DISTANCE LEARNING: A CASE STUDY OF RAMKHAMHAENG AND SUKHOTHAI THAMMATHIRAT OPEN UNIVERSITIES

By

Viporn Katekao

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ABSTRACT

Title of Dissertation	:	Distance Learning: A Case Study of Ramkhamhaeng and Sukhothai Thammathirat Open Universities
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Distance education system is the diversity of the traditional classroom education. It serves the education for the needs of adults and disable or handicapped persons at the earlier period. Correspondence is the primary instructional delivery method. Radio and television broadcasting are the powerful tools for instructional delivery in the later time. Today, the advanced telecommunication technology enhances the education in more widespread areas than ever before. Distance learning is the subset of distance education. Distance learning utilizes the development of telecommunication and computer advancement to achieve the new paradigm of education. Information technology (IT) plays the vital roles to delivery data and information into the multi forms of texts, sound, image and motion. Distance learning employed the capability of information technology (IT) to facilitate the various forms of communication with the miracle and unpredicted outcomes of education as well as the speedy boundless information.

Two open universities in Thailand employ the distance learning system to serve the education, namely Ramkhamhaeng University (RU) and Sukhothai Thammathirat Open University (STOU). Ramkhamhaeng University (RU) serves the distance learning system in parallel form of education where both face-to-face classroom and self-study education are facilitated. Sukhothai Thammathirat Open University (STOU) serves the distance learning system in the distinctive form which based on individualized study or self-directed study.

The main objective of this research is to evaluate the effectiveness of distance learning administration, comparing with RU and STOU, as the impact of the outputs in terms of the students' learning satisfaction and the students' educational effectiveness. The research based on the Gooler's criteria of distance learning administration effectiveness, evaluating on the students' aspects.

The Gooler's seven criteria include access, relevancy to needs and expectations, the quality of the program offered, learner outcomes, effectiveness and efficiency, impact, and generation of knowledge. The acceptability is also included to evaluate the effectiveness of distance learning administration as the outcome.

The research has reviewed various factors in distance learning both qualitative and quantitative perspectives of education as well as the development of distance education and its history.

Three crucial elements to the successful distance education are considered. They are instructional design, technology, and supports. These three elements are used as the influential factors to examine the effectiveness of distance education in this research.

In order to assess the learning satisfaction, the measurement was evaluated on the educational supports, the technological supports, and the educational costs and time spent. The educational supports include the curriculum, faculty, student, and service and staff supports. Technological supports involved the instructional delivery modes, the efficiency of the computer-mediated communication (CMC), human-computer interaction (HCI), and technological utilization.

The measurement of educational effectiveness dealt with the influential factors including the information technology (IT) capability of access, efficiency, and effectiveness. Moreover, the research also studied students' needs and learning barriers, the educational environment, as well as the students' personal information.

This study utilized factor analysis to examine the construct validity of the measurement scales and it also enables us to determine the weight of individual variable, and reduce the number of variables to a set of meaningful interpretation. Reliability was used to check the consistent of variables and the validity of constructs on the measurement scale.

Multiple regression was utilized to determine the causal relationship of the independent variables to the dependent variable. Path analysis was employed to examine the path both in direct and indirect relationships among variables with the standardized coefficient beta values in order to form the path diagram of the causal model.

According to the research results, the research found that the human-computer interaction (HCI) has strongly direct effect on increasing the RU graduate students' learning satisfaction as well as computer-mediated communication (CMC) and the educational supports (curriculum supports, faculty and service supports). This claimed that RU distant graduate students prefer to study with the teacher-student interaction mode, either via the teleconferencing (HCI) or interaction via computer (CMC) such as e-mail and Internet searching. For the STOU graduate students who are self-directed study students, the research indicated that the curriculum supports, the faculty supports with counseling, as well as the interaction with the teacher (HCI) such as telephone and e-mail, are the factors strongly affecting on the students' learning satisfaction.

For the educational effectiveness, the variables such as IT efficiency, access and its effectiveness, learning evaluation, students' expectation and needs, are influencing the educational effectiveness to the RU graduate students as well as the number of dependents. While the IT efficiency, learning evaluation, context of instruction, and number of dependents affect the educational effectiveness to the STOU graduate students. We can conclude that the IT efficiency, learning evaluation and number of dependents are the major independent variables strongly direct affecting to increase the educational effectiveness to both RU and STOU graduate students.

At the undergraduate studies level, the research results determine that curriculum and student supports, instructional delivery modes, and computer-mediated communication (CMC) are the independent variables direct effecting to increase the RU undergraduate students' learning satisfaction. For the STOU undergraduate students, the faculty and student supports, computer-mediated communication (CMC), and human-computer interaction (HCI) are the independent variables direct affecting to increase the STOU undergraduate students' learning satisfaction.

According to the learning satisfaction aspect, the RU undergraduate students - as the self-study students - can also study real time via satellite at the regional campuses. Thus, the curriculum and student supports (learning materials, cassette tape, etc.), the instructional delivery modes and computer-mediated communication (CMC) increase the satisfaction of the students' learning. While the faculty counseling and student supports, human-computer interaction (HCI) and computer-mediated communication (CMC) are satisfying the STOU undergraduate students' learning. Since both RU and STOU undergraduate distant students are self-study students, so we can point out that the student supports and CMC are the necessary and independent variables direct affecting to both RU and STOU undergraduate students.

For the educational effectiveness, IT effectiveness has strong direct effect on both RU and STOU undergraduate students as well as IT accessibility and students' needs have direct effect on the RU students. While the students' expectation has strong effect on the STOU undergraduate students' educational effectiveness.

According to the integrated research results, the RU graduate students' learning satisfaction has direct effect on the effectiveness of distance learning administration at the value of 0.509 while there is no students' learning satisfaction effects on the STOU graduate students. This can be explained that because STOU graduate students are self-directed students and seldom meet their teachers whereas RU graduate students are compulsory to attend class every time. Therefore, the direct effects of the learning satisfaction and the educational effectiveness on the effectiveness of DL administration of RU graduate students are high to 0.509 and 0.656 respectively. The STOU graduate students' educational effectiveness has direct effects on the effectiveness of distance learning administration at the values of 0.478. However, the RU and STOU undergraduate students' learning satisfaction have strong direct effects on the effectiveness of distance learning administration at the values of 0.523 and 0.528 respectively. The RU and STOU undergraduate students' educational effectiveness have direct effects on the effectiveness of distance learning administration at the values of 0.513 and 0.591 respectively.

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ABBREVIATIONS

Abbreviations	Equivalence
AECT	Association of Educational Communication and Technology
CMC	Computer Mediated Communication
DELTA	Developing European Learning Through Technological Advance
D.E.	Distance Education
DL	Distance Learning
HTML	Hypertext Markup Language
ICT	Information and Communication Technologies
IRC	Interactive Relay Chat
ISD	Instructional Systems Design
MCU	Multi-point Control Unit
MIS	Management Information System
MOO	Multi-user Object Oriented
NAEB	The National Association of Educational Broadcasters
NCSA	The National Center for Supercomputing Applications
NECTEC	The National Electronics Computer and Technology
NESDP	The National Economic and Social Development Plan
OECD	The Organization for Economic Cooperation and Development
USOTA	The United States Office of Technology Assessment
USDLA	The United States Distance Learning Association
WCU	Western Carolina University
WWW	World Wide Web

To My Mom and Dad

With all my love and respect

♥

CHAPTER 1

INTRODUCTION

The purpose of this study is to develop and to test the conceptual framework to explain the effectiveness of distance learning administration as the outcome, by comparing Ramkhamhaeng University (RU) with Sukhothai Thammathirat Open University (STOU), including the factors influencing distance learning satisfaction and the educational effectiveness of students. The academic and technological supports, IT utilization for teaching and learning, the instructional delivery modes, the learning environment, and demographic data are used as the influential factors in order to determine the causal model.

The model is categorized by the educational institutions (RU and STOU) and study levels (graduate and undergraduate level) into eight categories of distance learning effectiveness (the integrated dimensions of students' learning satisfaction and students' educational effectiveness).

Because education is a process, most simply characterized as an interaction between teacher and student for the purpose of identifying, understanding, and confirming worthwhile knowledge, the transaction between teacher and student represents a mutually respectful relationship. There is a very important distinction between learning that occurs in the natural societal context and that, which occurs, in a formal teaching situation.

Since the technological development is greatly advanced, the study will include the content of technological support for exploiting distance education for leveraging lifelong learning. The taxonomies about distance education are explored to explain both the characteristics and the results of the findings. The technological utilization, both in synchronous and asynchronous delivery modes, influences various distance educational models not only in the types of technologies that are used, but also in the locus of control over the pace and place of instruction. However, the faculty and institution are still primary controlled as in the traditional classroom environment.

1.1 STATEMENT OF THE STUDY

The traditional approach to education, stemming from the Greeks, has assumed that education is about the transmission of knowledge from one generation to its successors with the accompanying growth of continuing education. Education represents a special kind of learning, but not all kinds of learning are education. Educational objectives are divided into two main types: objectives of knowledge and objectives of skill. Knowledge involved in higher education is the final result of a great diversity of highly developed academic skills: research, evaluation, and theory construction.

The English philosopher Hirst (1974: 33) has suggested that "knowledge is achieved when the mind attains its own satisfaction or good by corresponding to objective reality" and he states that man has objectified conceptual schema over millennia so that forms of human knowledge have been achieved. It is significant that Hirst utilizes the idea of objectification whereas Paterson (1979: 69) regards knowledge as objective and that all education is about the expansion of individual knowledge that is the acquisition of that objective knowledge. While Hirst uses the term objectification, he actually appears to treat knowledge as objective when he suggests that there are seven forms of knowledge: mathematics, physical sciences, human sciences, history, religion, literature and the fine arts, and philosophy.

Knowledge is not a static entity; it is constantly growing and changing. As early as 1926, Scheler[1] (1980: 76) also suggested that there are seven categories of knowledge: myth and legend, knowledge implicit in natural language, religious knowledge, mystical knowledge, philosophical-metaphysical knowledge, positive knowledge of mathematics and the natural sciences, and technological knowledge. The latter types of knowledge are regarded as artificial since they change "from hour to hour".

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[1] P. Jarvis, "Content, Purpose, and Practice" in Lifelong Education for Adults: *An International Handbook, U.S.A.* pp. 22-28.

Education should be lifelong and all who seek to succeed must continually update and upgrade their knowledge. Universities are the main fields for higher education and have the responsibilities to upgrade over the national intellectual quality, in particular to produce high-level talent. However, education in the twenty-first century is facing with a number of challenges such as the rapid development of information science, the appearance of an increasingly unified global economy, and a free trade market and competition. Knowledge and information will spread with greater speed, to where science and education will become more important. Universities will have more frequent exchanges, and will become more mutually dependent because of globalization.

Today, many universities deliver instruction in diversity as the competition increases. Many institutions, both public and private, offer university courses for self-motivated individuals through independent study programs. Most students must study and work on their own, with supplied course materials, print-based media and postal communication, or some form of teleconferencing and/or electronic networking, plus learner support from tutors and mentors via telephone or E-mail.

Distance education has drawn widespread and growing interest in this decade, an interest is resulting in diverse and creative distance education systems. There are many factors that have contributed to this interest and resulting development. The main factor is the emergence of sophisticated communications technology. The existing technological infrastructure that facilitates communication and transmits information at a distance, awaits imaginative educators to design accessible and supportive distance education systems.

However, a serious problem for the emerging field of distance education is the conceptual and technological complexity. A conceptual order is required that goes beyond simply describing the past and which can provide a framework for creating the future. The time has come for a new paradigm: a paradigm which is not based upon the structural features of the efficiencies of mass produced and pre-packaged information, but instead, a paradigm based upon the effectiveness of immediate and individualized communication and sustained support of education at a distance. The focus of distance education is shifting from structural issues to process issues where the mediated communication will guide to the development of distance education in the future.

Therefore, the premise of this research is that to build an understanding of distance education through a critical analysis of the educational transaction at the open universities of Thailand. This research is an attempt to provide a framework around the future aspects of distance education with various domains, such as the educational support domain, the technological domains, the students' cost domain, the IT application domain, students' characteristics domain, and the educational environment domain. A framework opens to all methods of organizing the educational transaction, utilizing communications technology to provide a variety of educational opportunities, a framework based not only upon access to information but also provision for supporting the process of developing knowledge and understanding at a distance, and a framework that can guide the integration of distance education into a functioning system, serving the educational needs of all learners.

1.2 SIGNIFICANCE OF THE STUDY

For Thailand, the Eighth National Economic and Social Development Plan, which serves as a guideline for national development during the five-year period 1997-2001, has adjusted the development concept, shifting from growth orientated to people-centered development where the state of the nation is considered to be the final measure of success. Education should play a vital role to Thai citizens and be reformed by utilizing computers and technologies for lifelong education --, a continuous development of the learning process for a better quality of life and work force.

The National Education Development Plan has proposed an area approach of the human development system on education and training, and an empowerment system as well, by: increasing the availability of good quality care and education for well-balanced early childhood development; improving the quality of education at all levels; upgrading the skills and basic knowledge of industrial workers; providing opportunities for the underprivileged to develop to their full potential, and increase their access to basic social services; upgrading and expanding the infrastructure in the regions and rural areas; and so forth.

To serve the policy guideline of education at all levels, four basic principles of development[2] are proposed: -

- Folk Wisdom: The ability to learn, understand, differentiate between virtues and vices, create folk technological progress, and wisely choose from modern know-how for adaptation and survival.
- Spiritual Development: The ability to develop one's attitude or morality, becoming self-controlled, and self-disciplined in one's religious conduct. To concentrate only on essential subsistence for working and living sufficiently.
- Social Development: The ability to live in society in accordance with those essential social behavioral needs, such as the achievement of affiliations. To assist the community and demonstrate communication skills, to recognize and observe the one's social rights, duties and responsibilities towards society.
- Physical Development: The ability to maintain good health, to be able to develop one's physical capacity for work and job, and to maintain a long life expectancy at all ages.

In addition, the emerging information and communication technologies have made the educational decision-making environment more complex and advanced. This study has revealed the use of information and communication technology in the context of educational effectiveness accompanied by practical strategies in the instructional delivery modes for achieving them. As globalization refers to the increasing flow of technology, finance, trade, knowledge, people, values, and ideas across borders (Knight & de Wit, 1997). The speed of the trans-border flow has constantly increased, with faster methods of transport (of people and equipment) and faster methods of communication (of information and ideas). Knowledge and information will spread with greater speed where science and education will become of greater importance.

Therefore, the role of universities in the system of cooperation should be to strengthen the ability in market competitiveness and technology innovation, consisting of research, development, production, and marketing.

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[2] Teay Shawyun, Dr., (ABAC, 1999). "The New Millennium: Graduate Business Education in Thailand", in *The New Millennium: Business and Higher Education in Thailand* report, The third Interuniversity Conference, Bangkok, Thailand.

1.2.1 Global Information Technology (IT) Approaches

Information Technology (IT) represents most accurately the convergence of computer technology (both computer hardware and software), telecommunications technology and other related technologies as well. Information Technology (IT) can be described as "a new techno-economic paradigm affecting the management and control of production and service systems throughout the economy".

Three basic options were outlined for information technology (IT) development that developing countries might follow. They could stand aloof; they could go it alone; or they could integrate into the globalization process. (Robinson, 1991: 53-55)

- Standing aloof: Some very poor developing countries have no choice but to ignore the use of information technology (IT) and to continue to concentrate their efforts on improving the basic necessities of life. Selective policies could be devised to ensure that only appropriate and cost-effective information technology (IT) equipment and facilities be made available only necessary to improve the delivery of essential services.

- Going it alone: There must be an adequate level of education and skill, particularly in science and technology, to handle and master the technologies. A strong and adequate technical infrastructure and support would also be necessary.

- Integrating into the globalization process: This third option is based on two main approaches. The first is for much of the technology to be imported together with increased assistance in its use and in developing the necessary infrastructures. The second is based on the outward-looking policies, as the need for an adequate level of education and training, to absorb and diffuse information technology (IT) in order to develop and adapt to improve the technologies.

1.2.2 Global Information Technology (IT) Policies

A World Bank paper[3] (Hanna, 1991: 40-49) has outlined six key policy areas and choices related to information technology (IT) acquisition, adaptation, and diffusion that most developing countries must face. The six key policy areas are

1. Supply and diffusion of information technology (IT)
2. Development of necessary resources : applications and infrastructures
3. Human resource development to exploit information technology (IT) and to absorb the employment shift
4. Equitable access to national information resources and communications
5. Government role as a major user and promoter of information technology
6. International policy issues in information technology (IT)

- In the supply and diffusion policy area, countries are faced with the choice of adopting a supply-oriented or user-oriented policy. A supply-oriented policy would entail very high investments for large R&D efforts, where a user-oriented policy would require increasingly strong local capabilities for effective and successful adaptations of the technologies.
- In the area of applications, resources and infrastructure development are needed to prioritize in terms of financial and technical manpower capital. This could be vital in order to meet the skills and basic infrastructural requirement and be successful in exploiting information technology (IT).
- The third area of policy is concerned with education and training. Skills and employment arouse the need to prepare human resources to apply information technology (IT), which concerns the possible negative effect on direct employment as well as the changes in skill requirements at all levels. The significant labor displacement and the implications of information technology (IT) for employment vary according to a country's stage of development, economic growth rate, domestic market demand, and the new international division of labor.

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[3] TDRI, 1993. *The Role of Information Technology in the Information Society in the Year 2010.* Thailand Development Research Institute, Bangkok. October, pp.107-108.

- The fourth key policy area is associated with the socioeconomic issues concerning the access to information resources. The control of information and telecommunications; the information gap between the urban and rural areas; the free access to information both domestic and abroad; privacy and security; and the ownership of information. All need to be addressed and authorized.

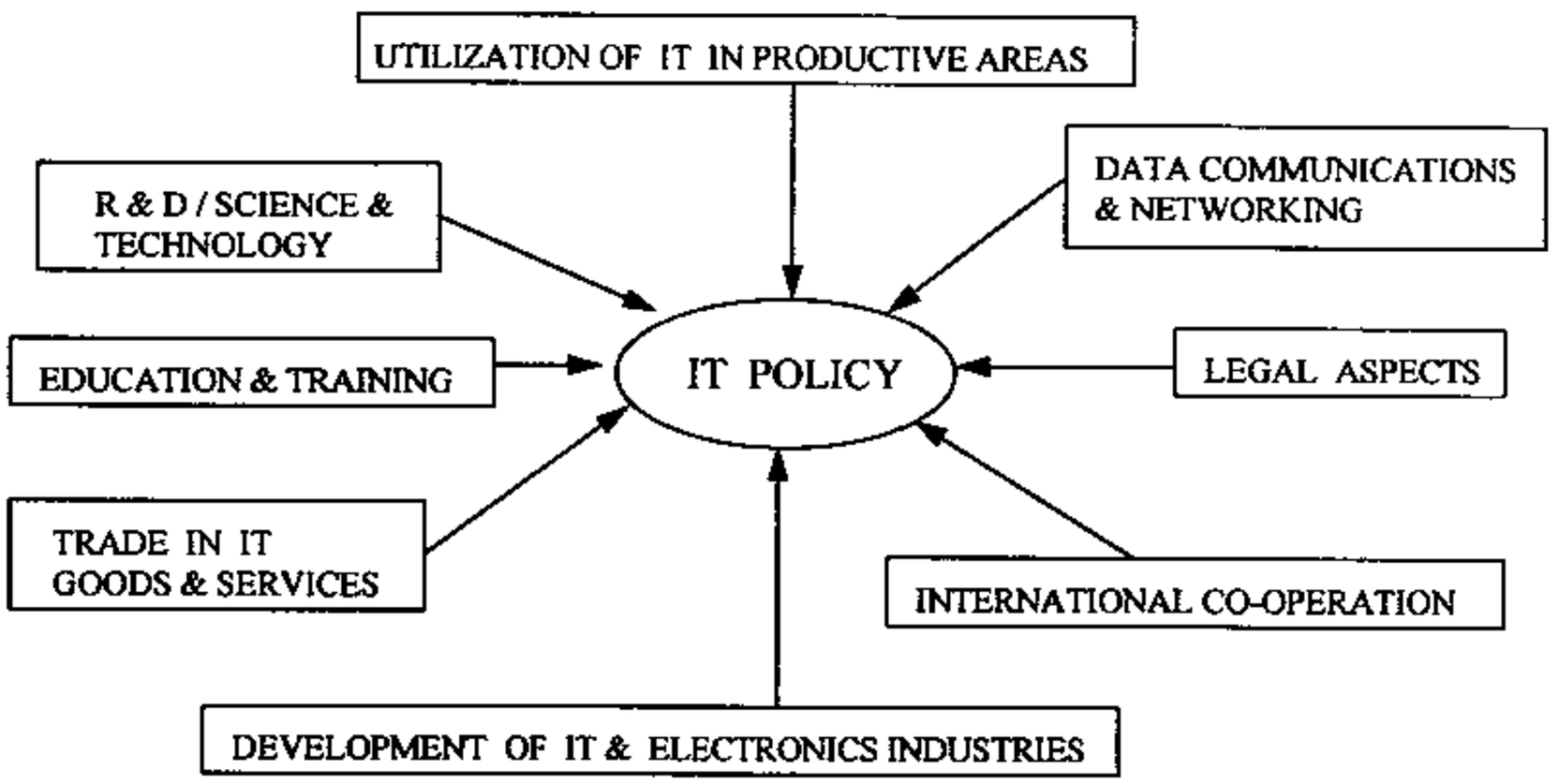

Figure 1.1: The global IT policy and the shift from IT policy to Policies to IT

Source: TDRI, 1993. *The Role of Information Technology in the Information Society in the Year 2010*. Thailand Development Research Institute, Bangkok. October, pp.107-108.

