AN ANALYSIS OF SELECTED VARIABLES TO DETERMINE FACULTY ATTITUDES TOWARD ADOPTION OF COMPUTER-BASED INSTRUCTION AT OKLAHOMA STATE UNIVERSITY

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CHAPTER I

INTRODUCTION

A widespread consensus in higher education has been the potential of computer technology to revolutionize the teaching-learning process. The conception of technology as a principal force behind gradual transformation of the academic profession and careers of faculty prevails the era of technology. In recent years, billions of dollars were spent to acquire computer equipment in higher education. The 1998 National Survey of Information Technology in US Higher Education revealed student fees to be the most important revenue that helped pay for the rising technology costs on campuses. About 45.8 percent of higher education institutions that participated in the survey reported a mandatory student technology fee, up from 38.5 percent in 1997 and 28.3 percent in 1995. Although the number of public institutions imposing mandatory technology fees were on the rise, the average annual fee had remained fairly stable among public four-year colleges and universities at $120 per full time enrolled students.

But as we enter the 21st century, the use of computers for instructional purposes has not yet become comprehensively mainstreamed in university instruction (Butler, 1986; Carl, 1987; Greene, 1991; Snider, 1992; Gilbert, 1996; Kershaw, 1996). Roughly two decades after the first arrival of microcomputers on college and university campuses, American higher education institutions continued their struggle with computer and information technology. About 39.2 percent of the institutions that participated in the 1999 National Survey of Information Technology in Higher Education identified instructional integration of computers as the single greatest challenge, up from 33.2 percent in 1998 and 29.6 percent in Fall 1997. It is predicted that this issue will prevail over the next two to three years. Faculty tend to be problem and process (not technology) focused; they are pragmatic or conservative and favor evolutionary change. Typically, they need significant technical support, demand proven applications, not untested tools that require risk-taking and experimentation and compelling evidence that integration of computer technology will support their professional lives in meaningful ways and in their work performance (Baldwin, 1998).

Microcomputers being inseparable from today's higher education institutions, research on computer use in education discloses that the full potential of this technology was yet to be realized (Shumaker and Hossain, 1990). While some research indicated that organizational factors such as implementation costs and incentives for faculty in the form of money, release time and promotions to be important variables for the successful implementation of computer-based instruction, findings indicated that the university faculty's general attitude towards computer, and utility beliefs geared towards students were significant predictors of adoption (Faseyitan and Hirschbuhl, 1992).

Investment in computer-based technology will not provide positive returns unless all levels of the education system aggressively adopt planning and implementation of computers in classrooms. All the knowledge and advancement in technology will be futile if educators do not assume the role of innovators (*Education Week*, 1998). Baxter and Miller (1998) point out that:

> "The professorate is changing because of technology. The way faculty teach has been influenced by the addition of computers and other electronic technology. Education delivery has become decentralized. The locus of control has shifted from teacher-centered to student-centered. Faculty have been pressurized to change and adopt technology based learning. This has caused change in faculty attitudes threatening their independence. With the inclusion of technology into the curricula, faculty have become more dependent on technical support staff to aid them in their delivery of instruction.

Terms such as active learning, self-paced learning and collaborative learning have trickled into educational theoretical jargon. Thus, faculty have been faced with learning new technology, new ways of learning, and a change in access to faculty and education in terms of time and place" (p. 3).

In university instruction, nearly all disciplines have one or two courses pertinent to computer applications and computers were hence regarded as additional tools to the courses. Faculty possess the discretionary power to either use or not to use these computer-based applications. Computer-based applications range in the form of lectures, email, World Wide Web resources, multimedia, the Internet, etc. These have become a pervasive part of most classrooms and courses in particular (Mayer and Coleman, 2000). Computer simulations and other instructional technologies have been around for more than a decade, and more and more faculty in all areas of academia are moving to computer based instruction. The Campus Computing Project (1998), which conducts an annual survey of computer use in higher education, estimated that in 1998 nearly 45% of college and university courses used email (a 400% increase since 1994), one-third of all courses used Internet resources (up 100% since 1996), and nearly one-quarter used web pages for course materials (up 350% since 1994).

Interestingly, some faculty members have readily accepted and adopted the use of computers in their instructional activities while many others have ignored it and some openly resisted it for various reasons. Research on university instruction indicated a widespread adoption of computers in university instruction has yet to be realized (Faseyitan and Hirschbuhl, 1992). As part of faculty commitment to students, faculty engage in preparing graduates with the ability to apply computer knowledge into their job demands, thus emphasizing the necessity for faculty to integrate the use of technology into the teaching process (Bruder, 1989).

In spite of the explosion and widespread usage of e-mail and World Wide Web in colleges and universities, and despite the accelerating pace and rapid proliferation of technological innovations in the market place, the relative pace of faculty adoption of computers for instruction faces slow progression. Several explanations have been forwarded to help decipher this slow diffusion of adopting and implementing computer technology into instructional settings. These vary greatly ranging from: fear of replacement by computers, lack of technical training (Budin, 1991; Cuban, 1986; Snider, 1992), conservative outlook of higher education towards adoption of new technologies (Saettler, 1990), and the engagement of fewer institutions to support the enormous costs associated with creating and maintaining the hardware infrastructure which is detrimental to widespread adoption of computer technology into the classroom (Green, 1995). Also, increased demand for available campus or classroom space impelled by rising enrollments (Geoghegan, 1994), little or no institutional support for the development and use of computer technology in instruction (Green and Eastman, 1994), little or no involvement of administration (on most campuses) with computer technology (Green and Eastman, 1994), and the lack of definitive research to support computer efficacy in the instructional delivery process (Gilbert, 1996; Kulik and Kulik; 1991) stalled the adoption process of computer-based instruction in universities. In addition, making the transition from a traditional "chalk and talk" course to a computer based one can be enormously time consuming and expensive. At this point, concerns arose especially among untenured faculty about whether the investment in "computerizing" their teaching methodology is worth the price. More broadly, many members of the academy express the fear that the use of instructional technology will be judged primarily on how it affects faculty productivity, not instructional quality, and that financial pressures will force universities and colleges to replace professors with computers-through distance education, video conferencing, online laboratories etc., (Mayer and Coleman, 2000).

Twigg (1994) suggested lack of widely available affordable technology, narrow conception by higher education faculty to not supply comprehensive instructional support for learners, rather promote investigation of a particular cognitive phenomenon or to test the efficacy of a few lessons in an experimental laboratory setting, pedagogical confusion, non-transformative teaching methods that continue to rely on traditional curriculum and traditional delivery methods, and finally, theoretical chaos infused by rarely well-articulated and consistent theory of computer-based instruction and learning severely impedes adoption of computer technology (Baker et. al, 1997). Several other factors forwarded to explain slow diffusion are increased cost for maintenance, software limitations (Geissinger, 1993; Green, 1995), and lack of organizational support (Green and Eastman, 1994). Often overlooked but yet an important factor that can negatively influence adoption of computer technology as suggested by Geoghegan (1994) deals with unrealistic expectations pertaining to development, dissemination and implementation of instructional technology, relatively short life span of computer applications, and the alliance developed by the instructional technology organization ("the techies"), and outside vendors. Since these alliances possess a firmly established yet common interest level in the technological aspects of the technology, it tends to marginalize the remainder of the faculty who consider themselves to be incompetent to "speak the language"; and finally, the failure of the administration to articulate to mainstream faculty in pragmatic terms a compelling reason to adopt the technology.

In addition to unrealistic expectations about money and technical skills required to develop and implement simple instructional applications, the length of time often required (ranging from five to more than ten years) in taking a computer application from initiation to institutionalization phase significantly impedes adoption of computer based instruction by higher education faculty. Many faculty members are reluctant to move beyond word processing because they believe (wrongly) that technology will not be terribly important for the courses they teach in the next five or ten years. Hence, any remedial action planned and implemented doubtless will be futile without a passionate commitment on the part of the institutional administration and faculty. It also calls for clearly articulated and consistently acted upon administrative protocol in order to attain continuous improvement in the quality of teaching and learning process (Ehrmann and Kumar, 1994).

In addition, because of the academic independence and relative autonomy of the faculty in higher education, transformational change cannot be achieved in colleges and universities merely through administration fiat as is possible in the corporate world (Dolence and Norris, 1995). Baldwin (1998) points out that "In addition to being a subject matter expert, this new professor (21^{st} century) will need instructional technology skills, counseling skills, and a keen knowledge of group dynamics. These skills are necessary to integrate technology into the teaching-learning process and to facilitate the individualized, active, and collaborative learning strategies that new technologies can promote (p. 10)."

Kershaw (1996) identifies a three-stage process essential for faculty academic behavioral change. The first, and most critical stage is to enhance faculty perception of the necessity and urgency for institution wide change. Successful implementation of this stage requires leadership at the highest levels of administration to provide the meaning, context and vision for the change. During the second stage, faculty must be helped to realize that institutional change implies nothing more than an aggregate of individual change. The third stage is defined by manifestation of observable change in mainstream faculty behavior.

Statement of the Problem

Recent studies reported that, despite the increasing number of computers in educational institutions, there has been minimal significant impact in the revitalization and transformation of teaching and learning. As a consequence, innovation or technology acceptance in institutions remains shallow. The change forecast by many advocates of technology had not yet occurred and vast majority of college and university faculty do not involve computers in their instruction in any way (Schumaker and Hossain, 1990; Zappone, 1991; Greene, 1991; Snider, 1992; Green and Gilbert, 1995; Gilbert, 1996; Kershaw, 1996, Bohr, 1997; Bain et. al. 1998; Green, 1999).

However, the practice or development of using computer technology to deliver course work in higher education had seen a veritable explosion. The use of technology has not only created new opportunities within the traditional classroom but also served to expand learning experiences beyond the popular notion of classroom. In the late 1990s, educational technology solutions in the form of tutorials, drill and practice, simulations, instructional games, multimedia, utilization of Internet and web-based learning, video conferencing, and applications such as power point, document camera, videodisc etc., all provided basic methods for using the computer to teach, reinforce, practice, or apply information (Schiller and Mitchell, 1993; Green, 1996; Gilbert, 1996; Fan, et. al. 1997; Baker et. al., 1997; Diller and Huling, 1997; Bollentin, 1998; Gates, 1998; Pattison, 1999; Miller and Miller, 1999; Rickman and Grudzinski, 2000). In addition, implementation of discipline-focused technology with technical staff working to identify, facilitate, and tailor technical tools and methods to the pedagogical needs of faculty, increased curricular use of computers in the humanities and social sciences; the percentage of faculty with moderate to high skill levels in operating desktop computers has risen from 35 to 92 percent; and 38 percent of all faculty have participated in a curricular computing grant program (Nixon and Lackie, 1999). Hence, computer technology was becoming the basis for a widely used delivery alternative at universities nationwide (Goggin et. al. 1997; Sims, 1997; Wegner and Holloway, 1999; Spotts, 1999; Wegner et. al. 1999; Fardanesh, 2000).

Meanwhile a gradual perhaps accelerating process in which individual faculty members find, try, discard, rediscover, adopt, adapt, and use applications of computer technology to improve teaching and learning was observed (Greene, 1991; Green and Gilbert, 1995; Gilbert, 1996; Smith, 1997). Several investigators concluded that barriers of varying origins prevented the adoption and diffusion of innovations such as computer-based instruction for instructional planning and use. Faculty attitudes toward computers and the effective integration of technology into instruction are closely related (Carl, 1987; Faseyitan and Hirschbuhl, 1992). Perceptions, attitudes, computer efficacies and values perceived by faculty in use of computer technology offered resistance to adoption of computer-based instruction (Bandura, 1977; Gressard and Loyd, 1985; Faseyitan and Hirschbuhl, 1992; Geissinger, 1993; Spotts, 1999).

Hence, the researcher aimed to understand the relationship between faculty attitudes and adoption of computer-based instruction and to determine the extent to which this relationship differed with selected variables of demographic data, organizational support and computer attitudes and beliefs.

Purpose of the Study

Despite considerable enthusiasm among many academicians for computer based instruction and a widespread belief that computer technology will result in a revolutionized teaching and learning process, some researchers urge caution and skepticism. The misconception of technology use by itself to cause newer ways of learning needs to be disregarded. It is true that educators are yet to make effective use of technological resources. "It is clear that the majority of contemporary uses of instructional technology still reflect eighteenth-and nineteenth-century notions of teaching and instructional delivery" (Mayer & Coleman, 2000). Thus, despite the greater availability of computer technology and a growing familiarity with its use by faculty in the instructional process, it is obvious that computer technology is under utilized within the system of higher education (Albright and Graf, 1992; DeLoughry, 1994; Geoghegan, 1994).

Hence, the purpose of this study is to identify why, with computer technology readily accessible and embedded in the environment of a comprehensive university, some faculty members adopted computer-based instruction while many others did not (referred to as non-adopters). Are these differences related to selected variables of faculty demographic characteristics, organizational support and/or computer attitudes and beliefs?

The ultimate goal of the researcher was to identify differentiating characteristics of adopters and non-adopters of computer-based instruction. This information will be invaluable to administrators, faculty and technology personnel as they engage in planning, implementation and adoption of computer-based instruction. Equipping students to face the challenges of the technological society is invaluable and definitely calls for support from university faculty and administration.

Adoption of computers for instructional purposes was examined in the light of faculty's actual activities involving the use of computers and computer applications for teaching, usage by students and restructuring teaching plans to incorporate increased use of computers. Demographic information on faculty participants was sought and comprised of faculty academic college, rank, discipline, years of service in higher education, research and teaching involvement, gender and age. Organizational support was measured by variables related to institutional policy, faculty incentives, technical assistance, staff development programs and funding source for computers. Faculty attitudes regarding computer-based instruction was assessed using computer efficacy, utility and computer attitude statements.

Research Questions

Answers to the following research questions were sought in this study:

1. To what extent do faculty adopt computer-based instruction?
2. What are the problems encountered by the faculty in adopting computer-based instruction?

3. Why do some faculty adopt computers in instruction while others are unwilling to do so?
4. How do demographic, organizational support and faculty computer attitudes and beliefs compare between adopters and non-adopters of computer-based instruction?
5. What is the relationship between faculty demographic data and faculty attitude regarding adoption of computer-based instruction?
6. What is the relationship between organizational support factors and faculty attitude regarding adoption of computer-based instruction?
7. What is the relationship between computer efficacy and faculty attitude regarding adoption of computer-based instruction?
8. What is the relationship between computer utility and faculty attitude regarding adoption of computer-based instruction?
9. What is the relationship between faculty attitudes and beliefs about adoption of computer-based instruction?
10. What combination of demographic, institutional and attitudes and belief factors pertaining to computer usage will help faculty overcome resistance and facilitate faculty adoption of computer-based instruction?

Hypotheses

The following hypotheses were investigated during this study:

General Hypothesis : There is no significant difference between faculty adopters and non-adopters of computer-based instruction on the individual factors related to faculty academic college, rank, discipline, research and teaching involvement, gender, age, institutional policy, faculty incentives, technical assistance, staff development program, funding sources, computer efficacy, utility and attitudes.

Specific Hypotheses:

H1: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and each demographic variable of faculty academic college, rank and discipline.

H2: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and each demographic variable of years in service in higher education institutions and Oklahoma State University.

H3: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and research and teaching involvement.

H4: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and each demographic variable of gender and age.

H5: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and individual organizational support factors pertaining to institutional policy, faculty incentives, technical assistance, and staff development program.

H6: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and funding sources for computers.

H7: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and computer efficacy.

H8: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and computer utility.

H9: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and computer attitudes.

Significance of the Study

Traditionally, university based training in computer technology is restricted by space. The enormous amount of knowledge created and delivered annually is retrieved only by a handful of local students. The adaptability of higher education to the new information society and hence, its ability to meet the rising needs of an even more demanding market dictates the future of colleges and universities (Langlois, 1998).

Over the past decade, computer related instruction has made an indelible impact on the teaching and learning process. Computer based applications are definitely shaping the new technological paradigm in higher education. Indeed, with advances in the Internet and capabilities of the World Wide Web, higher education administrators have been challenged to incorporate and inculcate computer based technology as pedagogical tools (Piotrowski and Vodanovich, 2000).

Technology continues to advance and change at a rapid pace. With this country having invested $2.5 billion in technology in higher education during the year 1994 (Larson, 1994), financial investment in technology not supported by faculty will lead to under utilization of the benefits offered by technology. Hence, to maximize the adoption of computer technology, Boschmann (1995) notes that "First, there must be high administrative support sustained by faculty endorsement. Next, those in leadership roles must be willing to commit funds, energy, and staff to develop and maintain the venture. Third, there must be an institutional reward system in place to encourage faculty creativity. Finally, the institution must be willing to take risks: risks in launching bold new programs, in hiring innovative staff, in aggressively seeking funds, and in creating meaningful curricula. The obstacle will not be lack of finances, for money has a way of flowing toward good ideas. Obstacles will be a shortage of committed people with ideas and with willingness to sacrifice their time and talent" (p. vii).

In addition, incorporating computers into instructional delivery methods will undoubtedly prepare students to better combat the challenges of the real work world. Computer based technologies, however, have opened the doors to a vast array of new learning opportunities for students. They offer personal and individualized learning experiences, ideally suited in a learner-centered instructional environment. Also, promote active learning, collaboration, mastery of course material, and student control over the learning process (Albright, 1999).

In times of rapid change, it may prove challenging to keep abreast of rapidly evolving technology. However, the fast pace does not exempt any faculty from striving to keep apace, especially for university faculty that set themselves as models to prepare students for an unpredictable future. It commends university faculty and administrators to be technologically competent and confident to model appropriate instructional applications of technology (O'Neil, 1995).

Researchers have focused their attention on the question of: why computers and computer based technologies aren't widely used in instruction. If they are used, what characteristics define these faculty groups? Faseyitan and Hirschbuhl (1992) emphasized faculty characteristics, organizational variables, and personal attributes to be major factors that promote technology adoption, however, findings suggest that faculty attitude towards computers is the key predictor of adoption among university faculties (Faseyitan and Hirschbuhl, 1992).

Hence, the researcher aimed to identify the attitudes of faculty at a comprehensive university towards computer-based instruction across selected variables of demographic characteristics, organizational support and computer attitudes and beliefs. The study involved:

(a) surveying randomly selected faculty from all seven academic colleges (stratified random sampling method) of a comprehensive university regarding their self reported use and attitudes toward computer-based instruction

(b) testing for significant differences between adoption of computer-based instruction by faculty and selected variables of faculty demographic characteristics, organizational support, computer efficacy, utility beliefs and computer attitudes and beliefs.

Definition of Terms

The following definitions are presented to clarify their use in this study:

Adoption: The point at which an innovation, which is computer-based instruction for the scope of this study is formally adopted by the faculty. Adoption of the innovation may be expressed at varied levels by the faculty. Adopters are faculty who adopt computer-based instruction to help prepare for teaching, use computers in the classroom for delivery of instruction and/or require students to use computers for the courses they teach. The terms adopt and use may be interchangeable in this study.

Adopters: Faculty that use or have adopted computer-based instruction.

Attitudes: University faculty feelings towards computer-based instruction.

Computer: For the purpose of this study, the term is generally defined to include mainframe computers, computer networks, mini and micro computers, and all computer related hardware and software applications such as power point presentations, Internet based notes, process and procedures used by faculty, e-mails etc.

Computer-Based Instruction: Application of computers by university faculty for delivery of instruction.

Discipline: Faculty's area of specialization. In this study, discipline will be grouped as technical to include mathematics or physical science based disciplines and non-technical to include all other disciplines.

Efficacy: Ability of university faculty to produce the intended effect or result by using computer-based instruction.

Faculty: Individuals with teaching, research and institutional service responsibilities within the university structure. For the purpose of this study, tenure track faculty employed at Oklahoma State University are only included.

Non-Adopters: Faculty who do not use computers to prepare for teaching, nor use computers in the classroom for delivery of instruction nor require students to use computers for the courses they teach

Organizational Support: Support extended by university administration to faculty promoting adoption of computer-based instruction. Support may be in the form of institutional policies, faculty incentives, technology center assistance, staff development programs, funding etc.

Research and Teaching Involvement: Number of years engaged in research and/or teaching.

Rank: University faculty's official tier or tenure-line status within the academic hierarchy.

Technology The use of computers and or computer based applications for the purpose of instruction delivery. In this study, the terms technology, computer technology, computer-based instruction, and instructional technology may be used interchangeably.

Utility Beliefs: University faculty member's views concerning the value of computer-based instruction in relation to preparing students to face the challenges of a technological society.

Limitations of the Study

The following limitations were inherent in this study due to the nature of the investigation. They include the following:

1. This study was limited to full-time tenure track or tenured faculty employed at Oklahoma State University, a comprehensive institution.
2. The subjects in the study included faculty employed at the university as of December, 2000.
3. The variables studied were university faculty's adoption of computer-based instruction across selected variables of demographic characteristics to include faculty academic college, rank, discipline, years of service in institutions of higher education, research and teaching involvement, gender and age, organizational support factors, and computer attitudes and beliefs.
4. Any variability in population, subjects, type of institution, or factors and conditions not specified were considered beyond the scope of this study.

Organization of the Study

Chapter I has included an introduction and statement of the problem to be studied, the purpose and significance of the study, a working definition of the commonly used terms throughout the study, and limitations incurred by the nature and method of the investigation.

Chapter II contains a review of the relevant literature pertaining to the topics of defining computer-based instruction, technological revolution in higher education, theoretical background for the study, and barriers to the adoption of computer-based instruction.

Chapter III describes the methods and procedures utilized in the study.

Chapter IV presents the compilation and analysis of the data in answer to the questions emanating from the problem studied in this investigation.

Chapter V summarizes the study with conclusions, implications, and suggestions for further research are included.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

Since the 1960s, the use of computer technology in education focused on means and methods to enhance the teaching process. For example, computer-managed instruction or computer-based instruction helped faculty with automated record keeping and scheduling of instructional events. New combinations of teaching approach, applications of technology, and instructional materials as in collaborative/cooperative learning recognition. Collaborative and cooperative learning provides an exciting example. Collaborative and cooperative learning are two closely related, small--but-growing pedagogical movements in higher education. In both these approaches an important element of the learning process is students working in small groups. Other teaching applications included simulations and games. In most cases, however, the computer augmented a teacher or faculty-directed instruction. As a result, the distinction between forms of instructional applications, e.g., computer-assisted instruction, computer-managed instruction, computer-based instruction, simulations etc., had given way to instructional systems. These systems exhibit direct, predictable and theory-based relationships between learning and instructional variables that would facilitate the process of teaching by faculty and learning by student. Thus, the question of concern is related to learning theory, instructional theory, and the effect of computer technology on the improvement of teaching and learning process.

A conventional application of artificial intelligence, defined as competency in problem solving by any humanly formulated rational method was computer-assisted or computer-based instruction and computer based learning. Computer-based instruction systems were model-based development efforts. Model-based instructional systems represented the process of instruction. It does not consider the concept of empirical verification that might explain the rationale of improved learning. It also aims at demonstrating the application of artificial intelligence which entails efforts to improve instruction through computer-based variables associated with artificial intelligence. Methods such as natural-language processing, expert tutorials, computer languages developed for instruction, and hardware-software characteristics (e.g., graphics, color, animation) were used extensively. More recently however, developments in artificial intelligence developments trace specific instructional and computer-based design variables directly to definable logic based on learning theory. In addition are supported by empirical verification (Tennyson and Park, 1987).

Computer-based instruction systems arranged various components of an instructional system by using principles and techniques of artificial intelligence. This method allowed both student and program flexibility. The learning environment closely resembled a teacher and student one-on-one and attempting to learn together. The learner was able to use and process knowledge stored in the system. The operational functions of a computer-based or computer-assisted instruction system were determined by three main components: the content or information to be learned, the instructional strategy, and a mechanism for understanding the student's current knowledge state. These components were often referred to as the expertise module, the student-model module, and the tutoring module.

An expertise module consisted of the domain knowledge as presented by the system to the student. The instructional information included both the content to be taught (declarative knowledge) and the application of that knowledge (procedural knowledge) to solve related problems. The expertise module generates and performs student assessment. Hence highly organized information structure was critical for manipulation during the process of teaching and learning.

The student-model module dealt with the progress in the student's learning of the material. This module hypothesized the student's misconceptions and performance strategies which enabled tutoring model. The tutoring model was then able to identify these problematic areas and indicate why the student was wrong, and suggest corrections. Major information sources for maintaining the student model were student problem-solving behavior of the student as observed by the system, direct questions asked of the student, assumptions based on the student's learning experience and assumptions based on some measure of difficulty of the subject-matter materials. Therefore information collected by the foregoing methods helped infer about the skills in the student and explained the student's behavior as a collection of knowledge components.

Tutoring model dealt with a set of instructional specifications pertaining to presentation of materials to the student. The module integrated knowledge components structured in the expertise module and pedagogical methods. This module interacted with the student in selecting problems to be solved, monitored, and critiqued the student's performance, provided assistance upon request, and selected remedial materials. Diagnostic information obtained in the student modeling process helped determine the teaching methods. The program's feedback specifically indicated which knowledge components the student had used incorrectly or less optimally, and provided the knowledge components that the student should learn (Tennyson and Park, 1987).

Yet another concept persistent in this field was the notion of individualized instruction. As the Definition and Terminology Committee of the Association for Educational Communications and Technology (1972) had indicated:

"The educational technology approach has been directed toward expanding the range of resources used for learning, *emphasizing the individual learner and his unique needs* {Italics added}, and using a systematic approach to the development of learning resources (Reiser, 1987, p. 12)."

Educational technology was a term widely used in the field of education and other areas, but was often used with different meanings. The term technology was used by some to denote hardware - the devices that delivered information and served as tools to accomplish a task. Others used technology to refer to a systematic process of solving problems by scientific means. Hence, educational technology referred to a particular approach that relied on use of computers to achieve educational purposes. Instructional technology referred to the use of such technological processes specifically for teaching and learning.

The most recent definition of the field of educational technology which used the term instructional technology was published by the Association for Educational Communications and Technology (AECT). Instructional technology was the theory and practice of design, development, utilization, management and evaluation processes and resources for virtually all aspects of teaching and learning in an effort to bring about more effective instruction (Ely, 1999). This conception of instructional technology which evolved in the 1960s, became known as the "systems approach" to instruction. The systems approach was manifested in the instructional development process. This approach was applied to the development of media based instructional systems, and learning materials, and curriculum development in higher education.. Sometimes, the term instructional technology was used interchangeably with academic computing. Both learning resources and academic computing were essential forms of instructional technology.

Definition of Computer-Based Instruction

Numerous synonyms for instruction with computers were in use within the educational technology jargon. In the U.S. the most common alternatives that appeared in the early literature are computer-based instruction (CBI), computer-based education (CBE), and computer-assisted learning (CAL).

Over the years, no single definition had been universally accepted for computer-based instruction derived from instructional technology. These terms have assumed different meanings and will continue to assume different meanings to different people. Yet most definitions were inclusive of one of the two types. One type of definition equated to audiovisual devices with a particular set of instructional media. The other described instructional technology as a process identified as the systems approach process. The best example of these two types of definitions were contained in a statement issued by the Commission on Instructional Technology (1970):

"Instructional technology can be defined in two ways. In its more familiar sense, it *means the media born of the communications revolution which can be used for instructional purposes alongside the teacher, textbook, and blackboard* {Italics added}.... The pieces that make up instructional technology {include: television, films, overhead projectors, computers, and other items of "hardware" and "software" (to use the convenient jargon that distinguishes machines form programs).....

The second and less familiar definition of instructional technology goes beyond any particular medium or device. In this sense, instructional technology is more than the sum of its parts. It is *a systematic way of designing, carrying out, and evaluating the total process of learning and teaching* {Italics added} in terms of specific objectives, based on research in human learning and communication, and employing a combination of human and nonhuman resources to bring about more effective instruction (Reiser, 1987, p. 11)."

Hence, educational technology comprises of a product and a process. Products referred to the equipment used in providing education and included the chalkboards to communication satellites. Process referred to the software produced such as overhead transparencies, videotapes, teleconferences and computer-assisted or computer-based instruction. The process of producing these software products usually referred to as instructional development may also be considered as educational technology. Some of the literature referred to educational technologies as instructional innovations combined different educational technologies, processes and strategies together (Carl, 1987). It was difficult to separate and distinguish these for the purpose of this study. Hence, the terms educational technology, computer-based instruction and computer technology were used interchangeably.

Computer-Based Learning

Computers as educational tools that supported learning; assumed various roles such as teacher, monitor, data base manager, game provider etc. From the perspective of a computer as a teacher or faculty, computer-based learning and teaching process assisted with organized collection of learning materials and was a source of learning experiences. Computers also helped to organize and distribute teaching activities, and collected an approach to collect and organized information pertaining to behavior of learners. With regards to learning materials research supports that teachers and faculty preferred computer based products that could be implemented, adapted and extended, to accommodate the learners and conditions of use. Computers were used to help humans communicate and collaborate in spite of physical separation due to distance. The computers provided access to computer networks, served as a mailbox via electronic mail system, supported humans in the cooperative use of software applications and data. Thus, virtual work groups were developed that were scattered over wide areas asynchronously in time (Greif and Sarin, 1988).

Education theorists, futurists, teachers, learners and taxpayers were demanding that universities, like other public social institutions actively engage in providing opportunities to improve and enhance their capacity to deliver educational core functions pertaining to teaching and learning. Post secondary institutions were to re-create the adult learning system such that resources and services were accessible, affordable, and accountable to the learner. Educational organizations were encouraged to use their potential to fully participate in a virtual learning system, and that the infrastructures were well integrated to provide seamless access to services and technologies.

Technological Revolution

The use of technology in American higher education had recognized the potential of new technologies but still remained largely as an ad hoc enterprise, advancing unsystematically in response to the enthusiasm and achievements of certain devoted practitioners and the emergence of promising new devices. In most instances, researchers observed failure to complete exploitation of the technology and the education system perceived technology only as a supplement to the traditional lecture process.

"Past history has clearly shown that before one technology can be developed ...... a new one appears on the horizon .....The result has been that these technological innovations have achieved marginal instructional benefits and have often ended in disillusionment." (Saettler, 1990, p. 404).

Audiovisual Devices

Audiovisual (AV) devices meant any piece of equipment which through mechanical or electronic means controlled the presentation of visual or auditory communication for instruction. Few examples of AV devices are overhead projectors, television monitors, computers etc. Instructor and printed text are media not considered as AV devices.

The beginnings of the AV movement have been traced to 1600s to the work of Johann Comenius. Johann proposed initially that since learning is accomplished through human senses, and real objects and illustrations could be used to supplement oral and written instruction. Later in the early twentieth century, school museums came into existence. As Saettler (1968, p. 13) indicated, these museums "served as the central administrative unit{s} for visual instruction by their distribution of portable museum exhibits, stereographs, slides, films, study prints, charts and other instructional materials". In the early 1900s, prior to the advent of sound films, visual instruction or visual education birthed the movement that was eventually to be called "audiovisual instruction". Besides stereoscopes and stereopticons, which were used in some schools during the second half of the nineteenth century, the motion picture projector was one of the early audiovisual devices used in schools. In 1913, Thomas Edison proclaimed:

"Books will soon be obsolete in the schools ....It is possible to teach every branch of human knowledge with the motion picture. Our school system will be completely changed in the next ten years" (Reiser, 1987, p. 13).

During the 1920s and much of the 1930s, technological advances in film and slide quality, radio broadcasting, sound recording, and motion pictures with sound helped foster growth in the visual instruction movement. In addition technology served to expand the focus of this movement from visual instruction to audiovisual instruction. Interestingly the field of computer technology continued to grow with minimal impact on the educational community. By 1930, commercial interests in the visual instruction movement had invested and lost more than $50 million, and the Great Depression worsened the decline. In 1932, the AV movement was consolidated within one organization known as, the Department of Visual Instruction (DVI) of the National Education Association. Over the years, this organization, now known as the Association for Educational Communications and Technology maintained a leadership role in the field of instructional technology. Throughout the history of the AV instruction movement, the worth of AV materials is inherent in its ability to present concepts in a concrete manner (Reiser, 1987).

World War II

The onset of World War II marked a slow growth of the AV instruction movement. However, AV devices such as films, film projectors, overhead projectors (which were first produced during the war), slide projectors (which were used in aircraft and ship recognition), audio equipment (which were used in teaching foreign languages), and simulators and training devices (which were employed in flight training) were used extensively in the military services and in industry.

Post-World War II Developments

The AV devices used during World War II were successfully used in the United States to effectively train large numbers of individuals with divers backgrounds. This event instilled a renewed interest in using AV devices in the schools. In the decade following the war, AV research were undertaken to identify various features, or attributes, of AV materials that influenced and facilitated learning. and those attributes that would facilitate learning in given situations. Principles of learning employed in AV materials were also identified.

During the early 1950s, various theories or models of communication that focused on the communication process, involving a sender and a receiver of a message, and a channel, or a medium, through which messages were sent were investigated. This interest proved the path for focus on the AV movement (Reiser, 1987).

National Defense Education Act: Title VII

In 1958, with the passing of the National Defense Education Act in the United States, under Title VII of the Act, the federal government provided extensive funding for media research and for the dissemination of media research findings. Filep and Schramm (1970) summarized the effects of this legislation:

"Title VII had a substantial impact on educational scholarship and brought numerous researchers into the field of educational media and technology. It also helped upgrade the quality of the research effort and contributed to the growth of many departments of instructional technology and related institutions. It was instrumental in several developments toward quality educational television and helped in the establishment of educational information-disseminating institutions such as the ERIC Clearinghouse." (Reiser, 1987, p. 16).

Instructional Television

The most important factor to affect the AV movement in the 1950s was the increased interest in television as a medium for delivering instruction. In 1952, the decision by the Federal Communications Commission to set aside 242 television channels for educational purposes spurred the growth of television for instructional delivery purposes. Thus, public (then called "educational") television stations were on the rise. By 1960, the number of such stations increased to more than 50 and their primary mission was to present instructional programs. Prior to 1960s, educational broadcasting served as the quickest, cheapest, and most efficient means of satisfying the nation's educational needs. Another factor that promoted the rapid growth of instructional television was funding provided by the Ford Foundation. During the 1950s and 1960s the foundation and its agencies spent more than $170 million on educational television. These sponsored projects included a closed-circuit television system, an experimental research program to assess the effectiveness of these projects, and the Midwest Program on Airborne Television Instruction, a program designed to transmit televised lessons from airplanes to educational institutions in six states. By the mid-1960s, due to the mediocre instructional quality of some of the programs, the widespread interest in using television for instructional purposes had abated severely. Ford Foundations stiffled their funding support and shifted their focus on public television, rather than on educational applications of instructional television.

Instructional programming still continued to be an integral part of the mission of public television, but that mission was broadened to encompass both cultural and informational presentations. In light of these developments, in 1967 the Carnegie Commission on Educational Television concluded:

"The role played in formal education by instructional television has been on the whole a small one . . . nothing which approached the true potential of instructional television has been realized in practice . . . . With minor exceptions, the total disappearance of instructional television would leave the educational system fundamentally unchanged" (Reiser,1987, p. 18).

Many reasons including teacher resistance to the use of television in the classrooms, installation and maintenance cost, and the inability of television by itself to present enhancement of student learning have been presented as to why instructional television have not been widely adopted to a greater extent within the educational regime. In spite of the negatives associated with this technology and failure to capture its maximum potential, the medium continues to be used in many educational systems.

In the 1970s, there was increased movement away from equating instructional technology with audiovisual devices. In 1972, the Association for Educational Communications and Technology presented a new definition to education technology:

"Educational technology is a field involved in the facilitation of human learning through the systematic identification, development, organization, and utilization of full range of learning resources, and through the management of these processes. It includes, but is not limited to, the development of instructional systems, the identification of existing resources, the delivery of resources to learners, and the management of these processes and the people who perform them . . . The approach that is characteristic of educational technology is . . . the use of a broad range of resources for learning, the emphasis on individualized and personalized learning, and the use of the systems approach." (Reiser,1987, p.19-20).

The systems approach for designing the process of instructional delivery entails a systematic way of designing, implementing, and evaluating the entire process of learning and teaching. This approach is presented basically as an empirical approach to the design and improvement of instructional delivery process.

Programmed Instruction

After World War II, programmed instruction movement in the mid-1950s was the next major factor that promoted the development of the systems approach concept. Educational problems were solved by an empirical approach. It involved gathering data regarding the effectiveness of the materials, identification of instructional weaknesses , and revision of materials. The instructional material consisted of a series of small frames or steps, each of which required an active response from the learner. The learner then , received an immediate feedback regarding the correctness of their response. Thus, permitted learners to proceed at their own individual pace. Hence, programmed instruction was successful in creating an effective self-instructional system--a technology of instruction. This success in program instruction captured the interest of the educational community. By early 1960s, large numbers of programs were developed for use in schools, the military, and business and industry. This led to the development of a journal devoted exclusively to the topic of programmed instruction, and various programming techniques were also devised.

By the late 1960s, the programmed instruction movement was beginning to decline within the educational community for a variety of reasons. Research revealed that programmed materials and conventional instructional materials provided no significant effectiveness. In addition, students expressed these materials to be uninteresting and administrators and faculty had difficulty adjusting to the new roles thrust upon them. In the late 1960s as interest in programmed instruction was waning, educators began focusing on other forms of individualized instruction such as Personalized System of

Instruction Learning for Mastery, the Audio-Tutorial Approach and Individually Guided Education, etc. (Reiser, 1987).

Computer-Assisted Instruction (CAI)

As programmed instruction was beginning to be non viable, mainframe computers arose as a promising option for educators. By harnessing the potential of computer technology, expectations arose among educators to develop machines that would move beyond the scope of programmed learning. These expectations were evident in the opening statement of the Carnegie Commission on Higher Education's 1972 report *The Fourth Revolution: Instructional Technology in Higher Education*

"Higher education (and education generally) now faces the first great technological revolution in five centuries in the potential impact of [computers]." (p. 1)

The use of computers in skills training was first introduced by Gordon Pask in the early 1950s. Computer technology was used to develop advanced forms of teaching machines, that were capable of adapting to skill levels of the learners. These later came to be known as Adaptive Teaching Machines (Pask, 1960; Stolurow and Davis, 1965). Pace of instruction were selected by the learners. As computer technology and software improved, complex teaching machines with the capability of modifying instructional variables such as amount, type, practice with feedback, etc., as guided dictated by learner variables such as motivation, interest level, knowledge level etc., were envisioned (Ross, 1984). This combination of computer technology and programmed instruction came to be known as computer-assisted instruction (CAI).

Mainline CAI

From its inception, CAI adopted two divergent paths in education. The first path, known as mainline CAI, aimed at the application of CAI to help develop the process of teaching and learning of the traditional curriculum. This goal was attained through structured practice problem sets, games and simulation. A deviation from this path was referred to as computer-managed instruction. Instructions that were managed by computers used computerized placement and progress testing (Weisberger, 1971; Walker, 1986). The second path, referred to as computer-centered CAI, focused on the impact of computing on thinking and knowledge building. This path was later known as "computer literacy" or "artificial intelligence" which greatly favored using programming languages as problem solving tools (Dwyer, 1980).

In the mid 1960s, the CAI movement underwent rapid growth. This growth was due to millions of dollars of federal funding was made available to educational institutions and corporate laboratories for educational research and development (Morgan, 1978; Hirschbuhl, 1980). However, by the end of the 1960s, disenchantment with CAI was evident among educators and funding agencies. It was being used in only a fraction of educational institutions. Despite this apparent lack of enthusiasm for CAI among educators, work on CAI continued unabated in the early 1970s by the National Science Foundation (NSF). They were determined to identify more definitively whether CAI could be made educationally superior, cost-effective, and widely available. By the mid 1970s, it was clear that, due to a combination of technical and educational difficulties, CAI would not be the hoped-for revolution in education. CAI lacked quality software and the constraints of mainframe which was then mainly a time-shared computer use limited the curriculum options available to educators. Above all; the skills of both teachers and students were inadequate for the software requirements. In addition, no systematic attempts were made to dispel fear of computers held by educators, teacher training and staff development programs were inadequate, and many of the renewed pedagogical assumptions embedded in the CAI programs were not clearly articulated to teachers (Saettler, 1990).

Instructional use of computers in the early years focused on two major concepts that pertained to instruction. The first one dealt with instructing "about" the computer and "with" the computers. Instruction about the computer included computer programming and instruction "with" was applied to technical disciplines such as engineering, computer science, physical science, mathematics and business. Computer use was minimal in psychology and social science. Computer instructions were implemented in higher education at both the graduate and undergraduate level and primarily used drill, practice and problem solving (Rockhart and Scott-Morton, 1975). In the 1980s, student interaction with computers changed dramatically as computers became cheaper, powerful and more user friendly. Time sharing or batch mode required for mainframe and mini computers were eliminated. The availability of computer programs on floppy disks permitted application of computer simulations, number problems, tutorial and games. Computer-related tools such as video-discs performed several appropriate computer related instructional functions (Mosman, 1980; Hirschbuhl, 1980).

Individualized Instruction

In the late 1970s, individualized instruction began gaining recognition. The reasons were the commercial availability of personal microcomputer, improvements in the field of artificial intelligence, consolidation of communication technologies and the introduction of networking technologies. These developments stemmed off of the commercial introduction of transistors which were a replacement for vacuum tubes in the early 1960s. These transistors in turn paved the path to the era of digitization. The process of digitization and individualized instruction with the use of personal computers and communication technologies enabled vast quantities of data to be stored in compact areas. Thus digital electronics evolved and these possessed a broad spectrum of technological applications. Digitization had a profound effect on the future developments of computers, audio, video, electronic communication mode, and network technologies. In addition, the development of compression software helped dramatically decrease the amount of storage, enhanced transmission capacity required for digital data such as text, audio, video, graphics etc. (Gustafson, 1996).

Education and educators seem attracted by the potential of computer technology. From the evolution of the film in the '20s to television in the late '50s, computers in the '80s, and now information technology in the '90s, great expectations always existed that new technologies would some how enhance learning and instruction. In the '80s, during the revolution of microcomputers in higher education, computers emerged as a personal tool for writing in all disciplines, financial analysis in business, statistical application in the social sciences, etc. However, applications such as graphics, digital imaging, desktop publishing, electronic mail, multimedia, etc., decreasing prices of computers, and increased power, efficiency and convenience brought desktop and notebook computers to several students, faculty, and institutions that previously never considered themselves as users of computers. Midway through the '90s, a major break through in colleges and universities was a shift in emphasis from computers as a desktop tool to computers as the "communications gateway" via computer networks. Hence the promises and potential inherent in information technology epitomized among educators. Computers were now providing an "information-rich" environment that will support and revitalize instructional and scholarly activities among educators (Green and Gilbert, 1995).

Is Technology Necessary in Higher Education

With the advent of the 21st century, social issues related to education, and the mission of higher education gained a newer outlook. Higher education was expanding to provide access irrespective of circumstances that may be related to age, employment status, geography, culture, ethnicity, and family responsibilities. Access assumed that form of physical access to the course material, via the Internet or a learning device, to intellectual access in a neutral, non-judgmental context. Hence, faculty are increasingly challenged to turn to computer based technologies that would enable the development of a pedagogy that nurtures the learning process among the increasingly diversified student body, irrespective of whether in a residential campus setting or distributed to off-campus sites. Like learning, teaching therefore assumed a highly individualized role. Background and frame of reference influenced what a teacher or learner does with the computerized teaching tools. Once faculty got over the frustrating learning curve, they were then capable of manipulating technology in a fashion to fit their individual pedagogical preferences and styles. Individual personalities who enjoyed critical thinking gravitate to the professiorate. Under circumstances of fiscal resources of the higher education sector remained bountiful, and had the social issues associated with access, diversity, and educational currency not arisen, faculty would have taken on a different role. They would have continued, in the tradition of academic independence, to preserve the values associated with the traditional classroom lecture modality or to immerse themselves in the development of online courseware bearing their individual pedagogical signatures. The classroom lectures and its concomitant social relationships were based on "technologies" that prevailed successfully for centuries. With ample evidence, it was proven that computer-based information technology did indeed hold a meaningful and viable solution to some pressing social issues, its very inherent power to alter social and business relations produced unease and skepticism among those educators who cherished the values associated with traditional pedagogical forms. It also greatly contributed to the growing polarization between computer technology organizations and the faculty on campuses of higher education institutions.

The widespread use of computer based technology in a college or university setting represents a significant change from traditional ways in which higher education has been conducted. Technological change has severe repercussions throughout the many dimensions of institutional life. Technology helps breakdown organizational barriers and barriers previously created by time and distance, creates new opportunities for distance learning which affects the structure of the academic department, social interaction, residential college life, and the nature of instruction. Technology has the ability to increase and streamline communications between faculty, students, and administration. With all these benefits of technology, technology is also associated with communication problems because of differing computer attitudes and skill levels that prevail among educators.

It is required of universities to contend with political issues of resource allocation, financial constraints, competition and cooperation with other schools in order to stay ahead. Computer technology also brings with a change of the culture of higher education by changing the key roles of faculty, students, and administration. This change in key roles thereby alters the distinctive cultural characteristic of higher education institutions. In addition, technology helps create new ways for doing existing work more efficiently and faster, creates new work that previously was non-existent, enhances education and transforms the traditional ways in which the process of higher education conducted (Bair, 1996).

New information and communication technologies and particularly the Internet and its applications such as the most well known World Wide Web (WWW), in providing greater access to information and new instructional possibilities, are changing the learning, teaching and research process. Never has an innovation had such an impact on the system of higher education. The discovery of radio and television have changed the way people spend their time, but they have had little impact on higher education itself. Interestingly, there are signs and promises that the Internet will continue to have an even more pervasive impact, and universities are faced to keep up with this ever changing challenge (Langlois, 1998).

In addition, economic and political pressures had severe effect on educational institutions that were in the process of adopting computer based instruction and any related technologies. With the decrease in funding and increasing societal expectations for universities to be more cost-effective, the use of information technologies is seen as a promising way to reduce costs. At the same time, knowledge becomes a marketable product. Higher education is more and more market driven. Academic productivity is being redefined in many places and university teaching hence must be closely relate to the needs of economies and the labor market. Many governments, for instance in Europe, desire to produce a skilled work force that equipped individuals for independent lifelong learning. In such cases, the impetus for experimentation in information technologies in these countries arise from governments which are eager to reduce costs.

As a means for universities to be competitive, universities must invest in information technologies if they desire to convince their potential clients that they can provide resources that are also available elsewhere. In regions where there are many universities, universities are thriving in an environment where they are competing for the best students. Under these circumstances, students are more likely to choose institutions which offer relatively the best services. Moreover, it imposes universities and academic institutions to begin designing courseware or participate in the design of courseware if they want to be competitive in the educational market (Langlois, 1998).

