and teaching conducive to learning (Simonson, Smaldino, Albright, Zvacek, 2000).

Equivalency Theory

With all the changes in distance education and the many methods of instruction from independent study, of earlier times to the “virtual classroom” of today has inhibited the development of a single theory upon which to base practice and research (Simonson, 1999). New technologies and new ideas about distance learning challenged the traditional methods for distance education.

Simonson, (1999) points out that many definitions for distance education have been proposed, and most include the separation of teacher and student, the influence of an educational organization, the use of media to unite teacher and student, the necessity for two-way communication, and the potential for individualized learning. The definitions of classical European distance education focused on teaching and learning which took place at different times and different places, while recent definitions enabled by new interactive technologies emphasized teaching and learning occurring at the same time in different locations.

Simonson (1999) reveals that traditionally, theories of distance education were developed from sources outside the United States. However, recently, definitions and theories from within the United States based on the American system of education have begun to emerge. Distance education that retains traditional aspects of American education, while utilizing opportunities of telecommunications systems, was the environment in which the equivalency theory emerged.

Many people realized that new telecommunications technologies were responsible for the popularity of distance education in the United States. Interactive television systems, such as the Iowa Communications Network (Simonson & Schlosser, 1995), have allowed distance learners and instructors to see each other, and learn and teach in almost the same manner as they would if everyone were in the same classroom (Simonson, Schlosser, & Hanson, 1999). Keegan (1995) proposed that by electronically linking instructor and student at different locations creates a virtual classroom Keegan continued by saying that,

> "The theoretical analyses of virtual education, however, have not yet been addressed by the literature: Is virtual education (interactive, live televised instruction) a subset of distance education or to be regarded as a separate field of educational?" (p.18)

It is in this environment of virtual education that the equivalency theory of distance education emerged and why the researcher chose to use it as a framework to guide this study.

Because of new technologies and the impact of the "Virtual classroom" the equivalency theory was based on the following definition. Distance education is formal,

institutionally-based educational activities where the learner and teacher are separated from one another, and where voice, video, and data interaction occurs using telecommunication systems (Simonson & Schlosser, 1995).

Simonson, (1999) believes that instructional experiences are essential to learning and no one group of learners, local or distant, should compensate for different or lesser instructional experiences. The equivalency theory proposes that education at a distance should be designed on the concept of equivalency in the sum of learning experiences. According to Simonson, Smaldino, Albright, & Zvacek (2000) the more equivalent the learning experiences of distance learners are to local learners, the more equivalent will be the outcomes of the educational experiences for all learners. “The goal of instructional planning is to make the sum of the experiences for each learner equivalent” (P.36). Students should have learning experiences that are shaped by the learning environment. The key components of this theory are: equivalency, learning experiences, appropriate applications, students, and outcomes.

Equivalency: The environments of students located at the originating site and remote site are different. The learning environment should be designed to provide experiences of equal value for learners. The experiences at the originating site may not be an exact replication of those at the remote site however, they should have equivalent value.

Learning Experience: “A learning experience is anything that promotes learning, including what is observed, felt, heard, or done.” (Simonson, Smaldino, Albright, & Zvacek, 2000, p. 36). Students at different locations may require a different mix of

learning experiences; however, the goal is to make the sum of their experiences equivalent for each student. Equivalent resources should also be included.

Appropriate Application: The application of the learning experience should suit the needs of the learner and the situation as well as fit the expectations and facilities available to the students. Appropriate learning strategies should be used based on the facilities and technologies available to the students. This, too, should be equivalent at all locations.

Students: The students in the course should be based on their enrollment in the course and not by their location. As McHenry and Bozik (1995) have pointed out, in order to promote interaction within and between sites, students should be referred to by name and not simply location. Doing so will help to ensure equivalent learning experiences.

Outcomes: "Outcomes of a learning experience are those obvious, measurable, and significant changes that occur cognitively and affectively in learners because of their participation in the course or unit" (Simonson, Schlosser, and Hanson, 1999, P. 72). Two kinds of outcomes are described: instructor-determined and learners-determined. Instructor-determined outcomes are usually stated as course goals and objectives and define what students should be able to accomplish after completion of the course. Learner-determined outcomes are more personal, less specific, and relate to what a student hopes to achieve once participation in the course is completed.

The concept of equivalency or equivalent value is central to the equivalency theory. If all participants, teachers, students, and the public perceive ITV distance education to be equivalent to traditional classroom experiences, then ITV will become

more widely accepted, at least in America. However, if equivalency is not perceived, then distance education ITV will continue to be peripheral to the field of education (Simonson, Schlosser, & Hanson, 1999).

Simonson, (1999) points out that theory is important to the study of distance education because it directly affects the practice of the field. Distance education theories have traditionally come from sources outside the United States. Distance education in the United States has recently developed to the point where new theories have begun to emerge.

Simonson, (1999) suggest that with the development of communications technologies, such as the telecommunications systems many educators have begun to advocate the need for structured distance education that employ traditional aspects of American education. This new approach to distance education was based on ITV instructional delivery which required a different theory upon which to base practice than the traditional view of distance education as it has been practiced in the past. The Equivalency Theory can be employed as a framework for administrators and faculty to design and examine technology communications and instructional delivery of ITV distance education.

The equivalency theory will be particularly important in this study because ITV was used as the medium of instruction. The off-site students were able to see and hear the students and instructor located on the main campus. A comparison then was made determining whether the off-site students and the on-site students perceived equivalent value or equivalency in their learning experiences.