- The fifth key policy area is the government's role as a major user of information technology (IT) in the management of the economy and the delivery of social services. Policy issues include government procurement of information technologies and related products; computerization of government services; standardization and compatibility in hardware, software, and communications equipment and protocols; the sharing of databanks and other information technology (IT) resources; health and education to remote regions, and so on.
- The last key policy concern is to address issues of international dimension, including transborder data flows, international standards, information ownership, intellectual property; and international computer-related crime.

Policy makers may have to balance the possible effect of IT on the control of a country's own social and economic development against the dependency on a free flow of information and the need to be a part of the global village. As a result of continuing technological change and accelerating globalization, there is an active role for government to play as coordinator and facilitator to overcome barriers and further progress in the application of information technology (IT) to solve increasingly global problems. Two important trends regarding the IT policies noted are :

- A marked shift from IT creation to IT application : Gassmann (1992) reported that IT policies in the late 1980s and early 1990s have shifted among the Organization for Economic Cooperation and Development (OECD) countries from a supply-orientation to a user-orientation with focus on diffusion of IT application. The policies are emphasized to ensure fair distribution of IT skills and benefits to minority groups in some member countries.
- An evolution from "IT policy" to "policies in IT" : The convergence of separated policy areas to IT. -- science and technology, education and training, IT utilization in industry, IT production, data communications and networking, labor and legal aspects, trade and international cooperation.

1.3 OBJECTIVES OF THE STUDY

Today, political and public interest in distance education is especially high in areas where the student population is widely distributed. Each institution has developed its own form of distance education in accordance with local resources, the target audience, and the philosophy of the organizations which provide the instruction.

Education is universally recognized as an important investment in human capital. It contributes to socioeconomic development by endowing individuals with the means to improve their health, skills, knowledge, and capability for productive work. For societies as a whole, education enriches the political and cultural life of the community and strengthens the community's ability to exploit technology for social and economic advancement. The development of education is a key concern everywhere because of its broad and pervasive benefits.

Universities should become sources for the technology and support for enterprises and organizations in strengthening the public service system and facilitating the transfer of research achievements in scientific studies, integrated technology research, and joint interdisciplinary studies. Universities can gain an understanding of the market, competition, services and benefits from this cooperation. The virtual university will dominate provision on a global scale with a highly effective provider of good teaching in the sense of being a distributive channel of relevant knowledge. The virtual university provides the capacity for a campus-based university to deliver learning on-line and through multimedia, which will surely have a more important role in the future.

The research addressed will analyze the learning climate, barriers, technology and learning supports towards ascertaining the satisfaction and effectiveness of both graduate and undergraduate students in their utilization of instructional technology. Thus, this dissertation will study the influential factors upon the effectiveness of distance learning administration: a comparison between RU and STOU in terms of an instructional delivery method on the utilization of technology, the variety of supports, and the technological development process as well as information technology (IT) application components and demographic information.

The objectives of study are:

1. To study the approaches and status of RU and STOU distance learning systems
2. To compare the distance learning systems in the instructional delivery mode, the teaching and learning supports, and the technological utilization between RU and STOU
3. To test the model and determine which element has more influence in the distance learning system of RU and STOU
4. To describe the outcomes on the learning achieved and the satisfaction gained from distance learning at RU and STOU
5. To describe the problems and barriers of the RU and STOU students in the distance learning systems.

1.4 UNITS OF ANALYSIS

The units of analysis are Ramkhamhaeng University (RU) undergraduate and graduate students and Sukhothai Thammathirat Open University (STOU) undergraduate and graduate students at the regional campuses in the distance learning system.

1.5 EXPECTED BENEFITS OF STUDY

The assumption here is that education represents a special kind of learning, focusing on knowledge, skills and understanding. Learning that occurs in the natural societal context is rather different from what occurs in a formal teaching situation. As mentioned, education is a process most simply characterized as an interaction between teacher and student for the purpose of identifying, understanding, and confirming worthwhile knowledge. The transaction between teacher and student represents a mutually respectful relationship in order to gain knowledge.

Universities are the main organizations for higher education with their responsibilities for upgrading national intellectual quality, lifelong education and all achievements that succeed in producing high-level talents, where teaching and learning are the principal goals of educational organizations.

Ramkhamhaeng University (RU) and Sukhothai Thammathirat Open University (STOU) are two open distance learning universities in Thailand, in which distance education systems exploit the educational technology, media and methods of delivery instruction toward aspiring and adult students in remote areas, on the provision of educational equity and access.

Because the distance education systems involve a high degree of interactivity in the rural and distant communities, so the benefits of study will assess the future of a distance learning system, the learners' attitudes, and social needs that are measured by various kinds of instructional delivery modes, Thai learning systems and learner characteristics in order to improve learning behavior and utilize the appropriate technology for education.

With the proper use and diffusion of information technology (IT), IT can lead to the following benefits

- Cost and time reduction.
- Performance enhancement and quality improvement.
- Creation of new methods, products or services.
- Automated operation and robotic innovation.
- Remote access facilities.

However, many constraints and policy issues exist in providing distance education to remote rural areas. They include the high costs of technology and adequate equipment provision, the design and the cost in producing appropriate educational material and software such as videotapes and computer programs; the choice and assessment of the most appropriate courseware media; the expertise of the technicians and system analysts; the difficulties in administration and evaluation of progress; and the acceptance of the concept and technique by the education administrators and the public. Although one of the most significant social benefits of information technology (IT) is to provide distance or tele-education to all with the equality of opportunity on education.

The benefits of information technology (IT) on the educational system can be considered in terms of

- Educational management improvement and manpower skill development.
- Speed, accuracy and reliability.
- Higher quality of information systems development.
- Tele-education and conference enhancement.
- Virtual university creation.

Therefore, the benefits of this study are

1. To evaluate the possibility of improvements in education from technology improvement;
2. To propose a better way of education in which costs are reduced, and time is used efficiently and effectively;
3. To analyze and compare educational supports and technology on the university administration systems;
4. To acknowledge inter-university cooperation on education programs;

5. To upgrade knowledge, experience, and skills;
6. To prepare for the application of future technology on education and for the next generation.

1.6 THE ORGANIZATION OF THE THESIS

The study will be structured along the following outline:

Chapter I: Introduction explains the statement and significance of the study on distance education, including the objectives, the global IT policies and approaches, units of analysis, and expected benefits of study.

Chapter II: Literature review involves concepts and definitions of distance education and educational technology, modes of instructional delivery, and various technologies for distance education, including virtual education.

Chapter III: Distance education theories and proposed model for analysis are examined and constructed in order to investigate the effectiveness of distance learning administration of RU and STOU as the outcome of the students' learning satisfaction and the students' educational effectiveness.

Chapter IV: RU and STOU are examined in terms of educational history, modes of instructional delivery, technological utilization for education, educational strategies and the policies of RU and STOU, the information technology (IT) plan, the future of university educational plan for distance learning, and etc.

Chapter V: Research methodology involves both dependent and independent variables used to measure the effectiveness of distance learning administration as the outcome of the outputs in terms of the students' learning satisfaction and the students' educational effectiveness. The research methodology includes qualitative and quantitative analysis of the data.

Chapter VI: Output and impact of distance learning will describe the results of data process. The data are processed and analyzed by the statistical methods.

Chapter VII: Conclusions and recommendations conclude RU and STOU distance learning and also propose the trends of higher distance education in Thailand.

CHAPTER 2

LITERATURE REVIEW

This chapter focuses on the review of the literature. It explores and studies the characteristics of adult education, concepts, and definitions of the distance education with the technological utilization for teaching and learning on the various instructional delivery modes, involving the interaction between people and system. The key factors are academic subject matter, faculty, students, service, and technology as well as the technological development processes for leveraging lifelong learning.

This chapter includes nine parts as follows:

2.1 Distance Education Perspectives

2.2 Adult Education

2.3 Concepts of Distance Education

2.4 Definitions of Distance Education

2.5 Types or Models of Distance Education

2.6 Modes of Instructional Delivery

2.7 Technology in Distance Education

2.8 Virtual Education Strategies

2.9 Conclusion

2.1 DISTANCE EDUCATION PERSPECTIVES

The term "distance education" first appeared in the 1892 catalogue of the University of Wisconsin (Rumble, 1986). The term was popularized in German (*Fernunterricht*) by the German educator Otto Peters in the 1960s and 1970s (Peters, 1968), and was employed as a title for distance teaching institutions in France (*tele-enseignement*; Moore, 1987b).

Bjorn Holmberg and Michael Moore probably reintroduced the English term, distance education, in America at a meeting of the International Council for Correspondence Education (Moore, 1987b).

Many different scholars to a great variety of programs, providers, audiences, and media have applied the terms "distance education" and "distance learning" interchangeably. Historically, distance education meant correspondence study. Today, audio, video, computer, information and communication technologies are more common delivery modes. Institutions or instructors control educational delivery, while the student is responsible for learning. In other words, distance learning is the result of distance education. Another term that has some recent popularity is distributed education that represents the trend to utilize a mix of delivery modes for optimal instruction and learning.

Peters (1966) describes three basic criteria of education as follows:

1. Education implies the transmission of what is worth-while to those who become committed to it;
2. Education must involve knowledge and understanding and some kind of cognitive perspectives, which are not inert;
3. Education, at least, rules out some procedures of transmission on the grounds that they lack willingness and voluntaries on the part of the learner. (p. 45)

These three criteria consider the matter, manner, and cognitive perspectives of education. According to Peters, the subject matter must be considered worthwhile in terms of the development of the individual; while at the same time, the difficulties of determining what is worthwhile are acknowledged. As to the manner or process, it is the participation that constitutes education. Knowledge and understanding are acquired by it being integrated into the individual's view of the world. With regard to the third criterion, the process of initiation into "a form of thought or awareness by a variety of processes" must be as a result of "some kind of consciousness and consent on the part of the initiate" (Peters, 1966: 54). We can conclude that education identifies processes for intentional initiation of a student into modes of thought and awareness deemed of value by both teacher and student, such that knowledge and understanding are achieved.

Effective distance education programs begin with careful planning and a focused understanding of course requirements and student needs. Appropriate technology can only be selected once for the educational programs that evolve through the hard work and dedicated efforts of many individuals and organizations. The most common applications of information and communication technologies are found in administration, learning materials' development and educational distribution, and where possible, the student tuition in the form of the student-student and student-tutor interaction. Willis (1994) claimed that the success of distance learning programs rely on the consistent and integrated efforts of students, faculty, facilitators, support staff, and administrators.

The roles of key players in the distance education are described briefly:

Students: Meeting the instructional needs of students is the cornerstone of every effective distance education program. Regardless of the educational context, the primary role of the student is to learn. When instruction is delivered at a distance, additional challenges result because students are often separated from others sharing their backgrounds and interests, have few opportunities to interact with teachers outside of class, and must rely on technical linkages to bridge the gap separating class participants.

Faculty: In a traditional classroom setting, the instructor's responsibility includes assembling course content and developing an understanding of student needs. Special challenges confront teaching at a distance where the success of distance education efforts rest on the faculty in order to

1. Develop an understanding of the characteristics and needs of distant students with little first-hand experience and limited face-to-face contact.
2. Adapt teaching styles, taking into consideration the needs and expectations of multiple and diverse audiences.
3. Develop a working understanding of delivery technology, while remaining focused on their teaching role.
4. Function effectively as a skill facilitator as well as content provider.

Facilitators: The instructor often finds it beneficial to rely on a site facilitator to act as a bridge between the students and the instructor. To be effective, a facilitator must understand the students being served and the instructor's expectations. The role of on-site facilitators has increased in class for setting up equipment, collecting assignments, proctoring tests, and acting as the instructor's on-site eyes and ears.

Support Staff: Most successful distance education programs consolidate support service functions to include student registration, materials duplication and distribution, textbook ordering, securing of copyright clearances, facilities scheduling, processing grade reports, managing technical resources, etc.

Administrators: Effective distance education administrators are influential in planning an institution's distance education program. They are consensus builders, decision makers, and referees. They work closely with technical and support service personnel, ensuring that technological resources are effectively deployed to further the institution's academic mission. Most importantly, they maintain an academic focus, realizing that meeting the instructional needs of distant students is their ultimate responsibility.

2.1.1 History of Distance Education

Efforts in distance education were not made until the 1970s. The first significant contribution to distance education as a field of study was Peters' industrialization theory in 1973. It was not until 1981 that the first major attempt was made by Holmberg, in his book *Status and Trends of Distance Education*, to organize the existing knowledge of distance education. A second attempt to organize the knowledge of the field was Keegan's *The Foundations of Distance Education* in 1986. However, both authors were very captured by the correspondence era, and distance education systems based upon new and emerging communication technology were not adequately addressed. Moreover, the unique aspects of the field for theory buildin were not clearly identified. Overall it would appear that distance education is nearly twenty years behind the development of adult education as a field of study.

In recent years, there has been an explosion of interest in distance education and virtual education in the United States. Four generations of distance educational history in the U.S. were investigated as following:

The first generation was the introduction of correspondence education in the 1800s, especially its use by the land grant universities, starting in the latter part of the century, to deliver agricultural education to farmers in rural areas.

The second generation came with the introduction of television to deliver educational opportunities to all people in their homes. This occurred in the 1950s, and expanded with the introduction on public broadcasting of tele-courses in the 1970s.

The third generation emerged in the late 1980s when colleges and universities began to sporadically offering online courses, while the Internet was largely funded by the U.S. government and was a "club" of university faculty and military personnel. With the development of the postal service in the 19th century, commercial correspondence colleges provided distance education to students across the country. This trend continued well into the 20th century with the advent of radio, television, and other media that allowed for learning at a distance.

The fourth generation emerged at the end of the 20th century with the introduction of complete "virtual programs" of study. In the last decade, distance education has changed significantly with the use of computer-mediated learning, two-way interactive video, and a variety of other technologies. Colleges and universities are forging ahead to provide learning at a distance, and are making substantial investments in new technologies for teaching.

2.1.2 Distance Education: From Past to Future

Nothing before has captured the imagination and interest of educators simultaneously around the globe more than the World Wide Web. The Web is now causing educators to re-think the very nature of teaching, learning, and schooling. Claims have been made that the Web can free teaching and learning from the physical boundaries of the classrooms and the time restraints of class schedules. The learning resources of the world via the Web can augment learning resources of the college and university.

The Web can help us to re-focus from teaching to learning, from teacher-centered to student-centered. Many educational institutions exploited the Web in making education accessible, reported by Ronald D. Owston (1997) [1]:

Britain's Open University (http://keats.open.ac.uk/zx) is a prime example of a dedicated distance education institution that uses the Web to support its mission of providing accessible education. The institution normally requires students to spend some time on campus in residency. However it finds that there are always some students who cannot fulfill this requirement. In the summer of 1994, it experimented with offering electronically an advanced psychology course aimed at this kind of student, using the Web and other Internet tools. Students reportedly relished the opportunity to be able to continue their studies without interfering with family commitments; instructors found the experience exhausting, yet exhilarating; and the project evaluator wrote that the level of contact and interaction among students and instructors very similar to regular summer classes. The following year the Open University offered two computer science courses to students throughout the world via the Web. They intend to continue to expand their list of offerings, and even have a Web form on-line, which students can complete to suggest courses they'd like to see offered over the Internet.

City University (http://www.cityu.edu/inroads/welcome.htm), in Bellevue, Washington, another dedicated distance learning institution, operates with the mission of "making education available to all who desire it...without interrupting commitments to work and home." Recently, they established EDROADS (EEducation Resource and Online Academic Degree System) to take advantage of Internet based technology to offer their programs. At present, they provided on-line an MBA degree program and a Bachelor of Science in Computer Systems. Through the university's World Wide Web site, students around the world apply to the university, register for courses, and complete course work electronically. They can also send questions and assignments to the instructors from the Web site and participate in specialized live forums at the program and course level.

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[1] Ronald D. Owston, 1997. "The WWW: A Technology to Enhance Teaching and Learning?" In *Educational Researcher*, Vol. 26, No. 2, March 1997, York University, U.S.A., pp. 27-33.

Two examples of traditional institutions using the Web as the backbone of their distance learning efforts are Birkbeck College of the University of London, England, and the University of Massachusetts in Dartmouth. In 1995, Birkbeck's highly-regarded Crystallography Department (http://www.cryst.bbk.ac.uk/PPS/index.html) began to offer a 15 week course called The Principles of Protein Structure entirely over the Internet. At the heart of the course were Web based interactive, graphical learning modules created by 30 experts in protein structure from around the world. The Web activities were supported by on-line discussions with other students and course consultants. Some 250 students from countries around the world participated, including Brazil, China, Slovenia, and Croatia, as well as Western countries. Students and course consultants were split into study groups of 15 to 20. One of the groups' activities was to prepare and publish at the course's Web site, a research report on an assigned protein. Evaluations of the course were extremely positive. One participant, a doctoral student, posted his views of the course at the university's web site. He said was that he could study at his own convenience, access course resources simply by the click of a mouse, and maintain contact with a large number of scientists easily and informally.

A selection of standard, full-credit undergraduate and graduate courses is offered globally through CyberEd at the University of Massachusetts, Dartmouth, the Division of Continuing Education (http://www.umassd.edu/cybered/distlearning home.html). CyberEd courses make extensive use of the Web, complete with images, sound, and video, to present material, test, communicate among students and faculty, and submit assignments. Its goal is "to create a distance learning environment that rivals the traditional classroom environment in the quality and content of the learning experience...to encourage a new educational paradigm in which the instructor is no longer regarded as the sole source of all knowledge." Reports by participants and visitors posted at its Web site suggest that CyberEd is well on its way to achieving its goal.

As the list of established, accredited colleges and universities, extending access to their programs to students on the Web, grows. A new kind of institution: the "Virtual University", is emerging to challenge the dominant paradigm of higher education by providing universal access to on-line courses and degrees.

2.2 ADULT EDUCATION

The formal distance education had been established since the early nineteenth century. Due to the accelerated pace of change, communications technology has significantly contributed to a changing society - particularly in the growth and dissemination of information through the media – at distance on the part of adults, who are encouraged to continue learning as a lifelong process. Moore (1985: 44) states that most distance education historically is concerned with the education of adults and it seems to be informed by the theories and research about learning in adulthood, adult development, program planning, instruction and evaluation in adult education.

In the effort to extend educational opportunities and services to all children and adults, wherever they may be compelled by circumstances to live, educational program and services are expanding at all levels. Adult education with various instructional delivery modes is the method which has carried and is continuing to carry education to those who would be otherwise out of reach.

From history, each form of instructional media evolved, from print to instructional television, to current interactive technologies. The earliest form of distance learning took place through correspondence courses in Europe. This was the accepted norm until the middle of century, when instructional radio and television became popular.

For many decades, educators have argued about the concept, the meaning, and the use of the term "adult education" and terms related to it. Many countries have had no concept of adult education as a distinctive sector of education. Adult is defined in terms of age, maturity, or whether persons have terminated their initial education. Many writers have attempted to define adult education as a process unrelated to age, whereby persons, who have terminated their initial cycle of continuous education, may undertake any "sequential and organized activities with the conscious intention of bringing about changes in information, knowledge, understanding, or skills, appreciation, and attitudes" (Liveright and Haygood, 1968: 8).

2.2.1 Definitions of Adult Education

The General Conference of UNESCO in 1976 may have settled much of the confusion through having a General Recommendation on the Development of Adult Education accepted unanimously by representatives from 142 countries.

It included the following definition:

> The term, "adult education", denotes the entire body of organized educational processes, whatever the content, level, and method, whether formal or otherwise, or whether they prolong or replace initial education in schools, colleges, and universities, as well as an apprenticeship, whereby persons regarded as adult by the society to which they belong develop their abilities, enrich their knowledge, improve their technical or professional qualifications, or turn them in a new direction and bring about changes in their attitudes or behavior in the two-fold perspective of full personal development and participation in balanced and independent social, economic, and cultural development (UNESCO, 1976)

Many concepts closely related to adult education, were used in the literature since the early 1960s. These included "formal", "nonformal", "informal", "lifelong learning", "lifelong education", "continuing education", and "recurrent education". In some countries, the term "nonformal education" has been used, as "social education" formerly was used, as a synonym for adult education. In North America, the term "informal education" was applied almost as an equivalent to adult education, but that usage has almost disappeared. Now, a considerable part of adult education is formal. Three terms: formal, nonformal, and informal education apply to children, youths, and adults, so that all of them can describe the components of a total and integrated system of education.

The term "formal education" is used to describe the hierarchically structured, chronologically graded system, from primary school through university and including general academic studies, a variety of specialized programs and institutions for full-time teaching and professional training.

"Nonformal education" could be defined as any organized educational activity outside of the established formal system – whether operating separately or as an important feature of some broader activity – that is intended to serve identifiable learning clienteles and learning objectives.

"Informal education" is the lifelong process whereby all individuals acquire attitudes, values, skills, and knowledge from daily experience and from the educative influences and resources in their environment – from family and neighbors, from work and play, from the marketplace, the library, and the mass media.