Higher education faces tremendous social pressures. The universities have an obligation towards students. Not only should accessibility be considered rather students' demands should be taken into account. The society presents a new type of student, who may be computer literate, will expect their university and its teaching staff to be equally proficient and equipped with new technologies. As a service to their students, universities have to constantly update information technologies as, in future years, they will be widely spread in all areas of the labor market. This situation imposes information literacy to be essential for all future employees. Students of the 21st century are now looking for more flexible learning patterns and it is critical that universities commit themselves to creating new learning environments.

Hence, instructional management systems build a framework of specifications, standards, and definitions around which products would be developed. Such products would enable faculty to execute efficient searches on the Internet for relevant courses, research, and tailor course modules that fit their individual curricular demands and modes of expressions. And, thus these systems provide the infrastructure essential required for smooth transition to modalities for teaching and learning that addressed the issues of quality, access, and affordability. Technology also enforces a change in faculty role and students. It also imposed a change among faculty, students, administrator, vendors and publishers. Campus support services consisted largely of team members, professionals with formal training in curriculum design and development. A committed and fully engaged student that took part in active learning facilitated by technology, brought a new assertiveness to the faculty/student relationship. Faculty members were thus forced to move from a position of power and control to one requiring flexibility and spontaneity (Barone, 1998).

Nontraditional students have become the norm in the on-campus college student population in colleges and universities. Nontraditional students were those who are 25 years or older, attended college on a part-time basis, commuted at least 50 miles to college, or possessed any combination of these characteristics. The growth rate of nontraditional students from 1970 to 1985 was 114% versus 15% for traditional students. 80% of all students attending higher education institutions were commuters. In addition, nontraditional students are more autonomous than the traditional student, a ramification that impacted the traditional time on task philosophy for learning. Thus, advances in technology are inevitable in order to extend educational opportunities and make education via Internet via computers a reasonable alternative to the traditional educational delivery system (Donohue, 1997; Mannos, 1998).

Advantages of Computer-Based Instruction

Students and faculty possess strategies to survive in the traditional face-to-face classroom experience. With rapid increase in computer-based and video-based instructional environments, faculty's and learners are trying to make sense of the necessary strategies they need to survive in the new classroom environment (Grubb and Hines, 1999). Technology is a vital tool for productivity and quality. The array of technological devices for educational purposes includes computers, interactive video and audio equipment, telecommunications equipment, technology-based courseware for the delivery of instruction, courseware authoring systems, and computer software for managing instruction. Technology use by faculty at the course level in instructing students or in managing instruction, it enables both faculty and students to gain independence and efficiency. Eventually, faculty, students and the institutions all benefit from the availability of shared information via technology. As quoted by Zuboff (1988), "Rather than substituting machines for individuals, the technology enables or enhances individuals work" (p. 75). Thus, it is evident that the integrations of computer-based technology into the system of higher education does benefit both faculty and students.

Computers in Universities

Some of the newer applications of technology with the greatest potential to improve teaching and learning at the post-secondary level can be achieved only through the combined efforts of faculty, students, academic support service professionals and industry. The decision to build, and implement an institution-wide portal system deems collaboration, commitment and participation at all levels of the higher education institution. Ideally, such decisions are to be made by administrations based on collaborative input and recommendations representing the best thinking and planning of all key groups and services (Gilbert, 2000).

Beginning in the 1980s, colleges and universities began extensive investment into computers. Approximately $100 billion was spent annually (Hermann, 1988). According to The 2000 Campus Computing Project Survey revealed more college courses using technology resources. Three-fifths (59.3 percent) of all college courses now utilize electronic mail, up from 54.0 percent during the year 1999, 44.0 percent in 1998 and 20.1 percent in 1995. Similarly, two-fifths (42.7 percent) of college courses now use Web resources as a component of the syllabus, up from 10.9 in 1995, 33.1 percent in 1998 and 38.9 percent in 1999. Almost a third (30.7 percent) of all college courses have a Web page, compared to 28.1 percent in 1999, 22.5 percent in 1998 and 9.2 percent in 1996. Advocates of technology use in higher education anticipate that technology will allow the same number of faculty to teach more students at the current or enhanced level of learning and or allow campuses to serve the same number of students with fewer faculties and with no loss in learning. Technology has improved productivity related to a wide range of data management and transaction processing activities: personnel files, course schedules, library catalogs, budgets and account receivables, student transcripts, and admissions information.

Other areas of the University particularly affected by new computer applications that have-and will increasingly have-a large impact in several university areas are: the teaching and learning process, the educational products and services (programs and courses), organization and management of teaching, the process of research, publication facilities, libraries and information services that would provide increased access to information, administration of libraries, university management, efficiency of management processes, and technologies related to issues of institutional management.

Libraries and information services have, for many years, witnessed the benefits of computer based information communication technology. Their task to provide access of information for students, teachers and researchers, are the major components to the teaching, learning and research process. As to university management, information systems are, and have been for years, widely developed and used (Langlois, 1998).

Technology undoubtedly mediates expansion and increased efficiency of the instructional process. In comparison to the past, 21st century technology offers more information, offers greater stimulation, analysis and synthesis capacity to the student; increases the possibilities to exchange ideas and opinions among teachers and students; better exercises, efficient testing, more collaborative learning and problem-solving capacities. However, the fact to be not ignored is that, although course delivery is improved by information technologies, it does not ensure that the quality of course content has improved. Indeed, improving the quality of teaching and learning process is the university's biggest motivation in introducing new technologies. The dichotomy between quality, efficiency and productivity presented by computer technology is still a matter of concern among educators.

Within the infrastructure of the university system, development of new teaching materials and distance learning modules has proven to make significant contribution. Universities can establish communication channels internally or with other universities, that offer more training facilities, and develop educational packages that would be at the disposal of students located at a distance. Computer technology also aides in the development of courses in the 'flexible delivery' mode. It implies that parts of the courses are delivered traditionally, while others in WWW-based or other formats. Distance-learning programs are on the rise in university campuses. Many universities have begun creating entirely new divisions completely devoted to 'virtual courses'. Although the initial investment in equipment and in course development is expensive, it is believed that teaching will eventually become cheaper as it hopes to attract more students in the long rum, and thus necessitate less administration, less travel, fewer teaching staff, and cost effective (Langlois, 1998).

Traditionally, research networking and dissemination of information among researchers were based on personal contacts and publications. As electronic communications developed as an inherent component of research, information communication technologies have now become virtually inclusive for researchers who can now enjoy much wider international cooperation. After all, the Internet was an invention of the research community. Researchers in science and technology have felt an even greater need for information technology than researchers in the social sciences and the humanities. However, with the incredible increase in the volume of information in every discipline, the gap between these two categories, although still big, is narrowing. In most developed countries, the national authorities have built up national networking systems for research. These are linked to international networks to which all campuses are linked. These networks are used by a wide range of researchers. In developing countries, seemingly increasing number of universities are connecting up to the Internet (Langlois, 1998).

Kozma and Johnson(1997) identified seven ways, summarized below, of how computing and information technology can be used in the transformation of teaching, learning, and curriculum development. First, from reception to engagement where students move from being passive recipients of knowledge imparted by professors and textbooks to active engagement in the construction of knowledge. Secondly, from classroom to the real world by equipping students to apply their knowledge to real-world situations and contexts. Third, from text to multiple representations wherein technology expounds on the ability to express, understand, and use ideas in other symbol systems. Fourth, from coverage to mastery of skills, rules and concepts essential to performance in specialized disciplines. Fifth, from isolation to interconnection or collaboration which promotes meaning in context of other ideas and events. Sixth, from products to process of creating knowledge to facilitate the process of scholarship in students. Lastly, from mechanics to understanding in the laboratory

Computer Based Technology and University Administration

Developments in the administrative use of computers are relevant in four areas: student systems, business systems, recruiting, and fundraising. With the advent of centralized data bases, integration of disparate student information functions began during the late 1970s. This process of integration began to consolidate all facts about enrolled students. As the cost of technology began to decline, and falling prices of computers, student registration systems adopted on-line access system. Advantages associated with use of computer based technology within university systems are: batch processing, automatic degree audit processing, faculty work load and classroom utilization statistics became readily available owing to adoption of computer-based technology. Multiple clients across campuses are served now through on-line business systems such as payroll, personnel processing, purchasing, financial systems, inventory control, reporting requirements, and budgeting. With the decline of college-bound seniors drastically dropping nationwide in the late 1980s, computer-based recruiting was adopted. These recruiting systems included prospective applicant tracking tools, interfaces to testing services for quicker transmission of standardized test scores, automatic response systems, and a variety of on-line report functions for admission officers. These systems have enabled efficient admission processing and thus managed information tools for institutional research. In addition, a natural evolution of graduating students from student database to an on-line alumni data base helps manage files on prospective donors by the offices of alumni on most university campuses. Solicitations, acknowledgments, and general information about the university are automatically targeted to the alumni population and are electronically transmitted (Norris and MacDonald, 1993).

Academic leaders are striving harder than ever to improve the quality and accessibility of teaching and learning in higher education as they pursue to control costs and integrate new instructional applications of technology. Many of these academic leaders are hoping that by embracing the use of technologies to deliver instruction, they can simultaneously combat social economic problems and learning problems. Most administrators see no other way out as they exist in the era of technological revolution. Very few university administrators are yet to comprehend or mobilize the kind of planning, support services, and other resources essential to make a successful transition to the technological era. Yet universities are faced with the challenge of too many faculty members, students, and alumni possessing unrealistic expectations from the universities or faculty and administration fear disaster from bringing technology more fully into education. The eventual transformation of higher education and the integration of instructional technologies are inevitable to higher education. But the path to that transformation is only beginning to be shaped. There is a critical need to fully understand about the relative costs and advantages of traditional materials and approaches and the new options of technology incorporation. Judicious combinations of the old and the new, of paper and electronics, of face-to-face and more distant communications, seem most comfortable- and perhaps, most effective-for faculty and students. Applications of information technology cannot be integrated widely and effectively within a college or university without both the commitment of the institutions to the relevant infrastructure and the commitment of faculty members to the particular approach. Faculty members will not be successful with the new approaches without the information and help provided only by a combination of the services available from the library, academic computing, faculty development, the bookstore and other campus organizations. This same combination of groups must be represented in the development of an effective strategic approach to the infusion of technology into the academic life of the institution (Gilbert et. al., 1995).

Most academic leader hold the misconception that their educational institution is not at par with the use of information technology. Universities are lagging in implementing accounting and budgeting systems that identify the unusual expense linked to incorporation of computer technology. These annual costs are related to updating hardware that is gets obsolete in two or three years in spite of its efficient performance, software upgrading, and support services for which demand the demand is ever increasing as faculty and students become more sophisticated users of the technology. Many presidents and academic officers in higher education institutions are approving major investments in information technology based on the belief that real cost savings in instruction will be achieved without reducing the number of full-time faculty. Some institutions are adopting distance education as a solution for financial and other problems, without considering the requirements to prepare faculty for effective participation. Some institutional leaders do not seem to realize that a solution that seemingly eliminates need for most of the faculty could also, by extension, eliminate the need for the very existence of the college. This may happen if the academic leaders are not careful enough to evaluate the purpose in light of the goal of the educational institutions. In April 1995, the chancellor of the University of Maine was forced to resign as a result of faculty votes of "no confidence" in reaction to accelerated plans to extend the system's current distance education program. For years, this program had been cited as a "model" for other states and institutions in the area of distance education (Gilbert, 1995).

Faced with these pressures, the administrative system of the universities must undoubtedly take appropriate decisions to favor the demands imposed. It demands managers to not ignore information technologies yet not to succumb to the demands of information technology. It is a realistic notion that no information technology will meet all areas and all needs in the university, all teachers and all students. Thus, university administration need to critically evaluate the programs they will implement and where, and what consequences they expect from the use of computer based technology. These benefits may be changes in quality, productivity, cost-effectiveness issues, etc. University managers must have a clear understanding of what technology strategies to adopt in order to be successful in implementing new technologies yet meeting the goals of the institution (Langlois, 1998).

Computer Based Technology and Faculty

The potential use of computers in education among faculty, most notably computer-based instruction (CBI), has been widely documented (Rodriguez, 1993, Gillespie, 1998). Faculty have greatly benefited from the use of computer technology. Technology has significantly helped increase productivity, reduce operating costs, faculties have transferred much of their work from secretaries, mainframes, and minicomputers to desktop systems and word processors. Faculty now have increased academic freedom to prepare and develop their class materials, course syllabi, conference papers, grant proposals, manuscripts, and other documents at their own convenience and from anywhere as long as they are connected to the Internet. Sadly however, relatively few claim that "micro" revolution has caused any real gains in instructional productivity via integration of computer technology. In that realm, higher education is still left to combat these notions as they earnestly pursue with the promises offered by technology (Green and Gilbert, 1995).

Consider implications for faculty careers, faculty personnel policies, and faculty professional development support. "Information technologies provide an array of opportunities for enhancing the teaching aspect of faculty life. No longer must professors be limited to the traditional lecture and instructional techniques that depend on a teacher and students coming together in space and time on a regular basis. In other words, technology frees professors and students to engage in teaching and learning in a much wider arena - cyberspace as well as classroom space (Baldwin, 1998, p. 14)." Further, a new form of distance education being adopted among faculties are the presentation of course-related materials on the Internet and thus made available to students as part of their home page. This paves the path for these materials to become universally accessible to anyone. The number of reports on faculty use of electronic mail in otherwise conventional courses and disciplines are growing rapidly. With e-mail, many faculty report better and efficient communication with students about the subject matter, courses, and greater participation in class discussions of students. Interestingly, students who usually participate less actively such as women, minorities, and speakers of English as a second language have shown enhanced participation owing to electronic means of communication. Ironically, faculty report that course-related use of electronic mail also significantly increase their own workload (Gilbert, 1995).

Pertaining to faculty research, computer technology aids locating and accessing large amounts of relevant information on-line in their field. This on-line inter library loan access facility diminishes costs considerably. Countries where funds are not available to acquire books or to subscribe to periodicals have greatly benefited from computer technology. Contact development among scholars is greatly enhanced through computer based communication technology. E-mail and file transfers promotes rapid communication with colleagues around the globe. Technology also fortifies rapid dissemination of research results and publications. In developing countries, publishing electronically provides greater opportunities and cost efficiency for researchers who could not otherwise afford it. Also, the function of sending research results for peer-review to a large number of contacts helps saving a considerable amount of time and cost. This undoubtedly improves the quality of publications and research.

In addition, technology enables substantial travel savings. For example, communication between a doctoral student or researcher irrespective of physical separation is faster and cheaper. Increase in research capacity by sharing equipment, knowledge, and ideas, and using remote computer resource is yet another possibility. Many researchers in physical sciences are still working in poorly equipped laboratories. For these researchers, via the Internet, it is now possible for those institutions that have the necessary equipment, to receive sample data from their colleagues for examination and communicate the results faster. Moreover, scientists who need large computer facilities and do not have them can use remote computer resources elsewhere (Langlois, 1998).

Computer Based Technology and Students

Students benefit from computer technology not only in day-to-day activities but also prepares them to face challenges presented by the world which expects them to be conversant with technology. Knowledge and access to word processing, spreadsheets, and data bases help students in their daily work, helps them develop computer modeling skills essential to solve research problems or be self proficient to take an entire college course via computer-based materials. In the world of work, computers provide access to a broad range of information which can then be applied for problem solving. Thus, for students to be successful in an information-based economy and electronic information-rich world, students must be trained to use the technology in normal, day-to-day problem solving while they are still in school. This is possible only by faculty modeling use of computer-based instruction (Norris and MacDonald, 1993).

Johnson, Flesher and Ferej (1992) studied the effectiveness of a computer-based Technical Troubleshooting Tutor to instruction in troubleshooting using traditional methods and found that students who received computer-based instruction were better at troubleshooting than students that received traditional instruction. The study involved a control and treatment group. They were asked to locate four independent electrical faults and found that the treatment group that received the computer-based instruction solved 72% of the problems attempted while the control group solved fewer than half of the attempted problems. Stephenson (1992) affirmed that instruction involving the use of computers produced quicker learning and increased retention than traditional instruction. Clark (1993) researched the effect of computer-based instruction versus traditional instructional methods on problem solving abilities of "at-risk" college students and found that the computer-based instruction group obtained a mean score of 14.4 correct out of 21 items as opposed to a score of 13.9 correct for the group that received traditional instruction.

Computer-based instruction increased learning more from the course in the interactive version than in the traditional lecture version and reduced laboratory costs at University of Illinois at Urbana-Champaign which had twenty-five years of experience in the utilization of computer-based instruction (Boettcher, 1992). Also, computer-based courses require fewer teaching assistants than traditional courses per one hundred students taught, which results in cost savings. The integrated curriculum in science, engineering, and mathematics at Rose-Hulman Institute of technology exemplifies programs in which technology shifts the focus of faculty from a teacher to a coach. These curriculum that emphasize problem formulation and in depth interpretation of solution, students use computers and commercially available software to explore themes that link science, engineering and mathematics. Integrated curriculum produced increased grade point averages and decreased attrition rate with consistently higher student and may be ascribed to computers capturing the interest of the students due to hands-on experience (Norris and MacDonald, 1993).

Use of computers in instruction provide students with more control of their education as the system is designed to be learner-centered rather than teacher-centered. In addition, computers are able to match the learning styles, behaviors, speed of comprehension and intellectual capacities of students. As learning ceases to be formal, students have more control and are able to manage information and solving problems by themselves. They can receive teaching when needed, at any time of day and night, and delve into lifelong learning (Langlois, 1998).

Theoretical Framework: Diffusion Adoption Theory

Rogers (1995) diffusion theory explained the patterns through which innovations (such as computer-based instruction for the purpose of this study) diffused into a group. This process of diffusion took into account the social context in which the diffusion occurred. According to this theory, the process of diffusion depended on the knowledge and beliefs of the group members, the structure of the social networks involved, and the patterns of communications utilized by the that the group members.

Innovation perceived as new is prone to create uncertainty and resistance by those affected by the innovation or the members of the group (Rogers, 1995). An innovation is an idea, practice, or an object that is perceived as new by an individual or other units of adoption that are affected by the diffusion process (Rogers, 1995). Furthermore, newness in an innovation may involve new knowledge. This new knowledge may be portrayed as someone having known about an innovation but are yet to develop a favorable or unfavorable attitude towards it nor have adopted or rejected it (Rogers, 1995). The theory of diffusion adoption of innovation suggests that the characteristics of an innovation affect the subsequent degree and rate of adoption. These characteristics are:

Relative Advantage of Innovation

Compatibility

Complexity

Trialability of Innovations

Observability

<u>Relative Advantage of Innovation</u>

This is the degree to which an innovation is perceived as better than the idea it superseded or replaced. Relative advantage of an innovation might be measured in economic terms, increased productivity, yielding high economic profitability, or the gain of social status. Also, convenience and satisfaction are important factors that may predict the relative advantage of an innovation. A clear distinction to be made is that it does not matter so much if an innovation has a great deal of objective advantage rather what matters is whether the individual perceives the innovation as advantageous.

Compatibility

Compatibility is the degree to which an innovation is perceived as being consistent or compatible with the existing values, past experiences, and needs of the potential adopter within a group or social network. Innovation must be compatible with deeply embedded cultural values and with previously adopted ideas. Incompatible innovations that contradict with norms and values of a particular group are generally not easily adopted. Therefore the adoption of innovation requires prior adoption of a new value system. The question could then be asked if faculty are ready to change their value system as they venture into adopting an innovation that seemingly is compatible with existing values and norms within an organization or group..

Complexity

Complexity is the degree to which an innovation is perceived as difficult to understand and use. While some innovations are readily understood, others are more complicated. Complicated innovations are adopted more slowly. New ideas that are simpler to understand are adopted more rapidly than innovations that demand the adopter to develop new skills and understandings.

Trialability of Innovations

This characteristic has implications for the degree to which an innovation might be experimented with, on a limited basis. New ideas that can be tested empirically will generally be adopted more quickly than innovations that cannot be tested. This is because an innovation that can be experimented with presents less uncertainty to the individual who is considering it for adoption. Trialability reduces the risk and allows reversion to occur such as returning to the status quo if innovation does not prove satisfactory.

Observability

Observability indicates the visible results of the innovation. The easier it is for individuals to see the results of an innovation, the more likely they are to adopt it. Visibility of results or observability stimulates discussion of new ideas and subsequent adoption. In light of these characteristics innovations perceived by individuals as having greater relative advantage, consistent with existing values and past experiences, and are less complex to adopt, can be tested on a pilot basis, and results that are clearly visible will easily be adopted. Roger's diffusion theory indicates that these qualities of innovations are important characteristics that may guide adoption of an innovation by any group or organization or social network. .

In this study of analyzing selected variables that influence faculty attitudes toward computer-based instruction, Roger's diffusion theory of adoption was used to interpret the study in the context of Oklahoma State University. Several studies identified advantages of computer technology when compared with traditional lecture instruction. Some of the advantages of computer technology, when used appropriately, are that it provides means for both the learners and faculty to accomplish their goals and to increase instruction, learning efficiency and productivity (Fawson and Smellie, 1990). Fawson and Smellie also noted that computer technology was not a panacea for all education's problems. However, computer technology is in the process of transforming educators and is equipping them to adapt to the new era of educational practice as presented by the 21st century. Anticipated advantages and disadvantages perceived by potential adopters are believed to have an impact on how quickly and which innovation is likely to be adopted by the organization.

Innovations perceived by faculty as having greater relative advantage (denoted by computer utility statements in this study), increased compatability reflected by institutional policies developed in light of existing norms, values, past experiences, needs of the adopters within the social system of the university, minimal complexity and greater trialability eased with technical assistance and staff development program and finally, observability in terms of student placements and salaries upon graduation, enhanced research and teaching involvement will be adopted more rapidly than other innovations. These five characteristics depicted by variables related to demographic data, organizational and computer attitudes and beliefs in this study provide university faculty and administrators with greater clarity to comprehend the rate of at which innovations are adopted.

Barriers to Adoption of Computer-Based Instruction

Researchers have cited various reasons for the non-adoption of computer-based instruction within an organization or institution. The literature has generally consisted of observations made by either administrators or educational technologists or researchers. Some pertinent problems to adopt computers in instruction may be related to the organizational pattern of the university, the characteristics and work patterns of faculty; the belief system and values among the faculty, and relatively weak administrative forces to enforce change in the process of teaching and learning. Daly (1997-1998) identified five following potential problem areas regarding Web-based instruction: a) the credibility of Web information, b) computer network reliability, c) computer availability for students, d) differences in student technological skill and e) lack of ethical knowledge (of students) regarding use of Web information.

"If we are living in the era of a "knowledge revolution" or are entering and "information society, "what is more likely to change than the institutions of higher education which produce and consume knowledge and information? Although the information management capabilities of computers have made possible multinational corporations, and their analytic and imaging capabilities have made possible scientific and engineering breakthroughs, thus far relatively few changes have occurred in the practices of creating knowledge or teaching it or in the organization of higher education. But social changes are not made by tools in and of themselves; many revolutionary technical ideas have not made for social changes in the past, because they were in fundamental conflict with their social contexts." (Lyman, 1995, p. 33)

Yet another strongly opposing force that hinders adoption of computer-based instruction within an university has been the traditional ways of the university. Universities have long produced knowledge in an old-fashioned way. There has always been a kind of inertia in higher education, where change is measured in years rather than months. Universities are faced with the challenge of technology adoption not being convenient due to the prevailing bureaucratic environment. Depending on the region of the world where they are located (information technologies are more widely spread in Asia, the US and some Anglo-Saxon countries) or the incentives (economic gains), universities will adapt to technology more or less rapidly, but there are still large discrepancies throughout the world. Lack of computer literacy among administrators and faculty presents another barrier to adoption of computer-based instruction, Training and staff development programs available are limited within the institutions of higher education. Hence, most faculty are still not really prepared to use them in their class. They largely ignore the call for changes and continue to employ predominantly the lecture mode. Faculty continue to remain oblivious to the benefits of computer technology. Here again changes in the classroom are likely to fail without full commitment from the instructors and university administrators. Indeed, faculty and often have little motivation to become involved in a process for which, some believe, there is little reward. Most of the time use of computers in the process of instructional delivery is not considered for promotions or tenure. Career systems existing within higher education systems are still too rigid to incorporate these new possibilities (Langlois, 1998, Allison, 1998).

Given the focus of this present study, to determine faculty attitudes toward adoption of computer based instruction, barriers related to faculty is presented. Although it is noteworthy, that barriers to adoption of an innovation may be affected at varying levels within the higher education system. These may be reflective at the institutional, administrative, instructional, technical, societal and personal levels. Some of the related issues are financial support, incentive systems for faculty, time commitment, equipment reliability threat to faculty, faculty/student/administrative technological competency, faculty attitudes, software adequacy, behavioral patterns of students and interpersonal interactions among faculty and with students (Piotrowski and Vodanovich, 2000).

Faculty Barriers

In recent years, many authors have anecdotally discussed some of the shortcomings and obstacles of embracing the computer based technologies and applications such as the Internet in higher education settings. Such problems include lack of privacy issues, poor/limited interactions, technological difficulties such as server failure, overloaded circuits, "dead" links, software limitations, increased time commitment for faculty, limited faculty knowledge. training and support, technological rather than content focus, isolation, and archival/retrieval concerns, relatively short life span of software and technical difficulty in keeping abreast of the changing technological era (Piotrowski and Vodanovich, 2000).

For many reasons, a faculty member cannot adopt a new combination of teaching approach, application of technology, and instructional materials as easily as picking a new textbook for a course. Reasons may be attributed to that there is no longer any single comprehensive source of information about relevant instructional materials, including what might be found on the Internet for most courses. The amount of information now available at the disposal of any educator is voluminous. Even if the faculty member could obtain a "review copy," no one knows how to skim and evaluate as a potential instructional asset or as an electronic item in the same way that a book or article can be reviewed. This in part may be due to the question of validity and reliability of information available on the Internet. Second, time gap between the present technology and the individual facultys' experience presents a discrepancy. It is still quite rare for a faculty member to have had direct personal experience as a student or observer in a course where new applications of information technology were successfully used by the teacher. It is almost rare for a faculty member to have had any kind of formal training in the instructional uses of information technology. Third, if use of the Internet as a source of student access to course-relevant information is included, the advice and skills of an Internet librarian becomes all but essential. Fourth, if the intended combination includes faculty and/or student use of new applications of information technology, then the relevant hardware must be accessible, as should software, training in its use, and maintenance for it. Fifth, traditional classroom physical layouts and class meeting schedules often are inappropriate for teaching approaches that emphasize collaborative work among students, project-centered learning, or extensive use of some instructional applications of technology. Sixth, many of the attractive new options cannot be adopted unilaterally by a single faculty member--they require resources such as a local area network, for the sharing of documents that would be hard to justify for single courses (Gilbert, 1995). Baldwin (1998) notes that "At present it appears that most professors use technology to supplement traditional instruction, not to redefine the instructional process (p. 9)." "As a 1997 *Chronicle of Higher Education* article reported, the traditional professor is course designer, lecturer, discussion moderator, and learning evaluator. New technologies challenge these roles because some aspects can be performed more effectively or efficiently using technology." Examples: multimedia components developed by instructional technologists; lectures captured and distributed technologically; instruction of cooperative or collaborative learning modifying teaching approaches (Baldwin, 1998, p. 10)." "In addition to being a subject matter expert, this new professor will need instructional technology skills, counseling skills, and a keen knowledge of group dynamics. These skills are necessary to integrate technology into the teaching-learning process and to facilitate the individualized, active, and collaborative learning strategies that new technologies can promote (Baldwin, 1998, p. 10)." According to Saltrick (1996), "College faculty make up one of the most plugged-in professions in their use of technology for research - and one of the most retrograde in their use of technology for teaching" (p. 59). The reason for this distinction, she argues, is that technologies such as the Internet enhance information sharing that is a natural part of the scholarly process. In contrast, full utilization of new technologies requires major alterations in the usual work patterns associated with teaching. Hence, instructional technologies have been slower to foster change in that area of faculty job responsibility". "There is little doubt that technology is a principal force behind gradually transforming the work and careers of professors. Because this transformation is still under way, the eventual outcome remains in doubt (Baldwin, 1998, p. 12)." "The traditional three-part academic role has been firmly in place since the beginning of this century. Teaching, scholarship, and service remain the primary faculty function; but each is being broadened and diversified by technology (Baldwin, 1998, p. 12)." "Technology has likewise quickened the pace of change in faculty life. An outcome of this process may be role overload or role conflict as faculty seek to perform each of their traditional duties effectively while accommodating the rapid changes in pedagogy, research methodology, and service delivery that technology stimulates (Baldwin, 1998, p. 12)." "As the pace of knowledge production has quickened and become more specialized, this task has grown exponentially. Concurrently, the changes in faculty work fostered by technology require "that faculty develop skills not ordinarily associated with traditional instruction" (Plater, 1995, p. 29) or other standard faculty roles. Keeping pace with developments in technology and learning applications is a relatively new responsibility for professor. Designing a course that supplements or replaces lectures with on-line interactive materials "requires more technical know-how than most professors possess" (Young, 1997, p. A26 In (Baldwin, 1998, p. 13)." As noted by Daigle and Jarmon, (1997), “Faculty development programs focused on technology should seek to become both part of the fabric of the institution and agents for transforming it.” (p. 35). “Human capital is the most important resource of any university. Accordingly, faculty development initiative regarding technology should be treated as central component of the broader institutional plan. As such, they automatically become part of the overall institutional mission and vision, as well as strategic agents for organization change and transformation” (p. 36-37). “Just as technology is transforming the character of the physical infrastructure used to deliver instruction, so too the human infrastructure is inevitably altered. The student market is not longer the same, sources of information and means for accessing them are new, and the overall teaching-learning paradigm is different” (p. 38).

It has been noted that there were very few incentives for faculty to involve themselves in instructional development procedures. Reticence of faculty to change structure by which faculty teach and students learn has also been observed. University structures have a long-standing and rigid tradition which was resistant to changes in educational technologies. Conflicting value systems of administrators and faculty contributed significantly to resistance towards adoption of computers for instruction. The availability of resources may be a factor in adoption of computers. In studies of the diffusion patterns of instructional innovations within universities, faculty identified lack of resources as a major factor in not adopting computers for instruction. In a survey to determine why faculty did not participate in teaching improvement programs, many faculty indicated that good teaching was not rewarded in promotion and tenure decisions (Mitchell, 1999). Baxter and Miller (1998) observed that professorate is changing because of computer technology. Teaching strategies adopted by faculty has been influenced by the addition of computer and other electronic technology. Education delivery has become decentralized. The locus of control has shifted from teacher-centered to student-centered. Faculty have been pressured to change and adopt to this new technology. This change has greatly threatened faculty independence. With the inclusion of technology into the curricula, faculty have become more dependent on technical support staff to aid them in their delivery of course information. Terms such as active learning and collaborative learning have begun to enter the educational theoretical jargon.

Technology enforces change in faculty roles. With the use of educational software, faculty serve as guides and coaches for contacts rather than as lecturers and transmitters of knowledge. They become organizers of curricula and courses; they help students find the appropriate information, but they cease to be the providers of solutions. In the short term, demand for teacher monitoring is likely to increase. At the same time, many believe that information technologies are a great time-saver for teachers as they only have to answer questions and with the compilation of frequently asked questions, these files can be used by students. Thus, faculty have also been faced with learning new technology, new ways of teaching, and a change in access to faculty and education in terms of time and place (Langlois, 1998).

Summary

Chapter II presented a review of literature and research to support the rationale for this study. The chapter begins with an introduction to computer-based learning followed by a section defining computer-based instruction. The section on technological revolution noted that the movement in technology began as early as the 1600s and has rapidly evolved since. This revolutionary time has evolved into computers being an utmost necessity to effectively function in any domain of the society.

Thereafter, the necessity and advantages of computer technology in higher education is examined. The role of computers in universities, administration, faculty and student use of computers are discussed. Next, theoretical framework supporting the study is discussed. Finally, a brief discussion on barriers to adoption at the level of university faculty and administration as supported by the literature is elaborated. In general, it can be summarized that barriers to adoption may rise from demographic characteristics of the faculty, organizational support extended to faculty that encourage the use of computers and attitudinal factors of efficacy, utility beliefs and attitudes.

CHAPTER III

METHODOLGY

The primary purpose of this study was to identify variables that affect faculty attitudes toward adoption of computer-based instruction in a comprehensive university. In addition, assess why, with computer technology readily accessible and embedded in the environment of a comprehensive university, some faculty members adopted computer-based instruction while others were referred to as non-adopters. Are these differences related to selected variables of faculty demographic characteristics, organizational support and/or computer attitudes and beliefs? The ultimate goal of the researcher was to identify differentiating characteristics of adopters and non-adopters of computer-based instruction.

This chapter includes a discussion of the research design, instrument, subjects, research questions and hypotheses, data collection and statistical analysis.

Research Design

The basic research design selected for this study was ex-post facto. The variables in the study could not be manipulated by the researcher. Newman and Newman (1977) affirmed that true experimental research allows the researcher to establish cause-and-effect relationships owing to high internal validity and the ability to manipulate the variables. Therefore, experimental or quasi-experimental design would not be appropriate.

Ex-post facto design helps the researcher understand the association between two or more variables. Causal relationships are not examined under this kind of research design. Conclusions are formulated "after the fact." Ex post facto research with high external validity can be used to identify the relatedness of a subset of variables from a larger set of variables to the dependent variable. Employed in this study was a faculty self-reporting questionnaire to assess faculty demographic characteristics, organizational factors, faculty attitudes and beliefs of the respondents toward adoption of computer-based instruction. According to Isaac and Michael (1990), studies employing questionnaires or survey are descriptive in nature, the purpose of which is to describe systematically the facts and characteristics of a given population, factually and accurately. Questionnaires are used to generate databases that are descriptive and they do not necessarily seek or explain relationships, test hypotheses, make predictions or get at meanings and implications, although research aimed at such purposes may incorporate descriptive methods.

A descriptive research method was used for this study because it describes and interprets a given state of affairs as thoroughly and accurately as possible. It deals with conditions that exist, opinions that are held, existing and on going processes, and effects that are evident or trends that are developing (Best and Kahn, 1986). Burns (2000) explains explanatory questionnaires may seek to establish cause and effect relationship but without experimental manipulation. This study is designed to carry out both descriptive and explanatory form of questionnaire and may therefore provide simple frequency counts to inferential statistics such as correlation and analysis of variance. Statistical procedures may be modified based on the data.

The researcher was thus able to describe the current situation, as it corresponds to faculty self-reported levels of adoption of computer-based instruction, attitudes and beliefs. In addition, the researcher was able to determine whether the characteristics of diffusion adoption of innovation as identified by Rogers (1995) were similar between adopters and non-adopters of computer-based instruction. Variables studied pertain to selected demographics, organization-related variables and faculty attitudes and beliefs toward adoption of computers for instruction.

Research Questions

Answers to the following research questions were sought in this study:

1. To what extent do faculty adopt computer-based instruction?
2. What are the problems encountered by the faculty in adopting computer-based instruction?
3. Why do some faculty adopt computers in instruction while others are unwilling to do so?
4. How do demographic, organizational support and faculty computer attitudes and beliefs compare between adopters and non-adopters of computer-based instruction?
5. What is the relationship between faculty demographic data and faculty attitude regarding adoption of computer-based instruction?
6. What is the relationship between organizational support factors and faculty attitude regarding adoption of computer-based instruction?
7. What is the relationship between computer efficacy and faculty attitude regarding adoption of computer-based instruction?
8. What is the relationship between computer utility and faculty attitude regarding adoption of computer-based instruction?
9. What is the relationship between faculty attitudes and beliefs about adoption of computer-based instruction?

10. What combination of demographic, institutional and attitudes and belief factors pertaining to computer usage will help faculty overcome resistance and facilitate faculty adoption of computer-based instruction?

Hypotheses

The following hypotheses were investigated during this study:

General Hypothesis : There is no significant difference between faculty adopters and non-adopters of computer-based instruction and individual factors related to faculty academic college, rank, discipline, research and teaching involvement, gender, age, institutional policy, faculty incentives, technical assistance, staff development program, funding sources, computer efficacy, utility and attitudes.

Specific Hypotheses:

H1: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and each demographic variable of faculty academic college, rank and discipline.

H2: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and each demographic variable of years in service in higher education institutions and Oklahoma State University.

H3: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and research and teaching involvement.

H4: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and each demographic variable of gender and age.

H5: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and individual organizational support factors pertaining to institutional policy, faculty incentives, technical assistance, and staff development program.

H6: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and funding sources for computers.

H7: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and computer efficacy.

H8: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and computer utility.

H9: There is no significant difference between faculty adopters and non-adopters of computers for instructional purposes and computer attitudes.

Variables

Dependent Variable

Faculty Adoption of Computer-Based Instruction

Adoption of computer-based instruction was based on: 1) faculty using computers to prepare for teaching, 2) use computers for delivery of instruction in the classroom, and 3) requires students to use computers in the courses taught by the faculty. Computer-based instructional activities included tutorial, drill and practice, simulation, problem solving, demonstration, word processing, e-mail, power point presentations, making lecture notes available on the Internet etc.

Independent Variables

Demographic Characteristics of Respondents

1. College
2. Faculty rank

3. Academic discipline classified as technical or non technical.

4. Years of service in higher education

5. Years of service at Oklahoma State University

6. Research and teaching involvement

7. Gender

8. Age

<u>Organizational Support Factors</u>

10. Institutional Policy: Policies at the level of department or college that specifically encourages the use of computers in instruction;

11. Faculty Incentives: Incentives available to faculty for adoption of computer-based instruction;

12. Technical Assistance: Technical centers to assist faculty with computer software for instruction;

13. Staff Development Programs: Programs such as release time, summer salary, seminars or workshops related to computer-based instruction

14. Funding Source: Source of funding for computers for instructional use within the college or department.

<u>Attitudinal Factors</u>

15. Computer efficacy belief: ability of faculty to efficiently maximize the benefits of computer-based instruction;

16. Computer utility belief: University faculty member's views concerning the value of computer-based instruction in relation to preparing students to face the challenges of a technological society;

17. Computer attitudes: University faculty feelings towards computer-based instruction.

Description of the Survey Instrument

The instrument used in this study and entitled the Faculty Instructional Computing Questionnaire (FICQ) (see Appendix A) was originally developed by Faseyitan and Hirschbuhl (1992) to evaluate attitudes of university faculty in six state universities in the State of Ohio to adoption of computers for instructional purposes. Faseyitan (Doctoral Dissertation, 1991, p. 48-49) concluded:

> A review of the literature indicated no appropriate survey instrument that would examine the various aspects proposed in this study. One instrument used by Hill et al. Smith and Mann (1987) was geared towards consumers of home computers and included many demographic data not suitable for this study. Another instrument utilized by Keane and Gaither (1988) was designed to study software development activities. In view of this, an original instrument was developed for this study.
>
> The instrument developed, titled Faculty Instructional Computing Questionnaire (FICQ) (see Appendix A) assumed that self-efficacy (Bandura, 1977) plays an important role in the adoption of computer technology; that utility beliefs (Hill et al. 1987) is correlated with computer adoption; and that general attitude (Butler, 1984) is relevant to the adoption of instructional computing.

The Faculty Instructional Computing Questionnaire therefore, consisted of four sections. Section One consisted of eight questions pertaining to personal demography that are considered relevant to faculty adoption of computer-based instruction. Section Two consisted of six questions focusing on faculty adoption of computer-based instructional activities, the dependent variable. Section Three had six questions related to support extended by the organization for instructional computing. Section Four had 18 questions concerning faculty attitudes and beliefs toward adoption of computer-based instruction. This section included questions pertaining to computer efficacy beliefs

(Questions #21-#24), computer utility beliefs (Questions #25-#28) and computer attitudes (Questions #29-38). Responses to items in section four were measured on a five-point Likert scale.

Written permission to use the FICQ for this study was obtained from the test developer. A copy of the letter granting permission is shown in Appendix B. The questionnaire was pilot-tested using three experts at OSU in the field of computer technology. Each subject in the pilot group received a cover letter (Appendix C) that described the purpose of the study, procedures pertaining to completion of the questionnaire and return. In addition, comments from a panel of four experts comprising of two professionals in the field of computing information systems and two research statisticians were obtained. Their suggestions were incorporated to help refine the questionnaire to better suit the purpose of this study involving the specified population. This modified version of FICQ (see Appendix D) was used in this study.

Per the recommendation of the pilot group and the panel, following changes were incorporated:

- All possible options under demographic characteristics were spelled out for convenience of the subjects.
- A description of the modifications as presented in the modified FICQ are as follows: Item # 1 and # 2 were changed from university to college as this study focused only on faculty in the seven academic colleges at Oklahoma State University (OSU).
- Question pertaining to faculty department was deleted from the study per the advice of the Office of Research Compliance, Division of the Vice

President for Research at Oklahoma State University in order to ensure subject anonymity.

- Item # 4 was expanded to distinguish between years of service in higher education and years of service at OSU. Research involvement (Item # 5) was modified to incorporate all possible indicators of faculty involvement in research.
- Item # 6 indicative of faculty involvement in teaching were elaborated to include specifically the past three years.
- Age was incorporated into the questionnaire as theory supports the notion that age may influence adoption of computer-based instruction. Rogers (1983) in his research on adoption theory, demonstrated that there were wider differences in age between adopter categories.
- Items 15 through 18 were modified to incorporate the option "Don't Know" per the suggestion of pilot group and panel of experts in computer-based instruction.
- Summer salary was added to item # 19 as another option for the question pertaining to participation in an appropriate staff development program.
- Inquiry into funding source of computers was suggested by the panel of experts and hence was added to the questionnaire (Item # 20).
- Items 21, 23, 24, 27, and 29 were reworded to capture the attention of the subjects.

Permission to gather questionnaire information from the subjects was obtained prior to data collection from the Office of Research Compliance, Division of the Vice

President for Research at Oklahoma State University (see Appendix E). Approval for the study from this office ensured that subject rights have been protected.

Comments from a panel of four experts in computer technology were incorporated to reaffirm the internal consistency of the instrument. As no estimates of reliability were provided with the instrument, an additional goal for the researcher was to test the questionnaire using the study sample and hence be able to provide reliability measures for the modified FICQ. Reliability was measured using Cronbach coefficient alpha which is a form of internal consistency reliability index.

Internal reliability of an eighteen-item scale was assessed using Cronbach alpha technique. The scale produced an alpha of .8176 (see Appendix F) which is acceptable for an attitudinal scale (Burns, 2000). Information pertaining to content validity of the instrument was obtained from expert judgment of the pilot group. It was hence verified that the instrument has adequate content validity at the given time of the study for the population specified. However, content validity is not a fixed and changeless characteristic and needs to be examined when used with a different population or under altered testing situation.

Bullard (1998) performed factor analysis on the original instrument to test for validity and reliability of scores and found that section four consisted of four constructs. Part three of section four titled "Computer Attitude Statements" were split into two (Questions # 29-#33 and Questions #34-#38) constructs. Factor analysis indicated that 57% of the variance was explained with using four constructs for these questions.

Description of the Sample

This study was designed to examine faculty attitudes toward adoption of computer-based instruction at Oklahoma State University (OSU), a public comprehensive university. The reasons for the choice of a comprehensive university were:

1. One characteristic feature of comprehensive universities that classify them from other types of higher education institutions is their emphasis in research and teaching. Consequently, faculty will more likely be involved with computers both for instructional purposes and personal research.
2. Consequences of educational practices in institutions of higher education have a major impact on educational and business communities that rely heavily on students from comprehensive universities. This reason may be attributed to the fact that students from comprehensive universities may be exposed to the use of the latest technologies employed by the faculty for research and teaching purposes.
3. In addition, a personal factor motivates the design of this study. As a former employee and currently a student of a comprehensive university, I have observed faculty and staff grappling with technology related changes implemented by administration. These changes related to the introduction of a new software that was supposedly "user friendly" and helped the administration, faculty and staff perform daily tasks and maximize the benefits of computer-based technology. The initial reaction of faculty and staff, as observed by the researcher was resistance to change, having to adapt and adopt newer procedures, and deal with the hurdles presented by the technology. They felt frustrated over the fact that they could not access pertinent information as quickly as they were used to because this new software had a different

programming structure. However, the current state of affairs among the faculty and staff at OSU is that they had no choice but rather were forced to change if they desired to keep their jobs. Hence, the researcher was motivated to study the faculty at OSU to help understand those who did and did not adopt computer-based technology and what characteristics distinguished the two groups.

The sample for the study was full-time tenure track or tenured faculty from Oklahoma State University (OSU). The institution in this study is a large, comprehensive, public university in the Midwest. The institution offers 79 bachelor's, 66 master's, 44 doctor's, and 1 specialist's degree across its various campuses. The institution takes great pride in the strides it has made with regard to expanding its network computing resources, thus gaining national recognition in the field. The main campus is located in Stillwater, OK. It is the north-central portion of the state in a town with a population of about 42,000. The community is located within approximately 60 miles of two major metropolitan cities.

The sample for the study was drawn from OSU, Stillwater campus only. The sampling technique employed was random stratified sample, stratified at the level of academic colleges. The Office of Planning, Budget and Institutional Research at OSU using SAS program drew faculty listing.

Random stratified sampling ensures that groups or strata across the seven colleges at OSU are each sampled randomly. This method ensures that all colleges are represented in the sample in the same proportions as they are in the population. It minimizes sampling error as the sample cannot differ from the population with respect to the stratifying factor (Burns, 2000).

The criteria for sample selection were:

1. The individual subjects were full-time tenure track or tenured faculty from all seven academic colleges of the comprehensive university.
2. The subjects had teaching and research responsibilities within the college.
3. The individuals were of the rank of assistant professor, associate professor, professor, or regents professor.

This study excluded part-time faculty from the sample. The underlying assumptions were that part-time faculty generally (1) present limited involvement in scholarly or research oriented activities, thus possibly limiting their contribution to infusion of computer technology in instruction, (2) are mostly peripheral to administrative and department related decision making processes pertaining to curriculum and teaching methodologies, (3) tend to have limited access to professional development activities in comparison to full-time faculty, (4) may have restricted institutional commitment due to the nature of their position, (5) are less likely to receive encouragement and support for adoption of innovative teaching methods, hence may be non-adopters of computer-based instruction, and finally, (6) are minimally affected by any climatic change imposed on instructional delivery mode. Thus, faculty included in the sample were full-time tenure track or tenured faculty.