Summary

History proved that distance education was not a new concept, but one that was more than 160 years old. History also showed us sometimes there is a slow resistance to change, and technology sometimes promised more than it delivered. History also provided us with evolving technologies and constantly changing learning theories. This evaluation of distance education showed that it can be a comparable alternative for students with both advantages and disadvantages. However, many questions remained unanswered with an apparent lack of information about the total learner experience in distance education. Many variables have been studied in isolation of the learning experience, such as simply looking at outcomes or grades. Sufficient evidence existed to indicate a closer look from a student's perspective to examine student value or equivalency in the learning experience. The equivalency theory provided this framework for which to follow. The equivalency theory is uniquely American and based on core values of American education, such as the use of regular classroom teachers to facilitate the teaching and learning process, local control, small class size, rapport between teachers and learners, and personalized learning. As Simonson, Schlosser, & Hanson (1999) pointed out, "most importantly, equivalent distant learning relies heavily on the use of modem and powerful interactive telecommunications systems to be successful", (1999, p. 72). Examining student experiences and student value could lead to insight on the needs of learners and help to guide the development of ITV environments that support those needs.

Chapter III

METHODOLGY

The purpose of this study was to compare self-reported student value using a electronic questionnaire to survey students in two different instructional environments, the ITV originating site (classroom with instructor present) and the ITV remote site (classroom without instructor physical present). No human subjects are or can be identified in this study.

This study was presented to the Academic Vice President of Northwestern Oklahoma State University (NWOSU), and approval was obtained through an e-mail response dated July 10, 2006. The Assessment Director and Academic Vice President were eager to assist and thought this study would enable NWOSU to better assist students enrolled in ITV by understanding how students value the ITV learning experience.

This chapter describes the methods and data collection procedures used to complete this study. Methodology and procedures were selected based on the type of study pursued. This study focuses on an independent and dependent variable along with a relationship between those variables. A variable is a characteristic or attribute of an individual that can be measured by the researcher and varies among individuals studied (Creswell, 2002). Creswell (2002) defined an independent variable “as an attribute or characteristic that influences or affects an outcome or dependent variable” (p. 131).

Dependent variables are defined by Creswell (2002) as “an attribute or characteristic that is dependent on or influenced by the independent variable” (p. 136).

A quantitative approach is most appropriate for the above conditions. The dependent variable in this study is the equivalency of student value as measured by student response on a survey questionnaire. Student value is defined as the internal thoughts, feelings, observations, philosophies, and opinions of students in relation to their educational experience. The independent variable consists of site location (remote/originating site). The originating site is defined as the classroom that uses interactive television technology which initiates the broadcast and in which the instructor is physically present. The remote site is defined as a classroom that offers interactive television technology and receives the broadcasted instruction from the originating site. The instructor is typically not present at the remote site(s).

Quantitative research allowed this study to examine large numbers of subjects and look at various variables. Quantitative research assists in explaining whether one or more variable might influence another variable (Creswell, 2002).

Survey Instrument

A questionnaire using a four point Likert scale was used to collect data to explain the equivalency in learning experiences of ITV students from two different environments (originating and remote site). Ninety-seven students were surveyed for analyses of data to determine student value of an ITV learning experience.

The survey instrument was developed by the Faculty Evaluation and Development (FEAD) Task Force, at Northwestern Oklahoma State University in

September 2002. FEAD was charged with designing a faculty development program to serve as a resource for faculty improvement. FEAD'S goal was to develop a comprehensive faculty evaluation and development system that is fair; useful for personnel decisions; and promotes improvement in quality of teaching, scholarly activity, and university service.

FEAD'S first step was to review the current evaluation system, noting its strengths and weaknesses, and to suggest alternative methods of evaluation. Three members of the task force attended a workshop on faculty evaluation in St. Louis, Missouri in October 2002 that provided information on developing a fair and useful comprehensive evaluation system. Additional research compiled by several task force members reviewed what other Oklahoma regional universities use for faculty evaluation. FEAD decided to adopt an 8-step plan for developing a new evaluation system based on R.A. Areola's book, *Developing a Comprehensive Faculty Evaluation System* (Areola, 2000). FEAD believed this approach would provide a comprehensive evaluation system that could be adapted to support the mission and goals of Northwestern's faculty members.

Survey research is a form of quantitative research that allows the researcher to identify either the sample or the population, collect data through questionnaires or interviews, and draw conclusions or make inferences about the population (Creswell, 2002). Creswell (2002) also proposed that it is a preferred design to use when the researcher seeks to collect data quickly and economically for the study of attitudes and opinions. Creswell (2002) further noted that survey research emphasizes sample selections, collecting data using questionnaires, administering instruments with good

questions, and seeking a high response rate from participants. This study is considered a survey research because its main objective is to compare groups of students in two different environments and examine the variables that determine student value of equivalent learning experience.

A survey research design is preferred when attempting to describe the relationship between variables or comparing groups (Creswell, 2002). In this study a survey questionnaire was used to assess student value in perceived learning equivalency in two different environments. Two basic types of research surveys are used, cross-sectional and longitudinal. Cross-sectional designs are used to collect data that reflects current attitudes or values, opinions, and beliefs. Creswell (2002) contended that the cross-sectional design is the preferred research strategy when comparing two educational groups in terms of attitude, value, beliefs, opinions, or practices.

Reliability

Reliability of the instrument (student evaluation questionnaire) used in this study was established by a procedure called coefficient alpha. According to Thorndike (1997) the procedure for estimating the reliability of a test from a single administration of a single form depends on the consistency of the individual's performance from item to item. This procedure is based on the standard deviation of the test and the standard deviations of the separate items. Creswell (2002) suggested that the coefficient alpha is to be used for internal consistency if the items are scored as continuous variables (e.g., strongly agree to strongly disagree); the alpha provides a coefficient to estimate consistency of scores on the instrument. This procedure (Cronbach's Alpha) was

preformed using the SPSS program for testing internal consistency reliability. Cronbach's Alpha resulted in a .953, indicating a high internal consistency of the instrument used in this study.