The term "lifelong learning" is used internationally, but still lacks a commonly accepted definition. Cross (1981: 253) describes the term as "slippery, strikingly inconsistent, and subject to varying interpretations". Another more narrowly conceived definition appears in the reports prepared by the Lifelong Learning Project (1978) " Lifelong learning refers to the process by which individuals continue to develop their knowledge, skills, and attitudes over their lifetimes" (1978: 1).

Gross says that:

> Lifelong learning means self-directed growth. It means understanding yourself and the world. It means acquiring new skills and powers – the only true wealth which you can never lose. It means investment in yourself. Lifelong learning means the joy of discovering how something really works, the delight of becoming aware of some new beauty in the world, the fun of creating something, alone or with other people. (1977: 16)

Lifelong education often used as a synonym for lifelong learning, should more properly refer to the organized provision of opportunities for persons to learn throughout their lives. Delker makes the distinction between adult learning "as a major continuing mode of behavior", and adult education as the "organized and sequential learning experiences designed to meet the needs of adults" (1974: 24). Likewise, lifelong learning is the habit of continuous learning throughout life, a mode of behavior, whereas lifelong education is "the principle on which the overall organization of a system is founded" (Faure et al. 1972: 182). Dave integrates the characteristics of the concept into what may be the most satisfactory description:

Lifelong education seeks to view education in its totality. It covers formal, nonformal, and informal patterns of education, and attempts to integrate and articulate all structures and stages of education along the vertical (temporal) and horizontal (spatial) dimensions. It is also characterized by flexibility in time, place, content, and techniques of learning and hence calls for self-directed learning, the sharing of one's enlightenment with others, and adopting varied learning styles and strategies (1976 pp.35-36)

"Continuing education" is another broad term about education where Thomas provides a very broad definition:

> It is a system(s) of education, which includes formal and nonformal education, that is defined with respect to its various parts and agencies (elementary schools, secondary schools, colleges, and universities) in terms of specific educational objectives to be fostered, rather than in terms of the ages, or circumstances of learners. The system is available to persons of any age, part-time or full-time, voluntary or compulsory, and is financed by a mixture of private and public resources. It is distinguished from other educational activities in the society by the possession of the exclusive right to provide public recognition or certification for those completing its programs, though not all of its programs need lead to such certification (1981: 8)

In the early 1970s, another general term came into use. First in Europe "recurrent education" was coined to lend a more precise meaning to the concept of education permanence. It was conceived as a "comprehensive educational strategy for all post-compulsory or post-basic education over the total life span of the individual in a recurring way, i.e. in alternation with other activities, principally with work, but also with leisure and retirement" (OECD/CERI 1973: 24).

Another definition has been offered by Houghton and Richardson (1974: 7) "Recurrent education is a lifelong process consisting of a discontinuous, periodic participation in educational programs aimed at gradually dissolving the blocks of compulsory education and the working life (front-end model)".

The principal idea of recurrent education is that individuals will have systematic and genuine opportunities and access to education throughout their lifetime, both as an objective in its own right and closely related to the realities and objectives of the economic and social worlds in which they live. Recurrent education has been widely welcomed in occupationally related education.

These definitions with their overlapping tendencies and their lack of precision illustrate the phenomena of meaning and geographic specificity. Some writers use "continuing education" to mean "continuing higher (university level) education". Others use "recurrent education" as a synonym for "continuing education" or "lifelong education" to signify "adult education".

"Community education" means the body of social, recreational, cultural, and educational activities organized outside the formal school system for people of all ages, intended to improve the quality of life of the community. Education is also used in community development, in the process of preparing people to play their part to be activists within their community in both a political and social manner and to decide how to make their community a better place in which to live and work. It has been used as an agent in community action (Freire, 1972; Lovett et al., 1983).

As a form of non-traditional education, distance education serves mainly adults and those adult students who possess unique needs, motivations, goals and self-concepts. The adult student generally enters the learning environment, whether traditional or distant, with a high degree of motivation (Ehrman, 1990). Knowles' (1984) learner-focused theory of androgogy suggests that much of adults' intentional learning activity is motivated by the desire to move from their current level of proficiency to a new, higher level. Verduin & Clark (1991: 25) agree with both Knowles and Ehrman in their statement: "Discrepancies between adults' current level and their desired proficiency level, both of which directly affect their motivation and achievement in both learning activities and life role".

2.2.2 Types of Adult Education

While formal distance education has been recognized since the early nineteenth century, the development of new telecommunications and information technologies has led to a growing interest in learning at a distance in a less traditional manner with the type of educational delivery that meets the needs of many adults.

Adult education serves the undereducated or career oriented adult with the multifaceted characteristics of distance education (Verduin and Clark, 1991: 6-7) including:

1. **Time and place**. The choice of time and location in distance education appeals to working adults and the majority of potential students, who prefer evening or weekend study.
2. **Traditional affiliation**. Distance education has traditionally been offered through the continuing education and extension units of colleges and universities as a part of the off-campus units providing services for adults.
3. **Literature**. Articles, books, and other documents about distance education largely concern programs in which adults are the principal market.
4. **Learner traits**. The ability to be self-directed and internally motivated can affect a learner's satisfaction in order to complete a program. Successful study at a distance requires certain traits that are more typical of adult than of pre-adult learners. However, children may possess these traits as well.

Most of people who participate in adult education take part in one of three major kinds of programs (Verduin, Miller, and Greer, 1986). The first called *adult basic education* (ABE) is aimed at adults who have not acquired the basic educational skills and who need to function in a changing, increasingly technology-based society. The second type is *career education*, which involves helping adults to prepare for a vocation or profession or to upgrade their job-related skills. The third type of adult education is *leisure and enrichment education*, which offers learning experiences intended to help adults enrich their lives and the lives of others, and develop feelings of self-esteem and well-being.

2.2.3 Adult Education vs. Distance Education

Adult and distance education are relatively new fields of study. Adult education, as a field of study, marks its beginning in 1926 when Edward Lindeman wrote his book *The Meaning of Adult Education.* However, research efforts to establish the foundation of a discipline did not occur until the early 1960s. This was evidenced by Johnstone and Rivera's major survey of adult learning activities in 1962 as well as the publication of *Adult Education: Outlines of an Emerging Field of University Study* in 1964.

The interrelationship between adult and distance education can be understood by analyzing the concept of adult education. An adult can be described in terms of three aspects of characteristics: biological, psychological, and sociological.

The recognize the adult in a sociological or functional manner is to recognize the **roles and responsibilities** that he has assumed for himself and others. Verner (1964: 29) states that "not only are these roles immediately productive, they introduce a continuous sequence of new tasks for which pre-adult learning is never adequate preparation; continuous learning is therefore necessary". The necessity for continuous learning in conjunction with social responsibilities demands an integrated learning and living, which is the hallmark of adult education (Merriam, 1982: 124).

The second characteristic of adult education is that **participation** is largely voluntary. This demands collaboration with, and respect for, the participants.

Self-directed education is the important problem in adult education. Since education is a collaborative process, self-directed education is an interactive and socially recognized activity (Brookfield, 1986; Chene, 1983). Verner (1964: 31) believed that adult education is a formally planned and managed activity and adult learners are not normally designed to conduct their own education. He concluded that for "all practical purposes, self education is beyond the range of the responsibility of adult education, since it is an individual activity and affords no opportunity for an adult educator to exert influence on the learning process".

Knowles (1980) states that:

> The most visible characteristic of the system of adult education is its expansiveness and flexibility ... adult education has a history of adapting to new social needs and serving elements of the population previously unreached; it has spread to an ever-wider spectrum of institutions; it has developed new techniques and media; and it recruits and train large numbers of new personnel to deliver its services (p.39).

Adult education might easily be replaced with distance education because it is difficult to distinguish adult education from distance education since both are growing in their creative approaches to meeting the changing and increasing need for education.

Knowles (1980) has suggested three trends that augur change for the educational system: the integration of living and learning; self-directed learning; and lifelong learning.

- The integration of living and learning is the trend toward the unification of education, work, and life, based on the notion that learning is most effective when it is related to and integrated with working and living (Knowles, 1980: 40). The integration of living and learning is dependent upon the reduction of time and location barriers. Greater integration of living and learning could be realized with the increased use of distance education methods.
- Self-directed learning is the important concept and the ultimate aim of adult education (Brookfield, 1986; Mezirow, 1985). However, greater efforts need to be made on adult education by using the power of distance education technologies in order to have a significant influence on education and learning in the natural societal setting.
- Lifelong learning based on the notion that learning must be a continuing process from birth to death (Knowles, 1980: 40). Lifelong learning is the conceptual stage and is 'viewed as a concept which can guide the restructuring and rethinking about education in a society' (Apps, 1985: 26).

The realization of lifelong education is the adoption of distance education methods and communications technology.

As Waniewicz (1982: 89) states:

> Lifelong adult education becomes as essential as the education of children and young people. There are, however, a number of characteristics of adult learning that make it immeasurably more complex. The delivery of learning opportunities has to take into account the immense variety of needs, goals, and interests, as well as the immense variety of situations in which adults live. The education of adults at a distance is probably capable of meeting most of these needs and situations, but it is still in its early stages.

Holmberg (1980: 39) states that distance education is basically an educational discipline and in 'part it could be regarded as a special kind of adult education'. The methods of distance education are becoming increasingly more essential to adults and an understanding of the adult learner is essential to the successful design and implementation of many distance education programs. However, distance education can be more convenient and adaptable than classroom teaching for the active adult. Therefore a natural and mutually beneficial alliance between adult and distance education should be implemented.

To meet the increasing needs of adult learners, distance educators must become an integral component of adult education and begin working more closely with adult educators in reaching mutual goals. Technological methods will be deficient without the knowledge of the learner to guide the design of these systems. Furthermore, the knowledge of the learner is deficient without the appropriate technological methods to support the communication process in the educational transaction. Traditional and distance education programs, as well as adult and distance education programs, must become increasingly integrated for the benefit of all learners.

The relevant definitive characteristics of lifelong education have been summarized by Dave (1973). They include totality and universality in settings covered and clientele served; Dynamism and diversity in teaching and learning methods and materials; and focusing on promotion in learners of the personal characteristics necessary for lifelong learning (motivation, self-image, values, attitudes, and the like).

2.3 CONCEPTS OF DISTANCE EDUCATION

The first attempt in English to define distance education and to articulate a theory appeared in 1972, and later it was called the theory of transactional distance. The concept of transaction, derived from Dewey (Dewey and Bentley, 1949) explained that it "connotes the interplay among the environment, the individuals and the patterns of behaviors in a situation" (Boyd and Apps, 1980: 5). The transaction that we call distance education refers to the separation of teacher and learner, using the special teaching-learning strategies and techniques, which are identified as distinguishing characteristics of the educational practice. This separation leads to special patterns of learner and teacher behaviors.

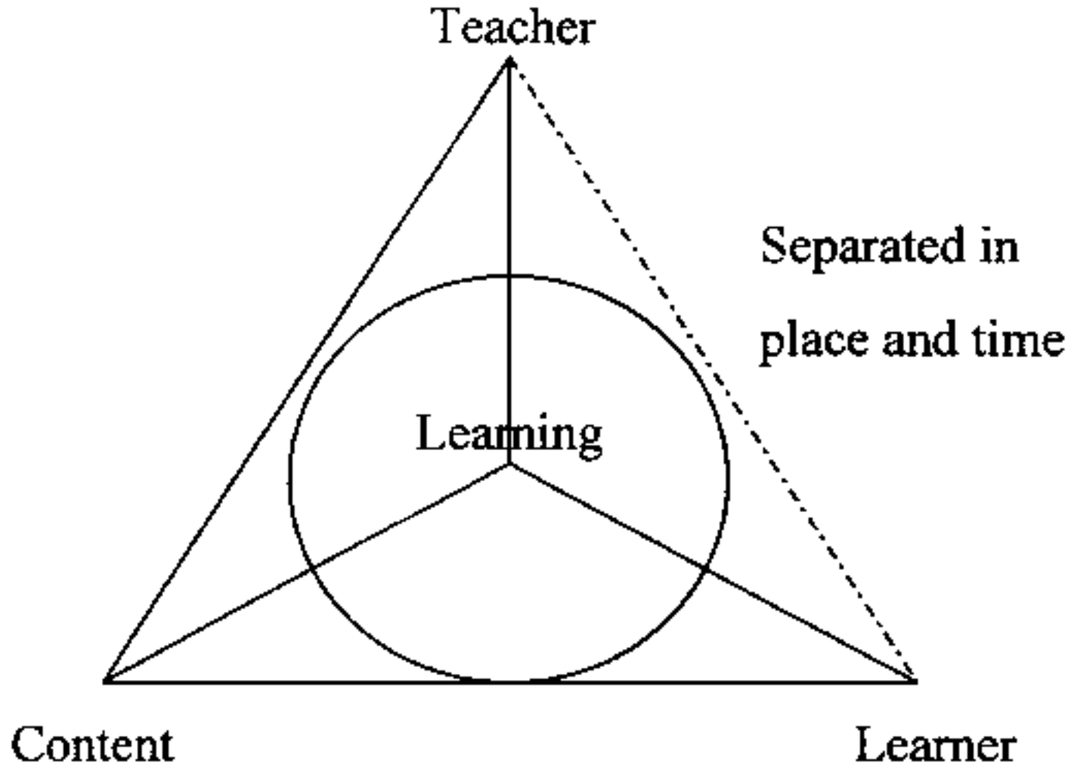

Figure 2.1: A framework for viewing instructional roles and decisions in distance education

Source: *Theoretical Principles of Distance Education*, Desmond Keegan, 1993

The proposed framework above: teacher, learner, and content, shows the instructional roles and decisions framework in distance education interaction.

The Teacher is someone whom an autonomous learner will seek out to help formulate problems, gather information, and so on (Moore, 1991). Moore does not use the word 'teacher' but generally speaks about 'programs'. Holmberg (1986, 1989) concentrates on the teaching process. Keegan (1986, 1990) refers to the teaching and learning acts and describes the interpersonal components of face-to-face teaching, which are missing in distance education. Garrison (1989: 18) describes the teaching role as collaborative and the teaching activity as one of negotiation and dialogue. Verduin and Clark (1991: 125) address the need for dialogue and support. Sammons (1990) criticized that teachers are those who have proposed the notion of learner independence, autonomy or control for not detailing the teaching role in promoting learner independence. He mentioned that the teaching role in relation to various types of learning seems necessary.

The Learner, and his/her needs to structure and control the learning situation, has received much emphasis in distance education. The learner role may vary depending on the learning to be accomplished as, for example, the so-called self-directed learner.

Content or subject matter largely determined the teaching and learning roles. Verduin and Clark call attention to the structure of the subject matter and the resulting implications for the teaching and learning roles with the notion of instructional approach fitting all types of learning.

Wedemeyer (1983) stated that there are five types of programs that are non-classroom-based: *distance education*, *non-traditional learning*, *independent study*, *out-of school learning*, and *external studies*.

- ❖ Distance education implies all of the elements necessary to describe learning at a distance with adding methods of study.
- ❖ Non-traditional learning may include classroom study in most definitions.
- ❖ Independent study appears to exclude group-based distance education while including self-instructional methods.
- ❖ Out-of-school learning refers to any teacher-learner meetings for learning purposes outside of regularly scheduled classes.
- ❖ External studies may refer to education without a residency requirement or to a combination of off-campus and distance study.

None of these terms precisely and solely defines learning in which the teacher is at a distance from the learner a majority of the time. Wedemeyer (1981) states that "all of the distance factors, whether they are social, cultural, psychic or physical, 'only the factor of physical distance between teacher and learner is irrelevant to learning' ..." (p. 39).

2.3.1 Interrelated Concepts of Distance Education

Distance education can be defined as planned learning that takes place at different locations from teaching. The environment for educational management of teaching and learning has changed very rapidly. The electronic revolution in communication and information technology will transform the university activity as geographically grounded teaching and learning institution, and enormously expand the horizons of the learners. Developments in communications and information technology present opportunities between various models of learning and teaching previously adopted at universities, such as off-campus teaching, distance education and open learning.

The concepts of "openness", "transactional distance" and "learner autonomy" are useful in understanding the learning and teaching systems, particularly in relation to the deployment of information technology.

The characteristic of openness could be common to both face- to-face and distance education delivery modes and any particular sample from either could be labeled in the continuum from closed to open. For example, a distance education program would be considered a relatively closed system if there were an over-dependence on prepared media with little choice of content and little interaction with lecturers and other students. The division between face-to-face and distance education has become "as many approaches used within distance education systems to teach students remotely [and which] can also be used to support classroom teaching" (Rumble, 1998).

Moore (1983) introduced the concept of transactional distance to define the separation between the teacher and learner. It is a function of two variables: structure and dialogue (see figure 2.4). Where

- Structure refers to the educational objectives, teaching strategies, and evaluation methods -- those [that] are prepared for or [that] can be adapted to the objectives of the learner; and [that] can be compared with certain aspects of Rumble's openness.
- Dialogue refers to the communication flow between teacher and learner. According to Taylor (1996) dialogue offers advantages to overcome the alienation of distance between teacher and students; it clarifies students' needs; and involves students in university culture.

The theory of transactional distance was first put forward in two pedagogical traditions in the 1960s. One was the humanistic tradition. which gave special value to the interpersonal, generally open-ended and unstructured dialogue in education, such as counseling in which many of the educational techniques were used. The other was in the behaviorist tradition, which gave great value to the systematic design of instruction that was based on behavioral objectives with maximum teacher control of the learning process. In the early 1970s distance the behaviorists dominated education. The title of the first paper in which the theory of transactional distance was publicly presented, was called learner autonomy (Moore, 1972).

Learner autonomy is a third dimension. It is independent learning emphasizing a state of readiness for fully self-directed learning. "The greater the transactional distance, the more autonomy the learner has to exercise" (Moore, 1991: 5). According to Malcolm Knowles, autonomous learning behavior should be natural for the adults.

In addition, Lewis and Spencer (1986) define "open learning as a term to describe courses flexibly designed to meet individual requirements. It is often applied to the provision which tries to remove barriers that prevent attendance at more traditional courses, but it also suggests a learner-centered philosophy". The adoption of a service approach or student-centered approach relates to the provision of education.

2.3.2 Relevant Concepts of Distance Education

Another concept of the distance education is any formal approach to learning in which a majority of the instruction occurs while educator and learners are at distance from one another (Verduin and Clark, 1991). Effort has been spent trying to formalize a theory specific to distance education. Keegan (1988) grouped the theories as follows:

- ❖ Theories of autonomy and independence (Wedemyer, 1981; Moore, 1988)
- ❖ Theory of industrialization (Peter, 1988)
- ❖ Theories of interaction and communication (Holmberg, 1977, 1981, 1988a, 1988b; Baath, 1980; Sewart, 1988)

Moore, Peters, and Holmberg presented the above theories and Keegan has analyzed these as the concept of distance education divided into two forms: distinctive and parallel.

- ❖ Distinctive form: Distance education considers a distinctive educational form based on individualized study. Many autonomous universities teach only to students at a distance and believe that distance education is a distinct form of education (Moore, 1988; Peters, 1988)
- ❖ Parallel form: A second perspective considers distance education as parallel to traditional education. Garrison (1989) asserted that distance education is not unique. The techniques appropriate for traditional education systems and distance education systems are the same. Many educators subscribe to the philosophy that distance education does not differ from conventional education in any real structural sense, but is distinctive only in the delivery system (Zigerell, 1984).

According to these two forms of distance education, concepts above (distinctive and parallel forms), Ramkhamhaeng University (RU) is the first distance educational institution in Thailand, established in 1971, and serves the learners in the parallel form of education, while Sukhothai Thammathirat Open University (STOU) established in 1980, serves the learners in the distinctive form of education.

2.4 DEFINITIONS OF DISTANCE EDUCATION

In 1986, Keegan refined his 1980 descriptive definition of distance education, proposing seven criteria:

1. The quasi-permanent separation of teacher and learner throughout the length of the learning process. This distinguishes it from conventional face-to-face instruction.
2. The influence of an educational organization both in the planning and preparation of learning materials and in the provision of student support services. This distinguishes it from private study and teach-yourself programs.
3. The use of technical media: print, audio, video, or computer, to unite teacher and learner and carry the content of the course.
4. The provision of two-way communication so that the student may benefit from or even initiate dialogue. This distinguishes it from other uses of technology in education.
5. The quasi-permanent absence of the learning group throughout the length of the learning process so that people are usually taught as individuals and not in groups, with the possibility of occasional meetings for both didactic and socialization purposes.
6. The presence of more industrialized features than in conventional oral education.
7. The privatization of institutional learning.

Keegan (1986) describes the first five criteria as "constant essential components" while the remaining two are described as "socio-cultural determinants" which are both necessary pre-conditions and necessary consequences of distance education (Keegan, 1986: 49).

Comparing Keegan's 1980 and 1986 definitions: *Separation* of teacher and learner in the 1980 definition becomes *quasi-separation* in the 1986 version, in recognition of the fact that face-to-face teaching is a part of many distance programs. The influence of an educational organization in the 1986 version (in the second element) makes clear that distance education is different from distance learning in the preparation of the instructional materials for student support services. Keegan moves from an emphasis on the use of print in the 1980 definition to acknowledgment in 1986 that the computers and a wide array of audio and video technologies also serve to unite teacher and learner and convey content. The fourth element of his definition is unchanged, except that Keegan notes that two-way communication distinguishes distance education from other uses of technology in education. Keegan retains his previous version of the fifth element of the definition, which allows for the possibility of occasional face-to-face meetings of learners, and also emphasizes self-study.