Sampling Strategy

Estimating the size of a sample needed for a study, factors to be considered are the probability of a Type I (α) or Type II (β) error, often referred to as power and the effect size used to determine the strength of the relationship between the independent and dependent variables. Effect size may be expressed in standard deviation units or correlation coefficients and eta^2, a type of correlation ratio. In the previous study Faseyitan (Doctoral Dissertation, 1991) estimated statistical power for large effects with the alpha level of .05 and concluded that if the effect between the variables is .50, then with 98% confidence level, it could be concluded that statistical analysis would detect the effect. Alpha of .05 was used since the consequences of rejecting the null hypothesis, and hence, committing a Type I error was not serious to warrant a more stringent alpha level of confidence. In addition, educational research publications generally accept a .05 level of significance.

Thus for the purposes of this study, sample size was determined on the basis of power and effect size. With 'r' the effect size = .50, 'p' the significance level = .05, and power of .80, sample size needed to detect various effects = 25 to 35 per group or strata. Hence for this study, in order to maintain equal proportion of samples across all seven academic colleges, a total of 245 subjects were selected to obtain a representative sample from the population. Over sampling was included to accommodate any anomalies in subjects. Hence, a total of 266 modified FICQ were distributed to the sample selected for the study (Shavelson, 1996; Burns, 2000).

Data Collection

Data for the present study was collected through mailed questionnaires. The sample comprised of full time tenured or tenure track faculty employed at Oklahoma State University (OSU). Subject responses were collected from the questionnaire. The procedure employed for data collection included the following:

1. Two hundred and sixty six subjects were selected for the study employing a random stratification method of sampling. All 266 subjects received the first

mail-out that included a cover letter briefly describing the study, directions pertaining to completing the questionnaire and a procedure for returning the instrument (see Appendix G); one copy of the instrument; two sheets of papers with to, from and return address.

2. A second mail-out was performed ten days later. All 266 subjects received the second mail-out to ensure subject anonymity. However, the cover letter included in the second mail-out (see Appendix H) emphasized that, if subjects had returned completed questionnaire the first time, they were to ignore the second mail-out. The second mail out included all documents included in the first mail-out.

Statistical Analysis

Descriptive statistics, chi square (Chi^2 or χ^2) analysis and analysis of variance (ANOVA) were employed to analyze the data collected for testing the research hypotheses in this study. The .05 level of significance (or alpha) was used for all tests of the hypotheses. Descriptive statistics were used for overall description of the sample and when the statistical procedures of Chi^2 or ANOVA presented any anomalies that required cautious interpretation of the results. Other descriptive statistics used were frequency counts, cumulative proportions and percentages, mean, standard deviation and variance.

Chi^2 is a nonparametric tests used to test a null hypothesis on the comparison of observed and expected frequencies. Two-way designs of Chi-square produce a contingency table analysis that determines if there is contingency or dependency between the two ways of grouping each subject. Thus, the contingency table displays observed and expected frequencies in its cells. ANOVA is a way of comparing means statistically.

It is used when the researcher analyzes the data from designs with an independent variable that produces two or more groups of subjects. Thus, helps to assess how the dependent variable varies across the levels of the independent variable. The independent variable divides the subjects into two or more groups or levels while the dependent variable differentiates individuals on some quantitative dimension. The ANOVA F statistic evaluates whether the group means on the dependent variable differ significantly from each other, reflecting the effect of the independent variable.

The personal computer version of the Statistical Package for the Social Sciences (10.0 for Windows) was the software used to compile the results for this study.

Summary

Chapter 3 began with a description of the research design and presentation of the research questions and hypotheses tested in this study. Next, the variables selected for the study are defined. Thereafter, the survey instrument Faculty Instructional Computing Questionnaire and modifications performed to suit the purpose of this study are described. This is followed by description of the sample, sampling strategy employed in this study, and data collection procedures are discussed. Finally, statistical procedures used to analyze the data to help answer the research questions and test the hypotheses are presented.

CHAPTER IV

ANALYSIS OF THE DATA

The primary purpose of the study was to identify variables that affect faculty attitudes toward adoption of computer-based instruction in a comprehensive university. In addition, assess why, with computer technology readily accessible and embedded in the environment of a comprehensive university, some faculty members adopted computer-based instruction while others did not (referred to as non-adopters). Are these differences related to selected variables of faculty demographic characteristics, organizational support and/or computer attitudes and beliefs? The ultimate goal of the researcher was to identify differentiating characteristics of adopters and non-adopters of computer-based instruction.

Data for this study was collected from self-reported responses from the specified sample. The sample included full time tenured or tenure track faculty employed at Oklahoma State University. The questionnaire entitled FICQ was mailed two times to all 266 subjects, selected by random stratified sampling method. This procedure of mailing was used to ensure subject anonymity. 156 usable questionnaires were obtained. The data was tabulated and analyzed.

This chapter provides the findings from the collected data and results of testing hypotheses. First, the response rate of the survey will be discussed. Next, classifying respondents into adopter and non-adopter categories are presented. Research questions and hypotheses are restated for easier understanding, and thereafter, results of the study are elaborated. This part presents description of the subjects, faculty instructional computing activities, descriptive data, answers t the research questions and results of hypotheses tested.

Response Rate

Two hundred and sixty six (N= 266) questionnaires were distributed to faculty in all seven academic colleges at OSU (n=38). There were one hundred and fifty nine (159) surveys returned by respondents or 60% response rate. One hundred and one (101) surveys were returned in response to the first mailing and fifty-eight (58) were returned in response to the second mailing. Out of the total one hundred and fifty nine surveys returned, one hundred and fifty six (156 out of 266) or 59% were usable for data analysis. Three of the returned survey had to be deleted due to incomplete information on demographics or failure to complete the questionnaire. Table 1 presents the distribution of respondents by the stratum academic college. Relatively, 19.2% of the faculty from the College of Arts and Sciences responded and College of Business Administration had the least number of respondents.

Table 1

Distribution of Faculty Respondents by Academic College

Academic College	N	# Polled	Percent	Response N	Percent
Ag. Sciences & Nat. Res.	53	38	71.6	22	14.1
Arts & Sciences	329	38	11.5	30	19.2
Business Administration	89	38	42.6	17	10.9
Education	83	38	45.8	21	13.5
Engr. Arch. & Techno.	116	38	32.8	22	14.1
Environmental Sciences	42	38	90.5	23	14.7
Veterinary Medicine	62	38	61.3	21	13.5
Total	774	266		156	100.0

Adopters and Non-Adopters of Computer-Based Instruction

Per the study definition of adopter and non-adopter, faculty who use computers to prepare for teaching (Item #9 of modified FICQ, Appendix C); or those who use computers in the classroom (Item #10); or those who require their students to use computers in the course(s) taught by the faculty (Item #11) were identified as adopters of computer-based instruction. Faculty who responded with "no" to all three items were identified as non-adopters. Based on these criteria, there were 148 (95.5%) adopters and 7 (4.5%) non-adopters of computer-based instruction (see Table 2). Since this classification of subjects presented an unequal balance between the two groups, the researcher analyzed the adopters on a continuum to determine the user status or extent to which the subjects adopted computer-based instruction.

Hence, the score of individual subjects on items 9, 10 and 11 were tabulated and frequency tabulation revealed 1 or .6% respondents to be non-adopters (total score on all three items = 2 with no response being equal to 0). 3 or 1.9% of the respondents had a score of 3, 20 or 12.8% of the respondents had a score of 4, 36 or 23.1% of the respondents with a score of 5 and 88 or 56.4% of the respondents scored 6 (Table 3). Hence, the researcher identified two groups among adopters for the purpose of this study: individuals with a score ranging from two to five were classified as "laggards" and those with a score of six were referred to as "adopters". Thus, 40.4% or 40% of the faculty were laggards and adopters comprised of 59.5% or 60% of the faculty. Further analyses proceeded on this premise. Hence, the research questions and hypotheses have been restated in this section. Accordingly, the research questions and hypotheses were restated to investigate differences between faculty adopters and laggards across selected variables.

Table 2

Distribution of Faculty Respondents into Adopters and Non-Adopters

Faculty Grouping	N	Percent	Cumulative Percent
Adopters	148	95.5	95.5
Non-Adopters	7	4.5	100.0
Total	155		

Table 3

Distribution of Faculty Respondents into Adopters and Laggards

Total Score	N	Percent	Cumulative Percent
2	1	.6	.7
3	3	1.9	2.7
4	20	12.8	16.2
5	36	23.1	40.5
6	88	56.4	100.0
Total	148	94.9	

Research Questions

Answers to the following research questions were sought in this study:

1. To what extent do faculty adopt computer-based instruction?
2. What are the problems encountered by the faculty in adopting computer-based instruction?
3. Why do some faculty readily adopt computers in instruction while others lag in the adoption process?
4. How do demographic, organizational support and computer attitudes and beliefs compare between adopters and laggards of computer-based instruction?
5. How do faculty demographic data compare between adopters and laggards of computer-based instruction?
6. How do faculty organizational support factors compare between adopters and laggards of computer-based instruction?
7. How do faculty computer efficacy compare between adopters and laggards of computer-based instruction?
8. How do faculty computer utility beliefs compare between adopters and laggards of computer-based instruction?
9. How do faculty attitudes and beliefs about adoption of computer for instruction compare between adopters and laggards of computer-based instruction?
10. What combination of demographic, institutional and attitudes and belief factors pertaining to computer usage will help faculty overcome resistance and facilitate faculty adoption of computer-based instruction?

Hypotheses

The following hypotheses were investigated during this study:

General Hypothesis : There is no significant difference between faculty adopters and laggards of the adoption of computer-based instruction and independent factors related to faculty academic college, rank, discipline, research and teaching involvement, gender, age, institutional policy, faculty incentives, technical assistance, staff development program, funding sources, computer efficacy, utility and attitudes.

Specific Hypotheses:

H1: There is no significant difference between faculty adopters and laggards adoption of computers for instructional purposes and each demographic variable of faculty academic college, rank and discipline.

H2: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and each demographic variable of years in service in higher education institutions and Oklahoma State University.

H3: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and research and teaching involvement.

H4: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and each demographic variable of gender and age.

H5: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and individual organizational support factors pertaining to institutional policy, faculty incentives, technical assistance, and staff development program.

H6: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and funding sources for computers.

H7: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and computer efficacy.

H8: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and computer utility.

H9: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and computer attitudes.

Demographic scores on respondents' college, academic rank, discipline, years of service in higher education and at OSU, research and teaching involvement, gender and age were retrieved from item #'s: 1, 2, 3, 4, 5, 6, 7, and 8, respectively. Data on the organizational factors of institutional policy, incentives, technology center assistance, staff development program, and funding source are retrieved from items 15, 16, 17, 18, and 20, respectively.

Class mean scores on computer efficacy reflect aggregate score for all the statements designed to measure computer efficacy on the modified questionnaire and those included items 21, 22, 23, and 24. Perception of computer utility is the sum of scores for items 25, 26, 27, and 28, while computer attitudes and beliefs include total scores on items 29 through 38.

Results of the Study

Description of Subjects

Table 1 reports the distribution of faculty respondents by academic college. College of Arts and Sciences responded at a higher rate than other colleges resulting in

19.2% of the total 156 responses. Table 4 contains data showing the distribution of subjects by rank. Faculty with the rank of professors make up 39.7% of the respondents and one Regents Professor categorized as "Other" on the survey (28.2% Assistant Professors, 31.4% Associate Professors, 39.7% Professors and 0.6% Other - Regents Professor).

Of the 156 returned responses, 27 (18.0%) came from technical disciplines, 123 (82%) came from non-technical disciplines, and 6 no responses were obtained (Table 5). Out of the 156 respondents, distribution by gender (Table 6) revealed 109 responses were received from male and 45 from female faculty (2 no response). Thus the percentage by gender of respondents was 70.8% male and 29.2% female.

Table 4

Distribution of Faculty Respondents by Academic Rank

Rank	N	Percent	Cumulative Percent
Assistant Professor	44	28.2	28.2
Associate Professor	49	31.4	59.6
Professor	62	39.7	99.4
Other (Regents)	1	.6	100.0
Total	156		

Table 5

Distribution of Faculty Respondents by Academic Discipline

Discipline	N	Percent	Cumulative Percent
Technical	27	17.3	18.0
Non-Technical	123	78.8	100.0
Total	150		

Table 6

Distribution of Faculty Respondents by Gender

Gender	N	Percent	Cumulative Percent
Female	45	28.8	28.8
Male	109	69.9	100.0
Total	154		

Faculty Instructional Computing Activities

Table 7 contains data on faculty use of computers for instruction. The data indicates that 95.5% (148 out of 156) faculty members used computers to prepare for teaching and only 4.5% reported not using computers to help prepare for teaching. One subject did not respond to this item. 72.5% of the faculty indicated using computers in the classroom while 27.5% responded that they did not use computers in the classroom and three of the respondents had no response. 70.3% of the faculty responding to the survey indicated that they required their students to use computers in the courses they taught while 29.7% did not have any such requirement and eight subjects had no response. In addition, out of the 156 respondents, 56.4% acknowledged their plans to restructure the curriculum so as to incorporate computers into the teaching process more than before and 43.6% had no such plans (Table 8).

Table 7

Distribution of Computer-Based Instructional Activities of Faculty

Comp.-Based Act.	N	%Yes	N	% No	Cum. %- Yes	Cum. % -No
Prepare for Teaching	148	94.9	7	4.5	95.5	4.5
Use in Classroom	111	71.2	42	26.9	72.5	27.5
Require Students to Use	104	66.7	44	28.2	70.3	29.7

Table 8

Distribution of Curriculum Restructure Plans of Faculty

Plans to Restr.Curr.	N	Percent	Cumulative Percent
Yes	85	54.5	56.7
No	65	41.7	100.0
Total	150		

The reported source of software used in instructional activities exhibited great contrast (Table 9). 59.6% of the faculty reported that the software they used was purchased commercially, 10.9% reported the software to be self-developed, 9% reported the software was developed by their college or department. 12.8% indicated the source of software to be other described by the respondents as commercial source but free for duration of course, donated by friend, came with lotus notes or blackboard.com software, personal funds, start up grants, other universities in the United States, free download from Internet, federal research etc.

Distribution of faculty subjects across type of computer application used for instructional purposes varied greatly (Table 10). Most widely used applications were tutorial, problem solving, simulation, data management, demonstrations and other applications such as statistical analyses packages, black board, power point, on-line chat for research purposes, threaded discussion, lotus notes, autocad etc. Other applications used were drill and practice, problem solving, testing, expert systems etc. Discipline specific software's reported include statistical packages like SAS, spread sheets, nutrient analysis, image manipulations, computer math systems, synchronous and asynchronous forms of research reporting, communication software etc.

Table 9

Source of Software Used by Respondents

Source of Software Used	N	Percent
Purchased Commercially	93	59.6
Other Sources	20	12.8
Self Developed	17	10.9
Developed by the College/Dept.	14	9.0

Table 10

Computer Application Usage of Respondents

Computer Application	N	Percent
Demonstration	48	30.8
Other	46	29.5
Data Management	45	28.8
Problem Solving	41	26.3
Simulation	38	24.4
Tutorial	36	23.1
Testing	21	13.5
Drill and Practice	19	12.2
Expert System	6	3.8
Games	5	3.2

Table 11 presents faculty participation in appropriate staff development program in the past three years that relates to use of computers in instruction. 51.9% of the faculty reported no participation in any program. 35.3% of the faculty participated in workshop, and 24.4% participated in seminars. Interestingly, 5.1% participated in summer salary, 4.5% in other programs such as tutorials, short term training sessions etc. Only 2.6% engaged in release time with N=156 in all types of staff development program. Majority of the faculty attended staff development programs (58.1%, n=90).

Table 11

Participation of Faculty Respondents in Staff Development Programs

Staff Development Program	N	Percent
Staff Development	90	58.1
None	60	51.9
Workshop	55	35.3
Seminar	38	24.4
Summer Salary	8	5.1
Other	7	4.5
Release Time	4	2.6

Descriptive Data

Descriptive statistics on faculty demographic characteristics and faculty mean scores on self reported computer efficacy, utility beliefs and attitudes are discussed in this section. Demographic information of faculty rank, discipline, gender and age are included. Data on faculty efficacy, utility, and attitudes pertaining to computers were collected on a 5-point Likert Scale that ranged from Totally Agree to Totally Disagree.

Computer Attitudes and Beliefs of Faculty by Rank

Table 12 represents a comparison of means (X) for faculty efficacy, utility and attitudes and beliefs by academic rank. There was only one respondent categorized under "other" to signify Regents Professor in the questionnaire. This respondent was included with the professor ranking. Total N and the standard deviation (SD) are also presented.

Professors rating of efficacy, and utility resulted in the highest mean of 3.96 and 3.97 respectively. The lowest mean of 3.80 on efficacy and 3.61 on computer attitude was for associate professor. However, assistant professors rated low on utility (3.45), efficacy was 3.85 and they rated the highest on computer attitude (3.67). It should be noted that subjects with rank of assistant professor, associate professor, and professor had a mean difference of less than one from each other.

Table 12

Comparison of Mean Efficacy, Utility, and Attitude Scores of Faculty by Academic Rank

Faculty Academic Rank	Efficacy X, N, SD	Utility X, N, SD	Comp. Attitude X, N, SD
Assistant Professor	3.85 (44) (.66)	3.45 (43) (.83)	3.67 (38) (.52)
Associate Professor	3.80 (49) (.69)	3.58 (49) (.90)	3.61 (46) (.56)
Professor	3.96 (59) (.77)	3.97 (60) (.87)	3.66 (57) (.63)
Total	3.88 (152) (.71)	3.70 (152) (.71)	3.65 (141) (.58)

Computer Attitudes and Beliefs of Faculty by Academic Discipline

The means of faculty attitude and belief toward computer adoption for instruction by academic discipline are presented in Table 13. Mean scores, N and standard deviation re presented in parenthesis. Faculty in the technical discipline rated highest on efficacy and utility beliefs toward computers (4.07 respectively) while non-technical faculty rated highest on computer attitude and belief (3.68).

Table 13

Comparison of Mean Efficacy, Utility, and Attitude Scores of Faculty by Academic Discipline

Discipline	Efficacy X, N, SD	Utility X,N, SD	Comp.Attitude X, N SD
Technical	4.07 (26) (.78)	4.07 (25) (.71)	3.49 (22) (.48)
Non-Technical	3.83 (121) (.70)	3.63 (122) (.91)	3.68 (114) (.60
Total	3.88 (147) (.72)	3.70 (147) (.89)	3.65 (136) (.59)

Computer Attitudes and Beliefs of Faculty by Gender

The means of faculty efficacy, utility beliefs and attitude toward computers by gender are presented in Table 14. Total N and standard deviations are presented in parenthesis. Male respondents rated the highest on computer efficacy and utility beliefs (3.90 and 3.73 respectively). However, female respondents rated highest (3.77) on computer attitude and beliefs. It should be observed that male and female subjects had a mean difference of less than one from each other on efficacy, utility and computer attitude.

Table 14

Comparison of Mean Efficacy, Utility, and Attitude Scores of Faculty by Gender

Gender	Efficacy X, N, SD	Utility X, N, SD	Comp. Attitude X, N, SD
Male	3.90 (108) (.72)	3.73 (108) (.83)	3.60 (100) (.59)
Female	3.82 (44) (.70)	3.60 (44) (1.02)	3.77 (41) (.56)
Total	3.87 (152) (.71)	3.69 (152) (.71)	3.65 (141) (.58)

Computer Attitudes and Beliefs of Faculty by Age

Faculty efficacy, utility beliefs and attitude toward computers by age revealed two respondents under the age of <25 - 29. As this cell did not meet the expected frequency count, these cells were merged to the 30 - 39 category (Table 15). Total N and standard deviations are in parenthesis within each cell. The table indicates faculty within the age group of 50 - 59 rated high on efficacy (3.91), while faculty within the age group of 60 - 69 rated the lowest (3.75). Interestingly however, utility beliefs and attitude toward computers were rated the highest by faculty within the age group of 60 - 69 (4.41 and 3.81 respectively).

Table 15

Comparison of Mean Efficacy, Utility, and Attitude Scores of Faculty by Age

Faculty Age	Efficacy X, N, SD	Utility X, N, SD	Comp. Attitude X, N, SD
30 - 39	3.85 (31) (.61)	3.46 (30) (.71)	3.59 (28) (.59)
40 - 49	3.88 (48) (.71)	3.59 (48) (.98)	3.71 (41) (.57)
50 - 59	3.91 (54) (.81)	3.75 (54) (.94)	3.58 (52) (.61)
60 - 69	3.75 (19) (.58)	4.14 (20) (.59)	3.81 (20) (.52)
Total	3.87 (152) (.71)	3.69 (152) (.89)	3.65 (141) (.58)

Research Questions and Test of Hypotheses

From the data, answers to the research questions in conjunction with a basis to test the hypotheses thereby deciding to either accept or reject the null hypotheses are presented in this section. In this presentation, the research questions and the hypotheses are restated to assist the reader in easy understanding of the hypothesis being tested in individual case.

Research Question 1

1. To what extent do faculty adopt computer-based instruction?

Research question one investigated the level of utilization of computer-based instruction by faculty. To answer this question, it was important to understand how many faculty used computers to prepare for teaching (Item # 9), in the classroom (Item # 10) and required students to use computers for the courses they taught (Item # 11). Table 7 reveals the number of faculty that used computers for the above mentioned items.

From these data it can be observed that 95.5% of the faculty adopted computer based instruction in varying levels and only 4.5% were non-adopters. No responses for these three items resulted in a score of 1 where a no response was coded as 0. Thus, the sample chosen for this study, provided unequal balance between the two groups.

Hence, regrouping of adopters of computer-based instruction was necessary. From Table 3, it can be understood that adoption of computer-based instruction varied among the adopters and hence, the researcher further classified the adopters as adopters and laggards based on the score obtained by each faculty on these items # 9, 10 and 11. Adopters obtained a score of 6 while laggards obtained a score of 2 -5 with no response tabulated as a zero. Thus the data showed that nearly 40% of the faculty were laggards and 60% adopted computers for instruction to its fullest extent, per the definition of an adopter.

Research Question 2

2. What are the problems encountered by the faculty in adopting computer-based instruction?

To determine the problems encountered by faculty in adopting computer-based instruction, their response to seven statements (Items 21, 22, 23, 24, 35, 37 and 38) indicating their level of agreement or disagreement on a five-point Likert scale was tabulated. These statements investigated the self-reported problems of respondents to adoption of computer-based instruction.

Item # 21 stated, "I don't understand how to use a computer as an instructional tool." Interestingly, only about 7% of the faculty (N=155) expressed that they strongly agreed/agreed that lack of understanding computers as an instructional tool, indeed was their problem. 2% had no opinion to this statement and 91% disagreed/strongly disagreed that this was a problem to them (Table 16). Thus, lack of understanding computers as an instructional tool was not identified by most respondents as a barrier to adopting computers for instruction.

In Table 17, 98%, 153 faculty responded that they disagreed/strongly disagreed that lack of expertise in understanding use of computers for instruction to be a problem for them to computer technology into the process of instruction (Item # 22). Only about 1% of the faculty agreed to the fact that they did not possess the expertise to learn the usage of computers for instruction.

The response to the issue of difficulty to adopt the use of computers for the courses taught by the faculty (Item # 23) is presented in Table 18. 34 faculty, 22% strongly agreed/agreed this issue to be a problem to them. However, 72% reported that there was no difficulty (disagreed/strongly disagreed) in adopting computers for the courses they taught.

With regards to difficulty in developing computer software for teaching purposes (Item # 24), Table 19 revealed 54%, 83 faculty strongly agreed/agreed to this item. 15% had no opinion to difficulty in developing software for teaching. 48 faculty, 30% disagreed/strongly disagreed to this statement, thus implied that they did not have any difficulty in developing the software for teaching.

63% of the faculty (n = 129) disagreed/strongly disagreed that use of computers in instruction would infringe the personal contact they have with the students (Item # 35, Table 20). 32 faculty, 21% expressed losing personal contacts with students due to use of computers in instruction. About 16% had no opinion to this notion.

Pertaining to rigidity and unreliability of computer software (Item # 37) for instructional purposes, Table 21 showed 32% of the faculty (n = 49) strongly agreed/agreed that they encountered this problem. 43 faculty (28%) had no opinion to this statement and 63 faculty (40%) showed that they disagreed/strongly disagreed to rigidity and unreliability of computer software for instruction.

Table 22indicated that 90% of the faculty (141 faculty) did not consider computers to be inappropriate at university/college level (Item # 38). Only less than 1% perceived computers in instruction to be inappropriate at the level of higher education.

Table 16

Faculty Response to Not Understanding Computers as an Instructional Tool

Responses	Frequency	Percent	Cumulative Percent
Strongly Agree	2	1.3	1.3
Agree	9	5.8	7.1
No Opinion	3	1.9	9.0
Disagree	64	41.0	50.3
Strongly Disagree	77	49.4	100.0
Total N = 155			

Table 17

Faculty Response to Lack of Expertise in Computers as an Instructional Tool

Responses	Frequency	Percent	Cumulative Percent
Strongly Agree	0	0	0
Agree	1	.6	.6
No Opinion	1	.6	1.3
Disagree	46	29.5	31.0
Strongly Disagree	107	68.6	100.0
Total N = 155			

Table 18

Faculty Response to Difficulty in Adopting Computers for Courses Taught

Responses	Frequency	Percent	Cumulative Percent
Strongly Agree	9	5.8	5.8
Agree	25	16.0	21.9
No Opinion	9	5.8	27.7
Disagree	60	38.5	66.5
Strongly Disagree	52	33.3	100.0
Total N = 155			

Table 19

Faculty Response to Difficulty in Developing Computer Software

Responses	Frequency	Percent	Cumulative Percent
Strongly Agree	34	21.8	22.1
Agree	49	31.4	53.9
No Opinion	23	14.7	68.8
Disagree	24	15.4	84.4
Strongly Disagree	24	15.4	100.0
Total N = 154			

Table 20

Faculty Response to Computers Sacrificing Personal Contact with Students

Responses	Frequency	Percent	Cumulative Percent
Strongly Agree	11	7.1	7.1
Agree	21	13.5	20.6
No Opinion	24	15.4	36.1
Disagree	69	44.2	80.6
Strongly Disagree	30	19.2	100.0
Total N = 155			

Table 21

Faculty Response to Rigidity and Unreliability of Computers in Instruction

Responses	Frequency	Percent	Cumulative Percent
Strongly Agree	4	2.6	2.6
Agree	45	28.8	31.6
No Opinion	43	27.6	59.4
Disagree	51	32.7	92.3
Strongly Disagree	12	7.7	100.0
Total N = 155			

Table 22

Faculty Response to Computers as an Inappropriate Instructional Tool in Universities

Responses	Frequency	Percent	Cumulative Percent
Strongly Agree	0	0	0
Agree	1	.6	.6
No Opinion	13	8.3	9.0
Disagree	66	42.3	51.6
Strongly Disagree	75	48.1	100.0
Total N = 155		99.4	

Research Question 3

3. Why do some faculty adopt computers in instruction while others lag in the adoption process?

Differences in adoption of computers for instruction among the adopters and laggards may be analyzed from Items 25, 26, 28, 30 and 31. These items measure utility and attitudinal beliefs held by faculty in light of themselves and their students, which may or may not motivate them to adopt computer-based instruction.

In Table 23, Item # 25 is presented to denote the distribution of faculty belief concerning computer usage by students as a prerogative to receive relatively higher paid jobs upon graduation. 24 % disagreed/strongly disagreed to this notion while 63% of them (99 faculty) agreed/strongly agreed that it was important to them that their students learn how to use computers which would help the students get a relatively higher starting salary upon graduation.

With regards to computer usage helping students obtain higher status jobs (Item # 26), 20% of the faculty strongly disagreed/disagreed to this statement (Table 24). However, 92 faculty, 60% agreed/strongly agreed that knowing about computers did help with their students getting higher status jobs.

Knowledge of computer usage by students for a successful professional career (Item # 28) was agreed/strongly agreed by 86% of the faculty (Table 25) while 9% disagreed to this opinion. 3% had no opinion to this statement.

The effect of computer usage in instruction to enhance learning process in students and teaching process among faculty (Items # 30 and 31), presented strong disagreement/disagreement among 12% (19 faculty) and 25% (39 faculty) on both these items, respectively. 59% agreed to enhancement in student learning due to computers in instruction and 49% agreed to the benefit of computers to improve teaching effectiveness (Tables 26 and 27).

Table 23

Faculty Response to Computer Requirement for High Starting Salary for Students

Responses	Frequency	Percent	Cumulative Percent
Strongly Disagree	11	7.1	7.1
Disagree	26	16.7	23.7
No Opinion	20	12.8	36.5
Agree	41	26.3	62.8
Strongly Agree	58	37.2	100.0
Total N = 156			

Table 24

Faculty Response to Computers and High Status Jobs for Students

Responses	Frequency	Percent	Cumulative Percent
Strongly Disagree	9	5.8	5.8
Disagree	23	14.7	20.8
No Opinion	30	19.2	40.3
Agree	48	30.8	71.4
Strongly Agree	44	28.2	100.0
Total N = 154			

Table 25

Faculty Response to Computers and Success in Career for Students

Responses	Frequency	Percent	Cumulative Percent
Strongly Disagree	2	1.3	1.3
Disagree	12	7.7	9.0
No Opinion	6	3.8	12.8
Agree	82	52.6	65.4
Strongly Agree	54	34.6	100.0
Total N = 156			

Table 26

Faculty Response to Computers Promoting Learning in Students

Responses	Frequency	Percent	Cumulative Percent
Strongly Disagree	2	1.3	1.3
Disagree	17	10.9	12.4
No Opinion	43	27.6	40.5
Agree	62	39.7	81.0
Strongly Agree	29	18.6	100.0
Total N = 153			

Table 27

Faculty Response to Computers Improving Teaching Effectiveness

Responses	Frequency	Percent	Cumulative Percent
Strongly Disagree	3	1.9	1.9
Disagree	36	23.1	25.2
No Opinion	40	25.6	51.0
Agree	54	34.6	85.8
Strongly Agree	22	14.1	100.0
Total N = 155			

Research Question 4

4. How do demographic, organizational support and computer attitudes and beliefs compare between adopters and laggards of computer-based instruction?

General Hypothesis

There is no significant difference between faculty adopters and laggards of the adoption of computer-based instruction and individual factors of faculty academic college, rank, discipline, research and teaching involvement, gender, age, institutional policy, faculty incentives, technical assistance, staff development program, funding sources, computer efficacy, utility and attitudes.

Specific hypotheses stated and analyzed below help answer the research question and test this general hypothesis.

Research Question 5

5. How do faculty demographic data compare between adopters and laggards of computer-based instruction?

Specific Hypothesis

H1: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and each demographic variable of college, rank and discipline.

Table 28 presents the results of chi square analysis performed to test this hypothesis. Overall analysis of chi-square test is provided in Appendix I. Demographic variable college was tested using Chi Square analysis. The results of the chi-square test indicated the Pearson Chi Squared observed value is 29.600 and it is significant, χ^2 (6, N=148) = 29.600, p = .000) and the sample proportions of faculty based on colleges are dissimilar between the adopters and laggards of computer-based instruction. Follow up tests may be conducted to examine particular sub-hypotheses.

In testing academic rank of faculty and adoption of computers for instruction, chi square analysis revealed 2 cells having expected count less than 5 (see Appendix J). Hence, the cells with less expected counts were collapsed. The basis for collapse was one respondent who responded to academic rank as "Other" to indicate Regents Professor. Hence, this respondent was collapsed with the professors. Reanalysis of the data (Table 28 and Appendix K for Overall Analysis) showed χ^2 (2, N=148) = 1.344, p = .511) for academic rank to be non-significant, indicating the sample proportions of faculty based on academic ranking to be similar between the adopters and laggards of computer-based instruction.

The chi-square analysis found no significant difference between faculties grouped as technical and non-technical across the dependent variable of computer adoption for instruction. Table 28 indicates that the observed proportions of faculty sample do not differ significantly from the hypothesized proportions at α = .05, χ^2 (1, N=142) = .200, p = .655) (see Appendix L for Overall Crosstabulation Analysis).

Table 28

Chi Square Test of Faculty Academic College, Rank and Discipline

Variable	Pearson Chi-Square Value	df	Significance(α = 05)
Academic College	29.600	6	.000
Rank (Before Collapse)	2.981	3	.395
Rank (After Collapse)	1.344	2	.511
Discipline	.200	1	.655

H2: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and each demographic variable of years of service in higher education institutions and Oklahoma State University.

Chi-square analysis revealed more than 67% and 58% respectively, of the cells having expected count less than 5, hence, this hypothesis was not tested further (Appendix M and N). Descriptive statistics (Table 29) for years of service in higher education revealed the mean to be 16.09 and years of service at Oklahoma State University (OSU) revealed a mean of 12.07. However, the standard deviations for the two variables were 9.27 and 9.18 respectively, indicating a large variance within the variable (85.92 for years of service in higher education and 84.34 for years of service at OSU). The mode and medians for the variables were 10 and 2 (mode) and 15 and 11 (median), respectively.

Table 29

Descriptive Statistics for Years of Service

Descriptives	Years of Service in Hr. Edn.	Years of Service at OSU
Mean	16.09	12.07
Median	15.0	11.00
Mode	10	2
Stand. Dev.	9.27	9.18
Variance	85.92	84.34
Total	147	150

H3: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and research and teaching involvement.

A chi-square analysis revealed that more than 75% of the cells had expected frequency less than 5, hence, this hypothesis was not tested further (see Appendix O and P). Descriptive data (Table 30) indicated that 27.6% (N = 156) were involved in writing books or chapters within the books as reported on the questionnaire. Percentages of faculty involvement in refereed publications were 81.4%, grants were 62.8%, and 82.7% reported involvement in national presentations. 18.6% expressed other kinds of research involvement. These were noted as international presentations, exhibitions, national research proposal review, school newsletters, researcher projects for performance etc.

With regards to involvement in teaching, 65.4% of the faculty reported teaching an average of 4 undergraduate courses in the past three years. While 43.6% faculty noted engagement in teaching an average number of 2 graduate level courses during the past three years. The variance in teaching involvement at undergraduate level was larger (sd = 2.64 and variance = 6.94) than that of graduate level (sd = 1.42 and variance = 2.02) (see Table 31.

Table 30

Descriptive Statistics for Research Involvement of Faculty Respondents

Descriptives	Ref. Pub	Books	Grants	National Presentations
Mean	5.86	1.74	3.79	7.48
Median	4.00	1.00	3.00	4.00
Mode	4	1	2	2
Stand. Dev.	4.93	1.31	3.10	9.75
Variance	24.34	1.72	9.59	94.97
Total	127	43	98	129

Table 31

Descriptive Statistics for Teaching Involvement of Faculty Respondents

Descriptives	Undergraduate Courses	Graduate Courses
Mean	3.98	2.24
Median	3.67	2.00
Mode	2	1
Stand. Dev.	2.64	1.42
Variance	6.94	2.02
Total	102	68

H4: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and each demographic variables of gender and age.

Hypothesis 4 was tested using chi-square analysis. With regards to gender (Table 32 and Appendix Q for Overall analysis) chi-square revealed no significant difference, χ^2 (1, N=146) = .380, p = .537) between male and female adopters and laggards. In testing for significant difference in age across adopters and laggards for computer-based instruction, chi-square analysis revealed 20% of the cells had expected count less than 5 (see Appendix R). Hence, the two respondents in the <25 - 29 group were collapsed with 30 –39 (see Appendix S). The chi-square value χ^2 (3, N=146) = 7.034, p = .071) (Table 32) denoted no significant difference across the variable of age between the two levels of adoption of computer-based instruction, namely, adopters and laggards.

Table 32

Chi Square Test by Gender and Age of Faculty Respondents

Variable	Pearson Chi-Square Value	df	Significance(α = 05)
Gender	.380	1	.537
Age (Before Collapse)	8.844	4	.065
Age(After Collapse)	7.034	3	.071

Research Question 6

6. How do faculty organizational support factors compare between adopters and laggards of computer-based instruction?

Specific Hypotheses

H5: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and each organizational support factor pertaining to institutional policy, faculty incentives, technical assistance, and staff development program.

Chi-square analysis performed to test the statistical significance of hypothesis 5 indicated each organizational factor of (Table 33 and Appendix T) institutional policy, faculty incentives, assistance from technology center, and staff development program to be non significant among adopters and laggards of computer-based instruction. The observed chi-square values for factors that determine organizational support for adoption of computer-based instruction were χ^2 (2, N=148) = 7.433, p = .204) for institutional policy, χ^2 (2, N=147) = 1.551, p = .460) for faculty incentives, χ^2 (2, N=148) = 2.640, p =

.267) for technology center assistance and χ^2 (2, N=148) = 3.817, p = .148) for staff development program.

Table 33

Chi Square Test for Organizational Support Factors

Variable	Pearson Chi-Square Value	df	Significance(α = 05)
Institutional Policy	7.433	2	.204
Faculty Incentives	1.551	2	.460
Technical Assistance Center	2.640	2	.267
Staff development Program	3.817	2	.148

H6: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and funding sources for computers.

No statistical analysis was employed to test hypothesis stated no significant difference between funding source for computers and adoption of computer-based instruction (see Appendix U). Table 34 showed 38.5% of the faculty (N = 156) acknowledged dean's office provided the computers, 60.3% reported department budget as the funding source, 47.4% indicated student technology fee furnished the computers, 29.5% observed grants to be the source to fund computers. 7.1% implied other funding sources that included start up money, personal funds, professorship, funds from the Office of Vice President for Research etc. Interestingly, 9.6% faculty admitted that they did not know the source that provided funds for the computers.

Table 34

Descriptive Statistics for Funding Source of Computers

Variable	N	Percent
Department Budget	94	60.3
Student Technology Fee	74	47.4
Dean's Office	60	38.5
Grants	46	29.5
Don't Know	15	9.6
Other	11	7.1
Total N = 156		

Research Question 7

7. How do faculty computer efficacy compare between adopters and laggards of computer-based instruction?

Specific Hypothesis

H7: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and computer efficacy.

Hypothesis 7 was tested using One-Way Analysis of Variance (ANOVA). Here, each subject was nested in one level of the independent variable - adopter or laggard. ANOVA results (Table 35) indicated statistically significant difference [$F(1,144) = 14.273$; $p<.05$] in computer efficacy across both the levels of the independent variable. Randomization and manipulated independent variable lead to the result that variation in adopters and laggards of computer-based instruction cause significant difference in faculty computer efficacy.

Table 35

ANOVA Summary Table for Faculty Computer Efficacy

Mean Computer Efficacy	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	102.606	1	102.606	14.273	.000
Within Groups	1035.154	144	7.189		
Total	1137.760	145			

<u>Research Question 8</u>

8. How do faculty computer utility beliefs compare between adopters and laggards of computer-based instruction?

<u>Specific Hypothesis</u>

H8: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and computer utility.

One-way ANOVA was used to test this hypothesis. ANOVA summary Table 36 showed a statistically significant difference [$F(1,144) = 26.504$; $p<.05$] between faculty utility beliefs of computer usage for instruction and levels of faculty adoption of computers for instructional purposes. Thus, variations in adopters and laggards of computer-based instruction caused difference in student oriented beliefs held by faculty pertaining to computer usage.

Table 36

ANOVA Summary Table for Computer Utility

Mean Computer Utility	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	280.702	1	280.702	26.504	.000
Within Groups	1525.079	144	10.591		
Total	1805.781	145			

Research Question 9

9. How do faculty attitudes and beliefs about adoption of computer for instruction compare between adopters and laggards of computer-based instruction?

Specific Hypothesis

H9: There is no significant difference between faculty adopters and laggards of the adoption of computers for instructional purposes and computer attitudes.

The test of hypothesis 9 (Table 37) indicated a statistically significant difference in mean computer attitudes and beliefs held by faculty grouped as adopters and laggards of computer-based instruction ([$F(1,133) = 25.779$; $p<.05$]). Thus, computer attitudes and beliefs significantly influences faculty adoption of computers for delivery of instruction.

Table 37

ANOVA Summary Table for Computer Attitudes and Beliefs

Mean Computer Attitude	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	696.900	1	696.900	25.779	.000
Within Groups	3595.426	133	27.033		
Total	4292.326	134			

Research Question 10

10. What combination of demographic, institutional and attitudes and belief factors pertaining to computer usage will help faculty overcome resistance and facilitate faculty adoption of computer-based instruction?

From the above results it may be concluded that faculty efficacy, utility beliefs, and attitudes pertaining to adoption of computer-based instruction to be significant determinants of faculty either being an adopter or a laggard. Fostering faculty efficacy, utility beliefs and attitudes may help overcome the resistance to and significantly facilitate faculty adoption of computer-based instruction. Although academic college was a significant determinant of adoption, specialized discipline areas of faculties resulted in being non-significant.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Purpose of the Study

The primary purpose of the study was to identify variables that affect faculty attitudes toward adoption of computer-based instruction in a comprehensive university. In addition, assess why, with computer technology readily accessible and embedded in the environment of a comprehensive university, some faculty members adopted computer-based instruction while others did not (referred to as non-adopters). Are these differences related to selected variables of faculty demographic characteristics, organizational support and/or computer attitudes and beliefs? The ultimate goal of the researcher was to identify differentiating characteristics of adopters and non-adopters of computer-based instruction.

Research Procedures

This study employed an ex post facto design, guided by theory and previous empirical findings. Based on these factors, research questions and hypotheses were formulated and tested. Self-reporting questionnaires were mailed to full time tenured or tenure track faculty from all seven academic colleges at Oklahoma State University. The questionnaire, Faculty Instructional Computing Questionnaire (FICQ) was modified for the purpose of this study (Appendix D). FICQ was modified on the basis of recommendations from the pilot-study group and panel of four experts in the field of computer technology. The pilot group consisted of three members who were associated with computer-based instruction.

Two hundred and sixty six subjects were selected by random stratified sampling technique. The questionnaire was mailed to all the subjects chosen for this study. A mail-out included a cover letter briefly explaining the purpose of the study, directions regarding answering and returning of the questionnaire: modified version of FICQ. One hundred and fifty nine questionnaires were returned and one hundred and fifty six were usable questionnaires. Data from the returned questionnaires were coded and statistical procedures of chi-square and analysis of variance were used to analyze the data. All computations were performed using the computer software package SPSS 10.0 version for Windows. An alpha level of .05 (the rejection level) was used to test all hypotheses. All computerized data were rechecked to ascertain correctness.

Summary of Major Findings

This section will discuss faculty instructional computing activities. The results obtained from answering the research questions tested by the hypotheses of the study imply the major findings of the study.

Summary of Faculty Instructional Computing Activities

The findings, as represented by the subjects derived from the specified faculty population at Oklahoma State University (OSU), contradicts the findings from the literature that there indeed has been a widespread adoption of computer-based instruction in higher education and in particular at OSU. Ninety-five percent of the faculty is adopters per the definition of an "adopter" selected for this study. Adopters are faculty who use computers to prepare for teaching, who use computers in the classroom for delivery of instruction and require students to use computers for the courses they teach. Since this study classified ninety five percent of the total faculty sample (N=156) as adopters and five percent as non-adopters, such a low number of subjects under non-adopters, presented an unequal sample distribution, the researcher therefore decided to look at the adopters on a continuum and group them based on the scores they obtained for adoption. Accordingly, subjects that made a perfect score of six were grouped as adopters and the remaining who were yet to attain the status of a full adopter, per the definition were grouped as laggards (scores on adoption for this category ranged from two to five). This categorization provided eighty-eight (sixty percent) adopters and sixty (forty percent) laggards. Thus, further analyses proceeded on this premise and may be concluded that university faculty as a group at OSU are using computers in instruction.

With regards to the source of computer software that faculty used in instruction, fifty nine percent of them claimed that the software's were purchased commercially and nine percent identified software's to be developed by their college or department. This may suggest the fact that in spite of OSU not providing the software, faculty are willing to obtain it from other sources they are convinced of the benefits these software's offer.

Distribution of faculty across type of computer application used for instructional purposes, it may be implied that appropriate learning application may be discipline specific. This variation may call for increased technical support to faculty that would target computer applications on a course-by-course basis. Faculty participation in staff development program seemingly had the highest percentage (fifty eight percent). It demands faculty be encouraged to participate in other skill enhancement programs that result in widespread exposure to develop comprehensive benefit of computer technology.

Computer related attitudes and beliefs held by faculty across rank and age, revealed that overall professors that belonged to the highest age category rated highest on mean efficacy and utility. It might be that over time (since they would have started off this career the traditional way of instruction delivery), they have gained a deeper appreciation to what technology offers and are greatly motivated to adopt computer-based instruction.

Adoption of computer technology across disciplines obviously rated faculty from technical disciplines higher. This might imply to the fact that computer and computer-based application usage are discipline specific.

Conclusions Derived From Hypotheses Testing

Each research question and corresponding hypothesis is stated and the results are provided.

1. To what extent do faculty adopt computer-based instruction?

From this study, it may be observed that ninety five percent of the faculty studied used computer-based instruction either to help prepare for teaching or actually used computers in the classroom or required their students to use computers in the courses they taught. Fifty five percent of the faculty has plans to restructure their teaching process so as to incorporate enhanced use of computers. In re-grouping adopter faculties, sixty percent of the faculty were adopters that met all the requirements of an adopter and forty percent of the subjects were identified as laggards that partially met the definition of adopter. It should be derived that they are indulging in computer-based instruction to a lesser extent in comparison to adopters.

2. What are the problems encountered by the faculty in adopting computer-based instruction?

Faculty that used computer-based instruction for the delivery of instruction indicated that the problems they encountered were adopting computers for the courses taught by the faculty, losing personal contacts with students as faculty engaged in using computer-based instruction, and problems of rigidity and unreliability with computer software.

3. Why do some faculty adopt computers in instruction while others lag in the adoption process?

Differences in adopting computers for instruction among the adopters and laggards, in general may be attributed to faculty perception of utility of computers. Most faculties believed that for students to be successful in their professional career to obtain highly paid and high status jobs, the work force required of students to know how to use computers. Yet another difference may be accounted by faculty perception of computer use as promoting learning process in students and improving their own teaching effectiveness.

4. How do demographic, organizational support and computer attitudes and beliefs compare between adopters and laggards of computer-based instruction?

General Hypothesis

There is no significant difference between faculty adopters and laggards of the adoption of computer-based instruction and individual factors related to faculty academic college, rank, discipline, research and teaching involvement, gender, age, institutional policy, faculty incentives, technical assistance, staff development program, funding sources, computer efficacy, utility and attitudes.

This hypothesis is tested below under specific hypotheses.

5. How do faculty demographic data compare between adopters and laggards of computer-based instruction?

Specific Hypothesis

H1: There is no significant difference between faculty adopters and laggards adoption of computers for instructional purposes and each demographic variable of faculty academic college, rank and discipline.