Validity

Validity was first established in this research as mentioned above by performing a reliability test on the instrument using Cronbach's Alpha. Content validity was established by having Dr. Simonson, author of the Equivalency Theory correlate the questions on the questionnaire to the components (sum of experience equivalency, learning experience, appropriate applications, and outcomes) measured in this study.

Criterion-related validity used to establish that the scores from the instrument can predict an outcome should be viewed with caution. As mentioned in the limitations of the study, predicting outcomes in this research could relate to the student experience, course, instructor, and technology at Northwestern Oklahoma State University.

Construct validity was established by using T-test statistical analysis to compare the mean scores of two groups (originating and remote sites). In addition to statistical analysis, the Equivalency Theory was used to guide this study and examine whether or not the mean scores supported the theory.

Data Collection Procedures

The participants included higher education students enrolled in an ITV course at Northwestern Oklahoma State University. Two groups will be examined students

receiving instruction face to face (originating site) and those receiving it via ITV technology (remote site).

This survey research used an electronic a questionnaire. In this study an electronic questionnaire developed in October of 2002 by the Faculty Evaluation and Development Task Force (FEAD) of Northwestern Oklahoma State University was used to obtained data (see Appendix A). Students logged onto a computer in a NWOSU campus computer lab while being monitored and assisted by a proctor, using a NWOSU web site to locate and download the questionnaire. After completing the questionnaires, student's submitted them to be stored in a data file on the NWOSU server. The data were stored confidentially and accessible only to the Director of Assessment and Systems Analysis in the Information Technology department who was assigned to the course and instructor evaluations. Ninety-seven questionnaires were completed and returned, 39 from the remote site and 58 from the originating site, from the same instructor, course, content, and site locations over the past three years. By using data from the same instructor, course, content, and site locations the researcher can better control the confounding variables (sometimes called spurious variables). Confounding variables can be described as attributes or characteristics that the researcher cannot directly measure because their effects cannot be easily separated from other variables, even though they may influence the relationship between the independent and the dependent variables (Creswell, 2002).

The 18 items on the questionnaire (see Appendix A) were matched to the four components of the Equivalency Theory. The Equivalency Theory offers a framework for examining the equivalency of the ITV learning experiences. October the 4, 2006 Dr. Simonson, author of the Equivalency Theory and Program Professor of Instructional

Technology and Distance Education of Nova Southeastern University located in North Miami Beach, Florida was contacted by e-mail to assist with the correlation of the 18 items of the questionnaire to the four components of the Equivalency Theory. Contact was later made by phone on October 5, 2006 between the researcher and Dr. Simonson to discuss the e-mail and correlation. Dr. Simonson and the researcher decided that for the central concept of the Equivalency Theory, equivalency or equivalent value of the sum of experiences, all items on the questionnaire would be used to compare the mean score between the remote and originating sites.

The first component of Equivalency Theory is the learning experiences. A learning experience is described as any situation that promotes learning, which includes what is observed, felt, heard, or done (Simonson, Schlosser, & Hanson, 1999). Items 9, 10, and 12 of the questionnaire (see Appendix A) were used to compare the mean score between originating and remote sites.

The second component of Equivalency Theory is appropriate application. Appropriate application includes timely learning experiences that are made available to both remote and onsite learners. Items 1, 2, 3, 4, 5, 6, 8, 10, 11, 14, 15, 16, and 17 of the questionnaire (see Appendix A) were used to compare mean scores between originating and remote sites.

The fourth component in the Equivalency Theory is outcomes. Simonson, Schlosser, & Hanson (1999) defined outcomes of a learning experience as the obvious, measurable, and significant changes that occur cognitively and affectively in the learner because of their participation in the course or unit. Items 13 and 18 of the questionnaire (see Appendix A) were used to compare mean scores between originating and remote

sites. Table 2 provides a quick reference to the four components of the Equivalency Theory and their relation to the 18 items on the questionnaire.

Table 2: Correlation of Equivalency Theory and Questionnaire Items

	Survey Questionnaire Items																	
Equivalency	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Appropriate Application	1	2	3	4	5	6		8		10	11			14	15	16	17	
Learning Experiences									9	10		12						
Outcomes													13					18

Data Analysis

Quantitative research collects numeric data in the form of scores. These scores are reported on instruments (questionnaire) by the participants (Creswell, 2002). When collected, the electronic surveys were scanned and a computerized report was generated which documented the mean for each individual question and total mean scores for the questionnaire. The means were then compared among the two different classroom environments (originating site and remote site) in order to make an evaluation regarding the research questions and original purpose of the study. A .05 level of significance was used to indicate statistically significant differences, a level which is deemed significant by Creswell (2002).

A calculated mean score of all 18 items on the questionnaire (see Appendix A) were used to analyze the research question one, “Do ITV students perceive equivalent value in the sum of their experiences at both remote and originating site locations?” A T-test was used for statistical analysis in comparing the two group mean scores (originating and remote site).

Using research question two, “Do ITV students perceive equivalency in the learning experience at both originating and remote sites?” a mean score were calculated from items 9, 10, and 12 of the questionnaire (see Appendix A). These scores were used to compare both the originating and remote sites. Again, the T-test was used for statistical analysis.

Using research question three, “Do ITV students perceive equivalency in appropriate application at both originating and remote sites?” mean scores were calculated from items 1, 2, 3, 4, 5, 6, 8, 10, 11, 14, 15, 16, and 17 of the questionnaire (see Appendix A). As with question a, these scores were used to compare both the originating and remote sites. Once again, the T-test was used for statistical analysis.