Garrison and Shale (1987) derived a similar definition with the principal difference in the use of the term *educational communication* rather than *instructional process* in the first element. Shale (1988) stated that the current technological developments are narrowing the gap between distance and conventional education. He urged that we should not define distance education in terms of distance but rather in terms of education, while Bagnall (1989) urged the examination of distance education in terms of student autonomy.

Distance education programs have been classified in a number of ways. Keegan classified distance study schemes as autonomous study. Distance education is distance teaching at a conventional educational institution, accomplished through independent divisions, seminars and home study, or integrated internal and external teaching (Rumble and Harry, 1982). Willen (1981) classified institutions teaching at a distance according to whether they were large-scale centralized operations or more small-scale decentralized models, such as those that are common in Sweden, Australia, and the United States.

Holmberg (1981) offered similar categories, calling large-scale operations "industrial" and characterizing small-scale approaches as "parallelism" because they paralleled residential study on campus.

Attempts to describe and explain the nature of distance education are to arrive at a series of organizing ideas, theories or values, which receive the universal support of both practitioners of the specialist area and those engaged in more general educational efforts. Various authorities have analyzed the concept of distance education in an attempt to identify the types of knowledge that ought to seek legitimately through connection to a theory of distance education. This knowledge will identify the essential nature of distance education.

Some definitions of distance education have been developed and described as follows:

Distance education is instructional delivery that does not constrain the student to be physically present in the same location as the instructor (Steiner, 1996). Its Hallmarks are the separation of teacher and learner in space and/or time (Perraton, 1988). The volitional control of learning by the student rather than the distant instructor (Jonassen, 1992), and noncontiguous communication between student and teacher, mediated by print or some form of technology (Keegan, 1986; Garrison and Shale, 1987).

The U.S. Office of Technology Assessment (1994) defines distance learning as the "linking of a teacher and students in several geographic locations via technology that allows for interaction."

The Distance Learning Homepage of Western Carolina University defines distance learning as "the delivery of instruction to the right group of people at the right time in the right place". Time, distance, or both may separate the educator and the learner. It may or may not include technology (WCU, 1995).

The U.S. Distance Learning Association (USDLA, 1996) states that distance learning is the application of electronic means to education in all areas: K-12, higher education, continuing education, corporate training, and military and government training, tele-medicine and those devoted to the pursuit of lifelong learning.

The VTEL Corporation[2] (1996) defines interactive distance learning as using "today's video technologies to reach more students, in more locations, with fewer instructors".

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[2] VTEL, (1996, January 3). Distance Learning [WWW document]

Most definitions of distance learning above include the use of technology. Some refer to the degree of interactivity and the distance between educator and learners or learners and learners. However, other definitions do not require the use of technology. In fact, distance learning in the older paradigm, can be as simple as postal correspondence and telephone communications, as the following definitions:

Distance education is education in which teacher and learner is separated during a majority of instruction (Verduin and Clark, 1991: 4).

Distance education is done by correspondence, at home. with the implication that people only study at home – or in the situation in which they spend their days – when they are forced to. Distance education is done by reading (Gillard, 1991a).

According to Moore's transactional distance (1990), distance education is a set of interrelationships about dialogue, structure, and autonomy.

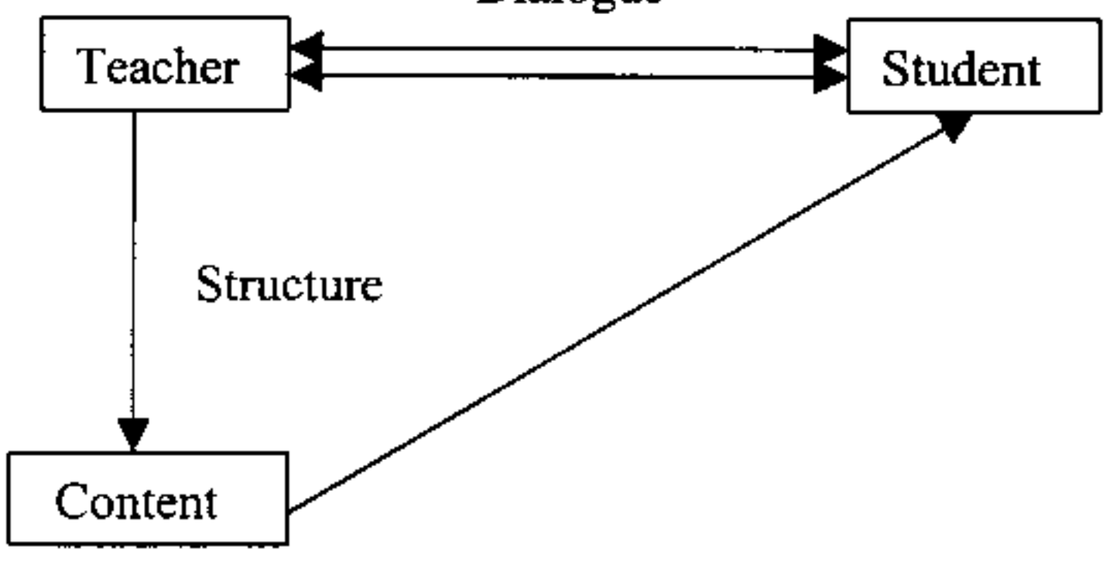

Figure 2.2: The communication loop in distance education

Source: Garrison & Shale, 1987b. *Understanding Distance Education: A Framework for the Future*

Garrison and Shale (1987) defined distance education as any formal approach to learning in which a majority of the instruction occurs while educator and learner are at a distance from one another.

Perraton (1981: 14) defined distance education as "an educational process in which an appreciable part of the teaching is done by a person, who is distant in time and/or in space".

Distance education is defined or named as non-contiguous, external, off campus, extramural. The existence of two forms of education, which are strictly separable:

- Traditional education based on personal communication and
- Distance education based on industrialized and technological communication (Keegan, 1980: 17).

Distance education is the various forms of study at all levels, which are not under the continuous, immediate supervision of tutors present with their students in lecture rooms or on the same premises, but who, nevertheless, benefit from the planning, guidance, and tuition of a tutorial organization (Holmberg, 1977: 9).

It is a form of indirect instruction (Peters, 1973: 16).

Distance teaching is defined as the "family of instructional methods," in which the teaching behaviors are executed apart from the learning behaviors, including those who are in a contiguous situation, and which would be performed in the learner's presence, so that communication between the teacher and the learner would be facilitated by print, electronic, mechanical or other devices (Moore, 1973: 664). This definition suggests that a "family of instructional methods" is appropriate to distance education.

In the conclusion, most authorities agree that distance learning usually consists of at least three characteristics (Verduin and Clark, 1991):

- Physical separation between the learner and the teacher: The separation of teacher and learner during at least a majority of each instructional process.

- An instructional delivery system bridges the separation between teacher and learner(s): The use of educational media such as print, audio, video, or computer-oriented media, unite teacher and learner and also carries course content.

- A formal organizational body (e.g. university or private training firm), which oversees the educational process: The provision of two-way communication between teacher, tutor, or educational agency and learner.

2.5 TYPES OR MODELS OF DISTANCE EDUCATION

Kaunda's (1970) and Rumble and Harry's (1982) typologies of distance study in conventional universities are synthesized as follow:

- A university offers external exams for credit or credentials: University of London, for example.
- A single department offers distance study in its discipline: University of Waterloo's program is an example.
- External tuition occurs through extramural or extension departments. This is most common in the United States, usually through continuing education units.
- Distance teaching units or departments duplicate the work of teaching departments. It is somewhat autonomous and only duplicates some of the on-campus teaching functions. The University of Wisconsin-Extension is an example.
- A distance-teaching department facilitates rather than duplicates the work of teaching departments, which may be required to accept external students. The highly successful external studies program at the University of New England in Australia is an example.

Methods of distance study can also be classified. Edstrom (1970) recognized three types of study practices in distance education: *individual study*, which is the most common; *group study*, in which learners meet as a group at a distance from the teacher; and *supervised study*, in which someone other than a teacher enforces a learning period.

As a whole, distance education courses involve two core activities by the learners:

- Independent study of course materials and resources.
- Interaction with other course participants (tutors, instructors, other learners, resource people).

A classification of distance education is presented in six distance education models as follow:

Type 1: Institutions offer degrees and course credit to students whom they have not taught directly. Institutions offer degrees through combinations of comprehensive courses or proficiency examinations; credit for equivalent academic work and experiential learning; and portfolio evaluations of prior learning, life, and work experiences.

Type 2: Institutions offer degrees to students whom they have already taught in some measure. Degree requirements can be met through a combination of credits for prior learning, life and work experiences, credit by examination, distance education coursework, and experiential learning. Type 2 universities are examples of both external and distance study. External degrees can be defined as those in which half or more of the credits needed for a degree may be earned or awarded for work external to the traditional on-campus programs of the institution. Assessment for prior learning plays a large role in these programs. The significance classifies external degree program as being distance study can be seen in the records and coursework of individual students. If more credit is given for distance study or by examination than for classroom study, not including experiential and portfolio credit, then the program is called a distance education program. If an external degree program is structured around face-to-face classroom study, whether on or off campus, then the program is a conventional one. The flexibility of learning options available in many programs allows one student to follow a program that is mainly conventional, while another uses distance education methods.

Type 3: Institutions are conventional universities that offer distance education degrees and coursework through extension, independent study, or continuing education units. Institutions offer considerable correspondence and independent study programs. They are the major academic providers of distance education in the United States.

Type 4: Institutions form consortia of education-related institutions to provide distance courses in common or over a wide geographic area. A consortium can be defined as a "formal organization of two or more member institutions, administered by a director, with tangible evidence of member support" (Niemeyer, 1985: 55). Since educational programming is so expensive, whether it is purchased or produced, educational institutions form consortia to share the costs and the risks of failure. Consortia members grant the same credit for participation, bringing a degree of consistency to their distance education practice (Niemeyer, 1985).

Type 5: Institutions are autonomous institutions for the teaching of distance students. Distance teaching universities have been opened around the globe in nations where the educational infrastructure is not well developed, or where access to higher education is highly restricted. Many distance teaching university planners have used the Open University of the United Kingdom as a model. The high quality of its publications and the many laudatory articles written about it make the Open University of the United Kingdom (OUUK) probably the only distance education unit that is positively viewed by American academics. However, no distance teaching university exists in the United States. A telephone tutor may be consulted about problems related to study by calling a toll-free number. Hence, institutions are those that have been established specifically for teaching at a distance.

Type 6: Institutions provide and develop educational media, which are used by informal distance learners. These organizations prepare media for people engaged in incidental or self-planned learning, but do not offer any assistance with the process. This is the biggest category of all, for it includes not only self-instructional materials of all kinds, including media intended for conventional education, such as textbooks, but also educational uses of distance media by incidental learners or self-planned learning. The point of this category is not to impress readers by adding up how many people engage in individual "distance learning," but rather to point out that learning at a distance is an integral part of the lives of most learners today.

2.6 MODES OF INSTRUCTIONAL DELIVERY

According to Keegan's research. a definition of distance education toward students' perceptions, which rely on a concept analyses approach, while others rely on their own philosophy of education. The students' perceptions produced three characteristics of distance education (Keegan, 1993: 104-5):

- The main characteristic of distance education is distance – in other words, the temporal, spatial or psychosocial separation: This separation does not necessarily imply the lack of personal or direct contact between students and teachers. This contact is modified through the use of communication techniques where the transmission of information, teaching, and student support are assured.
- The use of media (whether it is called technical support, delivery methods, technology, or media) is necessary for the delivery of knowledge or to ensure student support.
- Communication between the student and the teacher (tutor, counselor, or institution) whether it was delayed by mail or real time by telephone, through face-to-face meetings, videoconferences, etc. must be present.

Salomon (1981a) asserts, "education depends upon acts of communication" (p. 35). It means that the process of education must consist of a transaction between teacher and student. Peters (1966) refers to the process as a "shared experience" undertaken voluntarily. Chene (1983) and Sewart (1982) speak of the interaction between teacher and student as mediation. Another writer states "Education is a cooperative rather than an operative art" (Houle, p. 44). Still another writer suggests that education includes activities of explanation, analysis of performance, and criticism, which goes beyond simply presenting information (Lawson, 1974). All of supports viewed that education is a collaborative experience, which depends upon acts of communication.

An educational transaction quite clearly involves a teacher and a learner. The educational transaction is based upon seeking understanding and knowledge through dialogue and debate. A teacher must be authoritative, but not authoritarian. The act of teaching is not simply to pass on content, but teaching must also be concerned with the process of critically analyzing this knowledge and developing new perspectives based upon individual experiences and knowledge. Thus, teaching is the integration and balancing of content and process issues. In this way, teacher and student are interdependent and, in the best sense of education, are in a collaborative relationship. Understanding the educational transaction depends upon understanding the communication process. Not all communication is equivalent to all other forms of communication. Communication, like education, is a complex concept that requires considerable reflection as to its nature and mode of transmission.

The step in understanding the role of communication in distance education, the substantive differences among modes of communication are presented (adopted from Garrison & Shale, 1987b) as follows:

I. One-Way Communication
    1. Direct (no electronic transmission) e.g. lecture
    2. Mediated (electronic transmission) e.g. broadcasting

II. Two-Way Communication
    1. Direct (e.g. face-to-face dialogue)
    2. Mediated (e.g. teleconferencing)
        2.1 Real (e.g. CAI)
            a) Immediate (e.g. telephone)
            b) Delayed (e.g. electronic mail)
        2.2 Simulated (e.g. expert system)

Printed and written correspondence by mail was the only mode of delivery utilized in most early distance education. Print materials constituted the vast majority of items exchanged by teacher and learner in correspondence study, print study and correspondence study regarded as synonymous. Actually any packageable, mailable item can be part of a correspondence study.

2.6.1 Correspondence Study

It could be said that correspondence teaching began with the first letter from one person written to give instruction to another, and goes back to such classic examples as Plato' s epistles to Dionysius and the letters of the Elder Pliny to the Younger Pliny. But a search for the origins of the twentieth century pattern of correspondence teaching leads to the individual stories of a number of persons in different countries who saw in it a method of meeting differing needs.

In 1856 in Germany, Charles Toussaint, a Frenchman who was teaching French in Berlin, and Gustav Langenscheidt, a member of the Society of Modern Languages in Berlin, co-founded a school for teaching languages by correspondence. In the United States of America, Thomas J. Foster, a newspaper proprietor and editor in Pennsylvania in 1891, appalled at the loss of life in mining accidents, directed the writing of a course of instruction on mine surveying and machinery designed to teach safety measures. This course was the beginning of the International Correspondence Schools of Scranton, Pennsylvania.

Also Roger W. Axford (1963) stated, in *Brandenburg memorial essays on correspondence education*, vol. 1, University of Wisconsin, that:

> During the last half of the nineteenth century, there was a movement in the United States for the extension of university teaching. In keeping with the trend in university during this period, on July 1891, the Regents of the University of Wisconsin approved a faculty resolution for the development of university extension correspondence study courses (p.57).

> Correspondence teaching is effective in all subjects which can be taught by the lecture method alone, that is in all subjects in which the basis of teaching is words, which may be as easily written and read as spoken. In subjects in which practical demonstration and supervision in laboratory work are essential, only the theory can be taught by correspondence, but the usefulness of teaching theory by correspondence in conjunction with 'on-the-job' practical experience, and short resident sessions for laboratory work, is indicated by the growing use of correspondence teaching in technical subjects.

The term *correspondence teaching* is associated with the term *home study*. Both terms, correspondence teaching and home study, are in general use, but carry a difference in emphasis. Correspondence teaching implies a teaching responsibility on the part of the institution or person offering the service. The term home study, with its empnasis on place of study, is sometimes interpreted in the restricted sense of self-instruction. The difference between correspondence teaching and home study in this restricted sense depends upon the degree of contact between tutor and student. If a course of study consists of no more than the issue of study material, whether or not related to a terminal examination, and is not providing continuous teaching by a tutor, then the student' s home study has, in fact, become self-instruction. But if the student is required throughout his course of study to send practical evidence of his progress to a tutor, to send it at intervals sufficiently frequent to enable the tutor to correct the weaknesses as soon as they appear and to give further instruction when it is needed, then the student continues to be taught throughout his course of study.

Correspondence teaching is a method of teaching in which the teacher bears the responsibility of imparting knowledge and skill to a student, who does not receive instruction orally, but who studies in a place and at a time determined by his individual circumstances.

2.6.1.1 Principles of correspondence teaching

The principles of correspondence teaching, like the principles of teaching by any other medium, are rooted in the general laws of human learning. Learning is more effective when students want to learn. Learning is more efficient when it is made meaningful by the recall of relevant past experience. Learning is quicker and more lasting when the learning activity is appropriate to the learner's level of development. Learning is an activity which must be carried out by the learner. Immediate reinforcement helps learning. Transfer of learning makes possible the application of behavior or responses learned in one situation to other situations. In teaching by correspondence these responsibilities are carried out through a two-phase process, clearly described by Dr Gayle B. Childs of the University of Nebraska:

The first part of the process is carried forward by the syllabus or study guide. The syllabus bears the major responsibility for establishing objectives, determining learning experiences, and indicating instructional materials to be used. A good syllabus gives direction, explains, supplements, illustrates, provides for review, stimulates interest, and encourages self-evaluation. Finally, it provides some means for the student to submit to a correspondence study into which effective learning has taken place. This evidence may be in the form of written answers to specific question. an original essay, a completed dress in a homemaking course, a report of an experiment in chemistry, or a transcribed letter in shorthand.

It is at this point that the second part of the correspondence study teaching process begins. The teacher who receives the lesson from the student must evaluate it and convey the results of this evaluation to the student. Re-teaching and relearning may or may not be necessary. If necessary, it must be provided for.

2.6.1.2 Print Materials

Print is the foundation of distance education from which all other delivery systems have evolvedThe first distance-delivered courses were offered by correspondence study, with print materials sent and returned to students by mail. While technological developments have added to the repertoire of tools available to the distance educator, print continues to be a significant component of all distance education programs.

The advantages of Print are:

- Spontaneous: Print materials can be used in any setting, without the need for sophisticated presentation equipment.
- Instructionally transparent: The medium of delivery should enhance the content for the learner's attention. If the student reads well, the print medium is the most transparent instructional medium of all.
- Non-threatening: Reading is second nature to most students. As a result, they are easily able to focus on the content, without becoming mesmerized or frustrated by the process of reading itself.

- Easy to use: Print materials can be used any time and any place without the aid of supplemental resources such as electricity, viewing screen, and specially designed electronic classrooms. The portability of print is especially important for rural learners with limited access to advanced technology.
- Easily reviewed and referenced: Print materials are typically learner-controlled. The student rapidly moves through redundant sections, and focuses on areas demanding additional attention.
- Cost-effective: No instructional tool is less expensive to produce than print. In addition, facilities abound for the inexpensive duplication of these materials.
- Easily edited and revised: Print is both easy and inexpensive to edit and revise, in comparison to technically sophisticated electronic software,.
- Time-effective: When instructional print materials are created, the developer's primary focus remains on content concerns, not the technical requirements of the delivery system.

The Limitations of Print are:

- Limited view of reality: Print, by its reliance on the written word, offers a vicarious view of reality. It is impossible to adequately recreate motion in print.
- Passive and self-directed: Numerous studies have shown that higher learner motivation is required to successfully complete print-based courses. To a certain extent, the passive nature of print can be offset by systematic instructional design that seeks to stimulate the passive learner. Still, it takes more motivation to read a book or work through a written exercise than it does to watch a television program or participate in an audioconference with an instructor encouraging student participation and response.
- Feedback and interaction: Without feedback and interaction, instruction suffers, regardless of the delivery system in use. By nature, print materials are passive and self-directed. Even with print materials incorporating

feedback mechanisms and interactive exercises, it is easy for learners to skip to the answer section.

- Dependent on reading skills: Reading skills must often be improved. Lack of ability in this area cripples the effectiveness of even the most instructionally sound print material and must be overcome if print is to be used effectively.

Various print formats are available, including :

- **Textbooks**. Textbooks are the basic and primary source of content for the majority of distance-delivered courses. Textbooks should always be critically reviewed before adoption, this is especially critical when the learner and the instructor are not in daily contact.
- **Study guides**. Typically, distance educators use study guides to reinforce points made during class and through the use of other delivery systems. They will often include exercises, related readings and additional resources available to the student.
- **Workbooks**. In a distance education context, workbooks are often used to provide course content in an interactive manner. A typical format might contain an overview, the content to be covered, one or more exercises or case studies to elaborate the points being made, and a quiz or test (with answer key) for self-assessment. In addition, there are typically some forms of feedback, remediation, or "branching" loop to recycle students through the instruction as needed.
- **Course syllabus.** A comprehensive and well-planned course syllabus is the foundation of many distance-delivered courses. It provides course goals and objectives, performance expectations, descriptions of assignments, related readings (often by session), grading criteria, and a day-by-day overview of the material to be covered. The syllabus must be as complete as possible in order to guide the students through the course in the absence of daily contact with the instructor.

- **Case studies**. Case studies are an extremely effective instructional tool. Case studies are often designed around the limitations of print and intended to spark the students' imaginations in the particular case under consideration. Many case studies present a content-based scenario. They raise questions, pose alternative solutions, and then branch students to different sections of the text. There, the consequences of the selected alternative are described.