This hypothesis was designed to assess the relationship between academic college, rank and discipline across adopter and laggards of computer-based instruction. The variable academic college was supported at the .05 level whereas rank and discipline were not supported.

H2: There is no significant difference between faculty adopters and laggards adoption of computers for instructional purposes and each demographic variable of years in service in higher education institutions and Oklahoma State University.

No statistical analysis was applied to test this hypothesis due to the discrepancy between observed and expected frequency counts. Only descriptive statistics are provided which indicate that although the mean number of years of service in higher education and at OSU is large, the variation between the two groups is not large.

H3: There is no significant difference between faculty adopters and laggards adoption of computers for instructional purposes and research and teaching involvement.

This hypothesis was not tested. Descriptive statistics presented faculty involvement in research to be highest in terms of refereed publications. Also, most faculties studied engaged in teaching an average of four undergraduate level courses.

H4: There is no significant difference between faculty adopters and laggards adoption of computers for instructional purposes and each demographic variable of gender and age.

Gender and age indicated no statistical significance at the .05 level. Implying that on the basis of gender and age, adopters are not significantly different from laggards.

Research Question 6

6. How do faculty organizational support factors compare between adopters and laggards of computer-based instruction?

Specific Hypotheses

H5: There is no significant difference between faculty adopters and laggards adoption of computers for instructional purposes and individual organizational support factors pertaining to institutional policy, faculty incentives, technical assistance, and staff development program.

The results suggested none of these factors to be significantly influencing the process of computer-based adoption among faculty.

H6: There is no significant difference between faculty adopters and laggards adoption of computers for instructional purposes and funding sources for computers.

No statistical procedure was employed to test this hypothesis. Descriptive statistics indicated that sixty percent of the faculty reported departmental budget as the primary funding source for the computers they were using. Other sources indicated were student technology fee, grants and dean's office. Interestingly, nine percent indicated that they did not know the source. Hence, it might be concluded that faculty consider knowledge about funding source of their computers to be just another piece of in significant information.

7. How do faculty computer efficacy compare between adopters and laggards of computer-based instruction?

Specific Hypothesis

H7: There is no significant difference between faculty adopters and laggards adoption of computers for instructional purposes and computer efficacy.

The findings from this study indicated that personal efficacy statements regarding computer-based instruction significantly differed among adopters and laggards.

8. How do faculty computer utility beliefs compare between adopters and laggards of computer-based instruction?

Specific Hypothesis

H8: There is no significant difference between faculty adopters and laggards adoption of computers for instructional purposes and computer utility.

The findings from this study indicated that utility belief statements regarding computer-based instruction significantly differed among adopters and laggards.

9. How do faculty attitudes and beliefs about adoption of computer for instruction compare between adopters and laggards of computer-based instruction?

Specific Hypothesis

H9: There is no significant difference between faculty adopters and laggards adoption of computers for instructional purposes and computer attitudes.

The findings from this study indicated that faculty attitude statements regarding computer-based instruction significantly differed among adopters and laggards.

H7, H8, and H9 were tested at .05 level of significance. Faculty members who believed in the efficacy of computers, those who believed in the benefits of computer utilization, both for themselves and their students, and finally, those who had a positive attitude to the process of adopting computer-based instruction significantly influenced computer adoption in university instruction.

10. What combination of demographic, institutional and attitudes and belief factors pertaining to computer usage will help faculty overcome resistance and facilitate faculty adoption of computer-based instruction?

From all the above tested hypotheses, it might be concluded that academic college of the faculty, computer efficacy, utility beliefs and attitudes to computer-based instruction will help overcome faculty resistance and facilitate adoption of computers into instruction. However, other variables of rank, discipline, gender, age, and organizational support factors of institutional policy, faculty incentives, technical assistance and staff development programs did not have any significant effect on the adoption of computers for instruction. Thus attitudinal factors differ significantly among adopters and laggards of computer-based instruction.

Conclusions

In an attempt to analyze selected variables that determine adoption of computer-based instruction among faculty at Oklahoma State University, the study involved the use of adoption status of computer usage among the faculty. The independent variables utilized in the study were college, discipline, academic rank, years of service in higher education, years of service at the university, research and teaching involvement of the faculties, gender, age, organizational support factors and faculty's attitudes and beliefs with reference to adoption of computers for instructional purposes.

Faculty were grouped into an adopter status or laggard status based on the score faculty obtained on the following three items (Item # 9, 10, and 11) on the modified

Faculty Instructional Computing Questionnaire (FICQ). These items measure faculty use of computers to either prepare for teaching, or use computers in the classroom or require their students to use computers in the courses taught by the faculty. This conclusion section examines the results of these findings and how they compared to previous studies presented in the review of literature.

The findings of this study implied that there was a statistically significant difference between adopters and laggards of computer-based instruction with faculty college, computer efficacy, utility beliefs and attitudes and beliefs concerning adoption of computers in the instructional process. In comparison to previous studies (Faseyitan, 1991), ninety five percent of the faculty relied upon the use of computers for delivery of instruction and hence, they were regrouped into an adopter or laggard, depending upon their status of usage. Forty percent of the faculty formed the laggards group while sixty percent were grouped as adopters (Table 3).

Thus, the widespread adoption of computer-based instruction among the faculty selected for the purpose of this study imply that the characteristics of an adopter who adopt an innovation, which is computer-based instruction, meets all the requirements presented by Rogers Theory of Diffusion of Innovation (1995). It may be concluded that faculty at Oklahoma State University observed and evaluated the relative advantage of computer technology. As presented by Rogers (1995), relative advantage is the degree to which an innovation is perceived by the adopter as being better than or superceding an existing idea. The degree of relative advantage may be expressed in the form of economic profitability or improving current status. Faculty at Oklahoma State University perceived economic and social factors to be important in determining adoption of computer-based instruction. Tables 23, 24, 25, 26 and 27 reveal faculties adoption of computers for instruction were guided by ability of graduating students to obtain high starting salary jobs or high status jobs or success in professional career or enhancing student learning and improving teaching effectiveness. Hence, if faculty believed that adopting computers for instruction placed their students at an economic and social advantage in the market, faculty at Oklahoma State University were willing to use computers in instructional process.

Compatibility of adopting computer-based instruction denotes consistency with existing values and beliefs or with previously introduced ideas or even the needs of potential adopter. Complexity is the relative difficulty in understanding and adopting computers for the delivery of instruction. Faculty perception of compatibility in adopting computer-based instruction can be concluded from Tables 20, 21 and 22. Interestingly, most faculty in this study disagreed that computers in instruction would sacrifice their personal contact with students, computers to be rigid and unreliable for instructional purposes and computer as a tool being inappropriate for instruction at the level of universities. These items therefore, indicate that faculty at Oklahoma State University believe that adoption of computer-based instruction is compatible with their existing values pertaining to their profession and is indeed very satisfying both for themselves and their students.

Computer-based instruction was not perceived to be a complex task by the faculty at Oklahoma State University. Tables 16, 17, and 18 confirm this conclusion. From these tables it can be concluded that most faculty in this study disagreed to possessing a lack of understanding or expertise in use of computers for instruction. Most faculty also disagreed to difficulty in adopting computers for the specific courses taught. Thus, complexity as indicated by difficulty in understanding and using computers in the courses taught by the faculty imply that computer-based instruction is not a complex but yet is a compatible innovation that faculty at Oklahoma State University are agreeable to integrating computers into the curriculum. The study in its entirety reflects that experimenting with computer based technology or the trial ability and observability of the innovation proved to provide less uncertainty to the faculty. Faculty could conclude for themselves on the basis of past experiences that computers in instruction benefited their students and enhanced their professional contribution. Thus, the innovation, which is computer-based instruction in this study, met all five characteristics that defined an innovation to be adopted (Rogers, 1995) by the faculty at Oklahoma State University.

With regards to faculty use of computers for instructional activities, it may be concluded that faculty adopt computers as a tool to perform research, enhance the process of teaching effectiveness and learning by providing students with hands on experience to actual use of computers. Faculty feel strongly about the benefits students would procure when employing computers in the courses they teach as observed by the starting salary and status of the jobs obtained by their students upon graduation.

Interestingly, faculties are now beginning to view computers to be presenting comparative advantage over traditional means of conducting research. Computers enable faculty to perform research and exchange information at a much faster rate. Benefits of computer use both for themselves and students far outweigh the benefits. Faculty are now willing to explore software applications (Table 10) so they can glean the benefits of all kinds of applications. Source of the software they use (Table 9) or the funding source of their own computers (Table 35) does not inhibit faculty adoption of computer-based instruction. From forty five percent of the faculty that intended to restructure their courses so they can enhance the use of computers (Faseyitan, Doctoral Dissertation, 1991), current study revealed fifty seven percent of the faculty having course restructure plans to accommodate increased use of computer-based instruction.

Conclusions from Faculty Demographic Characteristics and Adoption of Computer-Based Instruction

The literature on specific faculty demographics that influence adoption was not conclusive. This study revealed faculty academic rank, discipline, gender and age were not significantly different among the adopters and laggards (Tables 28 and 33). The only demographic variable that implied significant difference was academic college. Interestingly academic discipline was non-significant. It may be concluded from this discrepancy that further studies demand a closer look at academic colleges and department specific use of computers in instruction.

Conclusions from Organizational Support Factors and Adoption of Computer-Based Instruction

The findings from the literature had suggested that faculty incentive programs in conjunction with technical support from a centralized technology center or support staff as requirements for an enhanced adoption of computer-based instruction in higher education (Keane and Gaither, 1988). This study looked to see if organizational support factors such as institutional policy, faculty incentives, assistance for faculty from technology centers, staff development programs and funding source of computers accounted for any significant difference among adopters and laggards of computer-based instruction.

Results (Tables 34 and 35) represent none of the above factors to cause a significant difference in adoption of computer-based instruction among adopters and laggards. It may be implied that faculty at OSU are committed to their profession and that the absence of organizational support in any form would not cause them to detour from this chosen path. Or it might be concluded that any of the above organizational support factors extended to the faculty by the organization is not significant to warrant an enhanced rate of computer-based instruction. Faculty are motivated to use of computers irrespective of the support they receive from their organization as they perceive that any support not obtained far outweighs the benefits they reap from computer technology. In addition, extent of computer usage does not enhance their promotion and tenure directly. But rather indirectly wherein use of computers greatly benefits their research in terms of information retrieval, exchange and presentation. Hence faculties are committed to learning and using computer-based technology.

<u>Conclusions from Faculty Computer Efficacy, Utility Beliefs and Attitudinal Factors and Adoption of Computer-Based Instruction</u>

Data from this study supported hypotheses 7, 8 and 9 as presented in Tables 36, 37 and 38. Faculty efficacy, utility beliefs and attitudes toward computers presented a significant difference among adopters and laggards of computer-based instruction. This finding is confirmed by Hill et al.(1987), Faseyitan (1991) and Bullard (1998).

It may be concluded that computer efficacy of faculty, the benefits of the technology both for themselves and their students, and positive attitude of faculties to computers favor adoption of computers into the instruction process to its fullest extent. The adopters of computer-based instruction in general possess higher level of personal efficacy on using computers for instruction, believe that computers will benefit the professional career of their students and overall possess a positive attitude to the influence of computers in the educational process.

Implications

Adoption of computers in instruction is gaining popularity among faculties in higher education at Oklahoma State University. The enhanced instructional and research tasks accomplished by computers surpasses the traditional approach of teaching and conducting research. Conclusive literature that support influential factors of adoption have not been studied extensively at Oklahoma State University, a large, public, comprehensive university. This study analyzed the effect of faculty demographics, organizational support factors, faculty efficacy, utility beliefs and attitudes to computer-based instruction.

Results of the study indicated that faculty academic rank, discipline, gender or age had no significant difference among adopters and laggards of computer-based instruction. The only demographic variable that had a significant influence was academic college, which however, was not confirmed by academic rank. This incongruity calls for careful look at this variable in further studies wherein academic colleges may be evaluated in the light of faculty department or area of specialization. It might be that irrespective of faculty academic discipline, faculties across all colleges, irrespective of academic discipline feel strongly that using computers in instruction will benefit both students and their own professional career. Given the user status of computers, university administration may now begin to focus on providing opportunities and support for all faculties to fully implement the use of computers in instruction.

May be providing externally or internally controlled incentives or having institutional policies that consider extent of computer use in instruction as a determinant of tenure status, may help bring all faculties at par with computer technology. Thus will keep the faculty educated about the benefits of the technology in comparison to the traditional process of conducting research and or teaching.

In addition, constantly updating faculty via technology assistance centers or staff development programs of the latest computer software packages that will perform instructional or research tasks at a greater pace with improved quality and efficiency, will undoubtedly pave the path for enhanced adoption. Faculty tend to be comfortable with the software they may be using currently and may remain oblivious to latest technology that would perform the same task with greater efficiency at a much faster rate. Constant updates for faculty will surely help faculty save time and resources. Thus, will harness their professional contribution to amass knowledge into problematic areas of educational technology.

Since most faculties are willing to restructure their curriculum to accommodate a greater use of computers in instruction, administration should seize the opportunity and provide appropriate resources. Building faculty efficacy about computers, grounding utility beliefs of computers with experience and developing a positive attitude to computer-based instruction relies heavily on administration. It is however, noteworthy that the population of faculty at Oklahoma State University are keeping themselves abreast of these criteria, which should imply to the administration that enhanced support from them would place the university faculty and their students at a higher status as the higher education system thrives in a competitive world. In conclusion, higher education continues to face the inevitable challenge imposed by the 21st century technological revolution. It is vital for institutions of higher education, the administration and the faculty to vigorously work towards integrating the technology within the curriculum. As a result of this integration, the benefits offered by technology to the process of teaching for the faculty and learning for the students will be realized, thus motivating faculty to enhance the process of integration. With the technological revolution, the influence of technology and students are certain. It may be mandatory for the system of higher education to fully prepare students that can successfully meet the challenges.

Recommendations

The following recommendations are presented based on the findings of this study.

1. Additional studies should be conducted to determine if there is a difference in use of computers in instruction across each department of Oklahoma State University. And if there is a difference, the extent of difference needs to be analyzed.
2. Studies assessing faculty needs for enhanced use of computers for instruction within the classroom setting should be carried out.
3. It is recommended that this study be duplicated with other institutions of higher education within the State of Oklahoma to help understand the trend of adoption within the State.
4. Other variables that may be incorporated into a study on this topic could be computer literacy among faculty, allocation of funds for computers and latest software packages and mode of faculty updates of technology.

5. Research on strategies to build faculty computer efficacy, utility beliefs and attitude to computers will greatly enable university administration understand techniques to overcome faculty resistance to change process related to computers.

Summary

Chapter V presents the purpose for the study, research procedures employed and a summary of major findings. The section on conclusion discussed the research findings in the context of hypotheses tested, stating the significant and non-significant variables. Thereafter, a brief discussion on implications of the study is presented followed by recommendations for further study. Results of the study disclosed faculty academic college, computer efficacy, utility beliefs and attitudes toward computers in instruction to be presenting a significant difference among adopters and laggards.

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APPENDIX A

Original Faculty Instructional Computing Questionnaire (FICQ)

FACULTY INSTRUCTIONAL COMPUTING QUESTIONNAIRE

SECTION 1: DESCRIPTIVE DATA

Directions: Please supply the information in the space provided.

1. University ________________ 2. College/School ________________

3. Rank ________________ 4. Discipline ________________

5. # of Publications for the past three years ____________

6. Your research involvement_____High_____Medium_____Low

7. Courses taught in an academic year_________sem.hrs/qtr.hrs.

8. Year in service (include this yr.)_________ 9. Sex_____M_____F

SECTION 2: COMPUTER INSTRUCTIONAL ACTIVITIES

Directions: Complete this section by placing an X on the appropriate space.

10. Do you use computers to prepare for teaching? ___Yes ___No

11. Do you use computers in the classroom? ___Yes ___No

12. Do you require your students to use computers in the course(s) that you teach? If no, skip the next two questions. ___Yes ___No

13. The software used in my course(s) were obtained from these source(s). Mark all that are applicable.

    a. Purchased commercially____ b. Developed by me____

    c. Developed in my university/college____

    e. Others (explain) ________________________

14. Mark the type(s) of application(s) of computers that you have used in your instructional activities.

    a. Tutorials___ b. Problem solving___ c. Simulations___

    d. Drill/Practice___ e. Data management___ f. Testing___

    g. Expert Systems___ h. Demonstrations___ i. Games___ j. Others___

15. Are you planning to restructure your teaching so as to use computers more than before? ___Yes ___No

SECTION 3: ORGANIZATIONAL SUPPORT FOR INSTRUCTIONAL COMPUTING

Direction: Complete this section by placing an X on the appropriate space.

16. Are you aware of any institutional policy in your university or college that specifically encourages the use of computing in instruction? Yes___ No___

17. Are there any special incentives for faculty to develop instructional software? Yes___ No___

18. Does your university or college have a unit or department that can assist you in developing instructional software? Yes___ No___

19. Are you aware of any staff development program in computers in your university? Yes___ No___

20. Mark the appropriate staff development program in which you participated in the past three years that relates to instructional computing.

    a. Time release ___ b. Workshop___ c. Seminars___

    d. Others (specify) ____________ e. None_______

21. Would you be more apt to use computers if they were available to you without cost? Yes___ No___

SECTION 4: COMPUTER ATTITUDES AND BELIEFS

Directions: Please circle the numbers according to how you feel about each statement.

5	4	3	2	1
Totally Disagree	Tend to Disagree	No Opinion	Tend to Agree	Totally Agree

Efficacy Statements

22.	I can never understand how to use a computer as an instructional tool.	5	4	3	2	1
23.	Some people have the expertise to understand how computers are used for instruction, but I cannot learn this.	5	4	3	2	1
24.	It is extremely difficult to adopt the use of computers for the courses that I teach.	5	4	3	2	1
25.	Development of instructional software is too difficult for me to do.	5	4	3	2	1

1	2	3	4	5
Totally Disagree	Tend to Disagree	No Opinion	Tend to Agree	Totally Agree

Utility Statements

26.	Students in my discipline will not get as high a starting salary when they graduate if they don't know how to use a computer.	1	2	3	4	5
27.	If my students know about computers, they can get higher status jobs.	1	2	3	4	5
28.	Expertise in computer applications is of utmost importance for students to get a good job.	1	2	3	4	5
29.	If students don't learn how to use computers, it will be difficult for them to be successful in their professional career.	1	2	3	4	5

Computer Attitude Statements

30.	I would like to use computers for instruction more than I do now.	1	2	3	4	5
31.	The use of computers in instruction improves students' learning and should be encouraged.	1	2	3	4	5
32.	Computers improve teaching effectiveness.	1	2	3	4	5
33.	Everyone should learn how to use a computer.	1	2	3	4	5
34.	More information on computer instructional techniques will be beneficial to my teaching activities.	1	2	3	4	5

5	4	3	2	1
Totally Disagree	Tend to Disagree	No Opinion	Tend to Agree	Totally Agree

35.	Use of computers in instruction is a passing fad.	5	4	3	2	1
36.	Using computers in instruction will sacrifice the personal contact I have with students.	5	4	3	2	1
37.	I would use computers in instruction if they did not require so much time for planning and implementation.	5	4	3	2	1
38.	Computer software is too rigid and sometimes unreliable.	5	4	3	2	1
39.	Computers are not appropriate for instruction at college level.	5	4	3	2	1

APPENDIX B

Letter Granting Permission to Use FICQ

Information Services
185 Carroll Street
Akron, OH 44325-3501
(330) 972-7188 Office
(330) 972-5238 Fax

January 11, 2001

Susan Mathew
40 South University Place
Apt 3
Stillwater, IK 74075

Dear Susan:

I grant you permission to use the FICO, and I am enclosing a copy and information regarding the instrument's validity and reliability. Please send me a copy of the results of your study.

Sincerely,

John J. Hirschbuhl

John J. Hirschbuhl Ph.D.
Professor
Interim Director of Instructional Technology
Manager of Instructional Design and Development

D:\Msword\Matthew.doc

APPENDIX C

Pilot-Study Cover Letter

OKLAHOMA STATE UNIVERSITY

OSU

School of Educational Studies

College of Education
204 Willard
Stillwater, Oklahoma 74078-4045
405-744-6275; Fax 405-744-7758

Adult Education
Aviation and Space Education
Higher Education
Human Resource Development
Organization and Leadership
Research and Evaluation
Social Foundations
Student Personnel
Technology

Pilot Study Cover Letter

January 29, 2001

Dear «Title» «LastName»:
<Campus Mailing Address>

Per the advise of Dr. Kenneth McKinley, I am forwarding you a copy of the questionnaire that I would like to use for my doctoral dissertation. The attached questionnaire is part of a university-wide study being carried out in an effort to understand faculty attitudes toward adoption of computer-based instruction. My aim is to: 1) identify why with computer technology readily accessible in the environment of a comprehensive university, some faculty members adopt computer-based instruction while others do not and, 2) identify differentiating characteristics of adopters and non-adopters of computer-based instruction. For the purpose of this study, tenure track faculties at Oklahoma State University (OSU), Stillwater campus will be randomly selected from all seven colleges at OSU (N=600). The Office of Planning, Budget & Institutional Research at OSU, will perform randomization using a statistical procedure.

The questionnaire is designed to take approximately 10 minutes to complete. Please complete all the items on the enclosed questionnaire. As a participant in this pilot study, your identity and response will be held in the strictest confidence by the researcher and the dissertation advisor. Upon completion of the study, all reported data will be aggregated and the questionnaires will be destroyed. **Returning completed survey implies your free, voluntary consent to participate in this pilot study and you will not be penalized for declining participation.**

Please comment on word recognition, clarity, relevancy, the likert-type scale and consistency of terms across items. I appreciate any suggestions that you may have concerning any aspect of this questionnaire or any aspect of computer adoption for instructional purposes not covered in this questionnaire. I humbly request that the questionnaire be completed at your earliest convenience. Upon completing the questionnaire, please give me a call at 332-0122 (H) or 4-6030 (W) and I will pick it up. Upon your request, I will be more than happy to share the results of the questionnaire with you.

Bringing Dreams to Life
The Campaign for OSU

OKLAHOMA STATE UNIVERSITY

OSU

School of Educational Studies

College of Education
204 Willard
Stillwater, Oklahoma 74078-4045
405-744-6275; Fax 405-744-7758

If you have any concerns or questions about the researcher (Susan Mathew. Principal Investigator), the research, rights of the subject(s), or any potential research-related harm or risk to the subject, you may contact Susan Mathew at 405-744-6030 (W) or via email at carolrachel939@hotmail.com or Sharon Bacher. IRB Executive Secretary, Oklahoma State University, 203 Whitehurst, Stillwater, OK 74078. Phone: 405-744-5700.

Thank you very much for taking the time to read through the questionnaire and for your comments to help refine the questionnaire.

Sincerely,

Susan Mathew
Doctoral Student
School of Educational Studies
College of Education
321 Willard, OSU
744-6030

cc: Dr. Kenneth McKinley
Professor Emeritus & Dissertation Advisor
School of Curriculum & Ed. Leadership
College of Education
307 Willard
744-8006 (W)

APPENDIX D

Modified FICQ

FACULTY INSTRUCTIONAL COMPUTING QUESTIONNAIRE

SECTION 1: FACULTY PROFESSIONAL DATA
Directions: Please supply the information in the space provided.

1. College: (place an "X" where appropriate)

_____ Agricultural Sciences & Natural Resources   ______ Arts & Sciences
_____ Business Administration   ______ Education
_____ Engineering, Architecture & Technology
______ Human Environmental Sciences   ______ Veterinary Medicine

2. Academic Rank:
______ Instructor ______ Lecturer ______ Assistant Professor
______ Associate Professor ______ Professor __________________________ Other
(Please specify)

3. Discipline: ____
4. Years of service in:
a. _________ Higher Education b. __________ at OSU
5. Research Involvement in the past 3 years: (write the number on the space provided)

	No. of
a) Refereed Publications	_______
b) Books	_______
c) Grants	_______
d) National Presentations	_______
e) Other (please specify)	_______

6. Instructional Involvement: Total number of courses you have taught during each academic year: (write the number on the space provided)

	1998/1999	1999/2000	2000/2001
a) Undergraduate Courses	_______	_______	_______
b) Graduate Courses	_______	_______	_______
c) Other (please specify)	_______	_______	_______

7. Gender: _____M _____ F

8. Age: <25-29 ______ 30-39 _______ 40-49 _______
50-59 ______ 60-69 _______ >69 _______

SECTION 2: COMPUTER INSTRUCTIONAL ACTIVITIES

Directions: Complete this section by placing an "X" on the appropriate space.

9. Do you use computers to prepare for teaching? _______Yes _______ No
10. Do you use computers in the classroom? _______ Yes _______ No
11. Do you require your students to use computers in the course(s) that you teach? **If no, skip the next two questions.** _______ Yes ______ No
12. The software used in my course(s) were obtained from these source(s). Check all that are applicable.
    a. Purchased commercially ____ b. Developed by me ______
    c. Developed in my college/department _____ d. Other (specify) ________________
13. Mark the type(s) of computer application that you have used in your instructional activities. Check all that are applicable.
    a. Tutorials _____ b. Problem solving ______ c. Simulations _____
    d. Drill/Practice ______ e. Data management _____ f. Testing ______
    g. Expert Systems _____ h. Demonstrations _______ i. Games ______
    j. Other (explain) ____
14. Are you currently planning to restructure your teaching so as to use computers in instruction more than before? _______ Yes _______ No

SECTION 3: ORGANIZATIONAL SUPPORT FOR INSTRUCTIONAL ACTIVITIES

Direction: Complete this section by placing an "X" on the appropriate space.

15. Are you aware of any institutional policy at OSU or in your college/department that specifically encourages the use of computers in instruction?
    ____Yes ____ No _____ Don't Know
16. Are you aware of any special incentives in your college/department for faculty to develop/use computer software for instruction? ____ Yes ____ No _____ Don't Know
17. Are your aware of a unit or technology center within your college/department that can assist you in developing/using computer software for instruction?
    ____ Yes ____ No ______ Don't Know
18. Are you aware of any staff development program related to use of computers for instructional purposes at OSU or in your college/department?
    _____ Yes _____No ______ Don't' Know
19. Mark the appropriate staff development program in which you participated in the past three years that relates to use of computers in instruction.
    a. Release Time _____ b. Workshop ______ c. Seminars _______
    d. Summer Salary _____ e. Other (specify) _________________________
    f. None _______
20. What is the source of funding for computers for instructional use in your college/department: (check all that apply)
    a. Dean's office __________ b. Department budget ______
    c. Student technology fee _____ d. Grants _______
    e. Other (specify) ____

SECTION 4: COMPUTER ATTITUDES AND BELIEFS

Directions: Complete this section by placing an "X" in the appropriate cell.

Efficacy Statements

Strongly Disagree, Disagree, No opinion, Agree, Strongly Agree

	Statement	**SD**	**D**	**N**	**A**	**SA**
21.	I don't understand how to use a computer as an instructional tool.					
22.	Some people have the expertise to understand how computers are used for instruction, but I cannot learn this.					
23.	It is difficult to adopt the use of computers for the courses that I teach.					
24.	Developing computer software for my teaching is difficult for me.					

Utility Statements

Strongly Disagree, Disagree, No opinion, Agree, Strongly Agree

	Statement	**SD**	**D**	**N**	**A**	**SA**
25.	Students in my discipline will not get as high a starting salary when they graduate if they don't know how to use a computer.					
26.	If my students know about computers, they can get higher status jobs.					
27.	Expertise in computer applications is not of utmost importance for students to get a good job.					
28.	If students don't learn how to use computers it will be difficult for them to be successful in their professional career.					

Computer Attitude Statements

Strongly Disagree, Disagree, No opinion, Agree, Strongly Agree

	Statement	SD	D	N	A	SA
29.	I don't like to use computers for instruction more than I do now.					
30.	The use of computers in instruction improves students' learning and should be encouraged.					
31.	Computers improve teaching effectiveness.					
32.	Everyone should learn how to use a computer.					
33.	More information on computer instructional technique will be beneficial to my teaching activities.					

Strongly Disagree, Disagree, No opinion, Agree, Strongly Agree

	Statement	SD	D	N	A	SA
34.	Use of computers in instruction is a passing fad.					
35.	Using computers in instruction will sacrifice the personal contact I have with students.					
36.	I would use computers in instruction if they did not require so much time for planning and implementation.					
37.	Computer software is too rigid and sometimes unreliable.					
38.	Computers are not appropriate for instruction at university/college level.					

APPENDIX E

Letter from IRB

Oklahoma State University
Institutional Review Board

Protocol Expires: 1/30/02

Date : Monday, February 19, 2001 IRB Application No ED0174

Proposal Title: AN ANALYSIS OF SELECTED VARIABLES TO DETERMINE FACULTY ATTITUDES TOWARD ADOPTION OF COMPUTER-BASED INSTRUCTION

Principal
Investigator(s) :

Susan Mathew	Kenneth McKinley
40 S. University Pl #3	307 Willard
Stillwater, OK 74075	Stillwater, OK 74078

Reviewed and
Processed as: Exempt

Approval Status Recommended by Reviewer(s) : Approved **Modification**

Please note that the protocol expires on the following date which is one year from the date of the approval of the original protocol:

Protocol Expires: 1/30/02

Signature Carol Olson

Carol Olson, Director of University Research Compliance

Monday February 19 2001
Date

Approvals are valid for one calendar year, after which time a request for continuation must be submitted Any modifications to the research project approved by the IRB must be submitted for approval with the advisor's signature The IRB office MUST be notified in writing when a project is complete. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

APPENDIX F

Reliability Measure Using Cronbach Alpha

RELIABILITY ANALYSIS - SCALE (ALPHA)

		Mean	Std Dev	Cases
1.	EFF21	4.3357	.8101	140.0
2.	EFF22	4.6714	.5289	140.0
3.	EFF23	3.7214	1.2585	140.0
4.	EFF24	2.7143	1.3848	140.0
5.	UTIL25	3.6571	1.3182	140.0
6.	UTIL26	3.5929	1.1989	140.0
7.	UTIL27	3.3429	1.3182	140.0
8.	UTIL28	4.1000	.9080	140.0
9.	COMPAT29	3.3500	1.0791	140.0
10.	COMPAT30	3.6500	.9665	140.0
11.	COMPAT31	3.3571	1.0531	140.0
12.	COMPAT32	4.2071	.8267	140.0
13.	COMPAT33	3.6357	1.0263	140.0
14.	COMPAT34	4.3357	.7158	140.0
15.	COMPAT35	3.5286	1.1719	140.0
16.	COMPAT36	2.9500	1.1588	140.0
17.	COMPAT37	3.1429	.9933	140.0
18.	COMPAT38	4.4071	.6559	140.0

Correlation Matrix

	EFF21	EFF22	EFF23	EFF24	UTIL25
EFF21	1.0000				
EFF22	.4104	1.0000			
EFF23	.3323	.3695	1.0000		
EFF24	.2849	.2736	.3090	1.0000	
UTIL25	.3241	.1262	.2586	.2415	1.0000
UTIL26	.3047	.0485	.2390	.1764	.7668
UTIL27	.1205	-.0024	.1447	.1210	.2876
UTIL28	.2768	.0389	.0875	.0744	.4195
COMPAT29	.1362	.1651	.3160	.1541	.0040
COMPAT30	.2155	.0267	.2150	.1612	.2044
COMPAT31	.2548	.0185	.2493	.0902	.1925
COMPAT32	.0888	-.0078	-.0686	.0144	.0788
COMPAT33	.0876	-.1028	.1381	-.0080	.0346
COMPAT34	.3005	.0654	.2962	.0394	.1229
COMPAT35	.1982	.1081	.4177	.0893	.1834
COMPAT36	.2786	.1608	.2025	.2331	.1959
COMPAT37	.2887	.1037	.3026	.3280	.2465
COMPAT38	.3367	.1810	.2779	.0736	.1793

RELIABILITY ANALYSIS - SCALE (ALPHA)

Correlation Matrix

	UTIL26	UTIL27	UTIL28	COMPAT29	OMPAT30
UTIL26	1.0000				
UTIL27	.2255	1.0000			
UTIL28	.4078	.2837	1.0000		
COMPAT29	.0609	.1072	.0154	1.0000	
COMPAT30	.3107	-.0011	.3189	.2149	1.0000
COMPAT31	.2528	.0355	.3235	.2374	.7881
COMPAT32	.0712	.1456	.0968	.1117	.2805
COMPAT33	.1125	.1196	.0008	.3368	.2332
COMPAT34	.1520	.2126	.2579	.2566	.4518
COMPAT35	.1901	.0309	.1934	.2907	.4122
COMPAT36	.2545	.0254	.1552	.0831	.2733
COMPAT37	.2727	.2096	.1994	.2618	.2623
COMPAT38	.1940	.1619	.2573	.2445	.4647

	COMPAT31	COMPAT32	COMPAT33	COMPAT34	COMPAT35
COMPAT31	1.0000				
COMPAT32	.3359	1.0000			
COMPAT33	.3342	.1489	1.0000		
COMPAT34	.4792	.2828	.2950	1.0000	
COMPAT35	.3998	.2129	.2689	.3616	1.0000
COMPAT36	.2800	.2362	-.0880	.2459	.1732
COMPAT37	.2191	.1827	.0796	.3064	.2004
COMPAT38	.4650	.2149	.3181	.6568	.2702

	COMPAT36	COMPAT37	COMPAT38
COMPAT36	1.0000		
COMPAT37	.4250	1.0000	
COMPAT38	.1690	.2745	1.0000

N of Cases = 140.0

Statistics for	Mean	Variance	Std Dev	N of Variables
Scale	66.7000	86.7439	9.3136	18

RELIABILITY ANALYSIS - SCALE (ALPHA)

Reliability Coefficients 18 items

Alpha = .8176 Standardized item alpha = .8292

APPENDIX G

First Mail-Out Letter

O K L A H O M A   S T A T E   U N I V E R S I T Y

OSU

School of Educational Studies

College of Education
204 Willard
Stillwater, Oklahoma 74078-4045
405-744-6275; Fax 405-744-7758

February 19, 2001

Dear «Title» «LastName»:
<Campus Mailing Address>

I am a doctoral student in the School of Educational Studies and am conducting this survey as part of my doctoral dissertation. The attached questionnaire is part of a university-wide study being carried out in an effort to understand faculty attitudes toward adoption of computer-based instruction. My aim is to: 1) identify why with computer technology readily accessible in the environment of a comprehensive university, some faculty members adopt computer-based instruction while others do not and, 2) identify differentiating characteristics of adopters and non-adopters of computer-based instruction. The results of this study may provide information to the administration and faculty on the current status of computer-based instruction and how best to assist in planning, implementation and integration of computer technology into the managerial and instructional structure of the university. Hence, your assistance in conducting this research will be greatly appreciated.

Adult Education
Aviation and Space Education
Higher Education
Human Resource Development
Organization and Leadership
Research and Evaluation
Social Foundations
Student Personnel
Technology

For the purpose of this study, faculties have been randomly selected from all seven colleges at Oklahoma State University (OSU), Stillwater campus. The Office of Planning, Budget & Institutional Research at OSU, performed randomization using a statistical procedure.

It is neither assumed nor implied that faculty must know about and be able to utilize computers for instruction purposes. **Your participation is crucial irrespective of your computer usage status.** Also, please note that I am interested in the utilization of any kind of computers (for instructional purposes) with any kind of hardware and software applications.

The questionnaire is designed to take approximately 10 minutes to complete. Please complete all the items on the enclosed questionnaire, which is designed to obtain information pertinent to your experience and opinion. **The surveys are absolutely not identified with any identification system or numbers.** Therefore, no identity of individuals or individual responses will be revealed in this study. All responses will be held in the strictest confidence. Upon completion of the study, all reported data will be aggregated and the questionnaires will be destroyed.

OKLAHOMA STATE UNIVERSITY

OSU

School of Educational Studies

College of Education
204 Willard
Stillwater, Oklahoma 74078-4045
405-744-6275; Fax 405-744-7758

Returning completed survey implies your free, voluntary consent to participate in this study and you will not be penalized for declining participation. It will be appreciated if you would return the completed questionnaire by March 6th, 2001. When returning the questionnaire, please remove the sheet which has your name and address. You may choose to either staple or tape the questionnaire when returning. I will be more than happy and willing to share the results of the questionnaire with you. Please send me a note with your full name and address or call me on campus or send an email to carolrachel939@hotmail.com. I welcome any comments that you may have concerning any aspect of computer adoption for instructional purposes not covered in this questionnaire.

Adult Education
Aviation and Space Education
Higher Education
Human Resource Development
Organization and Leadership
Research and Evaluation
Social Foundations
Student Personnel
Technology

If you have any concerns or questions about the researcher (Susan Mathew, Principal Investigator), the research, rights of the subject(s), or any potential research-related harm or risk to the subject, you may contact Susan Mathew at 405-744-6030 (W) or via email at carolrachel939@hotmail.com or Sharon Bacher, IRB Executive Secretary, Oklahoma State University, 203 Whitehurst, Stillwater, OK 74078. Phone: 405-744-5700.

Thank you very much for your invaluable time and participation in this effort to better understand the use of computers for instructional delivery in higher education.

Sincerely,

Susan Mathew
Doctoral Student
School of Educational Studies
College of Education
321 Willard, OSU
744-6030

cc: Kenneth McKinley, Ph. D.
Professor Emeritus & Dissertation Advisor
School of Curriculum & Ed. Leadership
College of Education
307 Willard, OSU
744-8006

Bringing Dreams to Life

APPENDIX H

Second Mail-Out Letter

OKLAHOMA STATE UNIVERSITY

OSU

School of Educational Studies

College of Education
204 Willard
Stillwater, Oklahoma 74078-4045
405-744-6275; Fax 405-744-7758

Second Mail Out

February 19, 2001

Dear «Title» «LastName»:
<Campus Mailing Address>

Adult Education
Aviation and Space Education
Higher Education
Human Resource Development
Organization and Leadership
Research and Evaluation
Social Foundations
Student Personnel
Technology

On February 5th, 2001 I mailed you a questionnaire designed to investigate faculty attitudes toward adoption of computer-based instruction at Oklahoma State University, as part of my doctoral dissertation. The researcher aims to understand the factors that influence adoption or non-adoption of computer-based instruction among university faculty members. Hence, be able to identify differentiating characteristics of adopters and non-adopters of computer-based instruction. The results of this study may provide information to the administration and faculty on how best to assist in planning, implementation and integration of computer technology into the managerial and instructional structure of the university. Hence, your assistance in conducting this research is very important. For the purpose of this study, faculties have been randomly selected for equal representation from all colleges at Oklahoma State University (OSU). The Office of Planning, Budget & Institutional Research at OSU, performed randomization using a statistical procedure.

I am forwarding you another questionnaire. **If you have returned the completed questionnaire, thank you for your invaluable time and participation– and please ignore this second mailing. If you were unable to reply the first time, I implore you to PLEASE take approximately 10 minutes to complete the questionnaire and send it back to me by March 1, 2001.**

It is neither assumed nor implied that faculty must know about and be able to utilize computers for instruction purposes. **Your participation is crucial irrespective of your computer usage status.** Also, please note that I am interested in the utilization of any kind of computers (for instructional purposes) with any kind of hardware and software applications.

The questionnaire is designed to take approximately 10 minutes to complete. Please complete all the items on the enclosed questionnaire, which is designed to obtain information pertinent to your experience and opinion. **The surveys are absolutely not identified with any identification system or numbers.** Therefore, no identity of individuals or individual responses will be revealed in this

Bringing Dreams to Life

OKLAHOMA STATE UNIVERSITY

OSU

School of Educational Studies

College of Education
204 Willard
Stillwater, Oklahoma 74078-4045
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study. All responses will be held in the strictest confidence. Upon completion of the study, all reported data will be aggregated and the questionnaires will be destroyed. **Returning completed survey implies your free, voluntary consent to participate in this study and you will not be penalized for declining participation.**

When returning the questionnaire (by March 1, 2001) please remove the sheet which has your name and address. You may choose to either staple or tape the questionnaire when returning. I will be more than happy and willing to share the results of the questionnaire with you. Please send me a note with your full name and address or call me on campus or send an email to carolrachel939@hotmail.com. I welcome any comments that you may have concerning any aspect of computer adoption for instructional purposes not covered in this questionnaire.

Adult Education
Aviation and Space Education
Higher Education
Human Resource Development
Organization and Leadership
Research and Evaluation
Social Foundations
Student Personnel
Technology

Thank you very much for your invaluable time and participation in this effort to better understand the use of computers for instructional delivery in higher education.

Sincerely,

Susan Mathew
Doctoral Student
School of Educational Studies
College of Education
321 Willard, OSU
744-6030

cc: Kenneth McKinley, Ph. D.
Professor Emeritus & Dissertation Advisor
School of Curriculum & Ed. Leadership
College of Education
307 Willard, OSU
744-8006

Bringing Dreams to Life

APPENDIX I

Crosstab of Faculty Respondents by Academic College

Crosstab of Respondents by Academic College

COLLEGE * Adopters and Laggards Crosstabulation

			Adopters and Laggards		Total
			Laggards	Adopters	
COLLEGE	Agricultural Science&Natural Resources	Count	10	11	21
		Expected Count	8.5	12.5	21.0
		% within COLLEGE	47.6%	52.4%	100.0%
	Arts & Sciences	Count	19	9	28
		Expected Count	11.4	16.6	28.0
		% within COLLEGE	67.9%	32.1%	100.0%
	Business Administration	Count	3	14	17
		Expected Count	6.9	10.1	17.0
		% within COLLEGE	17.6%	82.4%	100.0%
	Education	Count	5	15	20
		Expected Count	8.1	11.9	20.0
		% within COLLEGE	25.0%	75.0%	100.0%
	Engineering, Architecture & Technology	Count	7	15	22
		Expected Count	8.9	13.1	22.0
		% within COLLEGE	31.8%	68.2%	100.0%
	Human Environmental Sciences	Count	3	19	22
		Expected Count	8.9	13.1	22.0
		% within COLLEGE	13.6%	86.4%	100.0%
	Veterinary Medicine	Count	13	5	18
		Expected Count	7.3	10.7	18.0
		% within COLLEGE	72.2%	27.8%	100.0%
Total		Count	60	88	148
		Expected Count	60.0	88.0	148.0
		% within COLLEGE	40.5%	59.5%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29.600[a]	6	.000
Likelihood Ratio	30.958	6	.000
Linear-by-Linear Association	1.097	1	.295
N of Valid Cases	148		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.89.

APPENDIX J

Crosstab of Faculty Respondents by Rank Without Collapsing Data

Crosstab of Respondents by Rank Without Collapsing Data

RANK * Adopters and Laggards Crosstabulation

			Adopters and Laggards		
			Laggards	Adopters	Total
RANK	Assistant Professor	Count	16	27	43
		Expected Count	17.4	25.6	43.0
		% within RANK	37.2%	62.8%	100.0%
	Associate Professor	Count	21	23	44
		Expected Count	17.8	26.2	44.0
		% within RANK	47.7%	52.3%	100.0%
	Professor	Count	22	38	60
		Expected Count	24.3	35.7	60.0
		% within RANK	36.7%	63.3%	100.0%
	Other	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within RANK	100.0%	.0%	100.0%
Total		Count	60	88	148
		Expected Count	60.0	88.0	148.0
		% within RANK	40.5%	59.5%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.981[a]	3	.395
Likelihood Ratio	3.312	3	.346
Linear-by-Linear Association	.003	1	.953
N of Valid Cases	148		

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is .41.

APPENDIX K

Crosstab of Faculty Respondents by Rank With Collapsed Data

Crosstab of Respondents by Rank With Collapsed Data

RANK * Adopters and Laggards Crosstabulation

			Adopters and Laggards		
			Laggards	Adopters	Total
RANK	Assistant Professor	Count	16	27	43
		Expected Count	17.4	25.6	43.0
		% within RANK	37.2%	62.8%	100.0%
	Associate Professor	Count	21	23	44
		Expected Count	17.8	26.2	44.0
		% within RANK	47.7%	52.3%	100.0%
	Professor	Count	23	38	61
		Expected Count	24.7	36.3	61.0
		% within RANK	37.7%	62.3%	100.0%
Total		Count	60	88	148
		Expected Count	60.0	88.0	148.0
		% within RANK	40.5%	59.5%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.344[a]	2	.511
Likelihood Ratio	1.334	2	.513
Linear-by-Linear Association	.004	1	.952
N of Valid Cases	148		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 17.43.

APPENDIX L

Crosstab of Faculty Respondents by Academic Discipline

Crosstab of Respondents by Academic Discipline

DISCPLN * Adopters and Laggards Crosstabulation

			Adopters and Laggards		
			Laggards	Adopters	Total
DISCPLN	Technical	Count	10	17	27
		Expected Count	11.0	16.0	27.0
		% within DISCPLN	37.0%	63.0%	100.0%
	Non-Technical	Count	48	67	115
		Expected Count	47.0	68.0	115.0
		% within DISCPLN	41.7%	58.3%	100.0%
Total		Count	58	84	142
		Expected Count	58.0	84.0	142.0
		% within DISCPLN	40.8%	59.2%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.200[b]	1	.655		
Continuity Correction[a]	.053	1	.818		
Likelihood Ratio	.202	1	.653		
Fisher's Exact Test				.828	.412
Linear-by-Linear Association	.199	1	.656		
N of Valid Cases	142				

a. Computed only for a 2x2 table

b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.03.