Regarding research question four, “Do ITV students perceive equivalency in outcomes at both originating and remote sites?” mean scores were calculated from items 13 and 18 of the questionnaire (see Appendix A). Statistical analysis was formulated by using the T-test.

Table 3 provides a correlation between the dependent variable, independent variable, research questions, and the questionnaire items.

Table 3: Correlation of Data

Dependent Variable (Student Value of)	Independent Variable (Location of Student)	Research Question	Questionnaire Items
Sum of experience equivalency	Student location	Question #1	1-18
Learning experience equivalency	Student location	Question #2	9, 10, 12
Appropriate application equivalency	Student location	Question #3	1-6, 8, 10, 11, 14-17
Outcomes equivalency	Student location	Question #4	13, 18

As a result of the research questionnaire used for this procedure, the data collected focused on an independent and dependent variable and the relationship between those variables. By using the electronic questionnaire survey instrument, the data collected was monitored by the Director of Assessment and confidentially stored in the Information Technology department on the NWOSU campus. From the computerized report which documented the results of the data collected, the means were compared among the two different classroom environments. Analysis of data will be discussed in chapter four.

Chapter IV

RESULTS

This chapter reports the findings of the study. Chapter five will discuss the statistical procedures and the results of the data analysis as it relates to each research hypotheses and questions.

Participant Response

Analysis of data was conducted on ninety-seven student survey questionnaires over the past three years from 2004 to 2006. The data was retrieved by the Director of Assessment for Northwestern Oklahoma State University where it was stored confidentially in a file on the NWOSU server. Of the ninety-seven students, thirty-nine students were enrolled at the remote site location and fifty-eight were enrolled at the originating site location. The questionnaires used were from the same instructor, course, content, and site locations.

Table 4 provides a quick reference to the total number of participants at each site location.

Table 4: Participant Response by Location

Classroom Environment	Questionnaire Participants
ITV Originating Site	58
ITV Remote Site	39
Total	97

Findings

The questionnaire was used to determine student perceptions of equivalency in the sum of experiences, equivalency in the learning experiences, equivalency in appropriate applications, and equivalency in outcomes. A comparison was then made between the two learning environments (originating and remote sites).

Null Hypothesis One Research Question One

The first research null hypothesis stated that there would be no statistical difference in the perceived value in the sum of experience for students at both originating and remote site locations. This null hypothesis was related to research question number one which similarly stated, do ITV students perceive equivalent value in the sum of their experiences at both originating and remote site locations? Testing the null hypothesis was accomplished through a T-test analysis comparing the mean scores of all 18 items on the questionnaire. The mean scores of both the originating and remote sites were compared revealing that, t (1745) = -.735, $p > .05$, therefore no significant difference was perceived

by the students comparing both locations in the sum of their experiences, while taking this particular ITV course. This indicates that the null hypothesis was not rejected.

Table 5 provides a quick reference to the number of responses and the mean scores of both the originating and remote sites.

Table 5: Null Hypothesis and Research Question Number One

Variable	Site Location	N	Mean
Equivalency	Originating	1042	2.02
Sum of Experience	Remote	705	2.05

Null Hypothesis Two Research Question Two

The second research hypothesis stated that there would be no statistical difference in the perceived equivalency of the learning experience for students at both originating and remote site locations. This null hypothesis was related to research question two which similarly stated, do ITV students perceive equivalency in the learning experience at both originating and remote site locations? Testing the null hypothesis was accomplished through a T-test analysis comparing the mean scores of items 9, 10, and 12 of the survey questionnaire. The mean scores of both the originating site and remote site were compared revealing that, t (290) = 1.268, $p > .05$, therefore no significant difference was perceived by the students when comparing equivalency of the learning experience of both the originating and remote sites. This indicates that the null hypothesis was not rejected.

Table 6 provides a quick reference to the number of responses and the mean scores of both the originating and remote sites.

Table 6: Null Hypothesis 2 Research Question Two

Variable	Site Location	N	Mean
Learning Experience	Originating	174	2.19
	Remote	118	2.05

Null Hypothesis Three Research Question Three

The third research null hypothesis stated that there would be no statistical difference in the perceived equivalency in appropriate applications for students at both originating and remote site locations. This null hypothesis was related to research questions three, which similarly stated, do ITV students perceive equivalency in appropriate application of both originating and remote site locations? Testing the null hypothesis was accomplished through a T-test analysis comparing the mean scores of items 1-6, 8, 10, 11, and 14-17 of the questionnaire. The mean scores at both the originating and remote site were compared revealing that, $t(1258) = -.886$, $p > .05$, therefore no significant difference was perceived by the students when comparing equivalency of appropriate applications in the learning experience at both originating and remote sites. This indicates that the null hypothesis was not rejected.

Table 7 provides a quick reference to the number of responses and the mean scores of both originating and remote sites.

Table 7: Null Hypothesis 3 Research Question Three

Variable	Site Location	N	Mean
Appropriate Applications	Originating	752	2.01
	Remote	508	2.06

Null Hypothesis Four Research Question Four

The fourth research hypothesis stated that there would be no statistical difference in the perceived equivalency in outcomes for students at both originating and remote site locations. This null hypothesis was related to research question four, which similarly stated, do ITV students perceive equivalency in outcomes at both originating and remote sites? Testing the hypothesis was accomplished through a T-test analysis comparing the mean scores of items 13 and 18 of the questionnaire. The mean scores of both the originating and remote sites were compared revealing that, $t = (192) = -1.141$, $p > .05$, therefore no significant differences were perceived by the students when comparing equivalency of outcomes in the learning experience at both originating and remote sites. This indicates that the null hypothesis was no rejected.