2.6.2 Technologies in Mediated Communication

Early distance education programs relied primarily on print materials for instruction. This format is still the medium of choice in countries like Spain and Latin America where the cost of broadcast television in considered prohibitive (Garrido, 1991). In addition to the print material, Spain and Latin America now supplement with a series of daily radio broadcasts from Radio Nacional de Espana. Spain and Latin America are not alone in their widespread use of print material. Venezuela recently instituted, on a limited basis, both television and audiocassette delivery systems to supplement text-based instruction. Costa Rica has a similar program in operation (Garrison, 1990). While many countries must rely on print to disseminate instruction, Turkey and other developing countries, with large communication infrastructures already in place, use broadcast television (Mclsaac, 1990). As distance education increases world wide, the need for continued modern delivery systems will continue (Winn, 1990).

According to Margaret Cambre (1991), in the late 1950's and early 1960's, television production technology was largely confined to studio and live broadcasts, in which master teachers conducted widely broadcast classes. In the early 1970's, the emphasis turned from bringing master teachers into the classroom to taking children out of the classroom into the outside world. This trend was reversed later in the 1970's, as professionally designed and produced television series introduced students to new subject matter. This was an important complement to the classroom curriculum.

Much of the literature, which discusses the advancement of technology to facilitate the delivery of distance education, originated in the United States. Computer assisted instruction (CAI) and computer conferencing lead the list for the number of articles, asserting the belief that CAI and computer conferencing allow the shift from individualized, self-directed learning to collaborative learning (Lauzon & Moore, 1989). Additionally, Lauzon & Moore report that CAI meets the diverse needs and characteristics of adult learners by providing the opportunity for the learner to control and pace the instruction. Qualitative research by Cheng, Lehman & Armstrong (1991: 63) supports the effectiveness of CAI and reports CAI to be "an effective teletraining device for academic institutions". CAI was once viewed as one student working with material presented by one computer. However, advances in technology have allowed linkages of many computers and many students. These linkages are often entitled computer conferencing, which is an ideal communication tool for bridging time and space among those who share similar interests. It is effective in removing the barriers of time and space as constraints on communication (Lauzon & Moore, 1989: 40).

With the rapid technological change and shifting market conditions, the educational system is challenged with providing increased educational opportunities to all kinds of learners without limiting time and space. At its most basic level, distance education takes place when a teacher and student(s) are separated by physical distance, and technology (voice, video, data, and print) is used to bridge the instructional gap. These types of programs can provide adults with a second chance at a college education, reach those disadvantaged by limited time, distance and physical disability, and update the knowledge base of workers at their places of employment.

Garrison (1990) discusses the technology, "Distance education is inexorably linked to the technology of delivery. It can be seen as a set of instructional methods based largely on mediated communication capable of extending the influence of the educator beyond the former institutional setting for the purpose of benefiting the learner through appropriate guidance and support. Without technology, a future for distance education does not exist" (p. 45).

A wide range of the technological options is available to the distance educator, falling into four major categories:

- **Voice**: Instructional audio tools include the interactive technologies of telephone, audio conferencing, and short-wave radio. Passive (one-way) audio tools include tapes and radio.
- **Video**: Instructional video tools include still images, such as slides, pre-produced moving images (film, videotape), and real-time moving images combined with audio conferencing (one-way or two-way video with two-way audio)
- **Data**: Computers send and receive information electronically. The term "data" is used to described the broad category of instructional tools. Computer applications for distance education are varied and include:
    - Computer Assisted Instruction (CAI) uses the computer as a self-contained teaching machine to present discrete and individual lessons to achieve specific objectives. There are several CAI modes, including drill and practice, tutorial, simulations and games, and problem-solving.
    - Computer Managed Instruction (CMI) uses the computer to organize instruction and track student records and progress. The instruction itself need not be delivered via a computer, although CAI (the instructional component) is often combined with CMI.
    - Computer Mediated Communication (CMC) describes computer applications that facilitate communication and the delivery of instruction, including electronic mail (e-mail), fax, real-time computer conferencing, electronic bulletin boards, and World-Wide-Web applications.
    - Computer Based Multimedia such as HyperCard, hypermedia, and a still-developing generation of powerful, sophisticated, and flexible computing tools, have gained the attention of distance educators in recent years. The goal of computer-based multimedia is to integrate various voice, video, and computer technologies into a single, easily accessible delivery system.

- **Print** is a foundational element of distance education programs. Various print formats are available including: textbooks, study guides, workbooks, course syllabi, and case studies.

2.6.2.1 Broadcast for Education

The use of educational broadcasts has been widely advocated in both industrialized and developing countries. Some arguments that have been put forward in favor as the advantages are:

1. Broadcasts cannot only bring material and experiences not otherwise available into the classroom but also to remote learners.
2. Broadcasts give learners access to experiences outside the classroom at lower cost than visits and trips.
3. Broadcasts can present more effective teaching materials than the classroom teacher can create, and achieve economics of scale at the same time.
4. Broadcasts can enhance teacher effectiveness by their multiplier effect; watching or hearing master teachers at work will have a spin-off effect on the classroom teacher.

Broadcasts were thought to offer a means of creating a major increase in the effectiveness of educational systems worldwide, plus they would also result in a simultaneous lowering of per student costs - in other words, a dramatic gain in efficiency.

Some explanations for the low use of university broadcasts, which are conventional among advocates of the innovation:

1. Teachers are by nature conservative and resistant to any kind of change.
2. Teachers are afraid of being replaced by machines.
3. Teachers are afraid that their students will make unfavorable comparisons between their competence and the level displayed by the TV teacher.
4. Teachers are unwilling to surrender control of the classroom to an alien intrusion since they cling to the godlike authority they enjoy there.

The disadvantages or problems, the partial rejection or discontinuance of educational broadcasts given by teachers, are:

1. Inadequate advance information
2. Inaccurate advance information
3. Difficulty of controlling (selecting) content
4. Content irrelevant
5. Method unsuitable – encourages passivity, illiteracy and imposes lockstep
6. Level too high / low
7. Pace too fast / slow
8. No receiver
9. Receiver u / s
10. Poor reception
11. Competition for receiver
12. Educational returns do not justify difficulties in setting up
13. Syllabus overcrowded – no room for 'enrichment' material
14. Ancillary materials unavailable / arrive late / too expensive
15. Timetabling problems – broadcast schedule and institutional timetable conflict
16. Recording problems – no record or machine required for simultaneous record and playback
17. Accommodation of equipment
18. Theft of equipment
19. Available time devoted to other innovations
20. No mains / batteries
21. Poor audibility in classroom

2.6.2.2 Computers in Distance Education

The technological developments have made the computer a dynamic force in distance education, providing a new and interactive means of overcoming time and distance to reach learners.

The advantages of computers are:

- Computers can facilitate self-paced learning. In the CAI mode, for example, computers individualize learning while giving immediate reinforcement and feedback.
- Computers are the multimedia tools. With integrated graphic, print, audio, and video capabilities, computers can effectively link various technologies. Interactive video and CD-ROM technologies can be incorporated into computer-based instructional units, lessons, and learning environments.
- Computers are interactive. Microcomputer systems incorporating various software packages are extremely flexible and maximize learner control.
- Computer technology is rapidly advancing. Innovations are constantly emerging, while related costs drop.
- Computers increase access. Local, regional, and national networks link resources and individuals, wherever they might be. Many institutions now offer complete undergraduate and graduate programs relying almost exclusively on computer-based resources.

The limitations of computers are:

- Computer networks are costly to develop. Although individual computers are relatively inexpensive and the computer hardware and software market is very competitive, it is still costly to develop instructional networks and purchase the system software to run them.
- The technology is changing rapidly. Computer technology evolves so quickly that the distant educator, focused solely on the technological innovation, will constantly change equipment in an effort to keep pace with the "latest" technical advancements.

- Widespread computer illiteracy still exists. While computers have been widely used since the 1960's, there are many who do not have access to computers or computer networks.
- Students must be highly motivated and proficient in computer operation before they can successfully function in computer-based a distance-learning environment.

Conventional teaching institutions increasingly use computer-conferencing to extend their classes, and to individualize their instruction. In this view, computer-conferencing shifts the emphasis away from the mass production model of distance education to one which is more responsive to the needs of individual learners, and is a medium that supports learner empowerment and autonomy (Davie and Wells, 1991).

An example of distance education delivered by computer-conference is the Electronic University Network, in which member universities provide credit courses on floppy disks for home computers, augmented by e-mail and on-line data searching. An idea of the potential of the method is given by the Bangkok Project, which linked educational computer networks worldwide in a professional development activity for members of the distance education community (Anderson and Mason, 1993).

2.6.2.3 Internet in Distance Education

The Internet is the largest, most powerful computer network in the world. The Internet promises dramatic changes in the way we learn and teach, the way we interact as a society. It links computers of many different types, sizes, and operating systems, all sharing the Internet Transmission Control Protocol (TCP/IP), which allows computers of different types to communicate. Internet users can communicate with one another by mail, file transfer, computer conferencing, bulletin boards, and newsgroups. They can explore the World Wide Web (WWW) links to the same resources and to graphics, sound, and video materials. They can also have real-time interaction with other users through the Internet chat or through audio and video links.

In higher education, most students have access to Internet resources. Thus more possibilities are opened for distance educators to overcome time and distance to reach students through the Internet. With access to the Internet, distance educators and their students can use:

- Electronic mail (e-mail) is used to exchange messages or other information with people. Instead of being delivered by the postal service to a postal address, e-mail is delivered by Internet software through a computer network to a computer address.
- Bulletin boards can be accessed through the Internet. Two common public bulletin boards on the Internet are USENET and LISTSERV. USENET is a collection of thousands of topically organized newsgroups, covering everything from supercomputer design to bungee cord jumping, and ranging in distribution from the whole world to single institutions. LISTSERV also provides discussion forums on a variety of topics broken out by topic or area of special interest.
- World-Wide Web (WWW) is an exciting and innovative front-end to the Internet. The WWW provides Internet users with a uniform and convenient means of accessing the wide variety of resources (pictures, text, data, sound, video) available on the Internet. Popular software interfaces, such as Mosaic and Netscape, facilitate navigation and use of the WWW. The central organizing feature of the WWW is the "home page". Every organization and every individual user of the WWW can create a home page that contains whatever information they want to present. The hypertext capabilities of the WWW facilitate linking of information within your own home page and with all other homepage on the WWW.

Becoming familiar with the resources available on the Internet and the most effective ways to use them will be part of the instructional challenge. Distance educators can use the Internet and WWW to help students gain a basic understanding of incorporating the Internet and take full advantage of the networked world into a distance delivered course.

Some instructional possibilities of the Internet include:

- Using e-mail for informal one-to-one correspondence. Feedback from the instructor can be received more quickly than messages sent by mail. Students can read messages at their convenience and easily store them for later reference.
- Establishing a classroom bulletin board. Individual students can post their comments or questions to the class, and every other individual is free to respond. Setting up a class bulletin board can encourage student-to-student interaction. The conference can also be used to post all modifications to the class schedule or curriculum, and assignments or tests.
- Engaging students in dialogue with other students, faculty, and researchers by encouraging them to join a bulletin board(s) on topic(s) related to the class.
- Developing a classroom home page. The home page can cover information about the class, including the syllabus, exercises, literature references, and the instructor's biography. Other links could access library catalogs or each student's individual home page.

2.6.2.4 Interactive Videoconferencing (IV)

Interactive Videoconferencing (IV) is an effective tool that may be used in distance education settings. This system can be integrated into the distance education program with minimal adaptation to the curriculum and course, and is designed to support two-way video and audio communication between multiple locations.

Most Interactive Videoconferencing (IV) systems utilize compressed digital video for the transmission of motion images over data networks such as high capacity Integrated Services Digital Networks (ISDN). The video compression process decreases the amount of data transmitted over the lines by transmitting only the changes in the picture. By minimizing the bandwidth to transmit the images, video compression also reduces the transmission cost.

The cost effectiveness of IV systems increases with use. Interactive video conferencing systems can operate at different data rates, at various fractions of T-1 phone line capacity, enabling the transmission of multiple simultaneous video conferences over the same T-1 circuit. An IV system can also share a T-1 circuit with other digital data uses, such as Internet transmission or file transfers.

For point-to-point, Interactive Videoconferencing (IV) is commonly used to connect two locations using sophisticated computer technology. The core of IV is the codec (coder/decoder). It is the electronic device that transmits and receives the video signals that the class members will see on their television monitors (Galbreath, 1995). It may be easier to think of the codec as an extremely sophisticated modem. A modem takes digital data and transmits it over regular phone lines. The codec takes analog signals, compresses and digitizes them, and transmits the signals over digital phone lines (Woodruff and Mosdy, 1996). Other types of equipment, such as television monitors, are needed to make IV successful. Moreover, various types of instructional technology can be incorporated into IV, including video cassette recorders/players, microphones, cameras, and computers (Reed and Woodruff, 1995).

For point-to-multipoint, some systems are also capable of simultaneously connecting more than two sites through the use of a multi-point control unit, or MCU. Multi-point conferencing can be effective although the scheduling, technical, and logistical dimensions of MCU conferences can be imposing.

The advantages of Interactive Videoconferencing (IV) are:

- Effective Interactive video allows "real time" visual contact between students and the instructor or among students at different sites.
- Effective Interactive video supports the use of diverse media (Reed and Woodruff, 1995). Blackboards, handwritten documents, and videos may be incorporated at all sites.
- Effective Interactive video enables connection with experts in other geographical locations (Reed and Woodruff, 1995).
- Effective Interactive video can provide access to at-risk or special needs students (Woodruff and Mosby, 1996).
- Effective Interactive video provides additional access to students at remote sites.

The limitations of Interactive Video (IV) are:

- The initial cost of the equipment and leasing the lines to transmit conferences may be prohibitively expensive.
- Companies which produce codecs have each developed unique methods of compression which are incompatible, although protocols have been established to allow communication among brand names. However, this "universal standard" compromises resolution and quality to a certain degree.
- Students who did not locate with the instructor may remain uninvolved in the course, unless a strong effort is made by the instructor.
- If visuals, like handwritten or copied materials, are not properly prepared, students may have a difficult time in reading them.
- If the "pipe" that carries the transmission among sites is not large enough, the students may observe, "ghost images" when rapid movement occurs in "real time" (Red and Wooddruff,, 1995).
- If the system is not properly configured, class members may observe an audio "echo" effect (Reed and Wooduff, 1995). The result is audio interference that detracts from the learning environment.

The three types of Videoconferencing Systems, include:

- Small room videoconferencing. This system is designed primarily for small groups (1-12 participants) at all sites seated around a conference table (Woodruff and Mosby, 1996).
- Classroom videoconferencing. This type of system usually uses high quality AV components, codecs, and an interface that allows all participants to be seen on the monitors.
- Desktop video conferencing. This system utilizes a personal computer and video conferencing software. These systems are less expensive, but offer limited resolution. They are most effective for individual and small group use (Woodruff and Mosby,1996).

Designing Instruction for Interactive Video

- When designing instruction to be delivered over IV, the instructor should focus attention on all students. not just those at the "home" site. Lessons should incorporate a variety of activities for all students at the various sites. Use small group activities, student presentations, and an occasional break to add variety to the lesson. As a rule of thumb, instructors should change instruction methods every 10-15 minutes. In other words, switch from lecture to question-answer to small group activities on a regular basis.
- It is often helpful to bring guest lecturers into the classroom. It may also be helpful to have guest speakers at one or more of the distant sites. This will encourage involvement of the distant students, as well as allowing the students at the origination site to "see what it is like" to have the teacher at another location. When preparing class visuals, keep in mind that small fonts and light colors do not show up well over the monitors. A variety of formatting will also assist in maintaining student interest and attention. When formatting visuals, be sure that they will fit on the television monitor (Reed and Woodruff, 1995).

2.6.2.5 Instructional Television (ITV)

Instructional Television (ITV), is an effective distance education delivery system that can be integrated into the curriculum at three basic levels :

- **Single lesson** - Programs address one specific topic or concept, providing a lesson introduction, overview, or summary.
- **Selected unit** - A series of programs providing the content foundation for a learning unit in the course curriculum.
- **Full course** - Programs from one or more ITV series may be integrated into a full semester course, typically in conjunction with instructional print materials.

ITV may be either passive or interactive. Passive ITV typically involves pre-produced programs which are distributed by video cassette or by video-based technologies, such as broadcast, cable, or satellite. In contrast, interactive ITV provides opportunities for viewer interaction, either with a live instructor or a participating student site. For example, two-way television with two-way audio allows all students to view and interact with the teacher (Lochte. 1993). At the same time. cameras at remote sites allow the teacher to view all participating students. It is also possible to configure the system so that all student sites may view one another .

The advantages of Instructional Television (ITV) are:

- The medium is familiar because most people have watched television.
- Motion and visuals can be combined in a single format so that complex or abstract concepts can be illustrated through visual simulation.
- Instructional television is an effective way to take students to new environments.
- Time and space can be collapsed, so that events can be captured and relayed as they happen.
- It is very effective for introducing, summarizing, and reviewing concepts.
- It can be used effectively as a motivational tool.

The limitations of Instructional Television (ITV) are:

- Broadcast quality ITV is expensive to create.
- Video production is time consuming and can be technically demanding.
- Sites choosing to interactively participate in an ITV program may require specialized equipment, facilities, and staffing.
- Most prepackaged ITV courses use a mass media approach to instruction aimed at the average student. As a result, they can be ineffective in serving students with special needs.
- When used passively, without interaction, its instructional effectiveness can be limited.
- Unless professionally produced, completed ITV programs often look amateurish.
- Once completed, ITV programs can be difficult to revise and update.

2.6.2.5.1) Usage of Instructional Television (ITV)

The nature of the usage of instructional television has been closely linked with the scope and limitations of equipment. Six main functions have been emerged which have benefited education and training. They are:

1. Live display
2. Immediate playback
3. Delayed playback
4. Telecine
5. Off-air broadcasts and recording
6. Individualized learning

- Live display uses a property unique to the medium, which is the capability of transmitting sound and vision directly to as many locations as there are outlets. This has been used in training establishments, where it has proved useful in enabling an instructor of a specialized subject to demonstrate his skill to several classes simultaneously. As the result of this, the size of the class is not limited to the immediate environment, and the use of the zoom and close-up facility has been effective in drawing the attention of trainees or learners to particular details.
- Immediate playback provides an opportunity to record an action or movement and replay it within seconds. This has proved an effective facility for the analysis of both individual and interpersonal skills, in that material may be replayed for the benefit of subsequent instructor and trainee analysis.
- Delayed playback is the production of a complete entity either as a whole lesson or part of a lesson. The main advantage of such a tape is that if it is well planned, prepared and quality-controlled, it can be very effective in that locations, equipment or situations may be recorded and brought into the classroom. This has been used as a safety factor in areas where it is necessary to observe potentially dangerous processes, such as nuclear reaction, atomic bomb, heart surgery, and so on, and in some cases the medium has even been able to reduce course time by condensing material. Such productions can be cost-effective in saving travel time and cost. Experience has suggested that in using this function the medium is most

effective not as a complete substitute for an instructor, but as an aid to instruction, which may reduce the cost of personnel.

- Telecine is the process by which 8 mm or 16 mm film may be transferred to television. This has proved effective in education and training in that it enables an instructor to select, edit and use only those parts of a particular film, which have relevance to his or her lesson.
- Off-air broadcasts and recording is limited usage because of rarely relevant programs to the lesson proposed.
- Individualized learning is used as a supplement to conventional instruction, or in providing an opportunity for learning 'on the job', or establishments where an instructor may not be readily available. However, videocassettes provide a convenient and reliable learning format for trainees or learners to use.

2.6.2.5.2) Conducting ITV Lessons

Because teachers and students are physically separated by a distance, the teacher's challenge is to psychologically reduce the gap not only through the appropriate use of technology, but also through the use of effective teaching practices. Good teaching ensures that a rapport develops between students and teacher. Once basic teaching methods are considered, the following three step strategy is employed for conducting ITV lessons:

1. Set the Stage

- Remember that it takes longer to deliver instruction at a distance than in a traditional face-to-face setting. Plan lessons accordingly.
- Practice in front of a live camera prior to class. If possible, have a colleague, a few target students, or a media technician view your presentation and on-camera presence, offering suggestions for improvement.
- Organize all class material and visuals before the start of the class. It is best to have a trial run with technical staff so that all participants know the role they are expected to play.

- If using an overhead camera to electronically project visuals, understand its operation and limitations prior to the start of the class.
- Prepare viewers for new terminology to be used in the program, and answer any questions regarding the technical equipment being used, such as cameras, television monitors, audio equipment, etc..
- Inform students if there will be camera operators or technicians in the classroom. Although the students may be initially curious, this will fade as the class progresses. In-class technicians are trained to be as unobtrusive as possible.
- Students should have the necessary background materials to make the best use of televised lessons. Consider the use of study question to assist in focusing discussions.
- Consider team teaching to maintain viewer interest with a change of voice, image, and presentation style. If using guest speakers, give students necessary background information prior to the class. Do the same for the guest speakers. Let them know the specific purpose of their session, what is expected of them, and the general background of participating students.

2. During the ITV Session

- Vary facial expressions, tone of voice, body movements, and eye contact with the camera to enhance verbal communication .
- Engage students by using humor, asking questions, involving students, and praising student contributions.
- Maintain energy and dynamism to attract and hold the distance learners' attention. Remember, enthusiasm is contagious. So is boredom.
- Present content in five to ten minute blocks interspersed with discussion. Alternate between instruction and interaction.
- Keep lecture sessions simple and clear. To help focus viewing, indicate key points to look for.
- Do not read material.
- Maintain a moderate speaking pace.