APPENDIX M

Crosstab of Faculty Respondents by Years of Service in Higher Education

Crosstab of Faculty Respondents by Yrs. of Serv. in HE

YEARS.HE * Adopters and Laggards Crosstabulation

			Adopters and Laggards		Total
			Laggards	Adopters	
YEARS.HE	1	Count	1	2	3
		Expected Count	1.2	1.8	3.0
		% within YEARS.HE	33.3%	66.7%	100.0%
	2	Count	3	2	5
		Expected Count	2.0	3.0	5.0
		% within YEARS.HE	60.0%	40.0%	100.0%
	3	Count	3	1	4
		Expected Count	1.6	2.4	4.0
		% within YEARS.HE	75.0%	25.0%	100.0%
	4	Count	4	3	7
		Expected Count	2.8	4.2	7.0
		% within YEARS.HE	57.1%	42.9%	100.0%
	5	Count	0	3	3
		Expected Count	1.2	1.8	3.0
		% within YEARS.HE	.0%	100.0%	100.0%
	6	Count	1	3	4
		Expected Count	1.6	2.4	4.0
		% within YEARS.HE	25.0%	75.0%	100.0%
	7	Count	2	3	5
		Expected Count	2.0	3.0	5.0
		% within YEARS.HE	40.0%	60.0%	100.0%
	8	Count	2	3	5
		Expected Count	2.0	3.0	5.0
		% within YEARS.HE	40.0%	60.0%	100.0%
	9	Count	0	2	2
		Expected Count	.8	1.2	2.0
		% within YEARS.HE	.0%	100.0%	100.0%
	10	Count	5	4	9
		Expected Count	3.6	5.4	9.0
		% within YEARS.HE	55.6%	44.4%	100.0%
	11	Count	1	7	8
		Expected Count	3.2	4.8	8.0
		% within YEARS.HE	12.5%	87.5%	100.0%
	12	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within YEARS.HE	.0%	100.0%	100.0%
	13	Count	3	5	8
		Expected Count	3.2	4.8	8.0
		% within YEARS.HE	37.5%	62.5%	100.0%
	14	Count	0	2	2
		Expected Count	.8	1.2	2.0
		% within YEARS.HE	.0%	100.0%	100.0%

YEARS.HE * Adopters and Laggards Crosstabulation

			Adopters and Laggards		
			Laggards	Adopters	Total
YEARS.HE	15	Count	4	2	6
		Expected Count	2.4	3.6	6.0
		% within YEARS.HE	66.7%	33.3%	100.0%
	16	Count	2	4	6
		Expected Count	2.4	3.6	6.0
		% within YEARS.HE	33.3%	66.7%	100.0%
	17	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within YEARS.HE	.0%	100.0%	100.0%
	18	Count	1	4	5
		Expected Count	2.0	3.0	5.0
		% within YEARS.HE	20.0%	80.0%	100.0%
	19	Count	3	1	4
		Expected Count	1.6	2.4	4.0
		% within YEARS.HE	75.0%	25.0%	100.0%
	20	Count	2	6	8
		Expected Count	3.2	4.8	8.0
		% within YEARS.HE	25.0%	75.0%	100.0%
	21	Count	3	0	3
		Expected Count	1.2	1.8	3.0
		% within YEARS.HE	100.0%	.0%	100.0%
	22	Count	1	3	4
		Expected Count	1.6	2.4	4.0
		% within YEARS.HE	25.0%	75.0%	100.0%
	23	Count	1	2	3
		Expected Count	1.2	1.8	3.0
		% within YEARS.HE	33.3%	66.7%	100.0%
	24	Count	1	4	5
		Expected Count	2.0	3.0	5.0
		% within YEARS.HE	20.0%	80.0%	100.0%
	25	Count	1	4	5
		Expected Count	2.0	3.0	5.0
		% within YEARS.HE	20.0%	80.0%	100.0%
	26	Count	3	2	5
		Expected Count	2.0	3.0	5.0
		% within YEARS.HE	60.0%	40.0%	100.0%
	27	Count	1	2	3
		Expected Count	1.2	1.8	3.0
		% within YEARS.HE	33.3%	66.7%	100.0%
	29	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within YEARS.HE	.0%	100.0%	100.0%
	30	Count	2	1	3
		Expected Count	1.2	1.8	3.0
		% within YEARS.HE	66.7%	33.3%	100.0%

YEARS.HE * Adopters and Laggards Crosstabulation

			Adopters and Laggards		
			Laggards	Adopters	Total
YEARS.HE	31	Count	3	1	4
		Expected Count	1.6	2.4	4.0
		% within YEARS.HE	75.0%	25.0%	100.0%
	32	Count	1	2	3
		Expected Count	1.2	1.8	3.0
		% within YEARS.HE	33.3%	66.7%	100.0%
	35	Count	0	2	2
		Expected Count	.8	1.2	2.0
		% within YEARS.HE	.0%	100.0%	100.0%
	36	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within YEARS.HE	.0%	100.0%	100.0%
	40	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within YEARS.HE	100.0%	.0%	100.0%
Total		Count	55	84	139
		Expected Count	55.0	84.0	139.0
		% within YEARS.HE	39.6%	60.4%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	33.878[a]	33	.425
Likelihood Ratio	40.265	33	.180
Linear-by-Linear Association	.019	1	.891
N of Valid Cases	139		

a. 67 cells (98.5%) have expected count less than 5. The minimum expected count is .40.

APPENDIX N

Crosstab of Faculty Respondents by Years of Service at OSU

Crosstab of Faculty Respondents by Yrs. of Serv. at OSU

YEARSOSU * Adopters and Laggards Crosstabulation

			Adopters and Laggards		
			Laggards	Adopters	Total
YEARSOSU	1	Count	7	4	11
		Expected Count	4.4	6.6	11.0
		% within YEARSOSU	63.6%	36.4%	100.0%
	2	Count	4	10	14
		Expected Count	5.6	8.4	14.0
		% within YEARSOSU	28.6%	71.4%	100.0%
	3	Count	4	8	12
		Expected Count	4.8	7.2	12.0
		% within YEARSOSU	33.3%	66.7%	100.0%
	4	Count	2	5	7
		Expected Count	2.8	4.2	7.0
		% within YEARSOSU	28.6%	71.4%	100.0%
	5	Count	2	4	6
		Expected Count	2.4	3.6	6.0
		% within YEARSOSU	33.3%	66.7%	100.0%
	6	Count	1	2	3
		Expected Count	1.2	1.8	3.0
		% within YEARSOSU	33.3%	66.7%	100.0%
	7	Count	2	1	3
		Expected Count	1.2	1.8	3.0
		% within YEARSOSU	66.7%	33.3%	100.0%
	8	Count	2	0	2
		Expected Count	.8	1.2	2.0
		% within YEARSOSU	100.0%	.0%	100.0%
	9	Count	0	3	3
		Expected Count	1.2	1.8	3.0
		% within YEARSOSU	.0%	100.0%	100.0%
	10	Count	3	6	9
		Expected Count	3.6	5.4	9.0
		% within YEARSOSU	33.3%	66.7%	100.0%
	11	Count	4	5	9
		Expected Count	3.6	5.4	9.0
		% within YEARSOSU	44.4%	55.6%	100.0%
	12	Count	3	4	7
		Expected Count	2.8	4.2	7.0
		% within YEARSOSU	42.9%	57.1%	100.0%
	13	Count	2	5	7
		Expected Count	2.8	4.2	7.0
		% within YEARSOSU	28.6%	71.4%	100.0%
	14	Count	2	2	4
		Expected Count	1.6	2.4	4.0
		% within YEARSOSU	50.0%	50.0%	100.0%

YEARSOSU * Adopters and Laggards Crosstabulation

			Adopters and Laggards		Total
			Laggards	Adopters	
YEARSOSU	15	Count	3	1	4
		Expected Count	1.6	2.4	4.0
		% within YEARSOSU	75.0%	25.0%	100.0%
	16	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within YEARSOSU	.0%	100.0%	100.0%
	17	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within YEARSOSU	100.0%	.0%	100.0%
	18	Count	1	3	4
		Expected Count	1.6	2.4	4.0
		% within YEARSOSU	25.0%	75.0%	100.0%
	19	Count	2	1	3
		Expected Count	1.2	1.8	3.0
		% within YEARSOSU	66.7%	33.3%	100.0%
	20	Count	2	4	6
		Expected Count	2.4	3.6	6.0
		% within YEARSOSU	33.3%	66.7%	100.0%
	21	Count	2	2	4
		Expected Count	1.6	2.4	4.0
		% within YEARSOSU	50.0%	50.0%	100.0%
	22	Count	1	3	4
		Expected Count	1.6	2.4	4.0
		% within YEARSOSU	25.0%	75.0%	100.0%
	23	Count	0	3	3
		Expected Count	1.2	1.8	3.0
		% within YEARSOSU	.0%	100.0%	100.0%
	24	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within YEARSOSU	100.0%	.0%	100.0%
	25	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within YEARSOSU	.0%	100.0%	100.0%
	27	Count	1	1	2
		Expected Count	.8	1.2	2.0
		% within YEARSOSU	50.0%	50.0%	100.0%
	28	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within YEARSOSU	100.0%	.0%	100.0%
	29	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within YEARSOSU	.0%	100.0%	100.0%
	30	Count	1	1	2
		Expected Count	.8	1.2	2.0
		% within YEARSOSU	50.0%	50.0%	100.0%

YEARSOSU * Adopters and Laggards Crosstabulation

			Adopters and Laggards		
			Laggards	Adopters	Total
YEARSOSU	31	Count	2	2	4
		Expected Count	1.6	2.4	4.0
		% within YEARSOSU	50.0%	50.0%	100.0%
	32	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within YEARSOSU	100.0%	.0%	100.0%
	36	Count	0	2	2
		Expected Count	.8	1.2	2.0
		% within YEARSOSU	.0%	100.0%	100.0%
Total		Count	57	85	142
		Expected Count	57.0	85.0	142.0
		% within YEARSOSU	40.1%	59.9%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	26.386[a]	31	.703
Likelihood Ratio	32.303	31	.402
Linear-by-Linear Association	.001	1	.981
N of Valid Cases	142		

a. 58 cells (90.6%) have expected count less than 5. The minimum expected count is .40.

APPENDIX O

Crosstab of Faculty Respondents by Research Involvement

APPENDIX O

Crosstab of Faculty Respondents by Research Involvement

Crosstab

			Adopters and Laggards		Total
			Laggards	Adopters	
REF.PUB	15	Count	4	1	5
		Expected Count	1.9	3.1	5.0
		% within REF.PUB	80.0%	20.0%	100.0%
	17	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within REF.PUB	.0%	100.0%	100.0%
	20	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within REF.PUB	.0%	100.0%	100.0%
	26	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within REF.PUB	.0%	100.0%	100.0%
	27	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within REF.PUB	.0%	100.0%	100.0%
Total		Count	46	75	121
		Expected Count	46.0	75.0	121.0
		% within REF.PUB	38.0%	62.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.740[a]	17	.816
Likelihood Ratio	13.717	17	.687
Linear-by-Linear Association	.655	1	.418
N of Valid Cases	121		

a. 27 cells (75.0%) have expected count less than 5. The minimum expected count is .38.

NATNPRES * Adopters and Laggards

Crosstab

			Adopters and Laggards		
			Laggards	Adopters	Total
NATNPRES	1	Count	6	6	12
		Expected Count	4.6	7.4	12.0
		% within NATNPRES	50.0%	50.0%	100.0%
	2	Count	4	14	18
		Expected Count	6.9	11.1	18.0
		% within NATNPRES	22.2%	77.8%	100.0%
	3	Count	5	11	16
		Expected Count	6.1	9.9	16.0
		% within NATNPRES	31.3%	68.8%	100.0%
	4	Count	6	10	16
		Expected Count	6.1	9.9	16.0
		% within NATNPRES	37.5%	62.5%	100.0%
	5	Count	5	6	11
		Expected Count	4.2	6.8	11.0
		% within NATNPRES	45.5%	54.5%	100.0%
	6	Count	3	5	8
		Expected Count	3.1	4.9	8.0
		% within NATNPRES	37.5%	62.5%	100.0%
	7	Count	3	4	7
		Expected Count	2.7	4.3	7.0
		% within NATNPRES	42.9%	57.1%	100.0%
	8	Count	0	4	4
		Expected Count	1.5	2.5	4.0
		% within NATNPRES	.0%	100.0%	100.0%
	9	Count	2	3	5
		Expected Count	1.9	3.1	5.0
		% within NATNPRES	40.0%	60.0%	100.0%
	10	Count	2	6	8
		Expected Count	3.1	4.9	8.0
		% within NATNPRES	25.0%	75.0%	100.0%
	12	Count	3	2	5
		Expected Count	1.9	3.1	5.0
		% within NATNPRES	60.0%	40.0%	100.0%
	17	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within NATNPRES	.0%	100.0%	100.0%
	20	Count	1	1	2
		Expected Count	.8	1.2	2.0
		% within NATNPRES	50.0%	50.0%	100.0%
	21	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within NATNPRES	100.0%	.0%	100.0%

Crosstab

			Adopters and Laggards		Total
			Laggards	Adopters	
NATNPRES	22	Count	1	1	2
		Expected Count	.8	1.2	2.0
		% within NATNPRES	50.0%	50.0%	100.0%
	26	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within NATNPRES	100.0%	.0%	100.0%
	27	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within NATNPRES	.0%	100.0%	100.0%
	28	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within NATNPRES	.0%	100.0%	100.0%
	30	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within NATNPRES	100.0%	.0%	100.0%
	38	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within NATNPRES	100.0%	.0%	100.0%
	47	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within NATNPRES	100.0%	.0%	100.0%
	75	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within NATNPRES	100.0%	.0%	100.0%
Total		Count	47	76	123
		Expected Count	47.0	76.0	123.0
		% within NATNPRES	38.2%	61.8%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	19.167[a]	21	.574
Likelihood Ratio	23.556	21	.315
Linear-by-Linear Association	5.049	1	.025
N of Valid Cases	123		

a. 36 cells (81.8%) have expected count less than 5. The minimum expected count is .38.

GRANTS * Adopters and Laggards

Crosstab

			Adopters and Laggards		
			Laggards	Adopters	Total
GRANTS	1	Count	3	17	20
		Expected Count	7.1	12.9	20.0
		% within GRANTS	15.0%	85.0%	100.0%
	2	Count	5	18	23
		Expected Count	8.2	14.8	23.0
		% within GRANTS	21.7%	78.3%	100.0%
	3	Count	8	5	13
		Expected Count	4.6	8.4	13.0
		% within GRANTS	61.5%	38.5%	100.0%
	4	Count	3	6	9
		Expected Count	3.2	5.8	9.0
		% within GRANTS	33.3%	66.7%	100.0%
	5	Count	3	4	7
		Expected Count	2.5	4.5	7.0
		% within GRANTS	42.9%	57.1%	100.0%
	6	Count	2	3	5
		Expected Count	1.8	3.2	5.0
		% within GRANTS	40.0%	60.0%	100.0%
	7	Count	1	2	3
		Expected Count	1.1	1.9	3.0
		% within GRANTS	33.3%	66.7%	100.0%
	8	Count	2	2	4
		Expected Count	1.4	2.6	4.0
		% within GRANTS	50.0%	50.0%	100.0%
	10	Count	2	2	4
		Expected Count	1.4	2.6	4.0
		% within GRANTS	50.0%	50.0%	100.0%
	11	Count	1	1	2
		Expected Count	.7	1.3	2.0
		% within GRANTS	50.0%	50.0%	100.0%
	12	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within GRANTS	100.0%	.0%	100.0%
	13	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within GRANTS	100.0%	.0%	100.0%
	15	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within GRANTS	100.0%	.0%	100.0%
Total		Count	33	60	93
		Expected Count	33.0	60.0	93.0
		% within GRANTS	35.5%	64.5%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16.029[a]	12	.190
Likelihood Ratio	17.226	12	.141
Linear-by-Linear Association	8.341	1	.004
N of Valid Cases	93		

a. 20 cells (76.9%) have expected count less than 5. The minimum expected count is .35.

BOOKS * Adopters and Laggards

Crosstab

			Adopters and Laggards		
			Laggards	Adopters	Total
BOOKS	1	Count	10	14	24
		Expected Count	11.1	12.9	24.0
		% within BOOKS	41.7%	58.3%	100.0%
	2	Count	5	4	9
		Expected Count	4.2	4.8	9.0
		% within BOOKS	55.6%	44.4%	100.0%
	3	Count	1	4	5
		Expected Count	2.3	2.7	5.0
		% within BOOKS	20.0%	80.0%	100.0%
	4	Count	2	0	2
		Expected Count	.9	1.1	2.0
		% within BOOKS	100.0%	.0%	100.0%
	8	Count	1	0	1
		Expected Count	.5	.5	1.0
		% within BOOKS	100.0%	.0%	100.0%
Total		Count	19	22	41
		Expected Count	19.0	22.0	41.0
		% within BOOKS	46.3%	53.7%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.387[a]	4	.250
Likelihood Ratio	6.648	4	.156
Linear-by-Linear Association	1.477	1	.224
N of Valid Cases	41		

a. 8 cells (80.0%) have expected count less than 5. The minimum expected count is .46.

APPENDIX P

Crosstab of Faculty Respondents by Teaching Involvement

Crosstab of Faculty Respondents by Teaching Involvement

MEANUG * Adopters and Laggards

Crosstab

			Adopters and Laggards		
			Laggards	Adopters	Total
MEANUG	1	Count	5	5	10
		Expected Count	3.5	6.5	10.0
		% within MEANUG	50.0%	50.0%	100.0%
	1	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within MEANUG	100.0%	.0%	100.0%
	2	Count	2	1	3
		Expected Count	1.1	1.9	3.0
		% within MEANUG	66.7%	33.3%	100.0%
	2	Count	1	14	15
		Expected Count	5.3	9.7	15.0
		% within MEANUG	6.7%	93.3%	100.0%
	2	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within MEANUG	.0%	100.0%	100.0%
	3	Count	0	2	2
		Expected Count	.7	1.3	2.0
		% within MEANUG	.0%	100.0%	100.0%
	3	Count	5	6	11
		Expected Count	3.9	7.1	11.0
		% within MEANUG	45.5%	54.5%	100.0%
	3	Count	1	1	2
		Expected Count	.7	1.3	2.0
		% within MEANUG	50.0%	50.0%	100.0%
	4	Count	3	3	6
		Expected Count	2.1	3.9	6.0
		% within MEANUG	50.0%	50.0%	100.0%
	4	Count	2	5	7
		Expected Count	2.5	4.5	7.0
		% within MEANUG	28.6%	71.4%	100.0%
	4	Count	0	4	4
		Expected Count	1.4	2.6	4.0
		% within MEANUG	.0%	100.0%	100.0%
	5	Count	3	4	7
		Expected Count	2.5	4.5	7.0
		% within MEANUG	42.9%	57.1%	100.0%
	5	Count	2	4	6
		Expected Count	2.1	3.9	6.0
		% within MEANUG	33.3%	66.7%	100.0%

Crosstab

			Adopters and Laggards		Total
			Laggards	Adopters	
MEANUG	5	Count	0	3	3
		Expected Count	1.1	1.9	3.0
		% within MEANUG	.0%	100.0%	100.0%
	6	Count	3	1	4
		Expected Count	1.4	2.6	4.0
		% within MEANUG	75.0%	25.0%	100.0%
	6	Count	2	3	5
		Expected Count	1.8	3.2	5.0
		% within MEANUG	40.0%	60.0%	100.0%
	6	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within MEANUG	.0%	100.0%	100.0%
	7	Count	1	1	2
		Expected Count	.7	1.3	2.0
		% within MEANUG	50.0%	50.0%	100.0%
	7	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within MEANUG	.0%	100.0%	100.0%
	8	Count	2	0	2
		Expected Count	.7	1.3	2.0
		% within MEANUG	100.0%	.0%	100.0%
	10	Count	1	0	1
		Expected Count	.4	.6	1.0
		% within MEANUG	100.0%	.0%	100.0%
	10	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within MEANUG	.0%	100.0%	100.0%
	13	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within MEANUG	.0%	100.0%	100.0%
	19	Count	0	1	1
		Expected Count	.4	.6	1.0
		% within MEANUG	.0%	100.0%	100.0%
Total		Count	34	63	97
		Expected Count	34.0	63.0	97.0
		% within MEANUG	35.1%	64.9%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	27.801[a]	23	.223
Likelihood Ratio	34.812	23	.054
Linear-by-Linear Association	.013	1	.909
N of Valid Cases	97		

a. 44 cells (91.7%) have expected count less than 5. The minimum expected count is .35.

MEANGRAD * Adopters and Laggards

Crosstab

			Adopters and Laggards		
			Laggards	Adopters	Total
MEANGRAD	1	Count	7	15	22
		Expected Count	6.8	15.2	22.0
		% within MEANGRAD	31.8%	68.2%	100.0%
	1	Count	1	1	2
		Expected Count	.6	1.4	2.0
		% within MEANGRAD	50.0%	50.0%	100.0%
	2	Count	1	4	5
		Expected Count	1.5	3.5	5.0
		% within MEANGRAD	20.0%	80.0%	100.0%
	2	Count	4	10	14
		Expected Count	4.3	9.7	14.0
		% within MEANGRAD	28.6%	71.4%	100.0%
	2	Count	1	2	3
		Expected Count	.9	2.1	3.0
		% within MEANGRAD	33.3%	66.7%	100.0%
	3	Count	0	3	3
		Expected Count	.9	2.1	3.0
		% within MEANGRAD	.0%	100.0%	100.0%
	3	Count	2	1	3
		Expected Count	.9	2.1	3.0
		% within MEANGRAD	66.7%	33.3%	100.0%
	3	Count	2	0	2
		Expected Count	.6	1.4	2.0
		% within MEANGRAD	100.0%	.0%	100.0%
	4	Count	1	0	1
		Expected Count	.3	.7	1.0
		% within MEANGRAD	100.0%	.0%	100.0%
	4	Count	0	3	3
		Expected Count	.9	2.1	3.0
		% within MEANGRAD	.0%	100.0%	100.0%
	4	Count	0	1	1
		Expected Count	.3	.7	1.0
		% within MEANGRAD	.0%	100.0%	100.0%

Crosstab

			Adopters and Laggards		Total
			Laggards	Adopters	
MEANGRAD	5	Count	0	1	1
		Expected Count	.3	.7	1.0
		% within MEANGRAD	.0%	100.0%	100.0%
	5	Count	1	1	2
		Expected Count	.6	1.4	2.0
		% within MEANGRAD	50.0%	50.0%	100.0%
	6	Count	0	1	1
		Expected Count	.3	.7	1.0
		% within MEANGRAD	.0%	100.0%	100.0%
	6	Count	0	1	1
		Expected Count	.3	.7	1.0
		% within MEANGRAD	.0%	100.0%	100.0%
	7	Count	0	1	1
		Expected Count	.3	.7	1.0
		% within MEANGRAD	.0%	100.0%	100.0%
Total		Count	20	45	65
		Expected Count	20.0	45.0	65.0
		% within MEANGRAD	30.8%	69.2%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.473[a]	15	.490
Likelihood Ratio	17.781	15	.274
Linear-by-Linear Association	.329	1	.566
N of Valid Cases	65		

a. 29 cells (90.6%) have expected count less than 5. The minimum expected count is .31.

APPENDIX Q

Crosstab of Faculty Respondents by Gender

Crosstab of Faculty Respondents by Gender

GENDER * Adopters and Laggards Crosstabulation

			Adopters and Laggards		
			Laggards	Adopters	Total
GENDER	Male	Count	44	59	103
		Expected Count	42.3	60.7	103.0
		% within GENDER	42.7%	57.3%	100.0%
	Female	Count	16	27	43
		Expected Count	17.7	25.3	43.0
		% within GENDER	37.2%	62.8%	100.0%
Total		Count	60	86	146
		Expected Count	60.0	86.0	146.0
		% within GENDER	41.1%	58.9%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.380[b]	1	.537		
Continuity Correction[a]	.187	1	.666		
Likelihood Ratio	.383	1	.536		
Fisher's Exact Test				.584	.334
Linear-by-Linear Association	.378	1	.539		
N of Valid Cases	146				

a. Computed only for a 2x2 table

b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 17.67.

APPENDIX R

Crosstab of Faculty Respondents by Age Without Collapsing Data

Crosstab of Faculty Respondents by Age Without Collapsing Data

AGE * Adopters and Laggards Crosstabulation

			Adopters and Laggards		
			Laggards	Adopters	Total
AGE	<25-29	Count	2	0	2
		Expected Count	.8	1.2	2.0
		% within AGE	100.0%	.0%	100.0%
	30-39	Count	15	14	29
		Expected Count	11.7	17.3	29.0
		% within AGE	51.7%	48.3%	100.0%
	40-49	Count	12	34	46
		Expected Count	18.6	27.4	46.0
		% within AGE	26.1%	73.9%	100.0%
	50-59	Count	21	29	50
		Expected Count	20.2	29.8	50.0
		% within AGE	42.0%	58.0%	100.0%
	60-69	Count	9	10	19
		Expected Count	7.7	11.3	19.0
		% within AGE	47.4%	52.6%	100.0%
Total		Count	59	87	146
		Expected Count	59.0	87.0	146.0
		% within AGE	40.4%	59.6%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.844[a]	4	.065
Likelihood Ratio	9.707	4	.046
Linear-by-Linear Association	.144	1	.705
N of Valid Cases	146		

a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is .81.

APPENDIX S

Crosstab of Faculty Respondents by Age With Collapsed Data

Crosstab of Faculty Respondents by Age With Collapsed Data

AGE * Adopters and Laggards Crosstabulation

			Adopters and Laggards		Total
			Laggards	Adopters	
AGE	30-39	Count	17	14	31
		Expected Count	12.5	18.5	31.0
		% within AGE	54.8%	45.2%	100.0%
	40-49	Count	12	34	46
		Expected Count	18.6	27.4	46.0
		% within AGE	26.1%	73.9%	100.0%
	50-59	Count	21	29	50
		Expected Count	20.2	29.8	50.0
		% within AGE	42.0%	58.0%	100.0%
	60-69	Count	9	10	19
		Expected Count	7.7	11.3	19.0
		% within AGE	47.4%	52.6%	100.0%
Total		Count	59	87	146
		Expected Count	59.0	87.0	146.0
		% within AGE	40.4%	59.6%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.034[a]	3	.071
Likelihood Ratio	7.190	3	.066
Linear-by-Linear Association	.033	1	.856
N of Valid Cases	146		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.68.

APPENDIX T

Crosstab of Faculty Respondents by Organizational Factors

Crosstab of Faculty Respondents by Organizational Factors

POLICY * Adopters and Laggards

Crosstab

			Adopters and Laggards		
			Laggards	Adopters	Total
POLICY	Yes	Count	8	28	36
		Expected Count	14.6	21.4	36.0
		% within POLICY	22.2%	77.8%	100.0%
	No	Count	36	46	82
		Expected Count	33.2	48.8	82.0
		% within POLICY	43.9%	56.1%	100.0%
	Don't Know	Count	16	14	30
		Expected Count	12.2	17.8	30.0
		% within POLICY	53.3%	46.7%	100.0%
Total		Count	60	88	148
		Expected Count	60.0	88.0	148.0
		% within POLICY	40.5%	59.5%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.433[a]	2	.024
Likelihood Ratio	7.794	2	.020
Linear-by-Linear Association	6.820	1	.009
N of Valid Cases	148		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.16.

INCENTIV * Adopters and Laggards

Crosstab

			Adopters and Laggards		Total
			Laggards	Adopters	
INCENTIV	Yes	Count	11	20	31
		Expected Count	12.4	18.6	31.0
		% within INCENTIV	35.5%	64.5%	100.0%
	No	Count	38	59	97
		Expected Count	38.9	58.1	97.0
		% within INCENTIV	39.2%	60.8%	100.0%
	Don't Know	Count	10	9	19
		Expected Count	7.6	11.4	19.0
		% within INCENTIV	52.6%	47.4%	100.0%
Total		Count	59	88	147
		Expected Count	59.0	88.0	147.0
		% within INCENTIV	40.1%	59.9%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.551[a]	2	.460
Likelihood Ratio	1.527	2	.466
Linear-by-Linear Association	1.228	1	.268
N of Valid Cases	147		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.63.

TECHCTR * Adopters and Laggards

Crosstab

			Adopters and Laggards		
			Laggards	Adopters	Total
TECHCTR	Yes	Count	33	54	87
		Expected Count	35.3	51.7	87.0
		% within TECHCTR	37.9%	62.1%	100.0%
	No	Count	18	28	46
		Expected Count	18.6	27.4	46.0
		% within TECHCTR	39.1%	60.9%	100.0%
	Don't Know	Count	9	6	15
		Expected Count	6.1	8.9	15.0
		% within TECHCTR	60.0%	40.0%	100.0%
Total		Count	60	88	148
		Expected Count	60.0	88.0	148.0
		% within TECHCTR	40.5%	59.5%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.640[a]	2	.267
Likelihood Ratio	2.585	2	.275
Linear-by-Linear Association	1.657	1	.198
N of Valid Cases	148		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.08.

STAFFDEV * Adopters and Laggards

Crosstab

			Adopters and Laggards		
			Laggards	Adopters	Total
STAFFDEV	Yes	Count	29	56	85
		Expected Count	34.5	50.5	85.0
		% within STAFFDEV	34.1%	65.9%	100.0%
	No	Count	19	22	41
		Expected Count	16.6	24.4	41.0
		% within STAFFDEV	46.3%	53.7%	100.0%
	Don't Know	Count	12	10	22
		Expected Count	8.9	13.1	22.0
		% within STAFFDEV	54.5%	45.5%	100.0%
Total		Count	60	88	148
		Expected Count	60.0	88.0	148.0
		% within STAFFDEV	40.5%	59.5%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.817[a]	2	.148
Likelihood Ratio	3.799	2	.150
Linear-by-Linear Association	3.748	1	.053
N of Valid Cases	148		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.92.

APPENDIX U

Crosstab of Faculty Respondents by Funding Source for Computers

Crosstab of Faculty Respondents by FundingSource for Computers

DEANSOFF * Adopters and Laggards

Crosstab

			Adopters and Laggards		
			Laggards	Adopters	Total
DEANSOFF	1	Count	20	37	57
		Expected Count	20.0	37.0	57.0
		% within DEANSOFF	35.1%	64.9%	100.0%
Total		Count	20	37	57
		Expected Count	20.0	37.0	57.0
		% within DEANSOFF	35.1%	64.9%	100.0%

Chi-Square Tests

	Value
Pearson Chi-Square	.[a]
N of Valid Cases	57

a. No statistics are computed because DEANSOFF is a constant.

DEPTBUD * Adopters and Laggards

Crosstab

			Adopters and Laggards		
			Laggards	Adopters	Total
DEPTBUD	1	Count	37	54	91
		Expected Count	37.0	54.0	91.0
		% within DEPTBUD	40.7%	59.3%	100.0%
Total		Count	37	54	91
		Expected Count	37.0	54.0	91.0
		% within DEPTBUD	40.7%	59.3%	100.0%

Chi-Square Tests

	Value
Pearson Chi-Square	.[a]
N of Valid Cases	91

a. No statistics are computed because DEPTBUD is a constant.

STUDTECH * Adopters and Laggards

Crosstab

			Adopters and Laggards		
			Laggards	Adopters	Total
STUDTECH	1	Count	22	50	72
		Expected Count	22.0	50.0	72.0
		% within STUDTECH	30.6%	69.4%	100.0%
Total		Count	22	50	72
		Expected Count	22.0	50.0	72.0
		% within STUDTECH	30.6%	69.4%	100.0%

Chi-Square Tests

	Value
Pearson Chi-Square	.[a]
N of Valid Cases	72

a. No statistics are computed because STUDTECH is a constant.

GRANTS20 * Adopters and Laggards

Crosstab

			Adopters and Laggards		
			Laggards	Adopters	Total
GRANTS20	1	Count	17	29	46
		Expected Count	17.0	29.0	46.0
		% within GRANTS20	37.0%	63.0%	100.0%
Total		Count	17	29	46
		Expected Count	17.0	29.0	46.0
		% within GRANTS20	37.0%	63.0%	100.0%

Chi-Square Tests

	Value
Pearson Chi-Square	.[a]
N of Valid Cases	46

a. No statistics are computed because GRANTS20 is a constant.

OTHER20 * Adopters and Laggards

Crosstab

			Adopters and Laggards		
			Laggards	Adopters	Total
OTHER20	1	Count	4	6	10
		Expected Count	4.0	6.0	10.0
		% within OTHER20	40.0%	60.0%	100.0%
Total		Count	4	6	10
		Expected Count	4.0	6.0	10.0
		% within OTHER20	40.0%	60.0%	100.0%

Chi-Square Tests

	Value
Pearson Chi-Square	.[a]
N of Valid Cases	10

a. No statistics are computed because OTHER20 is a constant.

attitude to the process of adopting computer-based instruction significantly influenced computer adoption in university instruction.

10. What combination of demographic, institutional and attitudes and belief factors pertaining to computer usage will help faculty overcome resistance and facilitate faculty adoption of computer-based instruction?

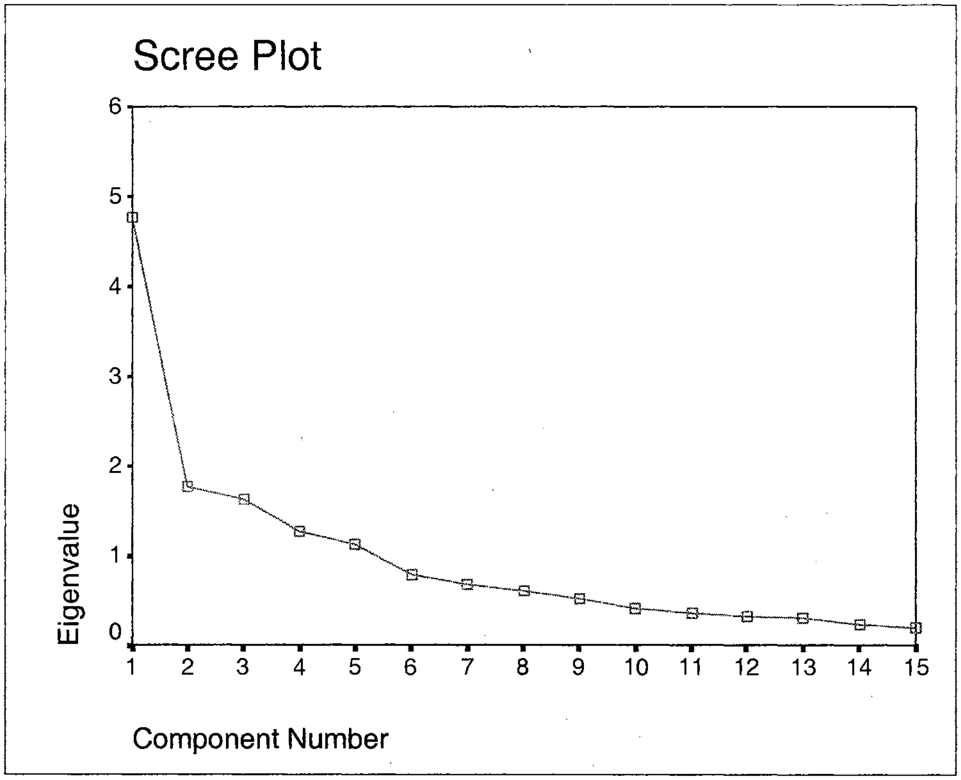
From all the above tested hypotheses, it might be concluded that academic college of the faculty, computer efficacy, utility beliefs and attitudes to computer-based instruction will help overcome faculty resistance and facilitate adoption of computers into instruction. However, other variables of rank, discipline, gender, age, and organizational support factors of institutional policy, faculty incentives, technical assistance and staff development programs did not have any significant effect on the adoption of computers for instruction. Thus attitudinal factors differ significantly among adopters and laggards of computer-based instruction.

Conclusions

In an attempt to analyze selected variables that determine adoption of computer-based instruction among faculty at Oklahoma State University, the study involved the use of adoption status of computer usage among the faculty. The independent variables utilized in the study were college, discipline, academic rank, years of service in higher education, years of service at the university, research and teaching involvement of the faculties, gender, age, organizational support factors and faculty's attitudes and beliefs with reference to adoption of computers for instructional purposes.

Faculty were grouped into an adopter status or laggard status based on the score faculty obtained on the following three items (Item # 9, 10, and 11) on the modified

Figure 11. Scree Test of Travel Inhibitors



The five factors represented 70.32% of the total variance explained. These five factors are "safety/security and lack of attractions," "environment," "travel barrier," "dissatisfaction, deterioration," and "lack of novelty seeking." The five factors are reported in Table 23.

Table 23: The Dimensions of the Travel Inhibitors

Attributes	Factor Loadings					CM*
Factor 1: Safety/Security and Lack of Attractions	**F1**					
Threats Of Aids	0.87					0.80
Prostitution	0.85					0.76
Crime	0.75					0.66
Lack Of New Attractions In Thailand	0.54					0.41
Factor 2: Environment		**F2**				
Pollution		0.85				0.77
Traffic		0.83				0.75
Crowding In Major Tourist Places In Thailand		0.63				0.63
Factor 3:Travel Barrier			**F3**			
Long Distance And Long Travel Time For The Entire Trip			0.77			0.62
Increase Of Costs(Air, Fare, Hotels)			0.76			0.63
Unfamiliar Types Of Food			0.62			0.68
Language Barriers			0.47			0.52
Factor 4: Dissatisfaction, Deterioration				**F4**		
I Am Dissatisfied With A Previous Trip To Thailand				0.83		0.75
Deterioration Of Tourist Attractions In Thailand				0.82		0.78
Factor 5: Lack Of Novelty Seeking					**F5**	
I Want To Visit Other Places Than Thailand					0.93	0.89
I Want To Discover Unknown Experience In Other Countries					0.93	0.89
Eigenvalue	4.77	1.77	1.62	1.28	1.12	
Variance (%)	31.78	11.8	10.8	8.50	7.47	
Cumulative Variance (%)	31.78	43.6	54.4	62.86	70.32	
Cronbach's Alpha/Pearson Correlation	0.82	0.78	0.70	0.61**	0.79**	
Number of Items (E=15)	4	3	4	2	2	

Note: *Communality, Bartlett test of Sphericity = 2926.874 (sig. =0.000), Measure of Sampling Adequacy = .786. ** Pearson correlation ($p \leq 0.01$).

Factor one was named "safety/security and lack of attractions." It represented 31.78% of the total variance explained with an eigenvalue of 4.77 and an alpha coefficient of 0.82. This factor included four attributes: "threats of AIDS," "prostitution," "crime," and "lack of attractions."

Factor two was labeled "environment." It accounted for 11.8% of the total variance with an eigenvalue of 1.77 and an alpha coefficient of 0.78. It included three attributes: "pollution," "traffic," and "crowding."

Factor three was named "travel barrier." It explained 10.8% of the total variance with an eigenvalue of 1.62 and an alpha coefficient of 0.70. Four attributes fall in this factor. They are "long distance and long travel time for the entire trip," "increase of costs (air, fare, hotels)," "unfamiliar types of food," and "language barriers."

Factor four was labeled "dissatisfaction and deterioration." It has two attributes: "I am dissatisfied with a previous trip to Thailand," and "deterioration of tourist attractions in Thailand." It accounted for 8.5 of the total variance with an eigenvalue of 1.28 and a Pearson correlation of 0.61.

Factor five was labeled " lack of novelty seeking." It includes two attributes. They are "I want to visit other places than Thailand," and "I want to discover unknown experience in other countries." It represented 7.47% of the total variance explained with an eigenvalue of 1.12 and a Pearson correlation of 0.79.

These five travel inhibitors were used to construct summated scale scores as independent variables in Analysis of Variances and Logistic Regression.

Image Differences by Demographics

One way Analysis of Variances (ANOVA) was used to determine whether there was a significant mean difference in the perceived image of Thailand across travelers with different demographic profiles. The dependent variable is each of the image dimensions including "social and environmental problems," "safe travel destination," "adventurous activities and scenic natural beauty activities," "rich culture," "good value cuisine and hotels," "easy access tourist destination," and "good shopping." The independent variable is each of the demographic profile including gender, marital status, age, education, occupation, and country of residence. In order to assess where were the significant differences, Bonferroni post hoc test was employed. The result of the ANOVA test was reported in Table 24.

Table 24: Image Differences by Demographics

Demographic Profile	The Dimensions of Image of Thailand						
	Social & Environmental Problems	**Safe Travel Destination**	**Adventurous Activities & Scenic Natural Beauty Activities**	**Rich Culture**	**Good Value Cuisine & Hotels**	**Easy Access Tourist Destination**	**Good Shopping**
Gender							
Male	3.51	3.43	3.68	3.93	3.78	3.62	3.46
Female	3.44	3.31	3.65	3.94	3.81	3.67	3.46
F value	0.84	2.87	0.12	0.04	0.23	0.88	0.00
Degree of freedoms	1, 508	1, 508	1, 508	1, 508	1, 508	1, 508	1, 508
P value	0.36	0.09	0.73	0.84	0.63	0.35	0.98
Marital Status							
Single	3.44	3.23	3.74	3.94	3.72	3.62	3.46
Married	3.50	3.51	3.58	3.94	3.87	3.67	3.46
F Value	0.62	17.24	5.73	0.01	6.04	0.46	0.00
Degree of freedoms	1, 508	1, 508	1, 508	1, 508	1, 508	1, 508	1, 508
P value	0.43	**0.00**	**0.02**	0.92	**0.01**	0.50	0.99
Age							
Group 1: Less than 20 years old	3.50	3.49	3.89	3.76	3.62	3.62	4.07
Group 2: 20-39 years old	3.47	3.27	3.71	3.91	3.74	3.61	3.41
Group 3: 40-59 years old	3.44	3.51	3.63	4.04	3.92	3.69	3.44
Group 4: 60 years old or older	3.57	3.51	3.29	3.95	3.92	3.74	3.42
F Value	0.26	3.82	5.21	1.74	3.18	0.71	5.39
Degree of freedoms	3, 505	3, 505	3, 505	3, 505	3, 505	3, 505	3, 505
P value	0.86	**0.01**	**0.00**	0.16	**0.02**	0.55	**0.00**
Post Hoc test (Bonferroni)	-	**2<3 (p ≤ 0.02) 2<4 (p ≤ 0.05)**	**1>4 (p ≤ 0.00), 2>4 (p. ≤ 0.00), 3>4 (p≤ 0.05)**		**2<3 (p. ≤ 0.09) 2<4 p. ≤ 0.10)**		**1>2 (p≤ 0.00); 1>3 (p≤ 0.00), 1>4(p≤ 0.01).**
Occupation							
Group 1: White Collar	3.48	3.34	3.68	3.95	3.78	3.63	3.39
Group 2: Blue Collar	3.37	3.67	3.54	3.89	3.73	3.82	3.43
Group 3: Not in Workforce	3.54	3.44	3.67	3.97	3.84	3.67	3.63
Group 4: Other	3.20	3.12	3.66	3.79	3.74	3.51	3.49
F Value	1.64	3.06	0.30	0.66	0.33	1.07	2.15
Degree of freedoms	3, 506	3, 506	3, 506	3, 506	3, 506	3, 506	3, 506
P value	0.18	0.052	0.82	0.58	0.80	0.36	0.09

Table 24: Image Differences by Demographics (Continued)

Demographic Profiles	The Dimensions of Image of Thailand						
	Social & Environmental Problems	**Safe Travel Destination**	**Adventurous Activities & Scenic Natural Beauty Activities**	**Rich Culture**	**Good Value Cuisine & Hotels**	**Easy Access Tourist Destination**	**Good Shopping**
Education							
Group 1: Primary/below	3.50	3.53	3.77	3.69	3.63	3.43	3.78
Group 2: Secondary/High School	3.38	3.39	3.58	3.86	3.69	3.63	3.53
Group 3: College/University	3.46	3.30	3.69	3.99	3.79	3.67	3.34
Group 4: Graduate/ Post Graduate	3.63	3.44	3.73	4.02	4.00	3.67	3.56
F Value	1.62	0.98	1.09	2.07	3.21	0.90	2.22
Degree of freedoms	4, 501	4, 501	4, 501	4, 501	4, 501	4, 501	4, 501
P value	0.17	0.42	0.36	0.08	**0.01**	0.47	0.07
Post Hoc test (Bonferroni)					**1<4 (p≤ 0.10 2<4 (p≤ 0.09)**		
Country of Residence							
Group 1: Asia	3.37	3.30	3.64	3.84	3.65	3.59	3.33
Group 2: Europe	3.94	3.43	3.86	4.23	4.17	3.78	3.75
Group 3: North America	3.97	3.55	3.74	4.29	4.32	3.94	3.87
Group 4: Oceania	3.82	3.26	3.63	4.11	3.95	3.74	3.69
Group 5: Other	3.28	3.68	3.62	4.00	3.95	3.67	3.66
F Value	9.94	3.57	1.18	6.60	13.30	2.31	5.33
Degree of freedoms	4,505	4,505	4,505	4,505	4,505	4,505	4,505
P value	**0.00**	**0.01**	0.32	**0.00**	**0.00**	0.06	**0.00**
Post Hoc test (Bonferroni)	**1<2 (p ≤ 0.00), 1<3 (p. ≤0.00), 1<4 (p ≤ 0.05)** 5<2 (p ≤ 0.15), 5<3 (p. ≤0.21), 5<4 (p ≤ 0.12)	**1<5 (p. ≤ 006)** 4<5 (p. ≤ 0.20)		**1<2 (p ≤ 0.00), 1<3 (p ≤ 0.01)**	**1<2 (p ≤ 0.00), 1<3 (p ≤ 0.00), 1< 4, (p ≤ 0.02) 1<5 (p ≤ 0.01)**		**1<2 (p ≤ 0.02), 1<3 (p ≤ 0.05)**

The ANOVA test showed that there was a significant difference in the perception of the image of Thailand as "safe travel destination" ($F = 17.24$, $p \leq 0.001$). Married travelers had a higher perception than single travelers. Moreover, married travelers had higher perception than single travelers towards the image of Thailand as "good value cuisine and hotels." However, single travelers had a stronger perception towards the image of Thailand as "adventurous activities and scenic natural beauty activities' than married travelers.

In terms of age groups, there was a significant difference in the perception of the image of Thailand as a "safe travel destination" ($F = 3.82$, $p \leq 0.01$). Travelers, who were in the age of 40-59 years old (group 3), and 60 years old and older (group 4), had a higher positive perception in this image than those who were in the age of 20-39 years old (group 2). Moreover, a significant difference was found in the image of "adventurous activities and scenic natural beauty activities" ($F = 5.21$, $p \leq 0.00$). Travelers, who were less than 20 years old (group 1), had a higher positive perception of this image than those who were in the age of 60 years old or older (group 4). Likewise, those who were in the age of 20-39 years old (group 2) had a higher perception in this image than those who were in the age of 60 years old and older. Also, those who were in the age of 40-59 years old had a higher perception in this image than those who were in the age of 60 years old and older. Moreover, a significant difference was found in the image of Thailand as "good value cuisine and hotels." Those who were in the age of 20-39 years old (group 2) had a higher perception in this image than those who were in the age of 40-59 years old (group 3) and those who were in the age of 60 years old and older. In addition, those who were less than 20 years old had higher perception towards the image of "good shopping" than those who were in the age of 20-39 years old. Likewise, the youngest age group had higher perception than those who were in the age of 40-59 years old (group 3) and those who were 60 year old and older (group 4).

Also, there was a significant difference in the image of Thailand as "good value cuisine and hotels" between travelers with different level of education. Those who had low education (primary/below and secondary/high school) degree had a lower perception in this image than those who had high level of education (graduate/post graduate degree).