Table 8 provides a quick reference to the number of responses and the mean scores of both originating and remote sites.

Table 8: Null Hypothesis 4 Research Question Four

Variable	Site Location	N	Mean
Outcomes	Originating	116	1.83
	Remote	78	1.96

Summary

The Equivalency Theory offers a framework for comparing student value of the learning experience in an ITV course learning environment. The Equivalency Theory and its four components, (equivalency, learning experience, appropriate applications, and outcomes) were used to guide this study and examine student perceived value in their learning experiences between two different learning environments, (originating and remote sites) while taking an ITV course. A comparison was then made using the mean scores of a questionnaire. A T-test was used for statistical analysis comparing the two groups (originating and remote sites). After completion of data analysis the findings showed, that this particular research found no significant difference using .05 as a level of significance for any of the research hypotheses or questions.

Table 9 provides a summary table for examining the dependent variable, independent variable, research null hypotheses and questions, survey items, and mean scores.

Table 9: Summary Table

Dependent Variable	Independent Variable	Research Null Hypothesis	Survey Items	Mean Scores
Equivalence	Originating	1-1	1-18	2.02
Sum of Experience	Remote			2.05
Learning	Originating	2-2	9,10,12	2.19
Experience				
	Remote			2.05
Appropriate	Originating	3-3	1-6,8,10,11	2.01
Applications			14-17	
	Remote			2.06
Outcomes	Originating	4-4	13,18	1.83
	Remote			1.96

Chapter V

SUMMARY, FINDINGS, CONCLUSIONS, LIMITATIONS, AND RECOMMENDATIONS

Introduction

Based upon the findings in Chapter Four, this chapter reports the conclusions, limitations, implications for research, theory, and practice, as well as recommendations for future study. This chapter contains six sections which will cover the summary of the study, discussion of the findings, conclusions drawn from the findings, limitations of the study, implications for research, theory, practice and recommendations for future study.

Summary

Due to the continuing debate and conflicting studies in regard to student values and attitudes toward interactive television as a mode of instruction (Anderson, 2000). , this study was developed to discover student perceptions regarding ITV as an instructional medium. The results of literature review, directed the researcher to inquire about student perceptions of an educational method of instruction that continues to grow despite the opponent/proponent debate. Hence, the purpose of this study was to compare self-reported student value using a questionnaire between students in two different

instructional environments, an ITV originating site (a classroom with the instructor present), and an ITV remote site (a classroom without the instructor physically present). This study was performed to examine if differences exist between site locations. Following the purpose, the researcher was guided by the following research questions and hypotheses.

Research Questions

1. Do ITV students perceive equivalent value in the sum of their experiences at both originating and remote site locations?
2. Do ITV students perceive equivalency in the learning experience both originating and remote site?
3. Do ITV students perceive equivalency in appropriate application at both originating and remote site locations?
4. Do ITV students perceive equivalency in outcomes at both originating and remote sites?

Null Hypotheses

Ho1 There is no statistical difference in the perceived value in the sum of experience for students at both originating and remote site locations.

Ho2 There is no statistical difference in the perceived equivalency of the learning experience for students at both originating and remote site locations.

Ho3 There is no statistical difference in the perceived equivalency in appropriate applications for students at both originating and remote site locations.

Ho4 There is no statistical difference in the perceived equivalency in outcomes for students at both originating and remote site locations.

Discussion of Findings

Based upon the results of data analysis in Chapter Four, this section provides a discussion of those findings concerning students perceived value of the learning experiences delivered in the two-way, video-audio interactive television mode of instruction from Northwestern Oklahoma State University. The perceived value of the learning experience was compared between those students located at the originating site and those located at the remote site. The purpose of this study was to compare student perceived value between site locations and not the value of the course itself. The study measured student perceptions using an 18 item student questionnaire and employed a survey research design that investigated differences in perceived student value between two groups of students, the originating and remote sites. The instrument used to gather data was an electronic questionnaire developed in October of 2002 by the Faculty Evaluation and Development Task Force (FEAD). The data collected and used for this study was taken from 2003 to 2006. A total of ninety-seven questionnaires were selected and used as data for this research, fifty-eight from the originating site and thirty-nine from the remote site. The same course, instructor, and site locations over a three year period were used as an attempt to control the confounding variables.

Findings

The first research null hypothesis stated that there would be no statistical difference in the perceived value in the sum of experiences for students at both originating and remote site locations. This null hypothesis was related to research question number one which similarly stated, “Do ITV students perceive equivalent value in the sum of their experiences at both originating and remote site locations?” Data analysis for null hypothesis one and research question one revealed that in terms of student perception of equivalency in the value of the sum of their experiences, even though environmentally different, found no significant difference in the value of the sum of their experiences while taking this particular ITV class.

From this finding it may be concluded that the design of the learning environment provided experiences of equivalent value for students at both originating and remote sites. Even though the experiences at the originating and remote sites were not environmentally the same, students found that the value of the learning experience was not significantly different.

Research null hypothesis two stated that there would be no statistical difference in the perceived equivalency of the learning experience for students at both originating and remote site locations. This null hypothesis was related to research question two which similarly stated, “Do ITV students perceive equivalency in the learning experience at both originating and remote site locations?” Data analysis for null hypothesis two and research question two revealed that in terms of student perception of equivalency in the value of the learning experience, even though environmentally different, found no significant difference in how they valued the equivalency of their learning experience.

For this study it could be concluded that students found the learning experience, which includes anything that promotes learning, including what is observed, felt, heard, or done, to be equivalent although environmentally different between the originating and remote sites.