- Do not digress—keep students on track .
- Include different kinds of student involvement—watching, reading, writing, and talking.
- Vary the center of focus for activities from the on-camera presenter to a receiver site group or individual.
- Incorporate timely breaks as a respite from the television monitor.
- Motivate peer learning and support by encouraging students to work together both in and out of class.
- Review the concepts discussed in the program and clarify any misunderstandings by asking focused questions.
- Integrate activities to reinforce the content presentation. These activities might include quizzes, worksheets, role-playing , and experiments.

Make sure opportunities are included to enhance student interaction by:

- Planning a block of time for interaction and then letting students know in advance that interaction is anticipated. Initiating an interaction within the first twenty minutes will get students motivated to participate in learning rather than lulling them into just watching.
- Designating students at distant sites to lead discussions or survey the room for questions.
- Clearly defining discussion topics or questions and then allowing time for students to prepare responses. Assigning discussion questions in advance of the television session will help students prepare for the interaction. Having the questions appear in writing on the screen so students see and hear the questions.
- Encouraging student-to-student interaction by asking an in-class student or a student from a distant site to respond to questions. The instructor does not always have to answer questions.
- Functioning as content facilitator not just content provider.

3. Following the Session

- Review the taped recordings of the presentation, either with technical staff, a colleague, or by yourself. Take notes for improving presentation, style, and delivery methods.
- Seek student feedback on the strengths and weaknesses of the instructional materials and the teaching strategies being used.
- Be open to new ideas and delivery techniques for improving instructional effectiveness.

2.6.2.6 Interactive Instructional Audio

Using the telephone with microphones and amplifiers is technically the simplest teleconference medium. Interactive instructional audio tools for the distance educator includes the telephone, audioconferencing, and short-wave radio. Audioconferecing can be audio-only conferencing typically utilizing the public telephone system to link together people at two or more locations. To enhance audioconferencing for larger groups, additional devices are used to reduce nose and interference. Technical components of a typical audio-only conference might include hand sets, speaker phones or microphones; an audio bridge that interconnects multiple phone lines and controls noise; and speaker phones or microphones, an audio bridge that interconnects multiple phone lines and controls noise; and a speaker device to facilitate multiple interactions.

Audiographic conferencing combines technologies for voice communication with image or data transmissions. While voice remains the principal communication medium, audiographic peripherals provide a visual component.

2.6.2.7 Teleconferencing

Teleconferencing is used as a generic term which encompasses any type of long distance discussion, in which two or more separated groups are joined through a telephone system (Parker, 1976). 'Telelecture' and 'telephone-based instruction' are specific forms of teleconferencing; the former is conferencing applied in an instructional setting, which does not use a dedicated telephone line, and the latter is conferencing applied in a fixed system, which uses a private, four-wire, dedicated telephone line. Additional terms such as conference calls, teleteaching and teletutoring, can be subsumed under telelecture or telephone-based instruction. depending on the system at the point of origin.

Thus, the delivery method that has led to the explosion of interest in distance learning is the teleconference, provided either by two-way video, one-way video accompanied by two-way audio, by audio, audio-graphics, or a computer network. The acceptability of distance education by teleconferencing is growing up because this family of media allows groups of distant learners to be taught in real-time by a classroom teacher. The assumptions about education of this "candid camera" approach are those of the traditional classroom, as the techniques used in teaching (Gehlauf *et al.*, 1991) but learning occurs at a remote distance.

2.6.2.8 Satellites in Distance Education

Satellites orbiting the earth are used to receive and retransmit signals for telephone, television, radio, and data communication. A communications satellite system comprises the satellites and the ground stations for transmitting and receiving the signals. Direct broadcasting satellites, which are geostationary, transmit radio and TV services that the consumers can receive through a cable redistribution network or a personal domestic disc antenna. The basic relay device in satellites, the transponder. has tremendous increases in efficiency and advances in compression technology (www-itsweb4.worldbank.org/.../back satellites.html).

Space technology, communications satellites are considered a useful development. Their arrival has caused a steep drop in the rates for international telephone calls and greatly increased the volume of live television exchanges. Some of the successful and useful applications of satellites in education have been identified. The institutions and participants involved tend to seek regular access to a satellite to continue the successful activity. Applications that are generally judged to be successful, are those which are cost-effective and have highlighted factors, which promote success in the use of big technology in education, and were listed by Hooper (1975).

In conclusion, technology plays a key role in the delivery of distance education. A systematic approach will result in a mix of media, with each serving a specific purpose:

- A strong print component can provide much of the basic instructional content in the form of a course text, as well as readings, the syllabus, and day-to-day schedule.
- Interactive audio or video conferencing can provide real time face-to-face (or voice-to-voice) interaction. This is an excellent and cost-effective way to incorporate guest speakers and content experts.
- Computer conferencing or electronic mail can be used to send messages, assignment feedback, and other targeted communication to one or more class members. It can also be used to increase interaction among students.
- Pre-recorded videotapes can be used to present class lectures and visually oriented content.
- Fax can be used to distribute assignments, announcements, receive student assignments, and to provide timely feedback.

Using this integrated approach, the educator's task is to carefully select among the technological options. The goal is to build a mix of instructional media, meeting the needs of the learner. Educators, however, must remain focused on instructional outcomes, not the technology of delivery. The key to effective distance education is focusing on the needs of the learners, the requirements of the content, and the constraints faced by the teacher, before selecting a delivery system.

2.7 TECHNOLOGY IN DISTANCE EDUCATION

Technology has been defined as the "creative application of science to industrial (or any practical) purpose" (Romiszowski, 1981: 11)

Technology is viewed as having both a process (software) and a product (hardware). Process means the creative application of knowledge to purposeful activities, software as a process concept is concerned with the theory of how something is experienced, while courseware is concerned with the content or what is to be experienced. Technology as a product or hardware is easier to distinguish because it is a physical product that facilitates what is being done through the application of knowledge. The subset of hardware is media, where media are the devices used to distribute information. Technology, in both a process and product sense, has been very much a part of education for a long time. Education has long been concerned with making the process of learning more effective and efficient. These concerns have fallen within the field of educational technology.

The technology of distance education has been described by Garrison (1985, 1989) as consisting of three generations reflecting advances in communications technologies. Distance education can be seen from the perspectives of three developmental stages: correspondence, teleconferencing, and computer-based learning.

The first generation of distance education relied upon correspondence and the mail system. The great advantages in this generation are a cost-effective and efficient method of providing access, and meeting the demand for educational services, while the downside of the correspondence technology is the dependence upon mail to communicate message since communication by text is delayed by its reflective nature.

The second technological generation, teleconferencing, provides immediate and sustained dialogue not only with the teacher, but also with the students themselves. In short, teleconferencing represented a "paradigm shift in the quest to provide sustained interaction and ultimately greater control for both teacher and student over the educational transaction at a distance" (Garrison, 1990:15).

The third technological generation with regard to the computer is computer-mediated communication (CMC). CMC combines the telecommunications of the second generation with computer capabilities to provide distinct methods of interacting educationally at a distance. The computer's capability for processing and controlling the flow of information may also be used for computer-assisted learning off-line. In short, CMC like teleconferencing represents a qualitative advance in facilitating interaction at a distance and therefore, represents an important communication technology in the emerging paradigm.

According to the history of education, we can say that at the end of the 1980s, the vast majority of distance education throughout the world was still primarily print-based. Print itself is, however, a technology, and one subject to considerable technological change.

By the year 2010, this will have changed in most developed countries, and in many of the newly emerging economic 'dragons' of South-East Asia. In particular, telecommunication-based technologies will have become the primary means of delivering distance teaching.

The main reasons for the increasing importance of technology in distance education can be summarized as follows:

- A much wider range of technology is becoming more accessible to potential distance education students;
- The costs of technological delivery are dropping dramatically;
- The technology is becoming easier to use, both by teachers and learners;
- Technology is becoming more powerful pedagogically;
- Distance education institutions will find it increasingly difficult to resist the political and social pressures of the technological imperative.

There is an infinite variety of ways in which technology can be used for teaching at a distance; several relatively distinct approaches have been adopted as follows:

- Extended classroom teaching
- Exploiting the medium
- Integrated curriculum development

2.7.1 Communications Technology

The infrastructure of communications technology, today, has made possible the control revolution in many aspects of our lives. Communications technology can play in education in managing the information explosion will eventually transform the structure of the educational transaction where the teacher is the primary source of information and control. As Heinich (1984: 69) suggests "the development of instructional technology has disturbed the symbiotic relationship between instructional materials and teachers". This reflects that technology alters the traditional educational relationships and communication is essential to any educational activity. Therefore communications technology is relevant not only to distance education, but to all educational activities.

Communication is oriented to the future. It involves exchange, implies participation and adaptation, and includes sharing. For this reason, teaching involves the very essence of the communication process, and the communication process involves teaching. So sharing and influence, teaching and learning, are about the communication involved.

The educational transaction is seen as a communication process, where two-way communication between teacher and student represents the most basic element of the educational transaction. Mediated communication using new and emerging technologies will play a significant role in both traditional and distance education. However, distance educators today need to design new educational systems, which capture the capabilities of all existing communications technology. Communication is the interface between teaching and learning, and technology represents the interface between structure (e.g. organization) and process. Thus, educational technology is the science of integrating structure and process. The importance of educational technology in distance education is not only to recognize the necessity of technological structure for mediated communication, but also to maintain an appropriate balance between it and the process or transaction of the educational phenomena. In other words, education is a socially recognized activity that is realized through interaction – not independence.

It is possible that people who apply for a job in industry will no longer be evaluated on the basis of their certifications obtained from educational institutions, instead they will be measured by their performance in specific job relevant areas, and they will be dismissed if they cannot perform adequately. Employers and industry are interested in abilities. New paradigms of student evaluation, which are based on the outside world of work and which can be globally supported, will emerge.

The same idea is expressed by Dolence and Norris (1995), who postulate the transformation of the concept of higher education from seat time-based education to achievement-based learning. "Classroom centered instruction should begin to embrace and make the transition to network learning. Indeed, the network becomes the fundamental organizational metaphor for Information Age educational enterprises. Our current emphasis on information acquisition should be replaced by a more sophisticated emphasis on knowledge navigation" (p.57) and team based problem solving.

"Access to data does not automatically expand students' knowledge; the availability of information does not intrinsically create an internal framework of ideas that learning can use to interpret reality. While presentational approaches transmit material rapidly from source to student, often this content evaporates quickly from learners's minds. To be motivated to master concepts and skills, students need to see the connection of what they are learning to the rest of their lives and to the mental models they already use" (Dede, 1996, pp. 12-13).

2.7.2 Information Technology in Distance Education

Information technology (IT) means "the collection, storage, processing, dissemination and use of information" (Chartrand and Morentz, 1979: 121). According to Chartrand and Morentz, information technology (IT) is for people and is in the control of people. It is meant to be an egalitarian concept that will in practice provide the appropriate information for all individuals to gain control of their lives.

Information management is the application of Information Technology (IT) to achieve that flow of information which will best enable an organization to achieve its goals. The relationship between IT and the management of an organization can be represented [3], as shown below:

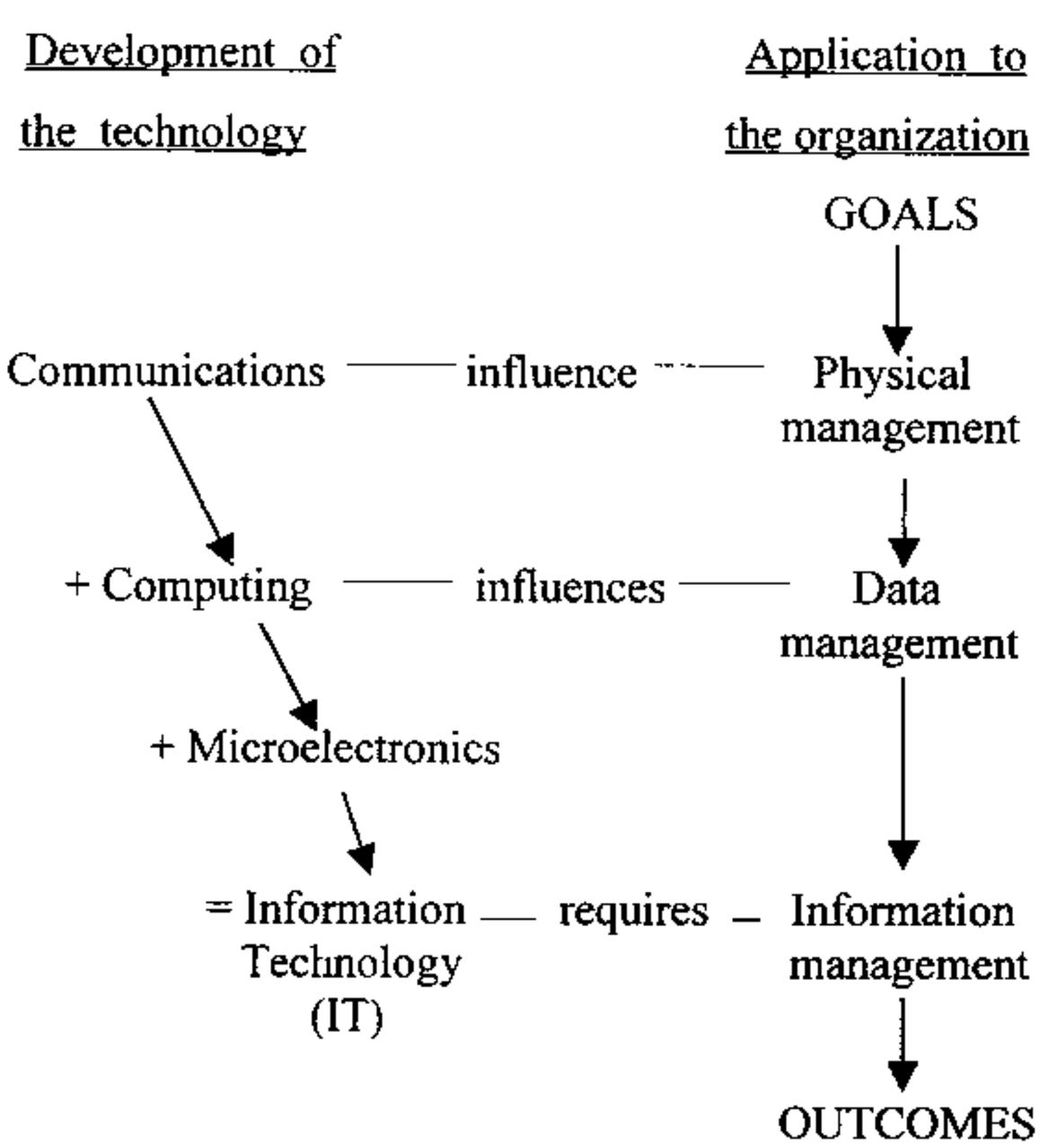

Figure 2.3: Development of technology (IT) and Application to organization

Source: Thomas Kempner, *The Penguin Management Handbook*, 1987

Information technology (IT), the use of computers and networks to electronically collect, manipulate, and disseminate data in organized ways, is a common thread of management or educational programs. IT capabilities have progressed significantly over the years. Most early uses of IT were to automate manual support processes, such as payroll, bookkeeping, and project tracking. These activities were characterized by well-defined procedures and reporting needs.

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[3] Thomas Kempner, *The Penguin Management Handbook*, Clays Ltd., England, 1987, p.243.

The information technology (IT) environment is rapidly changing, in both evolutionary and revolutionary ways. Technology is increasing in component and environment interrelationship and complexity. With the advent and expansion of Internet technologies, supply chains and business to business commerce, security technologies, such as public key infrastructures and digital certificates, and ongoing changes in software functionality, many enterprises find themselves awash in issues surrounding their technology choices and directions.

Information technology (IT) is becoming a very important component in the design and implementation of educational transaction because education must be based on timely, valid, accessible and comprehensible data and information, if education is to be relevant and worthwhile.

The higher education community is planning for a world in which information technology (IT) will be so pervasive that the institution of higher education will change. IT probably can be used to improve higher education but IT is exceedingly flexible and there are numerous choices for applying it. Some of those choices are straightforward matters of efficiency, best left to technical experts. Other choices will require us to reflect carefully on the values that a university ought to express. If educators have learned anything from attempts to improve life using IT, it is that significant improvements are possible only when institutions are rethought.

As the higher education community decides to use IT then it faces important choices. Before advanced communications technologies became widespread, educational decentralization and diversity were promoted by the limitations of the physical world. Universities were distant from each other geographically, and it was relatively difficult to transfer people and practices between them, consequently different universities evolved along somewhat independent paths. A new generation of students, never having encountered higher education before, may not even recognize the dangers of a centrally planned educational economy or an intellectually homogeneous society. Although many cyberspace visionaries have asserted that IT inevitably brings decentralization and choice to the world, this analysis of institutional isomorphism suggests that the opposite might be closer to the truth.

Information Technology (IT) can be used to enhance courses, curriculum, and student learning. Robert Kozma and Jerome Johnston, presented compelling evidence, drawn from a number of disciplines and a variety of campuses, about the role of information technology as a catalyst for the qualitative enhancement of the learning experience. Robert Kozma and Jerome Johnston summarized seven ways that information technology could be used in the transformation of teaching, learning, and the curriculum:

1. From reception to engagement: The traditional model of learning in higher education has the student passively absorbing knowledge disseminated by professors and textbooks. With technology, students are moving away from passive reception of information to the active engagement in the construction of knowledge.

2. From the classroom to the real world: Technology is breaking down the walls between the classroom and the real world.

3. From text to multiple representations: Text or speech represents a reserved place in the academy. Technology is expanding the ability to express, understand, and use ideas in other symbolic systems.

4. From coverage to mastery: Expanding on the classical instructional use, computers can teach and drill students on a variety of rules and concepts essential to performance in an interdisciplinary area.

5. From isolation to interconnection: Technology encourages one move from a view of learning as an individual act done in isolation toward learning as a collaborative activity.

6. From products to process: Technology moved past a concern with the products of academic work to the processes that create knowledge. Students learn how to use tools that facilitate the process of learning.

7. From mechanics to understanding in the laboratory: The scientific laboratory is one of the most expensive instructional areas of the academy. It is costly to maintain and to provide supervision to students. Technology provides the reliability on experiments.

The application of information and communication technologies to the provision of education is having a two-pronged effect on the market of education by institutions. First, there is now an emphasis on strategies that respond to niche learning needs rather than on a broad array of programs to a common market group. In other words, the market is being fragmented. Second, there is an unprecedented degree of competition, nationally and internationally, which is creating problems for those institutions that have historically used revenue from high-demand programs to subsidize the low-demand program. However, the consensus seems to be that these measures will, at best, be effective only in the short term since the technologies being used do not honor political boundaries.

Confronted with definitions of distance education based upon a reflection of technologies that existed at the time of their creation involving two premises:

- Distance education is individualized teaching with limited teacher-student interaction; the students are separated from the teacher in time and space and therefore they learn autonomously. This option includes authors who analyzed correspondence study, one-way multi-media courses and two-way student support. (Rumble, 1989a; Keegan, 1988; Holmberg, 1989)
- Technological innovations, especially digitalized technologies (interactive television, teleconference, etc.) have reduced the gap between face-to-face teaching and distance education by providing a wide range of communication possibilities to the institution to establish interaction with the distant learner. These technologies include two-way multi-media teaching (interactive television and audiography), and multi-media student support systems (computer-assisted conferences, audio conferences) (Shale, 1988; Garrison, 1989; Berker, 1989).

Therefore, mixtures of technologies will always produce better results than any single technology. Different devices may be used for courseware delivery and for interpersonal interaction, but the backbone technologies, along which the signals travel, are often the same. Hence, getting the optimum mixture requires great skill and knowledge with the emphasis on the quality of course design and the quality of instruction rather than on the technology itself.

2.7.3 Educational Technology in Distance Education

Educational technology is a combination of many disciplines. It began with the visual aids in teaching in the 1920s, became audiovisual instruction in the 1940s, and then drew from the communication and learning theories and the trends of learning psychology in the 1950s. In the 1960s, the ideas about design and management from communication systems formed educational functions. In the 1980s it incorporated principles of cognitive psychology, problem solving and thinking while paying more attention to individualized instruction, computer-assisted instruction (CAI) and optical storage media.

The points of view of various theoreticians and practitioners[4] such as AECT 1977; Lachance 1978; Becher 1981; Romiszowski 1981; Mitchell 1981; Scholer 1983; Stolovitch and La Rocque 1983; Boyd 1988, 1991; Hawkridge 1991; Koetting and Januszewski 1991; Winn 1991, agree on certain common characteristics of educational technology (Louise Sauve, 1993: 93)

- Human learning is an objective: educational technology is fundamentally preoccupied with learning-related problems and uses a systematic and a systemic approach to solve them.
- Systematic approach (pedagogical design): a systematic approach is a logical and gradual sequence of operations or activities. It is exemplified in the organizational and operational methods of educational technology.
- Systems method: the relationship between the systems approach, as a science and a source of general systems theory, and educational technology has been well established (Bertrand, 1990). It supplies a global conceptual framework for educational technology, which is both systematic in its procedures and systemic in its approach to problem solving.
- Use of media: educational technology's basic focus is on educational resources and the use of media in education.

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[4] Louise Sauve, 1993. "What's behind the development of a course on the concept of distance education?", in *Theoretical principles of distance education* by Desmond Keegan, 268 pages.

The increasing rapidity of technological change is now bringing such frequent changes in methods of work that the training, which a person receives in his youth, often no longer equips him for the span of his working life, and the need for retraining may recur at intervals throughout that time.