Furthermore, travelers from different regions had different perceptions towards the image of "social and environmental problems" ($F = 9.94$, $p \leq 0.001$). Asians had a lower negative perception in this image than those from Europe, North America, and Oceania (Australia and New Zealand). Also, a significant difference was found in the image of "safe travel destination" between Asians and travelers from other regions. Asians had lower perception in this image than those from other regions. Likewise, there was a significant difference in the perception of the image of Thailand as "rich culture" among Asians, Europeans, and North Americans. Asians had lower perception in this image than Europeans and North Americans. Moreover, travelers from different regions had different perception in the image of Thailand as "good value cuisine and hotels" ($F = 13.30$, $p \leq 0.0001$). The Bonferroni test indicated that Asians had a lower positive perception in this image than Europeans, North Americans, Oceania, and travelers from other countries. In addition, Asians had lower perception in the image of "good shopping" than Europeans and North Americans.

Travel Satisfaction Differences by Demographics

The one way Analysis of Variance (ANOVA) was also used to test whether international travelers with different demographic profiles have different level of travel satisfaction. The dependent variable is each of the travel satisfaction dimensions including "quality, service, and value of lodging and restaurant," "quality, service, and value of shopping and tourist attractions," "quality, service, and value of transportation," "quality, service, and value of foods, "and "environment and safety." The independent variable is each of the demographic profiles including gender, marital status, age, occupation, education, and country of residence. The result was reported in Table 25.

Table 25: Travel Satisfaction Differences by Demographics

Demographic Profile	The Dimensions of Travel satisfaction				
	Lodging & Restaurants Satisfaction	**Shopping & Tourist Attractions**	**Transportation**	**Foods**	**Environment & Safety**
Gender					
Male	3.73	3.69	3.50	3.73	3.44
Female	3.68	3.60	3.41	3.75	3.27
F value	.732	3.080	2.056	.071	6.942
Degree of freedoms	1, 504	1, 497	1, 503	1, 500	1, 503
P value	.393	.080	.152	.790	**.009**
Marital Status					
Single	3.63	3.57	3.37	3.76	3.24
Married	3.78	3.73	3.55	3.72	3.48
F Value	7.003	8.361	8.621	.278	14.204
Degree of freedoms	1, 504	1, 497	1, 503	1, 500	1, 503
P value	**.008**	**.004**	**.003**	.599	**.000**
Age					
Group 1: Less than 20 years old	3.74	3.81	3.55	3.67	3.49
Group 2: 20-39 years old	3.65	3.60	3.42	3.73	3.27
Group 3: 40-59 years old	3.77	3.69	3.45	3.77	3.43
Group 4: 60 years old	3.87	3.72	3.63	3.78	3.58
F Value	.098	1.960	1.424	.186	3.605
Degree of freedoms	3, 502	3, 495	3, 501	3, 498	3, 501
P value	2.114	.119	.235	.906	**.013**
Post Hoc test (Bonferroni)					**4>2 (p≤.05)**
Occupation					
Group 1: White Collar	3.70	3.65	3.43	3.71	3.36
Group 2: Blue Collar	3.66	3.67	3.53	3.81	3.45
Group 3: Not in Workforce	3.70	3.62	3.52	3.79	3.35
Group 4: Other	3.81	3.73	3.39	3.81	3.28
F Value	.330	.369	.868	.525	.285
Degree of freedoms	3, 502	3, 495	3, 501	3, 498	3, 501
P value	.803	.775	.457	.665	.836
Education					
Group 1: Primary/below	3.64	3.64	3.53	3.54	3.68
Group 2: Secondary/High School	3.64	3.61	3.45	3.59	3.32
Group 3: College/University	3.68	3.60	3.40	3.76	3.26
Group 4: Graduate/ Post Graduate	3.87	3.82	3.59	3.99	3.52
F Value	2.217	2.811	1.455	4.049	3.873
Degree of freedoms	4, 497	4, 490	4, 496	4, 493	4, 496
P value	.066	**.025**	.215	**.003**	**.004**
Post Hoc test (Bonferroni)		**4>3(p≤.023)**		**4>2(p≤ .00)** 4>1(p≤ 0. 15)	**1>3 (p≤.032) 4>3 (p≤.028).**

Table 25: Travel Satisfaction Differences by Demographics (Continued)

Demographic Profiles	The Dimensions of Travel Satisfaction				
	Lodging & Restaurants Satisfaction	**Shopping & Tourist Attractions**	**Transportation**	**Foods**	**Environment & Safety**
Country of Residence					
Group 1: Asia	3.58	3.53	3.35	3.56	3.26
Group 2: Europe	4.03	3.89	3.69	4.22	3.62
Group 3: North America	4.26	4.13	3.95	4.33	3.70
Group 4: Oceania	3.86	3.81	3.61	3.85	3.33
Group 5: Other	3.81	3.80	3.56	4.07	3.54
F Value	12.435	12.083	7.933	17.41	6.047
Degree of freedoms	4, 501	4, 494	4, 500	4, 497	4, 500
P value	**.000**	**.000**	**.000**	**.000**	**.000**
Post Hoc test (Bonferroni)	**1< 2 (p≤.000)** **1< 3(p≤.000)** **3>5(p≤..028)**	**1<2(p ≤.000)** **1<3(p≤.000)** **1<5(p≤..009)**	**1<2(p≤.001)** **1<3(p≤.000)**	**1<2(p≤.000)** **1<3(p≤.000)** **1<5(p≤.000)**	**1<2(p≤.005)** **1<3(p≤..023)** **1<5(p≤.048)**

The ANOVA test showed that there was a significant difference in the travel satisfaction on "environment and safety" between male and female travelers ($F = 6.942$, $p \leq 0.009$).

Furthermore, single and married travelers had significant different level of travel satisfaction on "quality, service, and value of lodging and restaurant," "quality, service, and value of shopping and tourist attractions," "quality, service, and value of transportation," and "environment and safety" at the significance level of $p \leq 0.01$. Married travelers were more satisfied than single travelers.

Regarding the travelers' age groups, there was a significant difference in the travel satisfaction on "environment and safety" among travelers with different age groups ($F = 3.605$, $p \leq 0.013$). Travelers who were 60 years old and older (group 4) had a higher satisfaction on "environment and safety" than those who were in the age of 20-39 years old (group 2).

As for the education, there was also a significant difference in the travel satisfaction on "shopping and tourist attraction" ($F = 2.811$, $p \leq 0.025$). Travelers with graduate and postgraduate degree (group 4) had a higher satisfaction on "shopping and tourist attraction" than those with college and university degree (group 3). Moreover, there was a significant difference in travel satisfaction on "foods" among travelers with different level of education ($F = 4.049$, $p \leq 0.003$). Travelers with graduate or postgraduate degree (group 4) were more satisfied with "foods" than those with secondary/high school degree (group 2). In addition, travelers with different level of education had different level of satisfaction on "environment and safety" ($F = 3.873$, $p \leq 0.004$). Travelers with primary school degree/below had a higher satisfaction than those with college/university degree (group 3). Also, those with graduate/postgraduate degree (group 4) had a higher satisfaction on "environment and safety" than those with college/university degree (group 3).

As for the countries of residence, the ANOVA test showed that there was a significant difference in all of the travel satisfaction across travelers from different regions. First, a significant difference in the travel satisfaction on "quality, service, and value of lodging and restaurant" was found (F = 12.435, $p \leq 0.000$). Asians were less satisfied than Europeans, North Americans, whereas travelers from North America were more satisfied than those from other regions. Second, travelers from different regions had different level of satisfaction on "quality, service, and value of shopping and tourist attractions" (F = 12.083, $p \leq 0.000$). Again, Asian travelers were less satisfied than Europeans, North Americans, and travelers from other regions. Third, a significant difference was found in the travelers' satisfaction on "quality, service, and value of transportation" (F = 7.933, $p \leq 0.000$). Asian travelers were less satisfied than Europeans and North Americans. Fourth, travelers from different regions had different level of satisfaction on "quality, service, and value of foods" (F = 17.409, $p \leq 0.000$). Again, Asians were less satisfied than Europeans, North Americans, and travelers from other regions. Finally, there was a significant difference in travel satisfaction on "environment and safety" among travelers from different countries of residence (F = 6.047, p ≤ 0.000). Asian travelers were less satisfied than Europeans, North Americans, and travelers from other regions.

Travel Motivation Differences by Demographics

The one way Analysis of Variance (ANOVA) was used to test whether international travelers with different demographic profiles have different travel motivations. The dependent variable is each of travel motivation dimensions including "special interests," "novelty seeking," "good value food, shopping, a variety of things to do," "deals on tour promotion and currency exchange," "Buddhism," and " natural attractions." The independent variable is each of the demographic profiles including gender, marital status, age, occupation, education, and country of residence (see Table 26).

Table 26: Travel Motivation Differences by Demographics

Demographic Profiles	The Dimensions of Travel Motivation					
	Special Interests	**Novelty seeking**	**Good value food, shopping, a variety of things to do**	**Deals on tour promotion, currency exchange**	**Buddhism**	**Natural attractions**
Gender						
Male	3.06	3.80	3.71	3.55	3.56	3.63
Female	2.77	3.80	3.68	3.52	3.52	3.45
F value	14.43	0.00	0.17	0.22	0.29	5.69
Degree of freedoms	1, 508	1, 508	1, 508	1, 508	1, 508	1, 508
P value	**0.00**	0.97	0.68	0.64	0.59	**0.02**
Marital Status						
Single	2.87	3.77	3.69	3.49	3.51	3.54
Married	2.96	3.83	3.70	3.59	3.58	3.54
F Value	1.36	0.92	0.02	2.98	0.72	0.01
Degree of freedoms	1, 508	1, 508	1, 508	1, 508	1, 508	1, 508
P value	0.24	0.34	0.88	0.09	0.40	0.93
Age						
Group 1: Less than 20 years old	3.19	3.56	3.64	3.47	3.37	3.63
Group 2: 20-39 years old	2.88	3.77	3.70	3.51	3.51	3.50
Group 3: 40-59 years old	2.96	3.88	3.74	3.57	3.64	3.65
Group 4: 60 years old	2.78	3.95	3.56	3.68	3.57	3.47
F Value	1.87	2.78	1.02	1.03	1.09	1.34
Degree of freedoms	3, 505	3, 505	3, 505	3, 505	3, 505	3, 505
P value	0.13	0.06	0.38	0.38	0.35	0.26
Occupation						
Group 1: White Collar	2.92	3.81	3.70	3.56	3.52	3.54
Group 2: Blue Collar	3.00	3.77	3.64	3.61	3.70	3.79
Group 3: Not in Workforce	2.95	3.77	3.68	3.48	3.53	3.53
Group 4: Other	2.66	3.82	3.71	3.50	3.64	3.41
F Value	1.21	0.17	0.12	0.53	0.48	1.12
Degree of freedoms	3, 506	3, 506	3, 506	3, 506	3, 506	3, 506
P value	0.31	0.92	0.95	0.66	0.70	0.34

Table 26: Travel Motivation Differences by Demographics (Continued)

Demographic Profiles	The Dimensions of Travel Motivation					
	Special Interests	**Novelty seeking**	**Good value food, shopping, a variety of things to do**	**Deals on tour promotion, currency exchange**	**Buddhism**	**Natural attractions**
Education						
Group 1: Primary/below	2.98	3.61	3.50	3.71	3.34	3.50
Group 2: Secondary/High School	3.01	3.69	3.60	3.58	3.54	3.55
Group 3: College/University	2.88	3.84	3.69	3.54	3.61	3.54
Group 4: Graduate/ Post Graduate	2.82	3.95	3.89	3.41	3.46	3.55
F Value	1.01	2.75	3.83	1.51	0.91	0.03
Degree of freedoms	4, 501	4, 501	4, 501	4, 501	4, 501	4, 501
P value	0.40	**0.03**	**0.00**	0.20	0.46	1.00
Post Hoc test (Bonferroni)		**2<4(p≤0.05)** 1<4 (p≤0.14)	**1<4 (p ≤0.04), 2<4 (p ≤ 0.00)**			
Country of Residence						
Group 1: Asia	3.02	3.67	3.61	3.55	3.57	3.42
Group 2: Europe	2.77	4.17	3.95	3.48	3.56	4.16
Group 3: North America	2.69	4.38	4.15	4.01	3.31	3.48
Group 4: Oceania	2.49	3.93	3.66	3.28	3.31	3.64
Group 5: Other	2.72	3.90	3.76	3.42	3.59	3.67
F Value	4.79	12.56	7.47	4.90	1.03	10.85
Degree of freedoms	4, 505	4, 505	4, 505	4, 505	4, 505	4, 505
P value	**0.00**	**0.00**	**0.00**	**0.00**	0.39	**0.00**
Post Hoc test (Bonferroni)	**4 <1 (p≤0.01)**	**1<2(p≤0.00), 1<3(p≤0.00) 2<3(p≤0.29)**	**1< 2(p≤0.02), 1< 3 (p≤0.00), 3 >4 (p≤0.04)** 3 > 1(p≤0.14)	**3 >1 (p≤0.01), 3>4 (p≤0.01)** 3 >2 (p≤0.15),		**2 >1 (p≤0.00), 2>3 (p≤0.00), 2 > 4 (p≤0.04)**

There was a significant difference in the motivation on "special interests" between male and female travelers (F = 14.43, $p \leq 0.005$). Women were less motivated by the "special interests" tourism than men. Moreover, the ANOVA test showed a significant difference on the "natural attractions" (F=5.69, $p \leq 0.02$). Male were more motivated than females.

As for the level of education of the respondents, there were significant differences in the "novelty seeking," (F=2.75, $p \leq 0.05$) and "good value food, shopping, a variety of things to do," (F = 3.83, $p \leq 0.001$) among travelers with different level of education. In both cases, the travelers with secondary/high school degree (group 2) were less motivated than those with graduate/post graduate degree (group 4).

Regarding the countries of residence, a significant difference was found in five out of six travel motivation dimensions. First, a significant difference was found in the travel motivation on the "special interests" (F= 4.79, $p \leq 0.001$). Travelers from Oceania were less motivated by this factor than Asians. The mean score of Asians towards this motivation is towards neutral (3.02). According to Ap (2000), Asians tended to choose "neutral" answers.

A significant difference was also found in the "novelty seeking," (F = 12.56, $p \leq 0.001$). Asians were less motivated than Europeans and North Americans. However, North Americans were more interested in this travel motivation than Europeans.

A significant difference was also found in the travel motivation on "good value cuisine, shopping, and a variety of things to do" (F = 7.47, $p \leq 0.005$). Asians were less motivated than Europeans and North Americans. North American travelers were more motivated than travelers from Oceania. In addition, there was a significant difference in the travel motivation on "deals on package tours and currency exchange" ($F=4.9$, $p \leq 0.005$). North Americans were more interested in this factor than Asians and travelers from Oceania (Australia and New Zealand).

There was also a significant difference in the travel motivation on "natural attractions" among travelers from different country of residence ($F=10.85$, $p \leq 0.005$). Europeans were more motivated by this factor than Asians, North Americans, and travelers from Oceania.

Travel Inhibitor Differences by Demographics

The one way Analysis of Variances (ANOVA) was used to determine whether there was a significant mean difference in the travel inhibitors across travelers with different demographic profiles. The dependent variable is each of the five travel inhibitor dimensions including "safety/security and lack of attractions," "environment," "travel barrier," "dissatisfaction and deterioration," and "lack of novelty seeking." The independent variable is each of the demographic profile including gender, marital status, age, education, occupation, and country of residence. The result of the ANOVA was reported in Table 27.

Table 27: <u>Travel Inhibitor Differences by Demographics</u>

Demographic Profile	**The Dimensions of Travel Inhibitors**				
	Safety/Security & Lack of Attractions	Environment	Travel Barrier	Dissatisfaction, Deterioration	Lack of Novelty Seeking
Gender					
Male	2.91	3.13	2.94	2.47	3.38
Female	2.99	3.09	2.88	2.34	3.41
F value	1.069	.278	.791	2.500	.099
Degree of freedoms	1, 500	1, 501	1, 499	1, 500	1, 502
P value	.302	.598	.374	.115	.753
Marital Status					
Single	2.99	3.18	2.94	2.41	3.49
Married	2.91	3.04	2.87	2.39	3.28
F Value	1.121	2.919	1.092	.107	4.396
Degree of freedoms	1, 500	1, 501	1, 499	1, 500	1, 502
P value	.290	.088	.297	.744	**.037**
Age					
Group 1: Less than 20 years old	3.05	3.09	3.01	2.96	3.36
Group 2: 20-39 years old	2.99	3.14	2.95	2.42	3.54
Group 3: 40-59 years old	2.92	3.05	2.80	2.28	3.11
Group 4: 60 years old & older	2.71	3.11	2.90	2.28	3.25
F Value	1.361	.328	1.261	5.880	4.613
Degree of freedoms	3, 497	3, 498	3, 496	3, 497	3, 499
P value	.254	.805	.287	**.001**	**.003**
Post Hoc test (Bonferroni)				**1>2 (p≤.005)** **1>3(p≤.001)** **1>4(p≤.002)**	**2>3(p≤.002)**
Occupation					
Group 1: White Collar	2.97	3.13	2.91	2.41	3.42
Group 2: Blue Collar	2.80	2.95	2.94	2.34	2.78
Group 3: Not in Workforce	2.98	3.10	2.95	2.37	3.38
Group 4: Other	2.77	3.13	2.75	2.51	3.64
F Value	.813	.346	.612	.279	3.345
Degree of freedoms	3, 498	3, 499	3, 497	3, 498	3, 500
P value	.487	.792	.608	.841	**.019**
Post Hoc test (Bonferroni)					**2<1(p≤0.02)** **2<4(p≤0.02)**

Table 27: Travel Inhibitor Differences by Demographics (Continued)

Demographic Profile	**The Dimensions of Travel Inhibitors**				
	Safety/Security & Lack of Attractions	**Environment**	**Travel Barrier**	**Dissatisfaction, Deterioration**	**Lack of Novelty Seeking**
Education					
Group 1: Primary/below	2.78	2.97	2.83	2.41	2.98
Group 2: Secondary/High School	2.94	2.99	2.98	2.52	3.43
Group 3: College/University	3.01	3.16	2.89	2.37	3.40
Group 4: Graduate/ Post Graduate	2.83	3.18	2.86	2.27	3.44
F Value	1.207	1.182	.550	1.701	1.012
Degree of freedoms	4, 493	4, 494	4, 492	4, 493	4, 495
P value	.307	.318	.699	.148	.401
Country of Residence					
Group 1: Asia	3.10	3.08	3.01	2.55	3.41
Group 2: Europe	2.64	3.37	2.78	2.16	3.59
Group 3: North America	2.52	3.24	2.46	2.00	3.88
Group 4: Oceania	2.74	3.10	2.52	2.02	3.41
Group 5: Other	2.62	3.00	2.82	2.07	2.86
F Value	8.181	1.581	5.853	7.946	5.011
Degree of freedoms	4, 497	4, 498	4, 496	4, 497	4, 499
P value	**.000**	.178	**.000**	**.000**	**.001**
Post Hoc test (Bonferroni)	**1>2 (p≤..004)** **1>3(p≤.014)** **1>5(p≤.001)**		**1>3 (p≤ .005)** **1>4(p≤..016)**	**1>2 (p≤..032)** **1>3(p≤.024)** **1>4(p≤..028)** **1>5 (p≤.002)**	**1>5(p≤.006)** **2>5(p≤.006)** **3>5 (p≤.001)** 4>5(p≤.15)

There was a significant difference in "lack of novelty seeking" between single and married travelers ($F = 4.396$, $p \leq .037$). The "lack of novelty seeking" would deter more single travelers than married travelers.

In terms of travelers' age groups, the ANOVA test indicated no significant difference in the travel inhibitors on "safety/security and lack of attractions," "environment," nor "travel barrier." However, a significant difference was found in the travel inhibitor on "dissatisfaction and deterioration of attractions" ($F = 5.88$, $p \leq 0.001$). Travelers who were less than 20 years old (group 1), were less tolerant towards this inhibitor than those were in the age of 20-39 years old (group 2), 40-59 years old (group 3), and 60 years old and older (group 4). Moreover, a significant difference was found in the "lack of novelty seeking" among travelers with different age groups ($F = 4.613$, $p \leq 0.003$). Travelers who were in the age of 20 to 39 years old (group 2) were less tolerant towards the "lack of novelty seeking" than those who were in the age of 40-49 years old (group 3).

As for the occupation, a significant difference was found in the "lack of novelty seeking" ($F = 3.345$, $p \leq 0.019$). The travel inhibitor on "lack of novelty seeking" would bother more white-collar worker travelers than blue-collar workers and other travelers.

Regarding the countries of residence, a significant difference was found in the travel inhibitor on "safety/security and lack of attractions" ($F = 8.181$, $p \leq 0.000$). Asian travelers tended to be more neutral than Europeans, North Americans, and travelers from other regions. Also, there was a significant difference in "travel barriers" ($F = 5.853$, $p \leq 0.000$). Again, Asian travelers appeared to be neutral as compared to travelers from North America and Oceania. The ANOVA test also showed that there was a significant difference in the "dissatisfaction and deterioration of tourist attractions" ($F = 7.946$, $p \leq 0.000$). Asian travelers were less tolerant than travelers from Europe, North America, Oceania (Australia and New Zealand), and other regions. In addition, there was a significant difference in the travel inhibitor on the "lack of novelty seeking" ($F = 5.011$, $p \leq 0.001$). North Americans were the most disturbed by the "lack of novelty seeking," followed by Europeans, travelers from Oceania, and Asia. However, travelers from other regions appeared to be the least disturbed.

Likelihood of Revisiting

The logistic regression was used to assess both an individual and mutual impacts of the destination image, travel satisfaction, travel motivation, and travel inhibitors on the likelihood of revisiting. The logistic regression is an attractive alternative to discriminant analysis whenever the dependent variable has only two categories because of its insensitivity to variance/covariance inequalities across groups and its robustness in handing categorical independent variables as compared to the discriminant analysis (Hair et al., 1998). Moreover, several characteristics of the logistic regression results parallel to those of the multiple regression (Hair et al., 1998). However, there is a major difference between the multiple regression and logistic regression. Ostrowski, O'Brien, and Gordon (1993) stated that "in logistic regression, there is no equivalent to the R-square statistic indicating strength of the relationship, nor to the F-ratio, both of which are used in multiple regression" (p.20). This unique characteristics of the logistic regression is its low R^2 value when compared to that of the multiple regression (Hosmer and Lemeshow, 2000). Hosmer and Lemeshow (2000) commented that "unfortunately low R^2 values in logistic regression are the norm" (p.167).

In terms of model building and variable selection, Hosmer and Lemeshow (2000) suggested the use of the most parsimonious model. They noted that "the rationale for minimizing the number of variables in the model is that the resultant model is more likely to be numerically stable, and is more easily generalized, (p.92)."

Moreover, stepwise procedure is recommended for model building for exploratory studies (Hosmer and Lemeshow, 2000). Hosmer and Lemeshow (2000) stated that "(A stepwise) procedure provides a useful and effective data analysis tool. In particular, there are times when the outcome being studied is relatively new and the important covariates may not be known and associations with the outcome not well understood. Moreover, the stepwise procedure can provide a fast and effective means to screen a large number of variables and to fit a number of logistic regression equations simultaneously (p.116). Hair et al (1998) also commented that the reduced set of the stepwise method is almost as good as and sometimes better than the complete set of variables. However, the stepwise estimation becomes less stable and generalizable as the ratio of the sample size to independent variables declines below the recommended level of 20 observations per independent variable. However, this is not the problem for this study because the ratio of number of observations per independent variable in this study far exceeds the threshold ratio; there were more than 20 observations per each independent variable.

In order to minimize the chance of excluding important variables in the stepwise procedure, several statisticians recommend the increase of the alpha level to judge the importance of variables (Bendel and Afifi, 1977; Costanza and Afifi, 1979; Menard, 1995; Lee and Koval, 1997; and Hosmer and Lemeshow, 2000). Menard (1995), Lee and Koval (1997) and Hosmer and Lemeshow (2000) highly recommended the alpha level ranging from $p \leq 0.15$ to $p \leq 0.20$ for stepwise model building in Logistic Regression. They commented that the alpha of $p \leq 0.05$ is too stringent and often leads to excluding variables from the model.

Based on the literature reviews on the logistic regression, the following actions were undertaken. First, the model building and variable selection are based on the parsimonious purpose. Second, the stepwise procedure was used in model building and variable selection. Third, the forward selection and backward elimination are used in model building with the use of the alpha level of $p \leq 0.15$ for guiding entry and $p \leq 0.20$ for removal.

HYPOTHESES TESTING

Impact of the Destination Image on the Likelihood of Revisiting

Hypothesis 1

Hypothesis 1 proposes that the more positive the destination image, the more likely the international travelers would revisit a travel destination. The null and alternative hypotheses are stated as follows:

H_0: There is no significant relationship between the destination image and the likelihood of revisiting.

H_a: There is a significant positive relationship between the destination image and the likelihood of revisiting.

To test the hypothesis, the logistic regression was used to determine the impact of the image of Thailand on the likelihood of revisiting. The dependent variable was the log of the odds of the probability that travelers "would revisit" versus "would not revisit" Thailand. Odds ratio refers to the comparison of the probability of an event happening to the probability of the event not happening, which is used as the dependent variable in logistic regression (Hair et al., 1998, p.242). The independent variables were seven summated scales of the destination image dimensions.

The logistic regression model for the impact of the destination image on the likelihood of revisiting was proposed as follows (Menard, 1995; SPSS, 1995):

$$\text{Probability of revisiting} = \frac{1}{1+e^{-z}}$$

Where:

$e =$ the base of the natural logarithms

$Z =$ $B_0 + B_1 (X_1) + B_2 (X_2) + \ldots + B_7 (X_7)$

X_1: Image 1: "social and environmental problems;"

X_2: Image 2: "safe travel destination;"

X_3: Image 3: "adventurous activities and scenic natural beauty;"

X_4: Image 4: "rich culture;"

X_5: Image 5: "good value cuisine and hotels;"

X_6: Image 6: "easy access tourist destination;"

X_7: Image 7: "good shopping;"

B_0: coefficient of intercept; and

$B_1 \ldots B_7$: estimated parameters.

The result for the goodness of fit and parameter estimated of the logistic regression image model was shown in Table 28. The logistic regression resulted in a two-variable image model, including X_5: "good value cuisine and hotels " and X_1: "social and environmental problems." The two-variable image model demonstrates statistically significance at the overall model and for the variables included in the model.

Goodness of Fit

The log likelihood value (-2 Log Likelihood) was reduced from the base model value of 351.4 to 317.6 a decrease of 33.8. A smaller value of the –2LL measure indicates a better model fit. The goodness of fit measure, which compares the predicted probabilities to the observed probabilities, shows a value of 458.8. A higher value indicates a better fit. Likewise, the Hosmer and Lemeshow's goodness-of-fit-index was not significant, indicating that the model fits well because that there is no discrepancy between the observed and predicted classifications. However, the model chi-square of the two variable- image model was 33.8 and statistically significant at $p \leq 0.0001$, indicating that the two independent variables make better predictions of the dependent variable. These three measures of goodness of fit provide support for acceptance of the two variable image model as a significant logistic regression model and suitable for further examination (Menard, 1995).

Table 28: Goodness of Fit and Parameter estimates for the Image model

-2 Log Likelihood	317.6
Goodness of Fit	458.8
Cox & Snell - R^2	.07
Nagelkerke - R^2	.13

	Chi-Square	df	Significance
Model	33.8	1	.0000
Block	33.8	2	.0000
Step	3.6	1	.0586

---------- Hosmer and Lemeshow Goodness-of-Fit Test-----------

	Chi-Square	df	Significance
Goodness-of-fit test	4.7325	8	.7858

Classification Table for REVISIT

		Predicted .00 (0)	yes (1)	Percent Correct
Observed .00	0	12	44	21%
yes	1	25	422	94%

Overall 86%

--------------------- Variables in the Equation ----------------------

Variable	**B**	**S.E.**	**Wald**	**df**	**Sig.**	**R**	**Exp.(B)**
X1 : Image 1	-.3487	.1888	3.4133	1	.0647	-.0634	.7056
X5 : Image 5	1.1873	.2174	29.8158	1	.0000	.2814	3.2782
Constant	-.9561	.8898	1.1544	1	.2826		

-------------- Variables not in the Equation ----------------

Variable	Score	df	Sig.	R
X2 : Image 2	.0761	1	.7827	.0000
X3 : Image 3	.5448	1	.4605	.0000
X4 : Image 4	.0056	1	.9401	.0000
X6: Image 6	1.6404	1	.2003	.0000
X7: Image 7	.4495	1	.5026	.0000

Interpreting Regression Coefficients

Table 28 also reports that there was a significant positive relationship between the image of Thailand as a "good value cuisine and hotels" (X_5) and the likelihood of revisiting ($B = 1.1873; Wald = 29.8158; p \leq 0.01$). Since the independent variables were measured on the same five-point Likert scales, a comparison of the strengths of the relationship between the dependent variable and the independent variables can be directly interpreted. The largest coefficient value of the image of Thailand as a "good value cuisine and hotels" (X_5; $B = 1.1873$) suggests that this variable has the greatest impact on the likelihood of travelers to revisit Thailand. However, there was a negative relationship of the image of Thailand as "social and environmental problems" and the likelihood of travelers to revisiting Thailand ($B = - 0.3487; Wald = 3.4133; p \leq 0.10$).

No significant relationship was found on the image of Thailand as a "safe travel destination," "adventurous activities and scenic natural beauty," "rich culture," "easy access tourist destination," nor "good shopping" and the likelihood of travelers to revisit Thailand.

Given the coefficients of two significant independent variables, the logistic regression model can be written in terms of the logit as follows:

$$\ln (Y) = - 0.9561 + 1.1873(X_5) - 0.3487 (X_1)$$

It could be interpreted that when there is a one-unit increase in the image of "good value cuisine and hotels," (X_5), the log of the odds of the probability that the traveler "would revisit Thailand" versus "would not revisit" Thailand," would increase by 1.1873 units, by holding other variables constant. This suggests that the image of "good value cuisine and hotels" (X_5) had a positive impact on the likelihood of travelers to revisit Thailand.

However, a one-unit increase in the image of "social and environmental problems" (X_1) would result in the decrease of the log of the odds by 0.3487 unit, while holding other variables constant. This suggests that the image of "social and environmental problems" had a negative impact on the likelihood of travelers to revisit Thailand.

<u>Probability of Revisiting</u>

The logistic regression model for the impact of destination image on the probability of revisiting can be directly estimated from the following model (SPSS, 1999):

$$\text{Probability of Revisiting} = \frac{1}{1+e^{-z}}$$

Where:

$$Z = -0.9561+1.1873(X_5)-0.3487(X_1)$$

For those travelers who have high rating on the positive image of "good value cuisine and hotels" (X_5) with the rating of 4 (agree), and have low rating on the negative image of "social and environmental problems" (X_1) with the rating of 2 (disagree), the probability that they would revisit Thailand is 96%. By decreasing the negative image (X_1) by one unit to 1 (strongly disagree), and increasing the positive image by one unit to 5 (strongly agree), the probability of revisiting changes from 96% to 99%. Based on these estimates, it is likely that the probability of revisiting would occur because the probability is greater than 0.5 (SPSS, 1999).

In contrast, for those travelers whose rating on the positive image of "good value cuisine and hotels" (X_5) is 1 (strongly disagree), and their rating on the negative image of "social and environmental problems" (X_1) is 5 (strongly agree), the probability that they would revisit Thailand would decrease to 18%.

Since the coefficients for the image of Thailand are different from zero; and the probability of revisiting is likely to occur, the null Hypothesis 1, which proposed that there is no significant relationship between the image of Thailand and the likelihood of revisiting, is rejected. Moreover, the data found that there was a significant negative relationship between the negative image of Thailand and the likelihood of revisiting.

Impact of the Travel Satisfaction on the Likelihood of Revisiting

Hypothesis 2

The Hypothesis 2 proposes that the higher satisfaction the international travelers have toward their trip to a travel destination, the more likely they would the destination. The null and alternative hypotheses are stated as follows:

H_0: There is no significant relationship between traveler's satisfaction and the likelihood of revisiting.

H_a: There is a positive significant relationship between traveler's satisfaction and the likelihood of revisiting.

To test the hypothesis, the logistic regression was used to determine the impact of the travel satisfaction on the likelihood of travelers to revisit Thailand. The dependent variable was the log of the odds of the probability that travelers "would revisit" versus "would not revisit" Thailand. Odds ratio refers to the comparison of the probability of an event happening to the probability of the event not happening, which is used as the dependent variable in logistic regression (Hair et al., 1998, p.242). The independent variables were five summated scales of the travel satisfaction factors.

The logistic regression model for the impact of the travel satisfaction on the likelihood of revisiting was proposed as follows (Menard, 1995; SPSS, 1999):

$$\text{Probability of Revisiting} = \frac{1}{1+e^{-z}}$$

Where:

$e =$ the base of the natural logarithms

$Z =$ $B_0 + B_1 (X_1) + B_2 (X_2) + \ldots + B_5 (X_5)$

X_1: Satisfaction 1: "quality, service, and value of lodging and restaurants,"

X_2: Satisfaction 2: "quality, service, and value of shopping & tourist attractions,"

X_3: Satisfaction 3: "quality, service, and value of transportation;"

X_4: Satisfaction 4: "quality, service, and value of foods;"

X_5 Satisfaction 5: "environment & safety;"

B_0: coefficient of intercept; and

$B_1 \ldots B_5$: estimated parameters.

Table 29: Goodness of Fit and Parameter Estimates of the Satisfaction Model

-2 Log Likelihood	336.13
Goodness of Fit	496.02
Cox & Snell - R^2	.03
Nagelkerke - R^2	.06

	Chi-Square	df	Significance
Model	15.3	1	.0001
Block	15.3	2	.0005
Step	3.7	1	.0531

---------- Hosmer and Lemeshow Goodness-of-Fit Test-----------

	Chi-Square	df	Significance
Goodness-of-fit test	4.6636	8	.7928

Classification Table for REVISIT

		Predicted .00 (0)	Predicted yes (1)	Percent Correct
Observed .00	0	4	52	7%
Observed yes	1	19	428	96%
			Overall	86%

--------------------- Variables in the Equation ----------------------

Variable	B	S.E.	Wald	df	Sig.	R	Exp.(B)
X1 : Satisfaction 1	.4992	.2601	3.6845	1	.0549	.0692	1.6474
X4 : Satisfaction 4	.3933	.2095	3.5240	1	.0605	.0659	1.4818
Constant	-1.1256	.8366	1.8100	1	.1785		

-------------- Variables not in the Equation ----------------

Variable	Score	df	Sig.	R
X2 : Satisfaction 2	.4193	1	.5173	.0000
X3 : Satisfaction 3	1.1360	1	.2865	.0000
X5 : Satisfaction 5	.4556	1	.4997	.0000

The result for the goodness of fit and parameter estimates of the satisfaction model was shown in Table 29. The logistic regression resulted in a two-variable satisfaction model, including X_1: "quality, service, and value of lodging and restaurant," and X_4: "quality, service, and value of foods."

Goodness of Fit

The log likelihood value (-2 Log Likelihood) was reduced from the base model value of 351.4 to 336.13, a decrease of 15.3. A smaller value of the –2LL measure indicate a better model fit. The goodness of fit measure showed a value of 496.02. A higher value indicates a better fit. The Hosmer and Lemeshow's goodness-of-fit-index was not significant, indicating that the model fits well because that there is no discrepancy between the observed and predicted classifications. However, the chi-square of the model was 15.3 and the observed significance level was $p \leq 0.01$, indicating that the overall model was significant. These measures provide support for acceptance of the two variable-model as a significant logistic regression model and suitable for further examination (Menard, 1995).

Interpreting Regression Coefficients

Table 29 also shows that there was a significant positive relationship between the travel satisfaction on "quality, service, and value of lodging and restaurant," (X_1) and the likelihood of travelers to revisit Thailand *(B = 0.4992; Wald = 3.6845; p ≤ 0.10).* Likewise, there was a significant positive relationship between the travel satisfaction on "quality, service, and value of foods" (X_4) and the likelihood of travelers to revisit Thailand *(B = 0.3933; Wald = 3.5240, p ≤ 0.10).*

No significant difference was found on the travel satisfaction on "quality, service, and value of shopping and tourist attractions," (X_2) "Quality, service, and value of transportation,"(X_3), nor "Environment & Safety," (X_5).

Given the coefficients of the two significant independent variables, the logistic regression equation for the satisfaction model can be written in terms of the logit as follows:

$$\ln(Y) = -1.1256 + 0.4992\,(X_1) + 0\,.3933\,(X_4)$$

It could be interpreted that a one-unit increase in the travel satisfaction on "quality, service, value of lodging and restaurant," (X_1), the log of the odds of the dependent variable the traveler "would revisit" versus "would not revisit" Thailand," would increase by 0.4992 unit, while holding other variables constant. This suggests that the travelers' satisfaction on the "quality, service, value of lodging and restaurant" (X_1) had a positive impact on the likelihood of revisiting. Moreover, the largest coefficient of this factor ($B = 0.4992$) also suggests that the "quality, service, value of lodging and restaurant" (X_1) has the greatest impact on the likelihood of travelers to revisit Thailand. Also, a one-unit increase in travelers' satisfaction on "quality, service, value of foods" (X_4) would lead to the increase of the log of the odds of the dependent variable "would revisit" versus "would not revisit" Thailand by 0.3933 unit, while holding other variables constant.

The two variable satisfaction model does not indicate any significant impact of the travelers' satisfaction on "quality, service, value of shopping and tourist attractions," (X_2) "quality, service, value of transportation," (X_3), and "environmental and safety" (X_5) on the likelihood of travelers to revisit Thailand.

Probability of Revisiting

The model of the individual impacts of the travel satisfactions on the probability of revisiting Thailand can be directly estimated as (SPSS, 1999):

$$\text{Probability of revisiting} = \frac{1}{1+e^{-z}}$$

Where:

$$Z = -1.1256 + 0.4992\,(X_1) + 0.3933\,(X_4)$$

For those travelers whose ratings on the "quality, service, value of lodging and restaurant" (X_1) and "quality, service, value of foods" (X_4) are 4 (satisfied), the estimated probability that they would revisit Thailand is 92%. By increasing their level of satisfaction by one unit to 5 (very satisfied), the probability that they would revisit Thailand changes from 92% to 97%. Based on these estimates, it is likely that the probability of revisiting would occur because the probability is greater than 0.5 (SPSS, 1999).

However, if their ratings on "quality, service, value of lodging and restaurant" (X_1) and "quality, service, value of foods" (X_4) are 1 (very dissatisfied), the estimated probability that they would revisit Thailand would decrease to 44%.

Since the coefficients for the travel satisfaction variables are different from zero, the null Hypothesis 2, which proposed that there is no significant relationship between the travelers' satisfaction and the likelihood of revisiting, is rejected.

Impact of the Travel Motivation on the Likelihood of Revisiting

Hypothesis 3

Hypothesis 3 proposes that the higher travel motivation the international travelers have, the more likely they would revisit a travel destination. The null and alternative hypotheses are stated as follows:

H_0: There is no significant relationship between travel motivation and the likelihood of revisiting.

H_a: There is a significant positive relationship between travel motivation and the likelihood of revisiting.

To test the hypothesis, the logistic regression was used to determine the impact of travel motivation on the likelihood of travelers to revisit Thailand. The dependent variable was the log of the odds of the probability that travelers "would revisit" versus "would not revisit" Thailand. Odds ratio refers to the comparison of the probability of an event happening to the probability of the event not happening, which is used as the dependent variable in logistic regression (Hair et al., 1998, p.242). The independent variables were six summated scales of the travel motivation dimensions.

The logistic regression model for the impact of the travel motivation on the likelihood of revisiting was proposed as follows (Menard, 1995; SPSS, 1999):

$$\text{Probability of Revisiting} = \frac{1}{1+e^{-z}}$$

Where:

$e =$ the base of the natural logarithms

$Z =$ $B_0 + B_1 (X_1) + B_2 (X_2) + \ldots + B_6 (X_6)$

X_1: Motivation 1: "special interests;"

X_2: Motivation 2: "novelty seeking;"

X_3: Motivation 3: "good value food, shopping, a variety of things to do;"

X_4: Motivation 4: "deals on tour promotion, currency exchange;"

X_5 Motivation 5: "Buddhism;"

X_6 Motivation 6: "natural attractions;"

B_0: coefficient of intercept; and

$B_1 \ldots B_4$: estimated parameters.

The logistic regression resulted in a two-variable motivation model, including X_3: "good value food, shopping, and a variety of things to do," and X_2: "novelty seeking." The two-variable motivation model, including X_3 and X_2 demonstrates statistically significance at the overall model and for the variables included in the model.

Goodness of Fit

The goodness of fit of the motivation model was shown in Table 30. The log likelihood value (-2 Log Likelihood) was reduced from the base model value of 351.4 to 309.8, a decrease of 41.6, indicating a better model fit. The goodness of fit measure showed a value of 501.3. A higher value indicates a better fit. The Hosmer and Lemeshow' s goodness-of-fit-index was not significant, indicating that the model fits well because that there is no discrepancy between the observed and predicted classifications. However, the chi-square of the model was 41.6 and the observed significance level was $p \leq 0.0001$, indicating that the overall model was significant. These goodness of fit measures provide support for acceptance of the two variables-model as a significant logistic regression model and suitable for further examination.

Table 30: Goodness of Fit and Parameter estimates of the Motivation Model

-2 Log Likelihood	309.8
Goodness of Fit	501.3
Cox & Snell - R^2	.08
Nagelkerke - R^2	.16

	Chi-Square	df	Significance
Model	41.6	1	.0000
Block	41.6	2	.0000
Step	7.04	1	.0080

---------- Hosmer and Lemeshow Goodness-of-Fit Test----------

	Chi-Square	df	Significance
Goodness-of-fit test	8.864	6	.1813

		Predicted .00 0	Predicted yes 1	Percent Correct
Observed .00	0	11	45	20%
yes	1	17	430	96%
			Overall	88%

--------------------- Variables in the Equation ---------------------

Variable	**B**	**S.E.**	**Wald**	**df**	**Sig.**	**R**	**Exp.(B)**
X2 : Motivation 2	.6252	.2400	6.7878	1	.0092	.1167	1.8685
X3 : Motivation 3	1.0262	.2593	15.6606	1	.0001	.1972	2.7904
Constant	-3.7608	.9438	15.8791	1	.0001		

-------------- Variables not in the Equation ----------------

Variable	Score	df	Sig.	R
X1 : Motivation 1	.2491	1	.6177	.0000
X4 : Motivation 4	.0408	1	.8399	.0000
X5 : Motivation 5	.7851	1	.3756	.0000
X6: Motivation 6	1.9914	1	.1582	.0000

Interpreting Regression Coefficients

Table 30 also shows that the travel motivation on "good value food, shopping, and a variety of things to do" *(X_3), ($B = 1.0262$, $Wald = 15.6606$, $p \leq 0.01$),* and "novelty seeking" (X_2), *(B = 0.6252, Wald =6.7878, $p \leq 0.01$)* have positive impacts on the likelihood of travelers to revisit Thailand.

Given the coefficients of the two significant independent variables, the logistic regression model can be written in terms of the log of the odds as follows:

$\ln(Y) = -3.7608 + 1.0262\ (X_3) + 0.6252\ (X_2)$

It could be interpreted that a one-unit increase of the travelers' motivation on "good value food, shopping, and a variety of things to do *(X_3)*, the log of the odds of the dependent variable would increase by 1.0262 units, while holding other variables constant. This suggests that the travelers' motivation on "good value food, shopping, and a variety of things to do" *(X_3)* had a positive impact on travelers' likelihood of revisiting. Moreover, the highest value of the logistic regression coefficient of this factor (B = 1.0262) also indicates that the motivation on "good value food, shopping, and a variety of things to do" *(X_3)* has the greatest impact on the likelihood of travelers to revisit Thailand.

Moreover, when there is a one-unit increase of the travelers' motivation on "novelty seeking" *(X_2)*, the log of the odds of the dependent variable "would revisit" versus "would not revisit" Thailand would increase by 0.6252 unit, while holding other variables constant. This suggests that the travelers' motivation on "novelty seeking" *(X_2)*, has a positive impact on the likelihood of travelers to revisit Thailand.

Probability of Revisiting

The model of the individual impacts of the travel motivations on the probability of revisiting Thailand can be estimated as:

$$\text{Estimated Probability} = \frac{1}{1 + e^{-z}}$$

Where:

$$Z = -3.7608 + 1.0262\,(X_3) + 0.6252\,(X_2)$$

For those travelers whose ratings on the "good value food, shopping, and a variety of things to do" (X_3) and on "novelty seeking" (X_2) are 4 (agree), the estimated probability that they would revisit Thailand would be 95%. By increasing the degree of the two travel motivations by one unit to 5 (strongly agree), the probability of revisiting would change from 95% to 99%. Based on these estimates, it is likely that the probability of revisiting would occur because the probability is greater than 0.5 (SPSS, 1999). However, if travelers' ratings on X_3 and X_2 are 1 (strongly disagree), the estimated probability that they would revisit Thailand would decrease to 11%.

Since the coefficients for the travel motivation factors are different from zero, the null Hypothesis 3, which proposed that there is no significant relationship between the travel motivation and the likelihood of revisiting, is rejected.

Impact of the Travel Inhibitors on the Likelihood of Revisiting

Hypothesis 4

Hypothesis 4 proposes that the stronger travel inhibitors the international travelers have, the less likely they would revisit a travel destination. The null and alternative hypotheses are stated as follows:

H_0: There is no significant relationship between travel inhibitor and the likelihood of revisiting.

H_a: There is a significant negative relationship between the travel inhibitor and the likelihood of revisiting.

To test the hypothesis, the logistic regression was used to determine the impact of the travel inhibitors on the likelihood of travelers to revisit Thailand. The dependent variable was the log of the odds of the probability of "revisiting" versus "not revisiting" Thailand. The independent variables were five summated scale scores of the travel inhibitor dimensions.

The logistic regression model for the individual impacts of the travel inhibitors on the likelihood of revisiting was proposed as follows (Menard, 1995; SPSS, 1999):

$$\text{Probability of Revisiting} = \frac{1}{1+e^{-z}}$$

Where:

$e =$ the base of the natural logarithms

$Z =$ $B_0 + B_1 (X_1) + B_2 (X_2) + \ldots + B_5 (X_5)$

X_1: Inhibitor 1: "safety/security and lack of attractions;"

X_2: Inhibitor 2: "environment;"

X_3: Inhibitor 3: "travel barrier;"

X_4: Inhibitor 4: "dissatisfaction and deterioration;"

X_5: Inhibitor 5: "lack of novelty seeking;"

β_0: coefficient of intercept; and

$\beta_1 \ldots \beta_5$: estimated parameters.