Research null hypothesis three stated there will be no statistical difference in the perceived equivalency in appropriate applications for students at both originating and remote site locations. This null hypothesis was related to research question three, which similarly stated, “Do ITV students perceive equivalency in appropriate application of both originating and remote site locations?” Data analysis for null hypothesis three and research question three revealed that in terms of student perception of equivalency in the value of appropriate applications, even though environmentally different, found no significant difference in how students valued the equivalency in appropriate applications.

From this finding, it may be concluded that students perceived equivalency in the application of the learning experience to meet the needs of the learners and the situations, as well as fit the expectations and facilities available to the students at both originating and remote site locations.

The fourth research null hypothesis stated that there would be no statistical difference in the perceived equivalency in outcomes for students at both originating and remote site locations. This hypothesis was related to research question four, which similarly stated, “Do ITV students perceive equivalent value in comparing outcomes at both originating and remote sites?” Data analysis for null hypothesis four and research question four revealed that in terms of student perception regarding their value of outcomes, both groups originating and remote sites found no significant difference.

From this finding it may be concluded that students perceived equivalency in outcomes of their learning experience which are those obvious, measurable, and significant changes that occur cognitively and affectively because of their participation in the course.

Conclusions

The following conclusions can be drawn from the findings outlined above. Using the Equivalency Theory as a framework to guide this study, it can be concluded that in this study students found the ITV learning experience to be equivalent when comparing both locations (originating and remote sites). This study examined the ITV learning experience of students through careful examination of the Equivalency Theory and its components (equivalency in the sum of experiences, learning experiences, appropriate applications, and outcomes). In each component of the Equivalency Theory examined, students found their experience to have no significant difference, when comparing learning sites.

This study supports ITV technology as a quality means of instruction (Anagal, Dobrowolski, Francis, Minner, Parish, Prater, & Minsett, 1996). The findings suggest that in this study, site location was perceived as equivalent. It adds validity to the already numerous studies that claimed when comparisons are made between distance learners and traditional students, they showed no significant differences in classroom outcomes measured (Russell, 1999). By understanding student values, universities will be better informed to make adjustments to ITV course delivery that will afford students more equivalent learning experiences. The Equivalency Theory offers instructors, as shown in

this research, a way to examine their ITV course and use the components (learning experiences, appropriate application, students, and outcomes) to guide use of technology and instructional delivery.

Limitations

Study results should be considered with the following limitations in mind. This study recognizes that the learners' values about the relationship between communication technology and interaction may be limited to student experiences at Northwestern Oklahoma State University. In addition, student values may be limited to the particular instructor and type of curriculum studied at Northwestern Oklahoma State University. This study did not compare different modes of instruction other than two-way, video-audio, interactive television lecture format, so caution should be exercised when generalizing to other modes of instruction based on this study.

The demographics of the sample in this study may be unique and caution should be used with regard to population validity when generalizing the conclusions of this study to all types of curriculum.

Implications for Research, Theory, and Practice

Research

This research allowed theory to be put into practice by examining the ITV learning experiences of students located at Northwestern Oklahoma State University through the framework of the Equivalency Theory. This research, like other similar

research, could serve as a template for others to follow when examining ITV distance education at colleges and universities. It could also serve as a way to assess student value, delivery, and methodology of ITV instruction. In addition, this research adds to the knowledge base of ITV as a medium of instructional delivery, including, Anderson and Kent (2002) who also explored the controversy surrounding how students perceive the effectiveness of ITV teaching. Anderson, Banks, and Leary (2002) examined the effect of ITV courses on student satisfaction compared to traditional on-campus classes. Anderson, (2000) suggested that there is a lack of research devoted to student value of ITV and the existing literature has shown mixed results. ITV is one of the fastest growing forms of distance education in the United States. This research and others like it could assist educators in understanding its affects on learners.

Theory

With this study the implementation and understanding of Equivalency Theory will provide educators more sound decision making with regard to ITV distance education and teaching technologies. From the literature available and reviewed by the researcher, this was the first study to use the Equivalency Theory to examine the learning experience of ITV distance education. Theory is important to the study of ITV because it directly affects the practice of the field. Equivalency Theory used in this research is broken down into variables called components. These components, learning experience, appropriate applications, students, and outcomes used in this study allow faculty and administration to examine the use of teaching technologies as well as instructor methodology. As shown in this study, Equivalency Theory can be employed as a framework to design and

examine technology communications and instructional delivery of ITV distance education.

Practice

This research will contribute to the continued work in the area of ITV distance education. This study could be particularly helpful to colleges and universities evaluating their current position using ITV distance technology. As shown in research, Anderson & Kent (2002), understanding the learning experience from the student perspective can help colleges and universities improve retention and program success. The implications of these research findings as well as others could be important for the future of ITV distance learning. Many educational decisions could stem directly from student perceptions. These decisions could range from student retention in academic programs to tenure decisions about faculty members. The implications of this study could benefit administrators and faculty in the decision making process regarding ITV technology and its level of utilization in their programs and institutions. Academic programs themselves could be affected because of student perceptions. Lastly, this study using the Equivalency Theory to explain the learning experience of students taking an ITV course reminds us that technology doesn't teach, teachers teach.

Recommendations for Future Study

1. Replicate this study at other universities and colleges with similar populations to confirm the result of this study.

2. Replicate this study, by comparing the students' perceptions of effectiveness of teachers who have been trained to teach ITV two-way, video-audio with those who have not.
3. Replicate this study, by comparing the students' perceptions of ITV instruction with different subject content. Further research into whether course content impacts student perceptions would be beneficial.
4. This study was restricted to a specific geographic location and distinct population. A broader, state or national study is questionable, but would make generalization more reliable.
5. Develop and conduct a qualitative research study to explore the experiences of ITV students at both locations (originating and remote sites) for comparisons of student perception. Examining student experiences and student value may lead to insight on the needs of learners and help guide the development of ITV environments that will support those needs.
6. Further research into student values will help explain how both originating and remote site students view equivalency of the learning experience with ITV as a medium of instruction. Greater understanding of what students' value in their learning experience will help to determine the effectiveness of ITV for student learning.
7. Replicate this study using additional technologies, such as blended or hybrid ITV course delivery.