James Morrison (1996) states that telecommunications, software, and the Internet eliminate walls and boundaries of education, when an increasing number of students want and need non-traditional, flexible schedules, by offering distance education and training programs.

Educational technology has been particularly preoccupied with learning in individualized situations. Programmed learning was the first manifestation of this preoccupation. Educational technology is considered that its underlying principles and methods are necessary for the success of distance education. Thus, the technological evolution and the contribution of different trends have colored the definition of educational technology.

Wagner views that

> Educational technology and distance education are components of an even larger system where each function is a point along a continuum of contemporary educational practices. Distance education provides educational technologists with an exceedingly rich research and application environment, while educational technology provides distance educators with methods and means of improving performance. (Wagner 1990: 65-6)

Several authors have pointed out the direct relationship between distance education and educational technology as the following:

Perraton (1981: 14) proposed to examine distance education theory by using fourteen propositions that deal with the use of multi-media in teaching, and the necessity of using the systems approach to manage the complexity of this type of teaching.

Holmberg (1982) identified two major contributions made by educational technology to distance education: the use of learning objectives as a technique to structure course content to meet the needs of students, and the use of the systems approach to develop complex teaching systems.

Forsythe (1983) argued that educational technology and distance education are directly linked by the following characteristics: the use of a pedagogical design procedure and media; the emphasis being placed on student responsibility for his/her learning; and the possibility of a situation that provides for noncontiguous communication between student and teacher.

The developments in educational technology have seen a "gradual shift from an all-encompassing reliance on mass media . . . as alternative systems for the delivery of instructions to a concern for the individual, personal media . . . for instruction in the home, at work, and in the classroom" (Ingle, 1984: 14).

Hlynka and Nelson, (1985: 7) stated that:

> The concept 'educational technology' is at once rich, multifaceted and ambiguous. It is rich in that it encompasses many aspects of teaching and learning; it is multifaceted in that there is more than one possible stipulative meaning of the concept; and it is ambiguous in its lack of a precise definition.

Keegan (1986) defined characteristics of distance education with relation to educational technology on: the use of media to transmit information; the importance of two-way communication between teacher and student, who are separated throughout the process; and the predominance of individualized learning, and an industrialized form of course development and distribution.

However, there is no single definition of educational technology acceptable to everyone One of the more widely used definitions states that educational technology is a "complex, integrated process involving people, procedures, ideas, devices and organization, for analyzing problems and devising, implementing, evaluating and managing solutions to those problems, involved in all aspects of human learning" (AECT, 1977: 1). Educational technology is a broad concept-encompassing teacher and learner, as well as the process and product of learning. Instructional technology is considered a subset of this term because instruction is a subset of education (AECT, 1977).

2.7.3.1 Educational Technology vs. Distance Education

The crucial function of distance education is providing access to educational programming for the vast majority of learners, who are prevented from attending traditional educational institutions, by geographical or other barriers. Appreciating the role of technology in distance education is first an issue of access and then support. Communications technology is the means to address both access and quality issues in distance education by overcoming the separation of teacher and student.

Peruniak (1983) suggested that distance education uses technology to deliver instruction to geographically dispersed groups, while educational technology uses instructional design and development methodologies in distance education as a context within which to operate.

The industrialization process of distance education -- the relationships between distance education and educational technology -- has been examined and studied by Peters. In 1989, Peters pointed out that educational technology not only plays an important role in the industrialization process in education, but he also highlighted the dangers of this technological model of distance education. However, Evans and Nation (1989) also claimed that educational technology in distance industrialized education represents "instructional industrialism".

In addition, Butts (1986) proposed six types of problems that could be easily solved by contributions from educational technology. These problems are:

1. The cohesion and quality of produced course material;
2. The costs and constraints of using media other than print;
3. Controlling broadcasting via large television and radio networks, which are constricting to the learner;
4. Restrictions involving pedagogical design;
5. Difficulties in applying the appropriate management and control to an industrialized production and delivery system;
6. Difficulties in predicting distance student behavior.

Educational technology and distance education share the common grounds (Louise Sauve, 1993) as follows:

- The systematic procedure used to structure, to choose media and to deliver distance education, which can be viewed as the industrialization of distance education;
- The choice of media, which is one of the essential features of distance education: the use of media to re-establish the link between the student and the source of knowledge;
- The systems approach is the preferred approach for this form of complex teaching;
- The objective to encourage human learning, which is the common goal of educational technology and of distance education.

Keegan (1992: 17) highlights five distinctions between distance education and educational technology as follows:

1. Distance education is a form of education, while educational technology is not.
2. In distance education, the technology is a *substitute* for the teacher. In educational technology, the technology is a *supplement* to the teacher.
3. Educational technology studies the efficient use of technology for all types of teaching (at a distance and face-to-face). Distance education does not have that role. Distance education specialists study the use of technology in teaching the million students who chose to study outside of the conventional institutions. These distance education specialists analyze the findings of educational technologists and adapt them to the particular situations of their clients.
4. Distance education studies the problems of students who learn at home or at the office, to a large extent. Educational technology does abandon face-to-face group-based communication. It does in fact presume the face-to-face interaction as the basis for information and interpretation of the technology.
5. Educational technology is different from distance education in terms of cost structures. Educational technology often makes teaching more costly than using a teacher without technology (Teacher + Technology > Teacher). In distance education, the technology may make teaching either more costly or less costly depending on the choice of the cost-inducing variables and the volume of students in the program.

2.7.3.2 Educational Technology Components

From the analysis of the concepts of distance education and the utilization of technology for distance education, we can conclude that distance education requires help from the technology to establish the most effective education both economically and pedagogically. As a result, technological innovations have transformed the field from correspondence study to distance education with the emphasis on shifting support to the educational transaction through the use of a range of instructional and delivery methods.

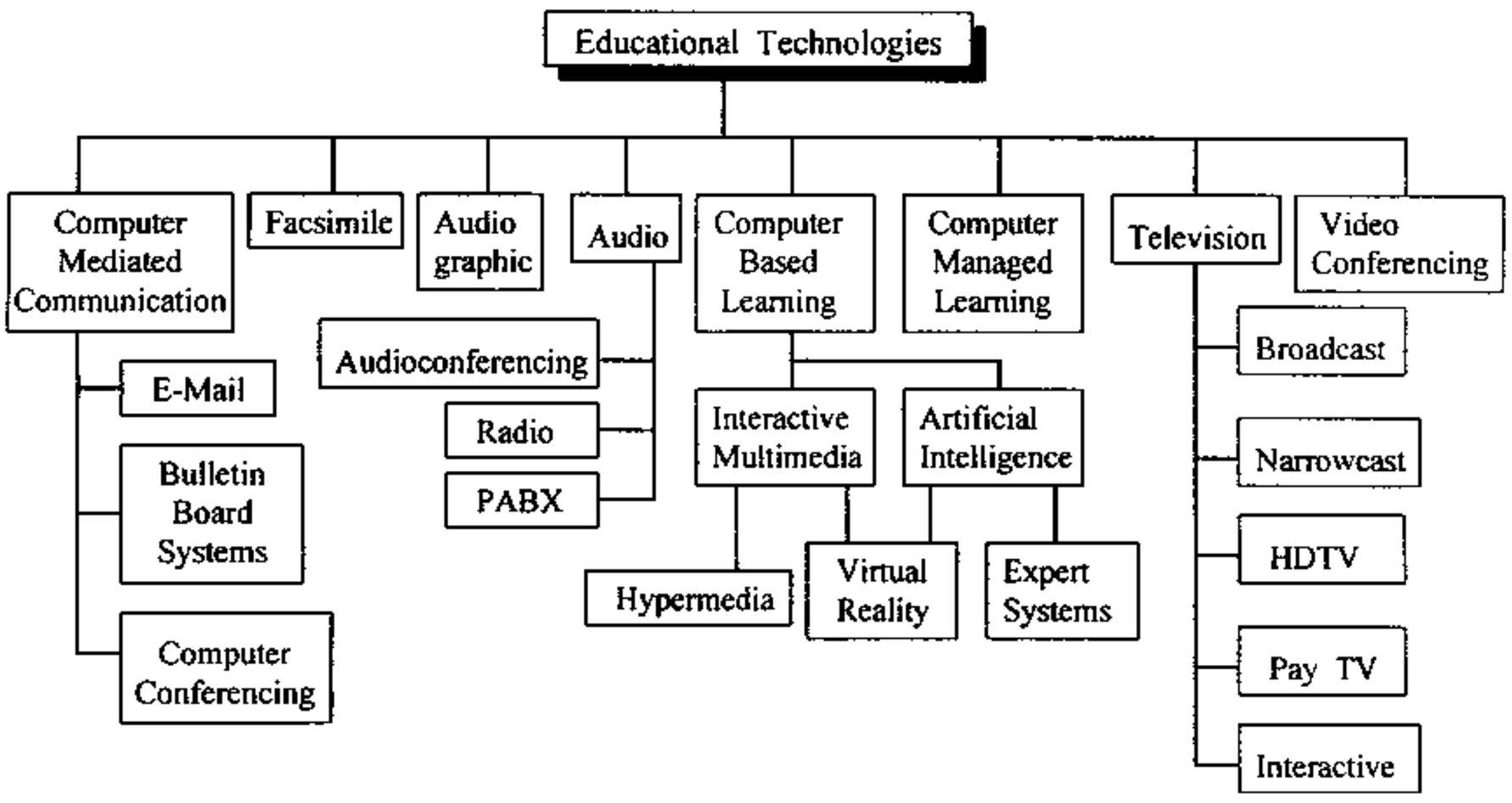

Figure 2.4: The overall components of educational technologies

Source: IT Plan Handbook of RU (1998)

As a conclusion, distance education can be defined as planned learning that takes place at a different location from teaching. It can be synchronous (real time) or asynchronous (delayed by some time) interaction. Computers and other technologies, as well as broad access to the Internet, offer new opportunities for the delivery of content.

2.8 VIRTUAL EDUCATION STRATEGIES

In recent years, the term "distance education" has frequently been exchanged with "virtual education". This term is generally used when former distance education institutions are completing only one of the following items: vision of possibilities, the involvement of technology, and the methodology of education

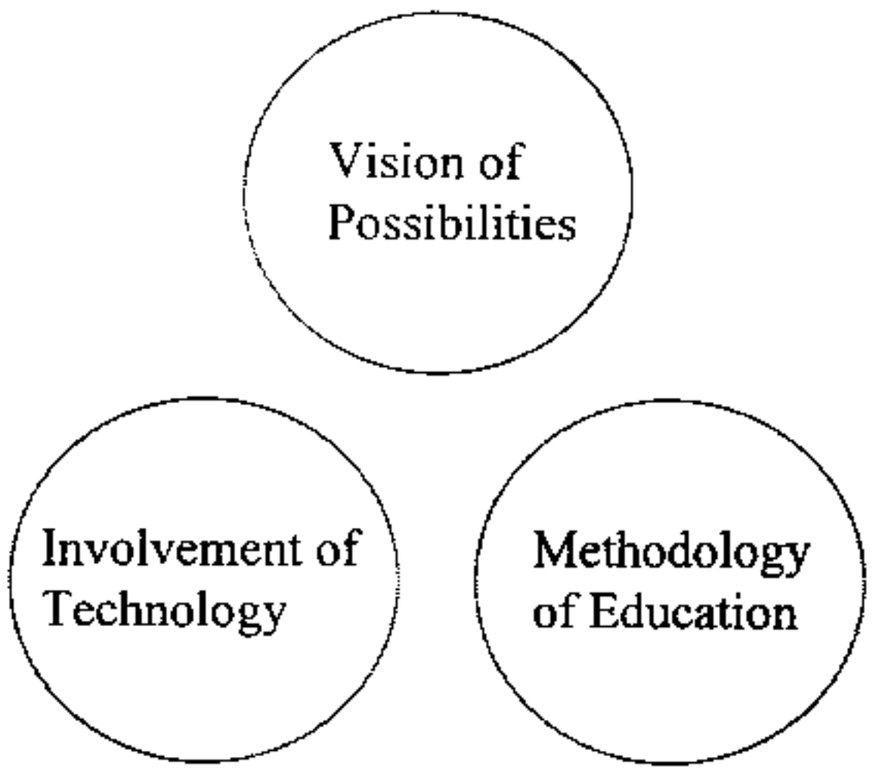

Figure 2.5: Three elements of virtual education

Source: http://www.homepages.mty.itesm.mx/~hstein/Approx.htm

a) Vision of Possibilities

The more recent developments in technology have the potential to revolutionize the education and training system (Bates, 1995). Information infrastructures are the lever for this evolution. The demand of information-technology-based teaching and learning will grow substantially, probably exponentially, over the next decade (Massy & Zemsky, 1995). When taking a course over the Internet or any other distance delivery technology, a course can be offered to students all over the world, it is possible to reach wider, more diverse audiences (Dede, 1996).

The main expressions used are "at any time" and "at any place". A virtual university permits students to be in a different places from the learning media and the instruction team. They can access learning materials at any time from their home computer, and participate whenever required. The flexibility opens the way to longer learning careers and extended education. Common phrases used are "Just in Time Learning" or "Competence Learning". The necessity of an increasing number of people who need to learning at their workplace can be satisfied.

The potentiality to connect students all over the world and to form collaborative learning groups, to get people of different nationalities working together, could be interpreted as a globalization of teaching and learning. The potential of communication technology makes the big difference to the common possibility of students' participation in democratic knowledge construction. Students are connecting new knowledge automatically to their own experiences and interests. Search, find and read necessary books and interact freely with students from other countries about the course subject is what is happening. (Layton, 1997).

Virtual universities for the education of employees in working or management skills will no longer compete for the best degrees and grades. The vision will change to the best learning outcomes in practical applications. Another dimension has been created by technological means. It is easy for us to upload or download information in or from this space, even voices, moving images and sound. Virtual spaces permits communication (text, moving images and sound) all over the world, it offers a medium for peaceful interaction, which is likely to get countries nearer to generating tolerance and understanding. Therefore, the virtual university is a "vision of possibilities" of a new educational system.

b) Involvement of Educational Technology

The second approach focuses on technology. Electronic mail, homepages and news, or discussion groups are frequently mentioned. There is a more extended range of technologies which are already in educational use: satellite classes, video conferences, One-Touch, C-U-See-Me, Netscape Chat and other computer programs, some of them designed for simulation of processes.

Technology enables asynchronous (non face-to-face) learning environments. A virtual university with this approach refers to the use of educational technology. The more technology is involved, the more faculty members become convinced that they are doing virtual education. However, it is not the condition for the virtual university that all parts of the educational process have to be asynchronous and that the student be away from a classroom presence.

Today technology is driving instructional design, and decision-making is often based on the wish to incorporate the newest technology. According to this view, once technology is in place, the teachers must decide what to teach, prepare the lessons, and interact with students via the camera, computer, telephone, or some combinations of these (Kearsley & Moore, 1996). The educational technology focuses on this approach, converting the pure application of some technologies into an innovation of the learning process.

c) Methodology of Education

At last virtual education can be defined by the methodology used in the educational process. There are many ways to think about educational methods. One could focus on a theoretical reflection of imaginable consequences of teaching methods and on what the teaching practice in the virtual university should be. On the other hand, one could attempt to analyze the teaching practice critically demanding congruence between what intended and what is actually done.

Focusing on the effectiveness of the communications media in distance education, there is some evidence (Kearsley & Moore 1996: 61-65) that shows no significant difference in student achievements between face-to-face and distance education. The purpose of this reflection is to define ambitious objectives which can be accomplished only by sophisticated procedures. The intention of the methodology mentioned here is to improve quality in teaching and learning, not to achieve the same results as face-to- face instruction.

The center of the learning process in virtual space is the student, acting as an autonomous, self-directed human being who, collaborating with others, constructs his own knowledge. It requires the student take a very active role. Various learning activities, such as projects, case studies, investigations, experiments, etc. substitute for the passivity of listening to a teacher' s lecture. The role of the instruction team is to create a learning environment which is interactive and participatory, with activities that are cooperative, collaborative, relevant, adapted to various learning styles and requiring higher order thinking skills.

To achieve student autonomy, teachers only interfere when necessary. Teachers need to control the learning processes and interact when they become convinced that students will not find adequate solutions to certain problems on their own. The role of the teacher is to facilitate and moderate a learning processes, providing students with significant information about the course, learning activities and evaluation.

This process demands many work and study skills and high motivation on the students' part, which they may not have necessarily when they begin to study. Therefore, the faculty has to provide extrinsic motivation, not by grades, but more by generating interest and convincing students about the significance of course subjects in real life issues.

In conclusion, we can see a great deal of variation in the stage of development of virtual models of education. The concept of virtual university should consist of the three dimensions to represent an innovative educational system. It should have a vision of possibilities, educational technology enabling distance learning and a congruent pedagogy. The vision alone will not change anything in reality, the technology is useless if not employed in an educational way, and a progressive methodology remains impotent without integration into a greater concept. Even if two parts join, it is not sufficient: Without vision the aims become trivial, without technology the system remains powerless and without an adequate methodology it remains inefficient.

A Virtual University is emerged and defined, as a result of the integration, in the following:

1. An institution which is involved as a direct provider of learning opportunities to students and is using information and communication technologies to deliver its programs and courses and provide tuition support. Such institutions are also likely to be using information and communication technologies for such other core activities as:

- Administration (e.g. marketing, registration, student records, fee payments, etc.)
- Materials development, production, and distribution
- Delivery and tuition
- Career counseling / advising, prior learning assessment, and examinations

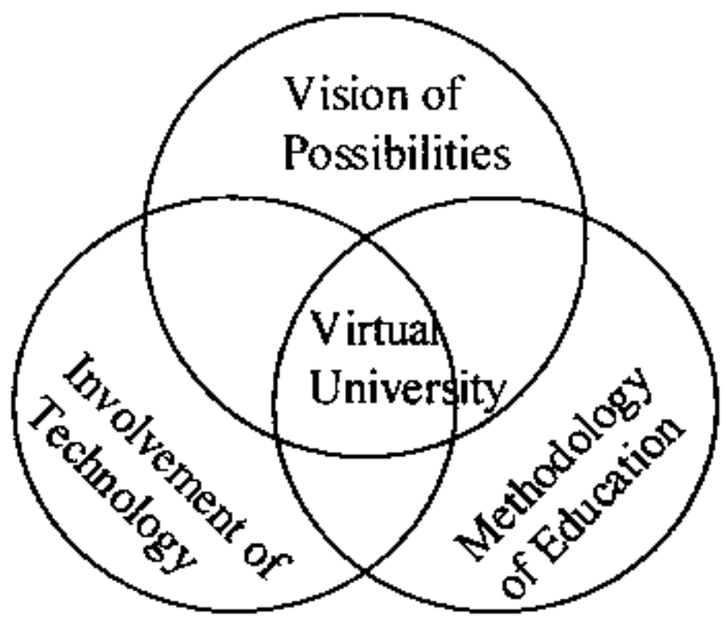

Figure 2.6: The integration of three dimensions: vision of possibilities, technology and methodology of education

Source: http://www.homepages.mty.itesm.mx/~hstein/Approx.htm

2. An organization that has been created through alliances / partnerships to facilitate teaching and learning that will occur without itself being involved as a direct provider of instruction. Examples of such organizations would be the Open Learning Agency of Australia, the emerging Western Governors University in the United States, and the National Technological University.

3. The virtual institutions may include both the public and private sectors and may focus on elementary, secondary, or tertiary levels as well as non-formal learning and continuing professional education, such as teacher upgrading.
4. The context of information and communication technology applications should be considered on issues such as:

- Technology infrastructure limitations that have been experienced
- Financial impacts
- Human resource requirements
- Learner acceptance
- Teacher acceptance
- Reaction of conventional institutions
- General demographic characteristics of learners being served.

2.8.1 Virtual Education in 3-Dimension

There are two categories of distance education delivery systems: synchronous (real time) and asynchronous (delayed time) interaction.

- Synchronous instruction requires the simultaneous participation of all students and instructors. The advantage of synchronous instruction is that interaction is done in "real time". Forms of synchronous delivery include interactive TV, audio graphics, computer-conferencing, IRC, and MOO.
- Asynchronous instruction does not require the simultaneous participation of all students and instructors. Students do not need to be together in the same location at the same time. Students may choose their own instructional time frame and gather learning materials according to their schedules. Asynchronous instruction is more flexible than synchronous instruction. Forms of asynchronous delivery include e-mail, audiocassette courses, videotaped courses, correspondence courses, and world-wide-web (WWW) based courses.

The advantages of asynchronous delivery include student choice of location and time, and interaction opportunities for all students (in case of e-mail). The disadvantage with e-mail based interaction is the written exchange, which could really pile up.

Colleges and universities are changing beyond recognition in their mode of delivery of teaching and research programs. As the information technology (IT) revolution leads to the emergence of new competitors and new institutions, offering similar competing programs across cyberspace[5], the so-called "virtual university" (Langenberg, 1996). The categories of educational delivery systems can be classified by time and place as follows:

Space Dependency		
Off Campus	Broadcast Video-conferencing Service teaching / Instruction	**Virtual University** E-mail Interconnectivity Virtual education
On Campus	Traditional activities Face-to-face Assessments Laboratory work	Multimedia Video-conferencing CD-ROM research facilitators
	Synchronous	Asynchronous
	Time Dependency	

Figure 2.7: The relation between educational delivery systems and sites

Source: Programmatic Review, School of Engineering, RTC Galway, November 1995

This ease of entry is facilitated by their freedom from time and space constraints. It is significant that a large portion of the market share is being lost to technologically driven "non-traditional" service providers.