The result for the logistic regression analysis was shown in Table 31. The logistic regression resulted in a single variable model including "travel barrier" (X_3).

Table 31: Goodness of Fit and Parameter estimates of the Travel Inhibitors Model

-2 Log Likelihood	334.135
Goodness of Fit	492.415
Cox & Snell - R^2	.02
Nagelkerke - R^2	.04

	Chi-Square	df	Significance
Model	9.308	1	.002
Step	9.308	1	.002

		Predicted .00	Predicted yes	Percent Correct
		0	1	
Observed				
.00	0	6	49	11%
yes	1	8	424	98%
			Overall	88%

---------------------- Variables in the Equation ----------------------

Variable	B	S.E.	Wald	df	Sig.	R	Exp.(B)
X3: Inhibitor 3	-.5762	.1932	8.8947	1	.0029	-.1417	.5620
Constant	3.8087	.6271	36.886	1	.0000		

--------------- Variables not in the Equation ----------------

Variable	Score	df	Sig.	R
X1: Inhibitor 1	.2930	1	.5883	.0000
X2: Inhibitor 2	1.4477	1	.2289	.0000
X3: Inhibitor 4	.4608	1	.4973	.0000
X5: Inhibitor 5	.0470	1	.8284	.0000

Note: The degrees of freedom is less than 1. Hosmer and Lemeshow Goodness-of-Fit Test is skipped.

Goodness of Fit

The chi-square of the model was 9.308 and the observed significance level was 0.002, indicating that the overall model was significant. The log likelihood value (-2 Log Likelihood) was reduced from the base model value of 343.443 to 334.135, a decrease of 9.308. The slight decrease in the log likelihood value, does not show high predictive accuracy. Although the model is statistically significant, care must be taken in interpreting the result.

Interpreting Regression Coefficients

Given the coefficient of a single significant independent variable, the logistic regression equation for the impact of the travel inhibitor on the probability of revisiting can be written in terms of the logit as follows:

$$\ln(Y) = 3.8087 - 0.5762\,(X_3)$$

It could be interpreted that a one-unit increase in the "travel barrier" would result in the decrease of the log of the odds of the dependent variable by 0.5762 unit. This suggests that the "travel barrier" (X_3) had a negative impact on the likelihood of revisiting.

Probability of Revisiting

The model of the individual impact of the travel inhibitor on the probability of revisiting Thailand can be directly estimated as (SPSS, 1999):

$$\text{Probability of revisiting} = \frac{1}{1+e^{-z}}$$

Where:

$$Z = 3.8087 - 0.5762\,(X_3)$$

For those travelers whose rating on the "travel barrier" (X_3) is 1 (strongly disagree), the estimated probability that they would revisit Thailand would be 96%. If their rating changes by one unit to 2 (disagree), the estimated probability that they would revisit Thailand would change from 96% to 93%. Based on this estimate, it is likely that the probability of revisiting would occur because the probability is greater than 0.5 (SPSS, 1999).

However, if travelers' rating on the "travel barrier" (X_3) is 5 (strongly agree), the estimated probability that they would revisit Thailand would be 72%. It should be noted that there is a difference in the probability of revisiting when travelers "disagree" and "agree" that the "travel barrier" would deter them from revisiting Thailand. This suggests that the "travel barriers" have a slight impact on the probability of "not revisiting" Thailand.

Since the coefficient for the travel inhibitor is different from zero, the null Hypothesis 4, which proposed that there is no significant relationship between travel inhibitor and the likelihood of revisiting, is rejected.

The Impacts of the Bundle of Travel Determinants on Repeat Visitation

The previous four logistic regression models assessed the individual impact of the destination image, travel satisfaction, travel motivation, and travel inhibitor on the likelihood of travelers to revisit a destination. In the real world, travelers do not separately consider each of these travel factors one at a time but consider them simultaneously. Therefore, it is interesting to determine which travel factors would affect the probability of revisiting and to what extent those travel determinants would have the impact on the repeat visitation. The following hypothesis was proposed:

Hypothesis 5

Hypothesis 5 proposes that a bundle of the destination image, travel satisfaction, travel motivation, and travel inhibitors affects the likelihood of revisiting. The null and alternative hypotheses are stated as follows:

H_0: There is no significant relationship between the destination image, travel satisfaction, travel motivation, travel inhibitors and the likelihood of revisiting.

H_a: There is a significant relationship between the destination image, travel satisfaction, travel motivation, and travel inhibitors and the likelihood of revisiting.

To test the hypothesis, the logistic regression was used to determine the mutual impact of the bundle of the four travel determinants on repeat visitation. The dependent variable was the log of the odds that travelers "would revisit" versus "would not revisit" Thailand. The independent variables were the summated scales of the seven image, five travel satisfaction, six travel motivation, and five travel inhibitor dimensions.

The logistic regression model for the mutual impacts of the bundle of the travel determinants on repeat visitation model was proposed as follows (Menard, 1995; SPSS, 1999):

$$\text{Probability of Revisiting} = \frac{1}{1+e^{-z}}$$

Where:

$e =$ the base of the natural logarithms

$Z =$ $B_0 + B_1 (X_1) + B_2 (X_2) + \ldots + B_{23} (X_{23})$

X_1: Image 1: "social and environmental problems;"

X_2: Image 2: "safe travel destination;"

X_3: Image 3: "adventurous activities and scenic natural beauty;"

X_4: Image 4: "rich culture;"

X_5: Image 5: "good value cuisine and hotels;"

X_6: Image 6: "easy access tourist destination;"

X_7: Image 7: "good shopping;"

X_8: Satisfaction 1: "quality, service, and value of lodging and restaurants,"

X_9 Satisfaction 2: "quality, service, and value of shopping & tourist attractions,"

X_{10}: Satisfaction 3: "quality, service, and value of transportation;"

X_{11}: Satisfaction 4: "quality, service, and value of foods;"

X_{12}: Satisfaction 5: "environment & safety;"

X_{13}: Motivation 1: "special interests;"

X_{14} Motivation 2: "novelty seeking"

X_{15}: Motivation 3: "good value food, shopping, a variety of things to do;"

X_{16}: Motivation 4: "deals on tour promotion, currency exchange;"

X_{17}: Motivation 5: "Buddhism;"

X_{18}: Motivation 6: "natural attractions;"

X_{19}: Inhibitor 1: "safety/security and lack of attractions;"

X_{20} Inhibitor 2: "environment;"

X_{21} Inhibitor 3: "travel barrier;"

X_{22}: Inhibitor 4: "dissatisfaction, deterioration;"

X_{23}: Inhibitor 5: "lack of novelty seeking;"

B_0: coefficient of intercept; and

$B_1 \ldots B_{23}$: estimated parameters.

The logistic regression model for the bundle of travel determinants results in five-variables model, including the travel motivation on "good value, food, shopping, and a variety of things to do;" (X_{15}), the positive image of "good value cuisine, hotels;" (X_5)., the "novelty seeking;" (X_{14}), the "travel barrier;" (X_{21}), and the negative image on: "social and environmental problems;" (X_1). The five travel determinant variable-model demonstrates statistically significance at the overall model and for the variables included in the model, (see Table 32).

Table 32 Goodness of Fit and Parameter Estimates of the Bundle of Travel Determinants on Repeat Visitation Model

-2 Log Likelihood	292.6
Goodness of Fit	466.3
Cox & Snell - R^2	.11
Nagelkerke - R^2	.22

	Chi-Square	df	Significance
Model	58.7	5	.0000
Block	58.7	5	.0000
Step	58.7	5	.0000

---------- Hosmer and Lemeshow Goodness-of-Fit Test-----------

	Chi-Square	df	Significance
Goodness-of-fit test	3.0694	8	.9299

Classification Table for REVISIT

		Predicted .00	Predicted yes	Percent Correct
Observed		0	1	
.00	0	18	38	32%
yes	1	23	424	95%
			Overall	88%

--------------------- **Variables in the Equation** ----------------------

Variable	**B**	**S.E.**	**Wald**	**df**	**Sig.**	**R**	**Exp.(B)**
X 1: Image1	-.4115	.2037	4.0799	1	.0434	-.0769	.6626
X 5: Image5	.5373	.2638	4.1478	1	.0417	.0782	1.7114
X 14: Motivation 2	.5249	.2473	4.5063	1	.0338	.0845	1.6903
X 15: Motivation 3	.9326	.2906	10.2978	1	.0013	.1537	2.5411
X 21: Inhibitor 3	-.5166	.2214	5.4432	1	.0196	-.0990	.5966
Constant	-1.9499	1.2969	2.2606	1	.1327		

Goodness of Fit

The log likelihood value (-2 Log Likelihood) was reduced from the base model value of 351.4 to 292.6, a decrease of 58.7. The smaller value of the –2LL measure indicated a better model fit. The goodness of fit measure showed a value of 466.3. A higher value indicates a better fit. The Hosmer and Lemeshow's goodness-of-fit-index was not significant, indicating that the model fits well because that there is no discrepancy between the observed and predicted classifications. However, the chi-square of the model was 58.7 and the observed significance level was $p \leq 0.001$, indicating that the overall model was significant. These goodness of fit measures provide support for acceptance of the five-variables model as a significant logistic regression model and suitable for further examination.

Interpreting Regression Coefficients

Given the coefficients of the five independent variables, the logistic regression equation for the mutual impacts of the bundle of the four travel determinants on repeat visitation model can be written in terms of the logit as follows:

$$\ln(Y) = -1.9499 + 0.9326\,(X_{15}) + 0.5373\,(X_5) + 0.5249\,(X_{14}) - 0.5166\,(X_{21}) - 0.4115\,(X_1)$$

It could be interpreted that, when there is a one-unit increase in the travel motivation on "good value food, shopping, and a variety of things to do," (X_{15}) the log of the odds would increase by 0.9326 unit, while holding other variables constant. Likewise a one-unit increase in the image of "good value cuisine, hotels" (X_5) resulted in an increase of the log of the odds by 0.5373 unit. Also, a one-unit increase in the travel motivation on "novelty seeking" (X_{14}) would lead to the increase of the log of the odds by 0.5249 unit. This suggests that the travel motivation on "good value food, shopping and a variety of things to do," the image of "good value cuisines and hotels," and the travelers' motivation on "novelty seeking" had positive impacts on the likelihood of revisiting.

However, the increase of the "travel barrier" (X_{21}) would cause the decrease of the log of the odds by 0.5166 unit. Moreover, when there is a one-unit increase in the negative image of "social and environmental problems," (X_1), the log of the odds would decrease by 0.4115 unit. This suggests that the "travel barrier" and the negative image of "social and environmental problems" had negative impacts on the likelihood of travelers to revisit Thailand.

The highest value of the coefficients of the travel motivation on "good value food, shopping, and a variety of things to do" (X_{15}), $(B = 0.9326)$ suggests that this factor has the greatest impact on the likelihood of travelers to revisit Thailand, followed by the positive image of "good value cuisine and hotels," (X_5), $B =.5373)$ the travel motivation on "novelty seeking," $(X_{14}, B = .5249)$ the "travel barriers," $(X_{21}, B = -.5166)$ and the negative image of "social and environmental problems" $(X_1, B =-.4115)$ respectively.

Probability of Revisiting

The model of the mutual impacts of the bundle of the four travel determinants on the probability of revisiting can be directly estimated as (SPSS, 1999):

$$\text{Probability of revisiting} = \frac{1}{1+e^{-z}}$$

Where:

$$Z = -1.9499 + 0.9326\,(X_{15}) + 0.5373\,(X_5) + 0.5249\,(X_{14}) - 0.5166\,(X_{21}) - 0.4115\,(X_1)$$

For those travelers whose ratings on the travel motivation on "good value food, shopping, a variety of things to do," (X_{15}), on the image of "good value cuisine, hotels," (X_5), and on the travel motivation on "novelty seeking" (X_{14}) are 5 (strongly agree), and their rating on the "travel barrier," (X_{21}) and on the negative image of "social and environmental problems" (X_1) are 1 (strongly disagree), the estimated probability that they would revisit Thailand is 99.9%. Based on these estimates, it is likely that the probability of revisiting would occur because the probability is greater than 0.5 (SPSS, 1999).

In contrast, if travelers' rating on the travel motivation on "good value food, shopping, a variety of things to do," (X_{15}) and the image of "good value cuisine, hotels," (X_5), and the travel motivation on "novelty seeking" (X_{14}) are 1 (strongly disagree), and their rating on the "travel barrier", (X_{21}) and on the negative image of "social and environmental problems" (X_1) are 5, (strongly agree), the estimated probability that they would revisit Thailand would decrease to 10%.

Since the coefficients of the destination image, travel satisfaction, travel motivation, and travel inhibitor dimensions are different from zero, the null Hypothesis 5, which proposed that there is no significant relationship between the destination image, travel satisfaction, travel motivation, and travel inhibitor on the likelihood of revisiting, is rejected.

Competitiveness of Thailand as A Travel Destination

One of the last objectives of this study is to identify the competitiveness of Thailand as an international travel destination as compared to four major Southeast Asian travel destinations including Hong Kong, Indonesia, Malaysia, and Singapore. This section aims to identify the competitiveness of Thailand as compared to the selected Southeast Asian travel destinations. The positioning analysis was modified from the study of Haahti and Yavas (1983). Using a five point Likert scale (1 = very poor, 2 = poor, 3 = average, 4 = good, 5 = very good), respondents were asked to rate Thailand and other travel destinations in 14 travel attributes. Table 33 shows the raking for the top five Southeast Asian travel destinations from the top ranking (equals to 1) to the last ranking (equals to 5).

Table 33: Ranking of Selected Southeast Asian Travel Destinations by Travel Attributes

Attributes	Hong Kong			Indonesia			Malaysia			Singapore			Thailand		
	R	Mean	SD	R	Mean	SD	R	Mean	SD	R	Mean	SD	R	Mean	SD
Shopping	1	3.98	1.03	4	3.52	1.04	5	3.47	0.88	2	3.89	0.94	3	3.88	0.87
Cultural/historical sites	5	3.25	1.00	2	3.68	0.92	3	3.39	0.90	4	3.31	1.00	1	3.95	0.77
Natural Scenery	5	3.18	1.07	2	3.84	0.93	3	3.79	0.86	4	3.45	1.07	1	4.00	0.79
Climate	2	3.50	0.88	3	3.42	0.92	4	3.40	0.83	1	3.52	0.94	5	3.27	0.95
Cuisine in restaurants	1	3.93	1.01	5	3.37	0.95	4	3.41	0.95	2	3.84	0.96	3	3.65	0.97
Hotels	3	3.74	0.99	5	3.52	0.95	4	3.69	0.84	1	4.01	0.90	2	3.88	0.83
Overall Service Quality	3	3.67	0.89	5	3.52	0.96	4	3.61	0.82	1	3.87	0.93	2	3.80	0.79
Conventions/Exhibitions Facilities	2	3.67	0.96	5	3.20	0.87	4	3.35	0.87	1	3.77	1.01	3	3.57	0.78
Friendliness of People	5	3.12	1.13	3	3.43	1.02	4	3.40	0.94	2	3.55	0.96	1	3.88	0.90
Travel Price	4	3.24	1.08	2	3.71	0.95	3	3.51	0.88	4	3.24	1.00	1	3.97	0.82
Ease of Access	1	3.88	0.99	4	3.46	0.99	3	3.62	1.04	1	3.88	0.96	2	3.75	0.89
Transportation	2	3.97	1.01	5	3.25	0.98	4	3.39	0.94	1	4.05	0.93	3	3.47	0.95
Safety & Security	2	3.82	0.98	5	3.02	1.09	4	3.42	0.95	1	4.23	0.81	3	3.46	0.92

Note: Scale 1 = very poor, 2 = poor, 3 = average, 4 = good, 5 = very good;

Ranks 1= the 1st ranking, to 5 = the 5th ranking

Hong Kong is ranked first as offering the best shopping, cuisine, and ease of access but it is ranked last in terms of culture, natural attractions, and friendliness of people. Thailand is regarded as the best Southeast Asian travel destination in terms of cultural and historical sites, natural scenery, friendliness of people, and travel price but its climate is ranked last. Singapore is ranked first as offering the best climate, hotels, overall service quality, conventions/exhibitions facilities, ease of access, transportation, and safety & security but almost last for its culture, nature, and price. Indonesia is ranked second for its cultural/historical sites, natural scenery, and travel price but last for its cuisine, hotels, overall service quality, convention/exhibitions facilities, transportation, and safety and security. Malaysia is ranked third to next to last for almost all of the travel attributes.

To obtain further insights into the relative position of Thailand versus the 1st or the 2nd top travel destinations, a paired mean t-test was performed to determine statistically significant mean differences in traveler's perception towards each of the travel attribute between Thailand and the 1st or the 2nd top ranking travel destinations. The comparison was based on a destination by destination basis. See Table 34.

Table 34: Competitiveness of Thailand as A Travel Destination

Perceived Travel Positioning Thailand & 1st or 2nd Top Ranking Destinations	Mean [a]	Mean [b]	Mean Difference	t Value	2-tailed Sig.
Shopping: Thailand & Hong Kong	3.878	3.982	-0.104	-1.22	0.23
Shopping: Thailand & Singapore	3.878	3.889	-0.011	-.841	0.40
Cultural/historical sites : Thailand & Indonesia	3.954	3.677	0.277	2.95	**0.00**
Natural scenery: Thailand Indonesia	4.000	3.837	0.163	1.96	**0.05**
Climate: Thailand & Singapore	3.261	3.517	-0.256	-3.71	**0.00**
Cuisine in restaurants: Thailand & Hong Kong	3.650	3.934	-0.283	-3.28	**0.00**
Cuisine in restaurants: Thailand & Singapore	3.650	3.841	-0.191	-.894	0.37
Hotel: Thailand & Singapore	3.882	4.015	-0.133	-1.85	0.07
Overall service quality: Thailand & Singapore	3.801	3.869	-0.068	-0.94	0.35
Convention/exhibition facilities: Thailand & Hong Kong	3.567	3.663	-0.196	-2.39	**0.02**
Convention/exhibition facilities: Thailand & Singapore	3.567	3.765	-0.198	-2.61	**0.01**
Friendliness of people: Thailand & Singapore	3.874	3.549	0.325	3.73	**0.00**
Travel Price: Thailand & Indonesia	3.968	3.714	0.254	2.64	**0.01**
Ease of access: Thailand & Hong Kong	3.750	3.882	-0.132	-1.78	0.08
Ease of access: Thailand & Singapore	3.750	3.883	-0.133	-1.79	0.08
Transportation: Thailand & Hong Kong	3.474	3.964	-0.590	-7.18	**0.00**
Transportation: Thailand & Singapore	3.474	4.053	-0.604	-7.77	**0.00**
Safety & security: Thailand & Singapore -	3.459	4.232	-0.773	-10.70	**0.00**
Safety & security: Thailand & Hong Kong	3.459	3.815	-0.356	-4.59	**0.00**

Note: a = mean of Thailand, b = mean of 1st or 2nd Top Ranking Destinations

A pair comparison between Thailand and the 1st or 2nd top ranking travel destinations revealed statistically significant mean differences in 9 out of 14 travel attributes at a significance level of 0.05.

As confirmed by the pair mean t-test, Thailand is viewed superior to Indonesia for its cultural/historical sites, natural scenery, and travel price. In addition, Thai people are perceived friendlier than Singapore people. However, Thailand is rated lower than Singapore for its climate, convention/exhibition facilities, transportation, and safety & security. Likewise, Thailand is perceived inferior to Hong Kong in terms of cuisine, convention/exhibition facilities, transportation, and safety and security.

However, respondents did not see any difference in shopping in Thailand, Hong Kong, nor Singapore. The shopping is regarded as the strongly appealing attribute for these destinations. This also suggests that Thailand, Hong Kong, and Singapore are primary competitors to each other. Also, travelers perceived that these destinations have the same strengths in terms of ease of access.

Although the respondents rated Thailand's cuisine lower than that of Hong Kong and Singapore, the t-test revealed significant difference only a pair comparison between Thailand and Hong Kong ($p \leq 0.01$). Likewise, despite hotels in Thailand was rated lower than those in Singapore, no significant difference was found in this attribute.

Summary

This chapter reports the result of survey and data analysis. The demographic profiles and travel behaviors of the respondents were reported. Then, the Independent Sample Mean t-test was used to identify the significant difference of the perception of the image of Thailand, travel satisfaction, travel motivation, and travel inhibitors between first time and repeat travelers. Then, an exploratory factor analysis was used to reveal the underlying dimensions of the image of Thailand, travel satisfaction, travel motivation, and travel inhibitors. It was also used to construct summated scales for Analysis of Variances and Logistic Regression. The One Way ANOVA was employed to determine the significant difference in the perception of the image of Thailand, travel satisfaction, travel motivation, and travel inhibitor factors among travelers with different demographic profiles. Then, the Logistic Regression was used to examine the impact of each of the image of Thailand, travel satisfaction, travel motivation, and travel inhibitors on the likelihood of travelers in revisiting Thailand. Next, the Bundle of Travel Determinants on Repeat Visitation model was proposed. Finally, the competitiveness of Thailand as compared to other Southeast Asian travel destinations was analyzed.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary, discussion of the findings, and recommendations. First, the summary, discussion, and theoretical implication of the hypotheses testing are reported. Then, the practical implications and recommendations are discussed. Finally, the chapter concludes with limitation of the study and suggestions for future research.

Summary of the Findings

This study is a first attempt to empirically test five models of the impact of both an individual and mutual impacts of a bundle of travel determinants on repeat visitation. It is proposed that destination image, travel satisfaction, travel motivation, and travel inhibitors influence repeat visitation.

Most of the tourism models developed to date have focused on the role of destination image, travel satisfaction, travel motivation, travel inhibitors and pre-purchase destination selections. However, there is little information about the impact of these four travel determinants on repeat visitations. A few researchers have reported that there is a difference in travel motivation or perceived destination image on repeat visitation among different types of tourists. For example, Bello and Etzel (1985) found a significant difference in novelty seeking towards repeat visitation between common and novelty seeking tourists. Likewise, Fakeye and Crompton (1991) found differences in perceived destination image among non-visitors, first timers, and repeat visitors. Nevertheless, there is no empirical research to determine the mutual effect of destination image and novelty in influencing repeat visitation.

This study aims to explore the individual impact of destination image, travel satisfaction, travel motivation, and travel inhibitors on the likelihood of travelers to revisit a travel destination. The objective of this study is also to examine simultaneously the mutual impact of the destination image, travel satisfaction, travel motivation, and travel inhibitor on repeat visitation. Currently, there is no empirical study assessing simultaneously the mutual impact of these four travel determinants on repeat visitation.

Five models were proposed as a result of hypotheses testing. Thailand was used as the setting of this study. First, the logistic regression tested the impact of each travel determinant including destination image, travel satisfaction, travel motivation, and travel inhibitor on the likelihood that travelers would revisit Thailand. Then, the mutual impact of the bundle of these four travel determinants on the likelihood of revisiting was tested again with the use of logistic regression.

The following section discusses the results of the hypotheses testing of the five models.

Likelihood of Revisiting

Impact of Destination Image

Hypothesis 1 proposes that the more positive the image of a travel destination, the more likely the international travelers would revisit the destination. The result shows that two coefficients of the image of Thailand dimensions are different from zero, the null Hypothesis 1, which proposed that there is no significant relationship between the image of a travel destination and the likelihood of revisiting, is rejected.

The alternative Hypothesis 1 was supported by the significant positive relationship between the image of Thailand as "good value cuisine and hotels" and the likelihood of travelers to revisit Thailand. It was found that when there is a one-unit increase in the image of "good value cuisine and hotels," the log odds of the dependent variable that the traveler "would revisit Thailand" versus "would not revisit" Thailand, would increase by 1.1873 units, by holding other variables constant. This suggests that the image of "good value cuisine and hotels" had a positive impact on the likelihood of travelers to revisit Thailand. Moreover, the largest coefficient value of the image of Thailand as a "good value cuisine and hotels" also suggests that this travel determinant has the greatest impact on the likelihood of travelers to revisit Thailand. This finding supports earlier study that the perception of "value for money" influences travel decision-making. Stevens (1992) defines the "value for money" as the relationship between price and value that exists in the perceptions of the consumers, which are travelers' subjective reality. He found that price and quality perceptions are closely linked but value is more important than price (Stevens, 1992).

It was also found that there is a negative relationship between the image of "social and environmental problems" and the likelihood of travelers to revisit Thailand. A one-unit increase in the image of "social and environmental problems" would result in the decrease of the log odds by 0.3487 units, while holding other variables constant. This suggests that the image of "social and environmental problems" had a negative impact on the likelihood of travelers to revisit Thailand. This result also supports Sonmez and Graefe's (1998) study that "while perceptions of risk and feeling of safety during travel appear to have a stronger influence on the avoidance of regions rather than likelihood of travel to them" (p.175).

It can be concluded that the more positive and less negative image of a travel destination, the more likely travelers would revisit the destination. The result of this hypothesis is similar to that of Heung (1999)'s study on the airport restaurant service quality and Tsang (1996)'s study of perceived service quality in China's hotel industry. They found that there is a significant positive impact of perceived restaurant and hotel service on the visitors' likelihood of returning to the airport restaurants and China's hotels in their next trip to Hong Kong and China.

Also, the finding of this study conforms to the study of Goodrich (1978), stating that perceptions of product and service play an important role in an individual's choice (preference or non-choice) of that product or service. Moreover, it empirically confirms the theory of travel and tourism that the more favorable the perception of a vacation destination, the greater the likelihood of choice that destination over other less favorably perceived destinations (Mayo, 1973; Hunt, 1975; Goodrich, 1978; McLellan and Foushee, 1983, Chon, 1989; Chon and Olsen, 1991; Chon, 1992).

Impact of Travel Satisfaction

Hypothesis 2 proposes that the higher satisfaction the international travelers have toward their trip to a travel destination, the more likely they would revisit the destination. The result shows that two coefficients of the travel satisfaction dimensions are different from zero. The null Hypothesis 2, which proposed that there is no significant relationship between the traveler's satisfaction and the likelihood of revisiting, is rejected.

The alternative Hypothesis 2 was supported by significant positive relationships of the travel satisfaction on "quality, service, and value of lodging and restaurant," and "quality, service, and value of foods" on the likelihood of travelers to revisit Thailand. A one-unit increase in the travel satisfaction on "quality, service, value of lodging and restaurant," would result in the increase of the log odds of the dependent variable that the traveler "would revisit" versus "would not revisit" Thailand" by 0.4992 unit, while holding other variables constant. This suggests that the travelers' satisfaction on the "quality, service, value of lodging and restaurant" had a positive impact on the likelihood of revisiting. Moreover, the largest coefficient of the "quality, service, value of lodging and restaurant" has the greatest impact on the likelihood of travelers to revisit Thailand. Also, a one-unit increase in travelers' satisfaction on "quality, service, value of foods" would lead to the increase of the log odds of the dependent variable "would revisit" travelers versus "would not revisit" Thailand by 0.3933 unit, while holding other variables constant.

It can be concluded that the higher satisfaction travelers have toward their trip, the more likely they would revisit a travel destination. This finding confirms the results of previous studies (Oliver, 1980; Taylor and Baker, 1994; Zeithaml, Berry, and Parasuraman, 1996, and Heung, 1999), indicating that there is a positive relationship between product satisfaction and repurchase intentions.

Similarly, the study of Ostrowski, O'Brien, and Gordon (1993) on service quality and customer loyalty in the commercial airline industry found that there were relationships between reputation, service, value offered, and brand loyalty (Ostrowski, O'Brien, and Gordon, 1993). Their study revealed that "while the overall value is equal for the two carriers, intentions to continue using the same carrier appear to depend more on quality perception than on price perception" (p.20). The perceived image of airlines' reputation and service quality determines customer loyalty (Ostrowski, O'Brien, and Gordon, 1993).

Keane (1997) suggested that a high quality tourism destination could build its reputation and customer loyalty by selling premium service quality above its costs of production. In a highly competitive environment, the reputation of a tourism destination largely depends on perceived service quality (Keane, 1997). Although a high quality tourism destination may have a costly initial investment in building its reputation, it will benefit from a high level of repeat business (Keane, 1997). Likewise, Ostrowski, O'Brien, and Gordon (1993) noted that rewards of making the investment to improve service quality may well outweigh the costs.

Impact of Travel Motivation

Hypothesis 3 proposes that the higher travel motivation the international travelers have towards a travel destination, the more likely they would revisit the destination. The result shows that two coefficients of the travel motivation dimensions are different from zero. The null Hypothesis 3, which proposed that there is no significant relationship between the travel motivation and the likelihood of revisiting, is rejected.

The alternative Hypothesis 3 was supported by significant positive relationships of the "good value food, shopping, and a variety of things to do" and "novelty seeking" on the likelihood of travelers to revisit Thailand. A one-unit increase of the travelers' motivation on "good value food, shopping, and a variety of things to do" would result in 1.0262 units increase of the log odds of the probability of revisiting, while holding other variables constant. Moreover, the highest value of the coefficient of the travel motivation on "good value food, shopping, and a variety of things to do," indicates that this travel determinant has the greatest impact on the likelihood of travelers to revisit Thailand. Likewise, when there is a one-unit increase of the travelers' motivation on "novelty seeking," the log odds of the dependent variable would increase by 0.6252 units, while holding other variables constant. It can be concluded that the stronger the travel motivation the international travelers have, the more likely they would revisit the travel destination.

This result is consistent to the concept of Moutinho (1987), suggesting that quality and price ratio would influence future purchase intentions. In addition, the finding may support the concept of Ryan (1995), indicating that positive past experience, sensitivity to price, a strong sense of identification with the destination, risk aversion, and social opportunity may motivate travelers to come back. The finding may also confirm the concept of Schmidhauser (1976-1977), cited by Oppermann (1998), stating that continuous repeaters to the same destination are those tourists who are faithful to a destination when they had a positive experience with it.

Goodrich (1978), Mazursky (1989), Perdue (1985), and Sonmez and Graefe (1998) stated that past travel experience influences behavioral intentions. Sonmez and Graefe (1998) found in their study that past travel experience to a particular destination increases the intention to travel there again. Likewise, Mazursky (1989) cited in Sonmez and Graefe (1998), states that future travel is influenced by both the extent and the nature of past travel experience. Such personal experience may even exert more influence on travel decisions than information acquired from external sources (Mazursky, 1989, cited in Sonmez and Graefe, 1998). However, this study is not a causal relationship design.

This notion is not empirically confirmed. Additional research is needed to further the results of this study.

However, the finding of this study, indicating that "novelty seeking" motivates travelers to revisit Thailand, differs from that reported by Bello and Etzel (1985). They found that novelty-seeking travelers indicate a stronger intent to take a similar trip in the future but a lower likelihood of returning to the same destination. Kim and Lee (2000) stated that novelty seeking is strong in American cultures with high individualism, high masculinity, and low uncertainty avoidance. Philipp (1994) also found that a racial difference of tourism preference between African Americans and Caucasian Americans does exist in the novelty seeking. Philipp (1994), cited by Kim and Lee (2000), indicating that the novelty seeking was found more among Caucasian Americans than African Americans. Their study indicated that Caucasian Americans are more likely to agree with the statement: "When I travel I like to be on streets I don't know;" "When I travel I like to stay at motels and hotels which I have never heard about." This suggests that travelers' motivation for "novelty seeking" and their intent to revisit travel destinations vary among destinations. It also indicates that the travel motivation of international travelers to Thailand does not necessarily follow the Western models of tourist motivation.

Impact of Travel Inhibitors

Hypothesis 4 proposes that the stronger travel inhibitors the international travelers have towards a travel destination, the less likely they would revisit the destination. The result shows that one coefficient of the travel inhibitor dimensions is different from zero. The null Hypothesis 4, which proposed that there is no significant relationship between travel inhibitor and the likelihood of revisiting, is rejected. The alternative Hypothesis 4 was supported by a significant negative relationship between the travel inhibitor on "travel barrier" and the likelihood of revisiting. A one-unit increase in the "travel barrier" would result in 0.5762 unit decrease of the log odds of the probability of revisiting. It can be concluded that the stronger travel inhibitors the international travelers have, the less likely they would revisit the destination.

However, care must be taken when interpreting the result of this hypothesis because the probability of revisiting is more than the cut off point of 50% in the logistic regression. The model suggests that if a traveler's rating on travel barrier variable were 5 (strongly agree), the estimated probability that the traveler would revisit Thailand was 72%. In addition, although the travelers indicated that the "lack of novelty seeking" was their top travel inhibitor deterring them from revisiting Thailand, this travel inhibitor factor was not significant. The variation (due to the combined data set) in respondents' response towards this factor may be due to intervening variable such as countries of residence. Travelers from different country of residence may encounter different types of travel inhibitors. However, this relationship was not hypothesized in the original model and, therefore, not examined.

The Impacts of A Bundle of Travel Determinants on Repeat Visitation

Hypothesis 5 proposes that the bundle of the destination image, travel satisfaction, travel motivation, and travel inhibitors affects the likelihood of revisiting. The result shows that five coefficients of the image of Thailand, travel motivation, and travel inhibitor dimensions are different from zero. The null Hypothesis 5, which proposed that there is no significant relationship between the destination image, travel satisfaction, travel motivation, and travel inhibitor on the likelihood of revisiting, was rejected because the travel satisfaction is not significant. The alternative Hypothesis 5 was supported by significant positive relationships among 1) the travel motivation on "good value food, shopping, and a variety of things to do," 2) the positive image of "good value cuisine and hotels," and 3) the travel motivation on "novelty seeking," and significant negative relationships among 4) the "travel barriers," and 5) the negative image of "social and environmental problems" on the likelihood of revisiting.

The empirical finding shows that travel satisfaction dimensions do not have any impact on the likelihood of revisiting when being considered simultaneously with other travel determinants. The notion that satisfaction affects customers' future buying behaviors, is not empirically confirmed in this study. The finding shows that when respondents consider only the impact of travel satisfaction dimensions alone, their satisfaction on "quality, service, and value of lodging and restaurant," and "quality, service, and value of foods" would influence them to return to Thailand. However, when they considered simultaneously a bundle of the four travel determinants (destination image, travel satisfaction, travel motivation, and travel inhibitor dimensions), the travel satisfaction dimensions were not significant. A possible explanation may be that travelers' satisfaction associated with particular hotels or restaurants might influence them to choose a particular brand name on their next purchase but does not influence them to return to a particular travel destination.

Likewise, the result of this study conforms to the study of Bello and Etzel (1985), indicating that "unlike other types of consumer behavior in which satisfaction results in repeat purchases, the very attraction of a travel destination for one market segment discourages a repeat purchase because familiarity decreases or eliminates novelty" (p.24). Thus, it may be possible to conclude that in the travel and tourism industry, travelers' satisfaction would not guarantee future visits. Other factors such as the lack of novelty seeking, time and money constraints may deter travelers from revisiting the same destinations. However, this assumption is not empirically supported in this study.

Furthermore, travelers' motivation on "good value food, shopping, and a variety of things to do," and their perception of "good value cuisine and hotels," were similar (a good value for money and food). This supports the notion that preferences for tourist destinations are enhanced by favorable perceptions that travelers hold about those destinations (Goodrich, 1978). This also confirms Fishbein's theory, cited by Goodrich (1978) that "favorable impressions or perceptions of a tourist area increase the probability of choice of (preference for) that areas as a vacation destination" (p.13).

In conclusion, the bundle of travel determinants model suggests that positive and negative destination image are important during post purchase destination selection process. It also suggests that the travel motivation and the destination image on "value for money" carry the greatest weight on repeat visitation. Stevens (1992) noted that most consumers of tourism products do have thresholds of price and a quality level. In order to attract international travelers, a travel destination must be perceived as of a quality to or better than that of other countries, and its price must be perceived as attractive (Stevens, 1992).

Impacts of Number of Visits and Demographics

The following section discusses research finding, theoretical, and practical implications of the source of travel information, the impacts of number of visits and demographics on repeat visitation, and the competitiveness of Thailand as a travel destination. Then, it recommends practical strategies for the Tourism Authority of Thailand to increase the competitiveness of Thailand in the global travel and tourism industry.

Source of Travel Information

This study found that travelers used both informative and persuasive information as the most important source of travel information. Respondents indicated that travel agencies, tour guidebooks, and word of mouth from family, friends, and relatives were the most important source of information while planning a trip to a travel destination. This result is consistent with that reported by Mok and Armstrong (1996) indicating that Taiwanese and Hong Kong travelers considered travel agencies and word of mouth from friends and relatives as the most important source of travel information. Tour guidebooks and word of mouth from friends and relatives are objective, informative, and credible source of information (Gitelson and Crompton, 1983; Mill and Morrison, 1985; Mok and Armstrong, 1996). At the same time, travel agencies are perceived as the most important persuasive source of travel information for tourists who join all-inclusive package tours. Mok and Armstrong (1996) found that travelers who join all-inclusive package tours rely on travel agencies as their main source of information whereas independent travelers gather information mainly from friends and relatives.

In addition, this study showed that Internet (24%) and travel brochures (24%) were also widely used among the travelers in planning a trip to a travel destination. This suggests that the Internet became a new source of travel information as important as travel brochures in the new millennium. This result provides empirical support for the trend predicted by the World Tourism Organization (2000) that if destinations are not on the Web, they will be ignored by million of people who now have the Internet access.

However, the respondents of this study reported that overseas tourism bureaus, radios, and advertisements on buses were not their major sources of travel information. This result conforms to Mok and Armstrong' s (1996) study which showed that Taiwanese and Hong Kong tourists ranked tourism commissions, airlines, and T.V./radio commercials as unimportant sources of travel information.

It was also found that tourist attractions, price, safety, friendliness of people, and climate were the major concern of the respondents when selecting travel destinations. This finding is consistent with the study of Mok, Armstrong, and Go (1995) which showed that the most important travel attributes for Taiwanese tourists were safety, natural and cultural attractions, friendliness of people, and price respectively. They also found that the most popular mode of travel of Taiwanese travelers was joining all-inclusive package tours. Touche Ross survey (1975), cited by Mok and Armstrong (1996), suggested that convenience and tour economy were the most frequently cited reasons for purchasing package tours.

It can be concluded that international travelers rely heavily on recommendations from travel agencies, tour guidebooks, family, friends, and relatives as their major source of travel information. They also use the Internet and travel brochures in searching for travel information. Their major concerns were tourist attractions, price, safety, friendliness of people, and climate.

Image of Thailand

The result of this study indicates that Thailand has a negative organic image of "social and environmental problems." However, it has positive induced and organic images of "safe travel destination," "adventurous activities and scenic natural beauty," "rich culture," "good value cuisine and hotels," "easy access tourist destination," and "good shopping." These positive image dimensions are consistent with those found in the studies of Yau and Chan (1990) and Calantone, di Benedetto, Hakam, and Bolanic (1989). Their findings indicate that international travelers perceived Thailand as a safe, reasonable price, cultural and natural destination with friendly people and a variety of attractions and nightlife entertainment.

The six positive image dimensions also suggest that the "Amazing Thailand Years 1998-2000" campaign is successful in creating the induced images of a good value for money, cultural, and natural travel destination in the mind of travelers. The campaign also makes travelers aware of Thai cuisine, shopping, and easy immigration procedures. Moreover, this positive induced image becomes an organic positive image through travelers' experiences during their visits in Thailand.

However, the negative organic image of prostitution, AIDS, crowding, a gap difference between the rich and the poor, and traffic jams still exist in the mind of travelers. Part of this organic image stems from news reports and magazines about the social and environmental problems in Thailand (Fineman, 1990, Robinson, 1993, South

China Morning Post, 1997). These organic images have been confirmed when travelers experience such incidents during their visits in Thailand.

Image Difference by Number of Visits

A comparison of Thailand image attributes between first time and repeat travelers revealed statistically significant differences on the organic image of “easy access,” “a trip to Thailand worth the value for the money,” “scenic and natural beauty,” “easy immigration procedure,” and “good vacation place for children and family.” These organic images are stronger in the mind of repeat travelers than in those of the first time travelers’. This suggests that repeat travelers perceived the “hidden quality” (Fakeye and Crompton, 1991), which is not obvious among first time travelers. These organic images are the outcome of the number of visits that repeat travelers travel to Thailand. The number of visits enables them to make a comparison of the “value for money” between their previous and current trips. Travelers’ perceptions of the “value for money” are influenced by past travel to the destination (Stevens, 1992).

In terms of management implication, it is a positive sign indicating that the effort of the Tourism Authority of Thailand in positioning the image of Thailand as a good value for money and family travel destination does work. The repeat travelers are aware of the increase of tourist attractions for family and children. Also they noticed the recent improvement in tourist services such as easy access and easy immigration procedures.

The change in positive organic image among repeat travelers also confirms the findings of Gartner (1986), Phelps (1986), Chon (1987), Fakeye and Crompton (1991) and Chon (1991) indicating that the number of visits affects the perceived destination image. As the number of visits increase, travelers have better perceptions towards a travel destination in terms of quality and price ratio, tourist attractions, and facilities.

Image Differences by Demographics

A comparison in perception of image differences by demographics indicates no significant difference in gender and occupation. However, perceived image differences existed among marital status, age group, level of education, and country of residence. The significant differences in the perceived image of Thailand support the result of previous studies indicating that the destination image is formulated based on demographics (Chon, 1990; Fakeye and Crompton, 1991; Gunn, 1989; Baloglu and McCleary, 1996).

Single and young travelers perceived Thailand less favorably than married and middle aged/mature travelers on the organic and induced image of "safe travel destination" and "good value cuisine and hotels." The lower perception of young and single travelers towards Thailand's safety may be due to the fact that there is more crime against young backpackers who are closer to danger by going cheap and alone (Spaeth, Horn, Tucker, Sawp, Ganguly, and Tashiro, 2000). This suggests that Thailand has room for improvement. Negative organic image of crime against tourists threatens the success of the Tourism Authority of Thailand in promoting Thailand as a peaceful and relaxing atmosphere.

The lower perception of young and single travelers toward the image of good value for money may indicate low quality and cheap accommodations and restaurants that most young and single tourists patron. However, it may also indicate pricing problems in the Thai tourism industry. Although the Tourism Authority of Thailand has promoted Thailand as a good value for money travel destination because of the devaluation of the Thai Baht, unreasonable pricing of hotels, food, and beverage in major tourist resorts, can create tourist dissatisfaction. For example, Phuket becomes inaccessible to young backpackers and low to middle income Thai tourists due to its expensive hotel room rates, Service providers should not charge high price only because of profit making. Keane (1997) noted that the quality premium does not mean maximizing profit but minimizing the likelihood of quality deterioration.

The study found that single and young travelers had more positive perception towards the image of "adventurous activities & scenic natural beauty activities." This may be the result of the tourism promotion of the Tourism Authority of Thailand. Consequently, Thailand has long been popular among young and single travelers for its sun, sand, and sea. It may be also the result of the induced and organic image from word of mouth and movies. For example, the recent US movie: "the Beach," starring Leonardo DiCaprio, has made the beaches in Thailand more well known among young and single travelers (Bly, 2000).

The study also found that Asians had less favorable perceptions towards the images of Thailand as "safe travel destination," "rich culture," "good value cuisine and hotels," and "good shopping." This may be the result of inferior tour packages in Asian markets. For example, the "soon rien" (zero-dollar-tours) marketed by many Thai and Chinese tour operators, provide tourists with heavy discount or free accommodation, transports, and meals but tourists could be easily ripped off by visiting brothels, gambling dens, sex shows, and outrageous expensive jewelry and souvenir shops (Bangkok Post, 2000a). Consequently, tourists have negative perceptions towards Thailand. Keane

(1997) noted that a strategy of quality reductions would yield immediate cost savings, while the adverse effect on reputation will arise only in the long run.

Since travelers' satisfaction is the evaluation outcome of the performance expectancy and the perceived travel experience (Chon, 1990), the gap difference between the expected induced positive images and the perceived negative organic images would result in travelers' dissatisfaction. The result of this study indicating that travelers from different countries of residence have different perceptions towards the image of a travel destination also confirms the assumption of Goodrich (1978). He commented that "individuals from different parts of the world (and even those from the same parts of the world) differ in their preferences and perceptions regarding the tourist destinations (Goodrich, 1978, p.13)."

Travel Satisfaction

This study revealed five travel satisfaction factors of international travelers during their visit to Thailand. These travel satisfactions were "lodging and restaurant," "shopping and tourist attractions," "transportation," "foods," and "environment and safety."

Travel Satisfaction Differences by Number of Visits

It was found that repeat travelers had higher satisfaction than first time travelers on "food prices," "type of foods," "service in restaurants," "attitude of Thai people towards tourists," "prices of traveling in Thailand," and "prices of shopping items." This may suggest that the devaluation of Thai currency enables repeat travelers to gain from currency exchange and buy more things at better prices as compared to their previous visits.

Travel Satisfaction Differences by Demographics

The study found that female travelers had a lower level of satisfaction on the "environment and safety" than male travelers. This may suggests that recent crimes against women have created an unsafe tourist environment. For example, the murder of an Australian female traveler: Sherry Cobcroft killed in Krabi by two youths, one a monk (The Straits Times, 2000a) may have scared women. Moreover, female travelers tend to be a primary target of illegal guides who lead them to shop in high-priced cheap jewelry and souvenir shops.

The study also found that married travelers were more satisfied than single travelers on the "quality, service, and value of lodging and restaurant," "shopping and tourist attractions," "transportation," and "environment and safety." Due to the fact that many married travelers are on honeymoon or wedding anniversary trips in Thailand, they are more concerned with impressive travel experience than price. Moreover, married travelers tend to stay in four to five hotels/resorts, eat in fine dining restaurants, and use travel agency services such as airport transfers, and sightseeing tours. Since they pay higher prices, they tend to receive higher service quality and more satisfaction than young and single tourists, who are likely to travel on budget. Ostrowski, O'Brien, and Gordon (1993) pointed out that "value can be considered a function of both price and quality. The higher the quality offered for the price paid, the higher will be the value as perceived by customers " (p.20).

Likewise, the study found that travelers with graduate/postgraduate degrees had the highest travel satisfaction on "shopping and tourist attractions" and "foods." This may suggest that those travelers who hold graduate/postgraduate degrees are more likely to make enough money to allow them to buy luxurious services, which in turn results in their high satisfaction. Keane (1997) argued that since price must exceed cost in order to prevent quality deterioration, high prices might be interpreted as signals of high quality.

In addition, the result of this finding supports the study of Stevens (1992), indicating that more affluent and older travelers are less price-sensitive. However, they place a greater importance on high quality travel experiences, for example, meals become more important.