References

An Emerging Set of Guiding Principles and Practices for the Design and Development of Distance Education (1995). Retrieved March 30, 2006 from Penn State University. www.worldcampus.psu/ide/docs/guiding_principles.pdf

Anagal, J., Dobrowolski, N., Francis, B., Minner, S., Parish, T., Prater, G., et al. (1996). *Interactive instructional television: Education for rural areas* (Contract No. JO29B50069). Washington, DC: Office of Special Education and Rehabilitative Services. (ERIC Document Reproduction Services No. ED 394 778).

Anderson, L.P. (2000). Interactive televised instruction: Factors that influence student evaluations of business courses. *UMI Microform 9987936.*

Anderson & Kent. (2002). Interactive televised courses: Student perceptions of teaching effectiveness, with recommendations. *Journal of College Teaching,* 50 (2), 67-71. Retrieved February 7, 2006, from EBSCO Masterfile database.

Anderson, Banks, & Leary. (2002).The effect of interactive television courses on student satisfaction. *Journal of Education for Business,* 13 (1), 164-167. Retrieved December 14, 2005, from http://www.uni-oldenburg.de/zef/cde/found/simons99.htm.

Arreola, R. (2000). *Developing a Comprehensive Faculty Evaluation System* (2nd ed.). Bolton, MA: Anker Publishing Company, Inc.

Bisciglia, G., & Turner. M. (2002). Differences in attitudes between on-site and distance students in group teleconference courses. *The American Journal of Distance Education,* 16 (1), 37-52.

Carnavale, D. Jan 7, 2000. Survey finds 72 percent rise in number of distance education programs. *The Chronicle of Higher Education* 1. A57.

Clow, K. E. (1999). Interactive distance learning: Impact on student course evaluations. *Journal of Marketing Education*, 21(2), 97-106.

Comeaux, P. (1995, October). The impact of an interactive distance listening network on classroom communication. *Communication Education, 44,* (4), 352-361.

Creswell, John W. (2002). *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*. Upper Saddle River, New Jersey. Merrill Prentice Hall.

Cuffman, D.M., & MacRae, N. (1996). *Faculty development programs in interactive television* (RC No. 018 160). Murfreesboro, TN: Proceedings of the Mid-South Instructional Technology Conference. (ERIC Document Reproduction Services No. ED 400 806).

Egan, M. W., Welch, M., Page, B., & Sebastian, J. (1992). Learners' perception of instructional delivery systems: Conventional and television. *The American Journal of Distance Education,* 6 (2), 47-55.

Foster, A. (2006). A congressman questions the quality and rigor of online education. *The Chronicle of Higher Education,* 52(30), A38. Retrieved March 20, 2006, from http://chronicle.com/weekly/v52/i30/30a03801.htm

Geary, D. (1998). Perceptions of instructor- student interaction as a reason for persistence in two- way audio and visual distance education. *UMI Microform, 9841820.*

Gibson, C. C., (1996). Toward an understanding of academic self-concept in distance education. *American Journal of Distance Education, 10*(1), 23-36.

Gilroy, D.P., & Knutton, S. (1996). A preliminary comparative study of student perceptions of distance learning provision. *Going the Distance: teaching, learning and researching in distance education* (Sheffield Division of Education Papers in Education), 117-128.

Grisham-Brown, J., Knoll, J. A., Collins, B. C., & Baird, C. M. (1997). *Multi-university collaboration via distance learning to train rural special education teachers and related services personnel* (RC No. 020 977) Lexington, KY: Promoting Progress in Times of Charge: Rural Communities Leading the Way Conference. (ERIC Document Reproduction Services No. ED 406 096).

Hinton, S., & Oleka, S. O. (1996). *College students' assessment of teaching by television* (RC No. 018 226). Tuscaloosa, AL: Paper presented at the Annual Meeting of the Mid-South Educational Research Association. (ERIC Document Reproduction Services No. ED 403 871).

Holmberg, B. (1995). *Theory & Practice of Distance Education.* London: Routledge.

Jeffries, Michael. (2006). Indiana Higher Education Telecommunication System. "The History of Distance Education." Retrieved June 13, 2006, from http://www.ihets.org/consortium.ipse/fdhandbook/resrch.html.

Johnson, K. (1999). Student attitudes and perceived learning effectiveness of courses offered in the satellite television mode of instructional delivery at the U.S. Army Logistics Management College. *UMI Microform, 9917747.*

Johnson, J., & Silvernail, D. (1994, October-September). Impact of interactive television and distance education on student evaluation of courses: A causal model. *Community College Journal of Research and Practice 18*(5), 431-440.

Keegan, D. (1996). *Foundations of Distance Education* (3rd ed.). NY: Rutledge.

Kochmon, A. (1998). An investigation of differences in participant outcomes resulting from the use of interactive televised distance learning. *UMI Mircroform,* 9907752.

Larson, M., & Bruning, R. (1996). Participant perceptions of a collaborative satellite-based mathematics course. *American Journal of Distance Education 10*(1), 6-22.

McHenry, L., & Bozik, M. (1995, October). Communicating at a distance: A study of interaction in a distance education classroom. *Communication Education 44*(4), 362-371.

Minich, E.L. (1996). *Using student feedback to improve distance education* (JC No. 960 495). Jacksonville, FL: Florida Community College. (ERIC Document Reproduction Services No. ED 397 893).

Moore, M. G., & Kearsley, G. (1996). *Distance education: A systems views.* Belmont, CA: Wadsworth.

Russell, T. (1999). The "No Significant Phenonmenon." Retrieved June 14, 2006, from http://cuda.teleeducation.nb.ca/nosignigicantdifference/.

Seay, R., Rudolph. H, Chamberlain, D. (2001). Faculty Perceptions of Interactive Television Instruction. *Journal of Education for Business,* 77 (1), 99-105. Retrieved December 14, 2005, from EBSCO Masterfile database.

Simonson, M. (1999). Equivalency Theory and Distance Education. *Tech Trends; for leaders in education & training.* 43(5), 5-8.

Simonson, M., Schlosser, C., & Hanson, D. (1999). Theory and Distance Education: A New Discussion. *The American Journal of Distance Education,* 13(1), 60-75.

Simonson, M., Smaldino, S., Albright, M., & Zvacek, S. (2000). *Teaching And Learning At A Distance.* Upper Saddle River, NJ, USA: Merrill/Prentice Hall.

Silvernail, D., & Johnson, J. (1990). The impact of interactive televised instruction on college student achievement and attitudes: A controlled experiment. *Journal of Instructional Media*, 17, 1-8.

Smith, C. K. (1996). *Convenience vs. connection: Commuter students' views on distance learning* (HE No. 029 325). Albuquerque, NM: Paper presented at the Annual Forum of the Association of Institutional Research. (ERIC Document Reproduction Services No. ED 397 725.

Sparks, B., & Farr, C. (1995). *Issues and problems in distance teaching to rural communities: A western perspective* (JC No. 960 068). Madison, WI: Paper presented at the Annual Conference on Distance Teaching and Learning. (ERIC Document Reproduction Services No. ED 393 476).

Thoms, K. J. (1996). *Ethical issues relating to teaching via an interactive two-way television system (ITV)* (IR No. 018 159). Murfreesboro, TN: Proceedings of the Mid-South Instructional Technology Conference. (ERIC Document Reproduction Services No. ED 400 805).

Thorndike, Robert M. (1997). Measurement and Evaluation In Psychology And Education. Upper Saddle River, New Jersey: Prentice Hall, Inc.

Verduin, J. R., Jr., & Clark, T. A. (1991).*Distance education: The foundations of effective practice.* San Francisco: Jossey-Bass Publishers.

Wheeler, C., Batchelder, A., & Hampshire, M. (1996). The instructional practices of televised distance education at Northern Arizona University. *Education*, 117, 172-179.

Zarghami, F. (1998). Constructs that contribute to student satisfaction for participating in graduate level courses delivered by full motion interactive fiber optic communication network. *UMI Microform, 9911661*.

APPENDIX

Course and Instructor Evaluation Questionnaire

Northwestern Oklahoma State University

Directions: Please rate your instructor for this course by indicating your degree of agreement with the following statements.

	Strongly agree	Agree	Disagree	Strongly disagree
1. The instructor utilized class time effectively.	O	O	O	O
2. Students had opportunities to ask questions.	O	O	O	O
3. The instructor encourage me to participate in the course.	O	O	O	O
4. The instructor motivated me to do my best work.	O	O	O	O
5. The instructor was enthusiastic when presenting course materials.	O	O	O	O
6. The instructor utilized a variety of teaching methods to help students learn.	O	O	O	O
7. The instructor presented material in a clear manner.	O	O	O	O
8. The instructor stimulated my thinking.	O	O	O	O
9. The instructor provide constructive feedback during the course.	O	O	O	O

10. The handouts were helpful.	O	O	O	O
11. The course was well organized.	O	O	O	O
12. The assignments help me understand course content.	O	O	O	O
13. The instructor's methods of evaluating my performance were fair.	O	O	O	O
14. The instructor was well prepared for each class.	O	O	O	O
15. I understand what was expected of me in this course.	O	O	O	O
16. The instructor was readily available for consultation with students.	O	O	O	O
17. I felt comfortable asking for extra help from the instructor.	O	O	O	O
18. The instructor returned graded assignments in a timely manner.	O	O	O	O

VITA

CHANDLER E. MEAD

Candidate for the Degree of

Doctor of Education

Thesis: USING EQUIVALENCY THEORY IN EXPLAINING THE LEARNING EXPERIENCE BETWEEN ORIGINATING AND REMOTE SITE STUDENTS TAKING AN INTERACTIVE TELEVISION (ITV) COURSE

Major Field: Higher Education

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Major Field: Higher Education

Scope and Method of Study: The use of interactive television as an instructional medium continues to grow. With the growth of ITV distance education, it is important to examine student values with regards to the ITV system of educational delivery. The purpose for undertaking the present study was to determine if differences exist in students' perceived value of site location in an ITV learning experience. The Equivalency Theory was used as a framework to guide the study and make comparisons between originating and remote site students. The survey study presented in this dissertation focused on one university ITV course with the same instructor over a three-year period. Comparisons were then made between the originating and remote site locations. The study participants included a total of 97 students, 39 students from the remote site, and 58 students from the originating site.

Findings and Conclusions: Data collected from the two sites showed no significant difference in the way students perceived value of site location in their learning experience. In this study the Equivalency Theory was used as way to examine the students' perceived value of the ITV learning experience. Understanding students' values may help instructors determine more productive ways to utilize ITV technology and instructional delivery, thereby affording the originating and remote site students a more equivalent learning experience.

ADVISOR'S APPROVAL: Ed Harris