It is important to notice that although Asians are the top major inbound tourist market to Thailand in terms of their highest tourist arrivals and tourism receipts (TAT, 1999), they had the lowest travel satisfaction on all of the five travel satisfactions. This suggests that the Thai service providers fail to provide the most important customers with good travel experiences. The study found that Asian travelers had the lowest satisfaction on "lodging and restaurants," "shopping and tourist attractions," "transportation," "foods," and "environmental and safety." This may suggest that Asian travelers receive lower service quality than travelers from Europe, North America, Oceania, and other regions.

As mentioned earlier, the highly discounted Asian tour packages include shopping itineraries to visit high- priced souvenir and jewelry shops. Also, the marginal profit of such tour packages are traded off with low quality lodging, food and beverage, and visits to deteriorated tourist attractions. However, such discounted tour packages with low service quality would not retain repeat travelers. Ostrowski, O'Brien, and Gordon (1993) stated that competition based on pricing will lead only to temporary share gains and will do little to build and maintain brand loyalty (Ostrowski, O'Brien, and Gordon, 1993).

Another possible explanation could be that service providers underestimate the expected level of service quality of Asians. Ap (2000) commented that some Asians such as Chinese, Japanese, and Koreans tend to keep silent instead of expressing their dissatisfaction to save face and avoid embarrassment of the vendors. This may lead to a misunderstanding that Asians are tolerant to low services and a poor product quality. Keown (1989), cited in Heung and Cheng (2000), studied tourists' shopping experiences in Hong Kong across different countries and found that Japanese tourists were the most concerned with their shopping experience, particularly in terms of neatness, friendliness of salespersons, honesty, and innovation. A post purchase judgement of Asian travelers suggests that when their travel experience was noticeably worse than that anticipated. It led to dissatisfaction (Heung and Cheng, 2000).

In conclusion, this study confirms earlier findings that quality services are the key to repeat visitation (Stevens, 1992; Keown, 1989; Heung and Cheng, 2000).

Travel Motivation

Travel Motivation Differences By Number of Visits

Whereas repeat travelers reported that they would revisit Thailand because of "Thai food" and "short distance," first time travelers said that they would revisit Thailand because of "seeing people from different culture." This may be due to the fact that first time travelers have not been to some regions of Thailand. In order to enjoy the various attractions in all various regions of Thailand, tourists may spend at least one month. However, the average tourist length of stay is only 7.96 days (TAT, 1999). Therefore, it is difficult for first time travelers to visit every region within one week. This also suggests that promotional campaigns and tour packages on "seeing people from different culture" should be used to target first time rather than repeat travelers. Since repeat travelers have visited Thailand before, their motivation on "seeing people from different culture" may not be as strong as that found among first time travelers. Repeat travelers may come back because Thailand offers them a good value for money travel experience.

Travel Motivation Differences by Demographics

The study also found that Asians were less motivated by "novelty seeking" than Europeans and North Americans. Europeans were highly interested in "novelty seeking." This result is consistent with the study of Yuan and McDonald (1990), indicating that novelty was ranked first as the primary motivation of French and British, but lower for Japanese tourists. Many Europeans and North Americans like to travel to remote areas to search for unspoiled natural and authentic cultural attractions (Cohen, 1982).

The findings also shows that Asians were less motivated by the travel motivation on "good value cuisine, shopping, and a variety of things to do" than Europeans and North Americans. This may be due to the fact that in some Asian destinations such as Hong Kong and Singapore, Chinese cuisine and shopping are as good as those found in Thailand. Also, it may be the result of the zero-dollar tour packages. As mentioned earlier, the marginal profit of such tour packages is traded off with lower quality food and shopping.

The study also found that North Americans were more interested in "deals on package tours and currency exchange" than Asians and travelers from Oceania. This may suggest that the strong value of US dollars during the Asian financial crisis in 1997 to 2000 enabled North Americans to gain more value for money than travelers from other regions.

This study also shows that Europeans were more motivated by the "natural attractions" than Asians, North Americans, and travelers from Oceania. This result conforms to the study of Cohen (1982) on "Marginal Paradise: Bungalow tourism on the islands of Southern Thailand." He indicates that young backpacker to Thailand are primarily from European countries. They go to Thailand to search for unspoiled natural attractions, specifically, beach paradises (Cohen, 1982).

As discussed earlier, the findings of this study indicating that different travel motivations varied upon country of residence, confirms the notion of Goodrich (1978), stating that "individuals from different parts of the world (and even those from the same parts of the world) differ in their preferences and perceptions regarding the tourist destinations (p.13)."

Travel Inhibitors

The respondents rated "I want to discover unknown experience in other countries" and "I want to visit other places than Thailand" highest as the travel inhibitors that would deter them from revisiting Thailand. This may suggest that the "lack of novelty seeking" is the major factor deterring travelers from returning. Although travelers were satisfied with their trips to Thailand, they may not come back due to the lack of novelty seeking.

This study also revealed five travel inhibitors that would deter travelers from revisiting Thailand. These inhibitors were "safety/security, lack of attractions," "environment," "travel barrier," "dissatisfaction, deterioration," and "lack of novelty seeking."

Travel Inhibitor Differences by Number of Visits

It was found that there were differences in the travel inhibitor on "lack of new attractions" between first time and repeat travelers. The "lack of new attractions" would deter more repeat than first time travelers. This finding supports the concern of Thai tour operators, indicating that repeat visitors spend less time in Thailand and go on to new destinations due to a lack of new tourist attractions (Jariyasombat, 1996). Moreover, the steady growth of tourist arrivals in the 1990s may be due to the lack of a sense of discovery among repeat tourists.

Travel Inhibitor Differences by Demographics

The result of the study showed that Asian travelers were more likely to agree than travelers from North America, Europe, and Oceania that "safety/security, and lack of attractions" such as threats of AIDS, prostitution, and crime would deter them from revisiting Thailand. Due to a short length of stay, most Asian travelers tend to visit deteriorated tourist attractions in big cities. Moreover, Asians are more likely to be crime victims during their visits to brothels, gambling dens, and sex shows.

The result of this study empirically confirms that the "lack of novelty seeking" would deter travelers from Asia, Europe, North America, and Oceania from revisiting Thailand. The study also found that North Americans were the most sensitive towards the "lack of novelty seeking," followed by Europeans, travelers from Oceania, and Asia.

Unlike other products and services, tourism sells excitement, unknown experiences, and the sense of discovery to travelers. These tourism features expire as soon as the travelers arrive at destinations. Although travel destinations provide the visitors with good service and satisfaction, it is not guaranteed that those travelers will visit those destinations again.

Competitiveness of Thailand as A Travel Destination

This study also aims to identify the competitiveness of Thailand as compared to the other four major Southeast Asian travel destinations. Understanding travelers' perceptions of the positioning strategy of Thailand is useful for the Tourism Authority of Thailand in identifying Thailand's strengths and weaknesses as compared to other competing Southeast Asian travel destinations.

The result of this study reveals that Thailand, Indonesia, and Malaysia share similarities, albeit not in the same degree, in cultural/historical sites, natural scenery, and price. Likewise, Thailand, Hong Kong, and Singapore have the same strengths in terms of shopping, cuisines, hotels, overall services, conventions/exhibitions facilities, ease of access, transportation, and safety and security. Thailand has the same strengths as Indonesia and Malaysia in cultural/historical sites, natural scenery, and travel price whereas these attributes are the weaknesses of Hong Kong and Singapore. Meanwhile, Thailand shares similar strengths as Hong Kong and Singapore in shopping, cuisines, hotels, overall services, conventions/exhibitions facilities, ease of access, transportation, and safety and security. Likewise, these attributes are the weaknesses of Indonesia and Malaysia. Since Thailand combines the strengths of the other four travel destinations in one country, it is necessary to stress this advantage in travel promotion. For example, a theme such as "In Thailand, there are four countries in one" can be used to differentiate Thailand from the other four destinations.

Although Thailand was ranked as the best in terms of cultural and historical sites, natural scenery, friendliness of people, and travel price, there is room for improvement in terms of cuisine in restaurants, convention/exhibition facilities, transportation, and safety and security.

Although the Tourism Authority of Thailand has promoted the "Amazing Taste of Thailand 1998-2000," the cuisine in Thai restaurants is perceived inferior to that of Hong Kong. This may suggest that respondents may perceive the types and quality of food served in Hong Kong's restaurants better than those found in Thailand. Or, it may be implied that respondents perceive Hong Kong's Cantonese cuisine superior to Thai cuisine. However, the objective of this study is not to reveal the causal relationship of this notion.

It is interesting to note that Thailand, Singapore, and Hong Kong are perceived as the best Southeast Asian shopping destinations. Hong Kong and Singapore have been the best shopping paradises in Southeast Asia since their origins as British trading colonies (Walsh, 2000). However, during the last decade, Thailand became popular for its bargain shopping. The Tourism Authority of Thailand's aggressive promotional campaigns such as the "Visit Thailand Year 1987," "Thailand's Arts and Crafts Years 1988-1989," and "Amazing Thailand Grand Sales 1998-2000" are successful in positioning Thailand as a "shopping paradise in Asia." For example, the "Globo" Magazine of Germany ranked Thailand as the second most attractive shopping destination in the world in 1998 (TAT, 1999). Moreover, the friendliness of Thai people creates a good shopping impression to tourists. Walsh (2000) noted that "negotiating a price with the Thais is somehow less stressful than haggling with the Hong Kong and Singapore Chinese." In addition, the devaluation of the Thai baht and the Asian financial crisis are opportunities to the Thai shopping tourism industry. During the Asian financial crisis, the shopping in Hong Kong and Singapore has not been as attractive as Thailand's due to its US equivalent currencies (Walsh, 2000). Walsh (2000) commented that "long gone are the days when the Australian currency was worth twice as much as the Singapore dollar: now you're lucky if you manage to get parity at the exchange booth."

Although Thailand is perceived as a safe destination because of its political stability and the friendliness of Thai people, crimes against tourists and bus/ferry accidents are rising (Cheesman, 2000). This is due to lax safety regulations and poor law enforcement (Cheesman, 2000, the Straits Times (Singapore). This may suggest that it is time to restructure law enforcement and improve the efficiency of Thai police department.

Recommendations

This section proposes practical recommendations to the Tourism Authority of Thailand to increase the competitiveness of Thailand in the international travel and tourism markets.

Promotional Campaigns

Since travel agencies, tour guide books, and the Internet were the most important source of travel information to Thailand, the Tourism Authority of Thailand should organize familiarization tours for travel writers and travel agencies to educate them about tourist attractions, new travel opportunities, and tourist facilities and amenities in Thailand. Moreover, it was also found that recommendations from family, friends, and relatives are the top three most important source of travel information. Therefore, Thai service providers must provide travelers with good value for money service and products to exceed travelers' expectation. This would result in tourist satisfaction, which is essential in creating positive word of mouth.

As today travelers become more sophisticated and demanding, destination marketers should customize their tourist products, services, and promotional campaigns when targeting different tourist market segments. For example, informative promotion is appropriate for nonvisitors to create their awareness about a destination whereas persuasive promotion is intended to persuade potential travelers to buy and is most appropriate when an induced image is formed (Fakeye and Crompton, 1991). As for repeat travelers, tourism promotion should remind them about both positive organic and induced images of destinations so that they consider repeat visits and spread word of mouth (Fakeye and Crompton, 1991).

Images of Thailand

As discussed earlier, first time traveler were unaware about the hidden quality of tourist facilities and attractions in Thailand such as easy access and immigration procedures, and good value for money family travel destination. Thus, more promotional campaigns should be emphasized to potential first time travelers, specifically, those in Thailand's emerging tourist market segments to create the awareness about "Thailand's hidden qualities."

The Tourism Authority of Thailand should allocate more promotional budget and more marketing effort to increase and maintain the positive image of Thailand as a good value for money travel destination in terms of good cuisine and lodging. Also, the Tourism Authority of Thailand should design special travel packages, which highlight the good value for money in terms of food, shopping, and a variety of activities to do in Thailand. At the same time, it is necessary to eliminate the negative image of social and environmental problems such as AIDS, prostitution, traffic jam, pollution, and a large gap between the rich and the poor.

In order to eliminate the negative image of prostitution, the Thai people must be intolerant with prostitute patronage. Since people tend to remember more negative information; a fraction of dark area of a destination creates a negative image, (Mayo and Jarvis, 1981)." The presence of numerous massage parlors and adult entertainment in Thailand will confirm the negative image of prostitution in the mind of international travelers. As Belk, Ostergaard, and Groves (1998) commented that "given the enduring nature of prostitution, its profitability, and Thai cultural perceptions of the carnal nature of men, it is not realistic to expect to close down the sex industry" (p.210). Hence, the best way to eliminate the negative image of prostitution is to change the attitudes of Thai people to be against prostitute patronage.

It is also essential to always remind repeat travelers about the favorable images of Thailand such as unique and diverse tourism facilities and development of these and other attracting facilities (Goodrich, 1978).

Travel Satisfaction

As mentioned earlier, Asian travelers had the lowest travel satisfaction towards their trip to Thailand. In order to maintain Asian market share, it is necessary to improve the type, price, and quality of tourist services and products to regain their satisfaction. It seems to be difficult to control the practice of tour guides and tour operators on the zero dollar tours. However, it is possible to warn tourists about such practice. Although it is undesirable to warn tourists about such negative news, the warning would prevent dissatisfaction and negative word of mouth.

Furthermore, it is necessary to improve the quality of food and shopping in souvenir shops that target to Asian markets. Currently, there are a lot of complaints among Asian travelers that they have bought low quality products sold at high prices. Since price is one major concern of travelers to Thailand, the Thai service providers should offer a variety of price ranges of airfare, accommodations, and optional tour activities when designing tour packages. However, a tour package should not be priced too low; otherwise, it is traded off with commission from shopping and entertainment.

Travel Motivation

Thailand can be promoted as a "special interest tourism" destination. As the study indicated, Thai food motivated travelers to revisit Thailand, hence, special food tour packages can be developed and highlighted. Likewise, the recent promotion of health tourism including five-star spas, traditional Thai massage, Buddhist meditation, Yoga, and inexpensive health care services such as plastic surgery, can be used to attract price-sensitive travelers from Asian markets. However, it is necessary that the Tourism Authority of Thailand implements strict measures to maintain the international standard of the health care services in Thailand. In addition, tour promotions targeting sport tourism such as golfing and Thai boxing can be used to attract male travelers by hosting international golf tournaments and educating international golfers about the availability of professional golf courses at competitive prices in Thailand. This can be done through advertising which stress the variety of golf facilities and tournaments in sports magazines such as "Golf Digest" on televised sports events such as "ESPN."

To promote Thailand as a "shopping paradise," it is necessary to provide tourists with good quality products at reasonable prices. The semi annual year sales under the "Amazing Thailand Grand Sales" should be promoted as an annual shopping festival. This campaign is beneficial to both international and domestic tourism in terms of the increase of tourist expenditure and arrivals. Moreover, the Tourism Authority of Thailand should support and facilitate the Value-Added-Tax (VAT) refund" procedures to enhance tourists' shopping experience in Thailand. Moreover, regular "mystery shoppers" are useful to inspect the quality of products and price level in tourist shops. Likewise, the performance of Thailand's shopping tourism depends on the input of public and private sectors ranging from attractiveness of types, quality, and price of shopping items, access of tourists to shopping outlets, product quality control, efficiency of Thai tourist polices to provide tourists with safety and security while shopping and prevent them from cheating. Finally, the effective use of the image repositioning depends on the performance of Thai service providers in maintaining quality products and services at reasonable prices.

The result of this study, which indicates that travelers are motivated by the "novelty seeking," suggests that the Tourism Authority of Thailand is on the right track in promoting concurrently new cultural attractions in Thailand and those in neighboring countries. For example, the joint tourism promotion between Thailand and Cambodia, or Thailand and Vietnam under the campaign: "Two countries: One Destination," which combines tourist attractions in Thailand such as Sukhothai and Ayutthaya and those in Cambodia such as the "Angkor Wat," or "Hue" of Vietnam, would rejuvenate cultural tour packages of Thai travel agencies. These tour packages should be used when targeting European and North American tourist markets because the study shows that travelers from these two markets are highly concerned with the opportunity for novelty seeking. Moreover, the "Amazing Thailand: Gateway to Indochina" campaign and the joint tourism promotion of Thailand, Laos, Myanmar (Burma), and Vietnam under the theme: "Suwannathum" (Golden Land), which promote a discovery of new travel experiences in the Indo-China countries, would create the multiple effects to local people. This would also promote Thailand as an Indo-China aviation hub.

Travel Inhibitors

Promotional campaigns and tour packages should be focused on the opportunity for discovering new travel experiences to reduce the "lack of novelty seeking" through new tourist activities and attractions. As mentioned earlier, unlike other products and services, tourism sells excitement, unknown experiences, and the sense of discovery to travelers. These tourism features expire as soon as the travelers arrive at destinations.

As mentioned earlier, special interest should be used to create new travel activities and experiences. The Tourism Authority of Thailand should cooperate with neighboring countries to offer new travel routes for tourists who search for soft adventure activities such as hiking and white water rafting.

Finally, tourism development should recognize the value and heritage of local people. It should be implemented in harmony with the culture, and ecology of the host community.

Competitiveness of Thailand

The finding of the competitiveness of Thailand suggests that Thailand should give priority to improve its transportation, safety & security, convention/exhibition facilities, and cuisine in Thai restaurants. This information is helpful in making specific changes, and/or modifications in the tourism facilities.

First, there is a demand in the quality and number of mass transportation systems to increase the competitiveness of Thailand in terms of transportation. Moreover, the delay of the construction of the second Bangkok international airport is the disadvantage of Thailand to be the aviation hub in Southeast Asian countries. Likewise, the increase of nonstop or direct flights would increase the inflow of travelers to Thailand.

Second, it may be time for Thailand to reinforce serious and heavy penalties against criminals. This measure proves effective in Singapore, which is rated as the safest travel destination in Southeast Asia.

Third, there is a demand for convention and exhibition management, hotel operation, and foreign language training in colleges and universities to prepare staff for the Meetings, Incentives, Conventions, and Expositions (MICE) market. As for the language training, emphasis should be given on listening and speaking skills. In addition, it is crucial to facilitate customs procedures such as granting approval for MICE organizers to bring in heavy machines. Also, there is a demand for a high-speed telecommunications infrastructure and audiovisual equipment to handle high-tech conventions and exhibitions. Also, the increase of hotel room rate and airfare should be based on the increase of operating costs instead of the highest profit making to create a good value for money to meeting planners.

Fourth, the empirical finding of this study suggests that more promotional campaigns are needed to highlight the cuisine in Thai restaurants as compared to that of Hong Kong. It is also essential to increase travelers' awareness about the availability of

Cantonese and other international cuisines in Thailand. At the same time, it is necessary to stress the quality of Thai and international cuisines served in restaurants throughout Thailand. Moreover, food safety and sanitation should be stressed to increase travelers' confidence in food safety and sanitation.

The key for the success of Thailand's travel and tourism industry is the cooperation among public and private sectors, which is essential for ensuring the competitiveness of Thailand as a top international travel destination.

Limitations of the Study

As this is an empirical study, the findings are of an exploratory nature. One limitation of this study is the threat of the influence of special events such as the devaluation of the Thai baht, the "Amazing Thailand Years 1998-2000" campaign, and the Asian financial crisis from 1997 to 2000. These events had effects on travelers' satisfaction and their intention of future visits to Thailand because they give travelers a good value for money, which leads to travelers' satisfaction. About 93% of the respondents were satisfied with their trip to Thailand. Almost 90% of the respondents said that they would revisit Thailand. This affects the distribution of the dichotomous dependent variable in the logistic regression. However, it is necessary to note that highly skewed distributions are well known in most customer satisfaction studies, with most satisfaction scores clustering at the upper end of the response scale (Joreskog and Sorbom, 1995). To respond to this concern, this study used the logistic regression with the maximum likelihood estimation method, which is robust to moderate departures from normality (Joreskog and Sorbom, 1995, Hair et al., 1998). Another limitation of this study is that the questionnaires were not back-translated to validate the meanings of questions. Moreover, the Asian economic recession led to the sudden decrease of tourist arrivals from major Asian inbound tourist markets such as Malaysia, Korea, and Hong Kong. This affected the number of the proportionate sample in this study. Likewise, this study aimed to sample only the top 12 inbound tourist markets to Thailand. Therefore, the result is more applicable for the travelers from these markets than other markets. In addition, the survey was conducted in June, which is the low tourist season in Thailand. Therefore, the result of the survey conducted in peak seasons may be different from what was reported here. Furthermore, the sample size of each individual inbound tourist market is relatively small to assess tourists' perceptions of each of the 12 inbound markets.

Future Study

As mentioned earlier, this study was conducted during the three special events, which have had an impact on the perception and attitude of the respondents. Thus, another version of this study is recommended to assess the attitude of tourists during the normal economic situation. As Go and Zhang (1997) suggested that further research should be undertaken due to the dynamic condition of travel and tourism industry. Evaluation must be consistent and ongoing to detect weaknesses in strategy, the effects of changing circumstances, and the relevance of specific factors.

Moreover, a study of the image of Thailand as a Meeting, Incentive, Convention, and Exhibition (MICE) destination from the perspective of meeting planners, MICE participants, and convention management companies is highly recommended. The result of such a study will help the Tourism Authority of Thailand in planning marketing strategies to capture the lucrative MICE market.

Summary

This chapter discusses the hypotheses testing, research findings, theoretical and practical implications of the study. It also presents the practical recommendations to create the competitiveness of Thailand in the global travel and tourism industry. The chapter concludes with limitation of the study and recommendation for future research.

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APPENDIX A: PILOT TEST QUESTIONNAIRE

Dear Sir/Madam,

We are conducting a study to determine the international travelers' perception and satisfaction of visiting Thailand. This information will help Thai tourism industry to provide products and services to serve you better in the future. The survey will take approximately fifteen minutes. Your response will remain confidential. Thank you very much for your cooperation!
Sincerely,

Bongkosh Ngamsom
Graduate Student
School of Hotel and Restaurant Administration
Oklahoma State University

PART ONE: Please circle only ONE answer for each of the following questions.

1. How many times have you visited Thailand including this trip?

   1 One time　　2 2-3 times
   3 4-5 times　　4 More than 5 times

2. What is the purpose of this trip?

   1 Vacation/sightseeing　　2 Business
   3 Vacation and business　　4 Convention/exhibition
   5 Visiting Friends and Relatives　　6 En route to somewhere else
   7 Others (please specify.)__________

3. Are you traveling with a tour group?

   1 Yes　　2 No

4. Are you traveling with family?

   1 Yes　　2 No

5. Who chose Thailand as the destination for your trip? Circle all that apply.

   1 I am　　2 My family member(s)
   3 Whole family　　4 My travel group mate
   5 My employer　　6 Others (please specify.) ________

6. How long have you stayed in Thailand during this trip?

   1 3 nights or fewer　　2 4 to 7 nights
   3 1 to 2 weeks　　4 More than 2 weeks, how long________

7. As a traveler, what primary type of information do you look for most in a travel advertisement? Circle all that apply.

   1 Price　　2 Safety
   3 Climate　　4 Tourist attractions
   5 Friendliness of people　　6 Others (please specify)________

8. What sources of information did you use in planning this trip to Thailand? Check all that apply.

____Airline offices	____Radio
____Advertisement on buses	____TV
____Tour guide books	____Newspaper
____Travel brochures	____Internet
____Travel agencies	____Family/ friends/relatives
____Thai tourism bureaus at your country	____Others (please specify)________

PART TWO: Please indicate the level to which you agree regarding the image of Thailand as an international travel destination. Circle only ONE number for each statement.

Strongly **Dis**agree	(SD)	1
Disagree	(D)	2
Neutral	(N)	3
Agree	(A)	4
Strongly Agree	(SA)	5

How do you perceive Thailand on the following issues?	SD	D	N	A	SA
1. Interesting customs and culture	1	2	3	4	5
2. Nice and helpful local residents	1	2	3	4	5
3. Numerous cultural/historical attractions	1	2	3	4	5
4. Beautiful architecture and building (grand palace, temples)	1	2	3	4	5
5. Pleasant climate	1	2	3	4	5
6. Restful and relaxing atmosphere	1	2	3	4	5
7. Scenic natural beauty (seas, beaches and corals)	1	2	3	4	5
8. Opportunity for adventure (jungle tour trekking, rafting)	1	2	3	4	5
9. A variety of water activities (coral watching, diving, canoeing)	1	2	3	4	5
10. Many fashionable brand-name products in malls/stores	1	2	3	4	5
11. Good service in stores	1	2	3	4	5
12. Good golf courses	1	2	3	4	5
13. Good vacation place for children and family	1	2	3	4	5
14. Exciting entertainment and night life	1	2	3	4	5
15. Good bargain shopping and value for money	1	2	3	4	5
16. A variety of cuisine (Thai, Chinese, International)	1	2	3	4	5
17. Various restaurant types (fine dining, fast food)	1	2	3	4	5
18. Good quality of food in restaurants	1	2	3	4	5
19. Availability of international standard accommodations	1	2	3	4	5
20. Reasonable room rate	1	2	3	4	5
21. Good services in hotels	1	2	3	4	5
22. Easy access (many flights from your country to Thailand)	1	2	3	4	5
23. Easy immigration procedures	1	2	3	4	5
24. Availability of tourist information centers	1	2	3	4	5
25. Good tourist facilities and services	1	2	3	4	5
26. Few language barriers (streets and signs are written in English.)	1	2	3	4	5
27. High standard of sanitation and cleanliness	1	2	3	4	5
28. Stable political situation	1	2	3	4	5
29. A safe place to travel	1	2	3	4	5
30. A trip to Thailand worth value for money	1	2	3	4	5

PART TWO (CONTINUED): Please indicate the level to which you agree regarding the image of Thailand as an international travel destination. Circle only ONE number for each statement.

Strongly **Dis**agree	(SD)	1
Disagree	(D)	2
Neutral	(N)	3
Agree	(A)	4
Strongly Agree	(SA)	5

How do you perceive Thailand on the following issues?	**S**	**D**	**N**	**A**	**SA**
31. Inefficient local transportation system (buses, trains, taxis)	1	2	3	4	5
32. A lot of traffic jams	1	2	3	4	5
33. Heavy pollution (air and water)	1	2	3	4	5
34. Crowding in big cities	1	2	3	4	5
35. A large gap between the rich and the poor	1	2	3	4	5
36. A lot of massage parlors bars, night clubs, and prostitution	1	2	3	4	5
37. A risky destination due to AIDS problem	1	2	3	4	5

PART THREE: Please indicate your level of satisfaction by circling only ONE number for each of the following questions.

Strongly **Dis**satisfied	(SD)	1
Dissatisfied	(D)	2
Neutral	(N)	3
Satisfied	(S)	4
Very satisfied	(VS)	5

	How satisfied are you on the following issues?	**SD**	**D**	**N**	**S**	**VS**
1	Tourist attractions	1	2	3	4	5
2	Scenery	1	2	3	4	5
3	Customs and culture	1	2	3	4	5
4	Entertainment and nightlife	1	2	3	4	5
5	Shopping centers	1	2	3	4	5
6	Prices of shopping items	1	2	3	4	5
7	Type of shopping products	1	2	3	4	5
8	Quality of shopping products	1	2	3	4	5
9	Restaurants	1	2	3	4	5
10	Types of foods	1	2	3	4	5
11	Food prices	1	2	3	4	5
12	Tourist facilities	1	2	3	4	5
13	Services in hotels or guest houses	1	2	3	4	5
14	Hotels or guest houses room rates	1	2	3	4	5
15	Local transportation system	1	2	3	4	5
16	Prices of local transportation	1	2	3	4	5
17	A safe place for tourists	1	2	3	4	5
18	Environment	1	2	3	4	5
19	Cleanliness/hygiene	1	2	3	4	5
20	Attitude of Thai people toward tourists	1	2	3	4	5
21	Friendliness of service providers (Tour guides, hotel, restaurant staff)	1	2	3	4	5

22 Overall, are you satisfied with this visit to Thailand?

1 **YES** 2 **NO**

PART FOUR: Please indicate the level of your agreement regarding your motivation to visit Thailand by circling only ONE number for each of the following issues.

Strongly **Dis**agree	(SD)	1
Disagree	(D)	2
Neutral	(N)	3
Agree	(A)	4
Strongly Agree	(SA)	5

What will motivate you to visit Thailand again in the future?	SD	D	N	A	SA
1. Costs (overall affordability)	1	2	3	4	5
2. Favorable currency exchange rates	1	2	3	4	5
3. Deals on package tours	1	2	3	4	5
4. Special tour promotions (for example Amazing Thailand tour packages)	1	2	3	4	5
5. Short distance from your country	1	2	3	4	5
6. Visiting friends and relatives	1	2	3	4	5
7. Experiencing new and different things	1	2	3	4	5
8. Seeing people from different culture	1	2	3	4	5
9. Interesting cultural and historical attractions (festivals, historic towns)	1	2	3	4	5
10. Buddhist meditation	1	2	3	4	5
11. Holy shrines/temples	1	2	3	4	5
12. Different climate than that at home	1	2	3	4	5
13. Natural attractions (sea, beaches, corals, mountains)	1	2	3	4	5
14. Water activities (Scuba diving, canoeing, sailing)	1	2	3	4	5
15. Golfing	1	2	3	4	5
16. Shopping	1	2	3	4	5
17. Thai food	1	2	3	4	5
18. Thai boxing	1	2	3	4	5
19. Traditional Thai massage	1	2	3	4	5
20. Night life entertainment	1	2	3	4	5
21. Overall a variety of things to do	1	2	3	4	5
22. A Trip to Thailand worth value for money.	1	2	3	4	5
23. Others (please specify.)________________________	1	2	3	4	5

PART FIVE: Please indicate the level of your agreement regarding the factors that may deter you from visiting Thailand by circling only ONE number for each of the following statement.

Strongly **Dis**agree	(SD)	1
Disagree	(D)	2
Neutral	(N)	3
Agree	(A)	4
Strongly Agree	(SA)	5

Which (if any) of the following are reasons you will not visit Thailand again?	S	D	N	A	SA
1 I want to visit other places rather than Thailand.	1	2	3	4	5
2. I want to discover unknown experience in other countries	1	2	3	4	5
3 I am dissatisfied with my trip to Thailand.	1	2	3	4	5
4. Deterioration of tourist attractions	1	2	3	4	5
5. Crowding in major tourist places	1	2	3	4	5
6. Traffic Jams	1	2	3	4	5
7. Pollution	1	2	3	4	5
8. Lack of new attractions for family and children	1	2	3	4	5
9. AIDS	1	2	3	4	5
10. Prostitution	1	2	3	4	5
11 Crime	1	2	3	4	5
12. Language barrier	1	2	3	4	5
13. Unfamiliar of food types	1	2	3	4	5
14 Increase of costs (air fare, hotels)	1	2	3	4	5
15. Long distance	1	2	3	4	5
16. Others (please specify)________________________	1	2	3	4	5

17 Do you plan to visit Thailand again in the future?

1 Yes 2 No

X

17a **IF YES**, when do you plan to visit Thailand again?

1 within one year 2 1-2 years

3 3-5 years 4 More than 5 years

18 Will you recommend Thailand to your friends/relatives?

1 Yes 2 No

PART SIX: Please use the scale below and circle the number that best describes your opinion of the following five travel destinations.

Based on your experience and perception, please compare the attractiveness in terms of the availability of tourist facilities and attractions of the following five destinations:

Very Poor	1
Poor	2
Average	3
Good	4
Very good	5

	Hong Kong	Indonesia	Malaysia	Singapore	Thailand
1. Shopping	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
2Cultural/historical sites	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
3. Natural scenery	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
4. Climate	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
5.Cuisine in restaurants	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
6. Hotels/resorts	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
7. Overall service	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
8.Convention & exhibition facilities	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
9. Friendliness of people	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
10Price	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
11. Ease of access	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
12. Transportation	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
14.Safety&security	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
15 Overall	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

PART SEVEN: The following questions will help us to better understand our visitors so that we can design tourist products and services based on your demographic profile. Please circle only ONE answer for each question.

1. Your gender
   1 Male 2 Female
2. Your age group:
   1 Less than 20 years old
   2 20-29 years old
   3 30-39 years old
   4 40-49 years old
   5 50 –59 years old
   6 60 years and older
3. Your marital status:
   1 Single 2 Married
4. Your country of origin

1	Malaysia	5	China	9	Australia
2	Japan	6	Korea	10	United Kingdom
3	Taiwan	7	Singapore	11	United States
4	Hong Kong	8	India	12 Others (please specify)________	

5. Your Occupation

1	Professional	5	Managerial	9	Sales
2	Clerical/Office worker	6	Agriculture	10	Laborers/production
3	Students	7	Housewife	11	Retired/unemployed
4	Military	8	Teacher/Instructor/Professor		

12 Others (please specify)______________________________

6 Your Education level:
   1 Middle School or below 2 High school graduate
   3 College/university graduate 4 Graduate/Postgraduate degree

7 Your income level in your currency__________________

Thank you

APPENDIX B: QUESTIONNAIRES

Oklahoma State University

OSU

School of Hotel and Restaurant Administration
210 HES West
Stillwater, Oklahoma 74078-6173
405-744-1862; Fax 405-744-6299

Dear Sir/Madam,

We are conducting a study to determine tourists' perception toward Thailand as an international travel destination, tourist motivation, tourist satisfaction, and their intention to visit Thailand again. This information will help Thai tourism industry to provide products and services to serve you better in the future. The survey will take approximately 10-15 minutes.

This survey has been given to 500 randomly selected international travelers at the Bangkok International Airport. All respondents can be assured of complete confidentially and results will be published in total only. If you have any questions, please feel free to contact Bongkosh Ngamsom at (405) 744-1862. Completing this survey is completely voluntary; you may contact Sharon Bacher, IRB Executive Secretary, 203 Whitehurst, Oklahoma State University, Stillwater, OK 74078 U.S.A. (405) 744-5700 if you have any further questions.

Those respondents who are fully complete the questionnaire become eligible for a small souvenir from Thailand.

Thank you very much for your cooperation!

Sincerely,

Bongkosh Ngamsom
Researcher

SPONSORED BY

Siam University

Tourism Authority of Thailand

PART ONE: Please circle/check only ONE answer for each of the following questions.

1. How many **times** have you visited Thailand including this trip?

   1 First time 2 2-3 times
   3 4-5 times 4 More than 5 times

2. What is the **purpose of this trip**?

   1 Vacation 2 Business
   3 Vacation and business 4 Convention/exhibition
   5 Visiting Friends and Relatives 6 En route to somewhere else
   7 Other (please specify.)________________

3. Are you **traveling with a tour group**?

   1 Yes 2 No 3 Independently and with a tour group

4. Are you **traveling with family**?

   1 Yes 2 No

5. **Who chose Thailand** as the destination for your trip? Circle all that apply.

   1 I did 2 My family member(s)
   3 Whole family 4 My travel group mate
   5 My employer 6 Other (please specify.) ________

6. **How long have you stayed** in Thailand during this trip?

   1 3 nights or fewer 2 4 to 7 nights
   3 1 to 2 weeks 4 More than 2 weeks, how long________

7. As a traveler, which types of **information do you look for** in a travel advertisement? Circle all that apply.

   1 Price 2 Safety
   3 Climate of destination 4 Tourist attractions
   5 Friendliness of people 6 Other (please specify)__________

8. What sources of **information did you use** in planning this trip to Thailand? Check all that apply.

____1 Airline offices	____2 Radio
____3 Advertisement on buses	____4 TV
____5 Tour guide books	____6 Newspaper
____7 Travel brochures	____8 Internet
____9 Travel agencies	____10 Family/ friends/relatives
____11 Thai tourism bureaus at your country	____12 Other (please specify)__________

PART TWO: Please indicate the level to which you agree regarding the image of Thailand as an international travel destination. Circle only ONE number for each statement.

1 ——— 2 ——— 3 ——— 4 ——— 5

Strongly Disagree · Disagree · Neutral · Agree · Strongly Agree

How do you perceive Thailand?					
1. Interesting customs and culture	1	2	3	4	5
2. Friendly and helpful local residents	1	2	3	4	5
3. Numerous cultural/historical attractions	1	2	3	4	5
4. Beautiful architecture and buildings (grand palace, temples)	1	2	3	4	5
5. Pleasant climate	1	2	3	4	5
6. Restful and relaxing atmosphere	1	2	3	4	5
7. Scenic natural beauty (seas, beaches and coral)	1	2	3	4	5
8. Opportunity for adventure (jungle tour trekking, rafting)	1	2	3	4	5
9. A variety of water activities (coral watching, diving, canoeing)	1	2	3	4	5
10. Many fashionable brand-name products in malls/stores	1	2	3	4	5
11. Good bargain shopping	1	2	3	4	5
12. Good golf courses	1	2	3	4	5
13. Good vacations place for children and family	1	2	3	4	5
14. An adult oriented destination	1	2	3	4	5
15. A variety of cuisine (i.e. Thai, Chinese, International)	1	2	3	4	5
16. Availability of international standard accommodations	1	2	3	4	5
17. Easy access (many flights from your country to Thailand)	1	2	3	4	5
18. Easy immigration procedures	1	2	3	4	5
19. Availability of tourist information centers	1	2	3	4	5
20. Few language barriers	1	2	3	4	5
21. High standard of sanitation and cleanliness	1	2	3	4	5
22. Stable political situation	1	2	3	4	5
23. A safe place to travel	1	2	3	4	5
24. A trip to Thailand worth value for money (good quality at reasonable prices)	1	2	3	4	5
How do you perceive Thailand with these issues?					
25. Inefficient local transportation system (buses, trains, taxis)	1	2	3	4	5
26. A lot of traffic jams	1	2	3	4	5
27. Heavy pollution (air and water)	1	2	3	4	5
28. Crowding in big cities	1	2	3	4	5
29. A large gap between the rich and the poor	1	2	3	4	5
30. Numerous massage parlors bars, night clubs, and prostitution	1	2	3	4	5
31. A risky destination due to AIDS problem	1	2	3	4	5

PART THREE: Please indicate your level of satisfaction by circling only ONE number for each the following issues.

1 ——— 2 ——— 3 ——— 4 ——— 5

Very Dissatisfied · Dissatisfied · Neutral · Satisfied · Very satisfied

How satisfied are you?					
1 Type of tourist attractions	1	2	3	4	5
2 Quality of tourist facilities	1	2	3	4	5
3 Prices of traveling in Thailand	1	2	3	4	5
4 Service at tourist attractions	1	2	3	4	5
5 Type of shopping products	1	2	3	4	5
6 Prices of shopping items	1	2	3	4	5
7 Quality of shopping products	1	2	3	4	5
8 Service in stores	1	2	3	4	5
9 Type of foods	1	2	3	4	5
10 Food prices	1	2	3	4	5
11 Quality of foods	1	2	3	4	5
12 Service in restaurants	1	2	3	4	5
13 Types of lodging	1	2	3	4	5
14 Prices of hotels or guest houses	1	2	3	4	5
15 Quality of lodging facilities	1	2	3	4	5
16 Service in hotel or guest house	1	2	3	4	5
17 Types of local transportation system	1	2	3	4	5
18 Prices of local transportation fares (i.e. buses, air planes)	1	2	3	4	5
19 Convenience of local transportation system	1	2	3	4	5
20 Service of transporters	1	2	3	4	5
21 A safe place for tourists	1	2	3	4	5
22 Environment	1	2	3	4	5
23 Cleanliness/hygiene	1	2	3	4	5
24 Attitude of Thai people toward tourists	1	2	3	4	5

25 **Overall, are you satisfied with this visit to Thailand?**

1 **YES** 2 **NO**


PART FOUR: Please indicate the level of your agreement regarding your motivation to visit Thailand again by circling only ONE number for each of the following issues.

1	2	3	4	5
Strongly Disagree	**Disagree**	Neutral	Agree	Strongly Agree

What motivates you to visit Thailand <u>again</u> in the future?					
1. Overall Affordability	1	2	3	4	5
2. Favorable currency exchange rates	1	2	3	4	5
3. Deals on package tours	1	2	3	4	5
4. Special tour promotions (i.e. Amazing Thailand tour packages)	1	2	3	4	5
5. Short distance and travel time from your country	1	2	3	4	5
6. Visiting friends and relatives	1	2	3	4	5
7. Experiencing new and different things	1	2	3	4	5
8. Seeing people from different cultures	1	2	3	4	5
9. Friendliness of Thai people	1	2	3	4	5
10. Interesting cultural and historical attractions	1	2	3	4	5
11. Buddhism	1	2	3	4	5
12. Holy shrines/temples	1	2	3	4	5
13. Different climate than that at home	1	2	3	4	5
14. Natural attractions (sea, beaches, corals, mountains)	1	2	3	4	5
15. Golfing	1	2	3	4	5
16. Shopping	1	2	3	4	5
17. Thai food	1	2	3	4	5
18. Thai boxing	1	2	3	4	5
19. Adult entertainment	1	2	3	4	5
20. Overall variety of things to do	1	2	3	4	5
21. A Trip to Thailand worth value for money.	1	2	3	4	5
22. Other (please specify.)______________________	1	2	3	4	5

PART FIVE: Please <u>circle</u> only ONE number for each of the following statement.

1	2	3	4	5
Strongly Disagree	**Disagree**	Neutral	Agree	Strongly Agree

Which of the followings are reasons you will <u>not</u> visit Thailand again?					
1 I want to visit other places rather than Thailand.	1	2	3	4	5
2. I want to discover unknown experience in other countries	1	2	3	4	5
3 I am dissatisfied with a previous trip to Thailand.	1	2	3	4	5
4. Deterioration of tourist attractions in Thailand	1	2	3	4	5
5. Crowding in major tourist places in Thailand	1	2	3	4	5
6. Traffic	1	2	3	4	5
7. Pollution	1	2	3	4	5
8. Lack of new attractions in Thailand	1	2	3	4	5
9. Threat of AIDS	1	2	3	4	5
10. Prostitution	1	2	3	4	5
11 Crime	1	2	3	4	5
12. Language barriers	1	2	3	4	5
13. Unfamiliar types of food	1	2	3	4	5
14 Increase of costs (air fare, hotels)	1	2	3	4	5
15. Long distance and long travel time for the entire trip	1	2	3	4	5
16. Other (please specify)________________________	1	2	3	4	5

17 **Do you plan to <u>visit Thailand</u> <u>again</u> in the future? Circle only one number.**

1 Yes 2 No

17a **IF YES, <u>when</u> do you plan to visit Thailand again? Circle only one number.**

1 within one year 2 1-2 years

3 3-5 years 4 More than 5 years

18 **Will you <u>recommend</u> Thailand to your friends/relatives? Circle only one number.**

1 Yes 2 No

PART SIX: Please use the scale below and circle the number that best describes your opinion of the following five travel destinations.

1	2	3	4	5	0
Very Poor	Poor	Average	Good	Very Good	I haven't been there

	Hong Kong (a)	Indonesia (b)	Malaysia (c)	Singapore (d)	Thailand (e)
1. Shopping	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5
2. Cultural/historical sites	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5
3. Natural scenery	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5
4. Climate	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5
5. Cuisine in restaurants	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5
6. Hotels/resorts	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5
7. Overall service quality	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5
8.Convention / Exhibition facilities	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5
9. Friendliness of people	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5
10.Price	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5
11. Ease of access	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5
12. Transportation	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5
13.Safety&security	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5
14 Overall	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5 0	1 2 3 4 5

PART SEVEN: The following questions will help us to better understand our visitors so that we can design tourist products and services based on your demographic profile. Please circle only ONE answer for each question.

1. Your gender
   1 Male 2 Female
2. Your age group:
   1 Less than 20 years old 2 20-29 years old
   3 30-39 years old 4 40-49 years old
   5 50 –59 years old 6 60 years and older
3. Your marital status:
   1 Single 2 Married
4. Your country of residence
   1 Malaysia 2 China 3 Australia
   4 Japan 5 Korea 6 United Kingdom
   7 Taiwan 8 Singapore 9 United States
   10 Hong Kong 11 India 12 Others (please specify)________
5. Your Occupation
   1 Professional 2 Managerial 3 Sales
   4 Clerical/Office worker 5 Agriculture 6 Laborers/production
   7 Students 8 Housewife 9 Retired/unemployed
   10 Military 11 Teacher/Instructor/Professor
   12 Others (please specify)________________________
6. Your Education level:
   1 Primary/Middle School or below 2 Secondary/High school graduate
   3 College/university graduate 4 Graduate/Postgraduate
7. Your average annual household income in your currency________________________

Thank you for your participation!

APPENDIX C: IRB FORM

Oklahoma State University
Institutional Review Board

Protocol Expires: 5/26/01

Date: Friday, May 26, 2000 **IRB Application No:** HE00168

Proposal Title: A STUDY OF THE IMAGE OF THAILAND AS AN INTERNATIONAL TRAVEL DESTINATION

Principal Investigator(s):

Bongkosh Ngamsom
85 S. University Place, #11
Stillwater, OK 74075

Hailin Qu
201 HEWS
Stillwater, OK 74075

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Signature:

Carol Olson by

Carol Olson, Director of University Research Compliance

Friday, May 26, 2000
Date

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modifications to the research project approved by the IRB must be submitted for approval with the advisor's signature. The IRB office MUST be notified in writing when a project is complete. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

2

VITA

Bongkosh Ngamsom

Candidate for the Degree of

Doctor of Philosophy

Thesis: THE IMPACTS OF A BUNDLE OF TRAVEL DETERMINANTS ON REPEAT VISITATION: AN EXPLORATORY STUDY OF TOURISM IN THAILAND

Major Field: Human Environmental Sciences

Biographical:

Personal Data: Born in Bangkok, Thailand on January 1, 1972, the daughter of Praphan and Oranong Rittichainuwat. Married to Pinit Ngamsom on December 8, 1997.

Education: Graduated from Faculty of Arts, Chulalongkorn University, Bangkok, Thailand with an honor and a major in French and minors in Spanish and English in March 1993: Received Master of Hospitality Management from Conrad N. Hilton College of Hotel and Restaurant Management, University of Houston, TX, USA in December 1996. Completed the requirements for the Doctor of Philosophy degree with the concentration in Hospitality Administration, at Oklahoma State University in May 2001.

Experience: Management trainee in Labor Planning Section, Accounting Department at Wyndham Anatole Hotel, Dallas, TX, USA, in 1996; Employed by Siam University as a lecturer and program coordinator for an international program in hospitality management in 1997 and by Oklahoma State University, School of Hotel and Restaurant Administration as a graduate research associate from August 1998 to present.

Professional Memberships: American Marketing Association, Council on Hotel, Restaurant, and Institutional Education