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[5] Larry Elwood, "Strategic Planning in Ireland's Third-level Sector : Learning from Industry", *Administration Journal*, vol. 46, no. 4 (Winter 1998-1999), Ireland. pp. 59-75.

To provide an integrative model to enhance the learning environment through the capacity of communications technology, integration with information technology and educational technology; and providing a framework for redesigning instructional processes will achieve highly efficient and effective learning environments that supersede the geographic distance barrier. Under the constrainits of three parameters: time, place, and group size for distance education, we can construct a model of three dimensions to serve remote education as shown in figure 2.8

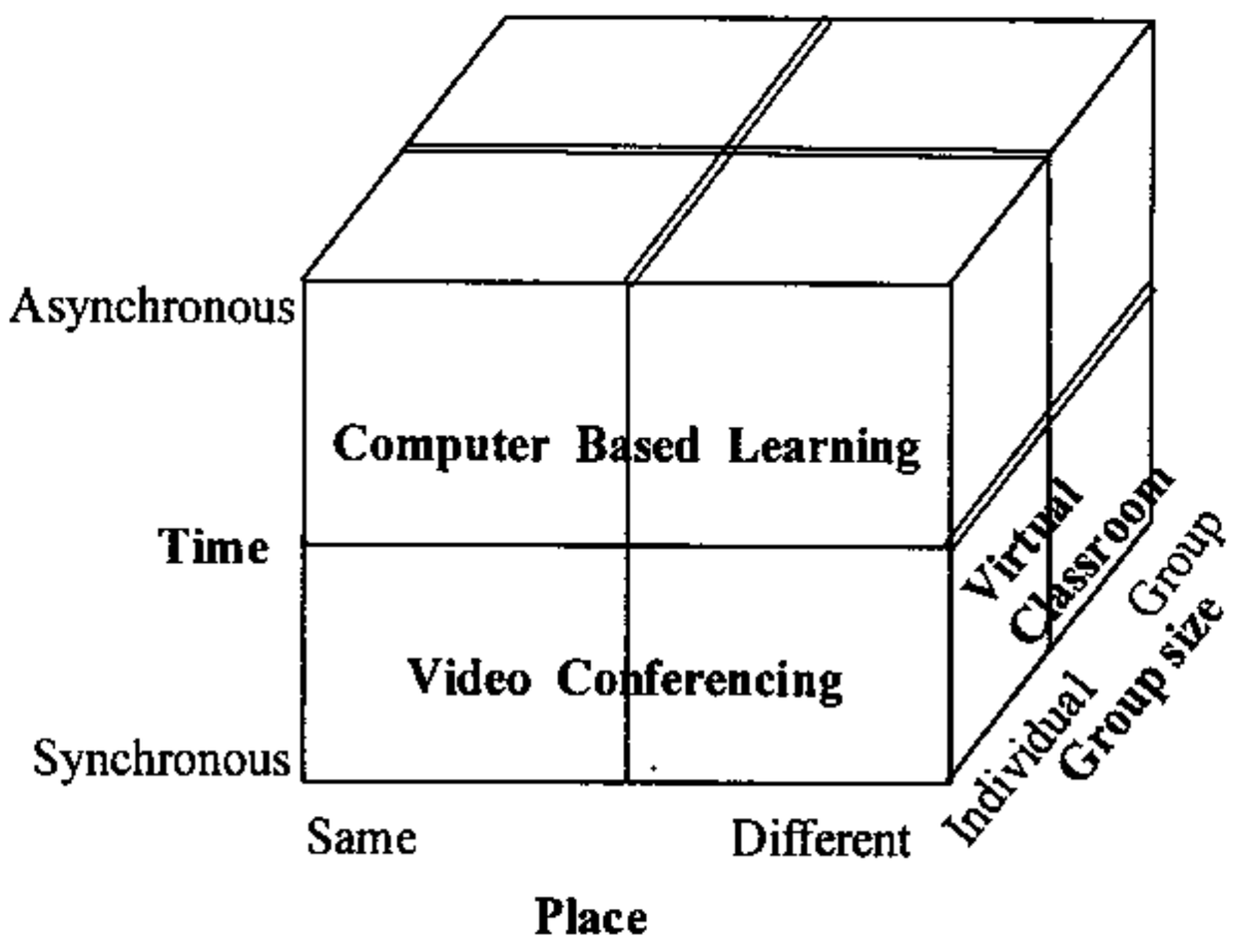

Figure 2.8: The Model of Distance Education

Source: Marc D. Miller & Thomas C. Padgett (1998) Online Journal of Distance Learning Administration, Vol. I, No. 1, Spring 1998, provided at http://www.westga.edu/~distance/miller11.html

From these three parameters: time, place, and group size. We can see that virtual university accommodates the virtual classroom with a synchronous delivery system both of individual and group size, while computer-based learning can be achieved by the asynchronous mode at various places and size. In other words, we can say that virtual education is the education of "at any time" and "at any place" that will be our education in the future for next generations.

2.8.2 The Global Education Perspectives

Nowadays, distance education programs exist in the majority of countries in the world, this growth is primarily due to increases in the expanding capabilities and services of telecommunications (Giltrow, 1989). Distance education is a subset of the universe of education, in which distance education students choose to remain in employment, at home, and with their families, where distance educators must change the practice of conventional education to serve remote education.

Global education includes the following three educational categories[6]:

- ❖ Transnational education
- ❖ On-line education and the "Virtual University"
- ❖ Collaborative education

Transnational education (TNE) denotes any teaching or learning activity in which the students are in a different country (the host country) to that in which the institution providing the education is based (the home country). This situation requires that national boundaries be crossed with information about the education, and by staff and/or educational material (whether the information and the materials travel by mail, computer network, radio or television broadcasts or other means). The forms of education are branch campuses, franchises, articulation, or distance education.

On-line education and the "Virtual University" denote the absence of a campus with a group of academics located together where the students are in distant and different locations apart from the staff or faculty (Butterfield, 1999). The students and staff are supported primarily on-line through some form of computer-mediated communication education. The concept of a virtual university will dominate knowledge provision on a global scale with a highly effective provider of good teaching in the sense of being a distributive channel of relevant knowledge. A virtual university provides a capacity of a campus-based university to deliver learning on-line and through multimedia, which will surely have more important role than the traditional university as ever before.

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[6] Dr. David Woodhouse, (2000) "International Quality Assurance", in *Quality Assurance in Higher Education : Standards, Mechanisms and Mutual Recognition Paper,* International Conference of Ministry of University Affair, Bangkok, Thailand, Nov. 8-10, 2000. pp. 3-7.

Collaborative education denotes the cooperation of universities all over the world to extend on-line courses via an Internet site with the numbers, and decentralized approach as successful indicators.

Collaboration in distance learning in the USA is the virtual institution that offers courses created by about 40 colleges and universities. Australia proposed Universitas 21 with a group of 18 universities from 10 countries; Peter Goodhew reports on what he calls "Europe's first totally Internet-based global masters degree in IT", which was developed by an English University with an Israeli partner. The government of Egypt has signed an agreement with VirtualAcademics.com so that the company's Barrington University can use satellites to transmit courses in English and computing to Arabic nations.

Therefore, we can say that distance education can be interpreted as "access to learning". The interpretation of "access to learning"[7] means that it makes education more attainable by more people, providing educational opportunities in the workplace, community, or the home, for those unable to attend school or college because of cultural, economic, or social barriers. Dedicated distant learning institutions and traditional colleges and universities have provided opportunities to students unable to attend campus for some time. Until recently, they relied mainly on correspondence, traditional print instructional materials, and perhaps, audio and video cassettes, or television. The Web based technology is starting to change now as educators devise new ways to capitalize on education. An inviting, graphical screen layout, interactive multimedia learning materials, simplified access and searching of databases, exponential growth of new resources around the world, and open technical standards that allow any brand of modern computer to access the Web are some of the advantages where the institutions see the Web as making learning more accessible. The Web is being used today to provide increased access to education.

Knowledge is organized and meaningful information; its acquisition is the focus of educational activities. To help individuals acquire knowledge for awareness, educators must move beyond the promise of communications and information technology and begin to harness the power of technology to induce knowledge.

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[7] Ronald D. Owston, 1997. "The WWW: A Technology to Enhance Teaching and Learning?" In *Educational Researcher*, Vol. 26, No. 2, March 1997, York University, U.S.A., pp. 27-33.

From the figure 2.8, we can elaborate the relationship of three-dimensional conceptual framework on the educational system among time, place, and group size with the various modes of instructional delivery and technological utilization. Thus the figure is illustrated as the holistic integration in figure 2.9 as follows:

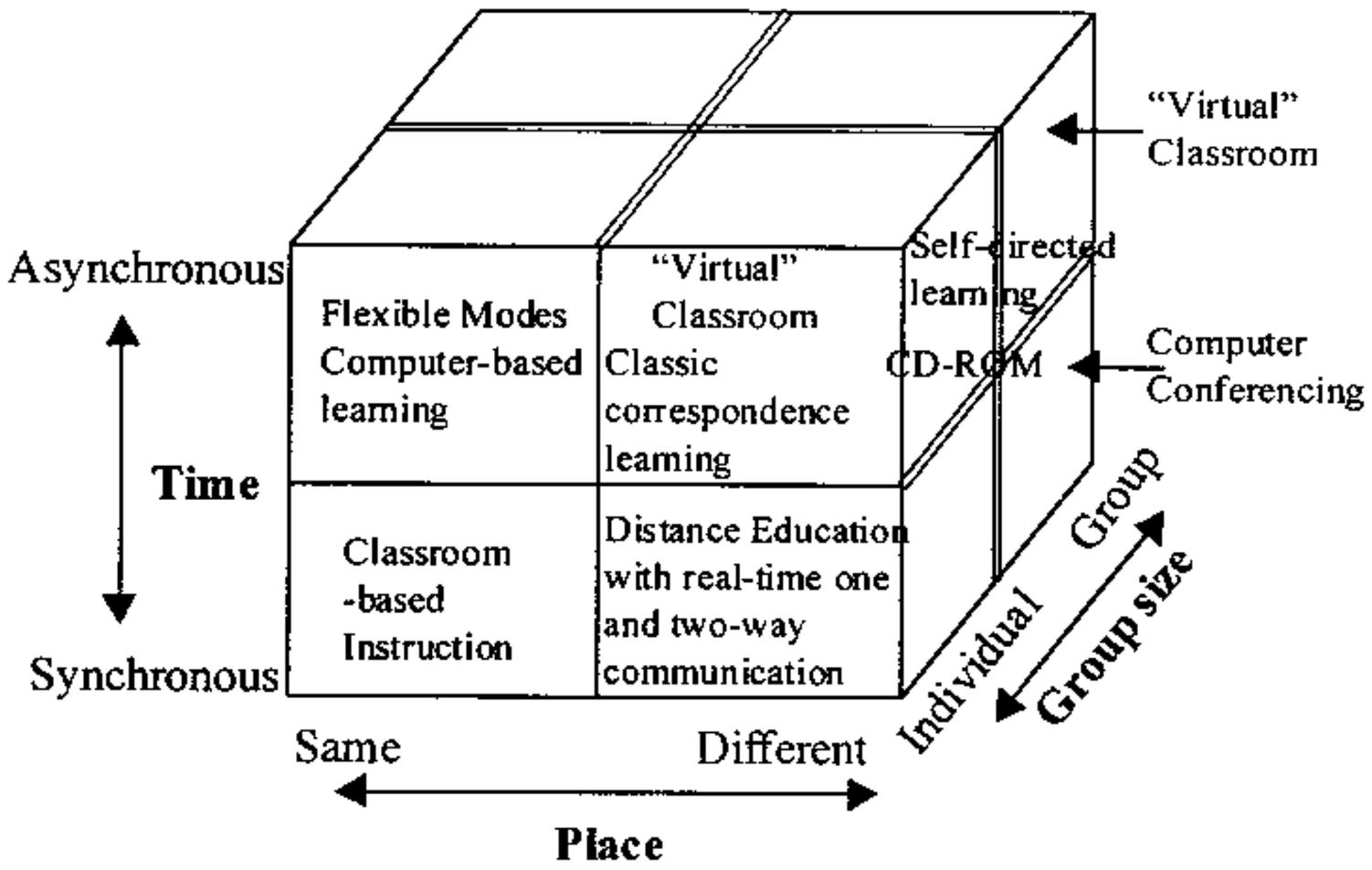

Figure 2.9: The integrated relationship of the educational system on a three dimensional framework

Source: Hedberg Brown and Arrighi, 1997. "On-line delivery: A model for successful implementation", http://www.aare.edu.au/99pap

It is accepted for distance education that the primary technology component is the computer mediated communication (CMC) system in conjunction with compressed video or videoconferencing system. A computer-mediated communication system is the use of the computer to structure, store, process, and distribute human communications (Hiltz and Turoff, 1985; Kerr and Hiltz, 1982). The most common forms are electronic mail, computerized conferencing, and bulletin board systems. A CMC system is frequently used for "asynchronous" text-based communication, meaning that the participants are distributed in time and space. It can also include graphics or digitized voice, as well as "synchronous" (real-time) exchanges (Turoff, et al. 1993).

The **place** dimension distinguishes the distance-learning situation from the traditional classroom. The instructor interacts with students directly in the originating classroom, and through compressed video or videoconferencing in the distant location (s). CMC system tools provide the interaction with the distant group(s).

The **time** dimension is similar in both the distance learning and traditional environments. Portions of the model-learning environment take place in real time (synchronous) and portions take place at the student's discretion (asynchronous). In the technology-supported environment, however, some options are available for both the synchronous and asynchronous situations that are not used in the traditional environment.

The **group size** dimension indicates that instruction can flow from instructor to individual in the form of lectures, assignments and tests. It can also flow among groups where students contribute to group activities, discussions, or learn from others. Group sizes are important as they influence the range of learning options available and the types of information technology that is most appropriate. With larger groups, the discussions become harder both to follow and to manage. In addition, the group activities can contribute to other social needs of the group members and this can increase a student's sense of belonging toward the class. But it is sometimes difficult to develop good group activities that involve the members at the distant site, and this can lead to a sense of dissatisfaction with the learning experience.

There are two methods of timing on the interaction amongst the participants in a course: synchronous and asynchronous. Synchronous interactions occur in real time. These interactions range from face-to-face communications, such as lectures and tutorials through to on-line conferencing. Synchronous presentation may alleviate some management problems, such as monitoring participants' attendance as well as reducing participants' sense of isolation. Synchronous interaction can present major access and equity issues when carried out across time zones.

Asynchronous formats are not dependent on time zones and open up the possibility of global interaction and communication. In an asynchronous format, participants have greater time to consider and develop their answers. This may facilitate participants' deeper processing of the information as they are able to spend more time considering the information in formulating a response.

2.9 CONCLUSION

In the twentieth century, the idea that education is for all people and that it can continue through adult life is being accepted more and more widely. The introduction of free and compulsory primary and secondary education in many industrializing countries in the late nineteenth century has produced adult populations with the background for further education. The countries with newly developing industrialization in the twentieth century are regarding educational programs as basic to their development and political independence. Illiteracy is gradually disappearing. Learning is no longer a privilege of a wealthy aristocracy or of a bureaucracy. It has become the right of each individual to acquire as much education as he is capable of absorbing.

In the effort to extend educational opportunities and services to all children and adults, wherever they may be compelled by circumstances to live, educational programs and services are expanding at all levels. Teaching by correspondence is the method which has carried and is continuing to carry education to those who would be otherwise out of reach.

The distance education students expect to be given institutional learning at home, and universities tend to provide degrees at home, mostly in the United States and various developed and developing countries. Adult education is the primary distance education.

The motivations of adult learners are very diverse, ranging from the pragmatic to those of an intrinsic nature. However, most adults have been highly pragmatic learners over time (Peterson and Associates, 1979). Adults may also seek additional learning for social relationships, stimulation, and knowledge for knowledge's sake (Houle, 1961; Morstain and Smart, 1974). Denton (1982), in his synthesis of the literature, suggests that the major motivations of adults for continued learning are preparing for an occupational change or advancement, seeking social relationships, learning for learning's sake, escaping boredom and seeking stimulation, and using knowledge to help some sector of society.

The printed word and illustration with complementary written individual guidance from a teacher can reach every person who can be reached by a postal service, or by some alternative method of distribution, such as centers for collection or by the use of field representatives. Organized correspondence teaching continues to be in many cases the only way, and a very effective way, of reaching many external students.

Communications have now become so rapid and so varied that there can be frequent and close contact with the external student. Airmail, radio, gramophone, tape recorder, television, films slides, teaching machines and programmed instruction can all contribute towards the instruction of external students. Audio-visual equipment, however, is expensive and not all who want to learn will be able to afford it.

However, technology is supposed to serve human purposes, but the burden of technology is that we must choose carefully how to apply it so that we do not sacrifice individuality. Innovative technologies can greatly increase energy and material efficiency, but they are not a be-all-and-end-all solution. In considering the limits of technology, we also need to remember that technology exists to serve us and our quality of life, not vice versa. Technology should be a tool to help us live more sustainable and fulfilling lives.

The nature of the 'information age' and communication is changing rapidly. Technologies that were previously considered advanced are becoming commonplace and new technologies are still being developed. Advances in technology since the Industrial Revolution have brought about a new form of education, knowing today as "distance education". The revolution in electronic communications of recent decades has given distance education a shift to a new paradigm known as "virtual education", in which new institutions claiming to deliver courses globally are emerging; trying to change their teaching strategies to deliver their course more effectively on a global basis; and commentators are adopting online technologies in order to teach globally. There is what Mason (1998: 15) called a "sliding scale" of provision . . . "from traditional distance education, to international distance education, to online courses, to virtual universities, and finally edging to globalization".

CHAPTER 3

DISTANCE EDUCATION THEORIES
PROPOSED MODEL FOR ANALYSIS

This chapter deals with the theories of distance education in order to construct the proposed model for analysis. The purpose is to evaluate the effectiveness of distance learning administration in terms of students' learning satisfaction and students' educational effectiveness. The evaluation will be done on the provision of instructional delivery methods; the interaction between educators and learners; the academic service and supports; and the technological utilization for learning. Various educational outcomes of the researchers will be explored.

The chapter covers the models and theories of distance education, a systems theory of educational effectiveness with multilevel analysis, a systems theory with an educational transformation process, and a systems theory with a quality approach. The instructional design theory, on-line delivery model, instructional delivery system, and the three elements of distance education with the instructional design, technology, and supports are included in order to explain the proposed model.

The academic supports and services as well as technological utilization are addressed to explain the dissertation's framework. The conceptual framework includes a concept of students' learning behaviors and perceptions, the learning climate, and the criteria for educational effectiveness.

Many studies dealing with educational effectiveness are explored in this chapter with a variety of criteria and outcomes. The dominant ones proposed in the conceptual framework are Gooler's seven criteria. These seem to be more concrete and objective with regard to the measurement of the learning effectiveness than most of others described in this chapter. Acceptability is also used to measure educational effectiveness. This research has concluded eight categories according to the studies level (graduate and undergraduate) and universities (RU and STOU) in order to compare them accurately and precisely.

3.1 THEORIES OF DISTANCE EDUCATION

Many authors have tried to lay the foundations on a theory of distance education where it could be based on the following:

- Delling's process model of 1966 asserted the physical distance between student and teacher (Keegan 1986);
- Wedemeyer's liberal, individualizing 'independent study' (1981) involved the social, cultural and psychic distances between the educator and the learner;
- Sewart's support model, called 'continuity of concern' (1981), stated that the teaching acts are separated in time and place from the learning acts (Sewart, 1981);
- Baath's two-way communication (1982) declared the use of two-way communication;
- Peters's view of distance education as an industrialized form of teaching and learning (1983), allowed a large number of students to participate in university study simultaneously, regardless of their place of residence and occupation;
- Holmberg's theory of the guided didactic conversation (1983);
- Smith's student-centered small-scale approach of 1983 (Keegan 1986);
- Holmberg's normative teaching theory for distance education (1985) insisted that it is not under the continuous, immediate supervision of tutors present with their students in lecture rooms or on the same premises;
- Perraton's three interrelated systems of teaching, administration, and assessment (1987) and *Keegan's theory of the reintegration of the teaching acts (1990)* stated that teaching and learning acts (or behavior) become separated spatially and/or temporally;
- Saba's model of the dynamic interrelationship of dialogue and structure (1990);
- Verduin and Clark's three dimensional model (1991) included: dialogue / support, structure / specialized competence, and general competence / self-directedness, the model involved mediated, non-contiguous communication between the student and the educator;

- Moore's (1990, 1991) theory of transactional distance included the concept of dialogue, structure, and the characteristics of each learner in order to understand and perceive, deriving from the geographic separation of learners and teachers.

By examining the above models, we could divide most authors into two categories:

❖ The first group model based on the notions of student autonomy and independence. In Delling's 1966 model: The learner is seen to be autonomous and independent, which is the heart of the distance education process. Wedemeyer (1981) reiterates the principles of individualization and open learning, and also defines the concept of independent study. Moore (1991) based on learner autonomy, has developed a two-dimensional model called "transactional distance" that incorporates the teaching strategies and evaluation methods (structure), and the interaction between teacher and learner when one gives instruction and the other responds (dialogue). Saba (1990) adds the notion of 'virtual contiguity' to Moore's model, insisting on the importance of integrated systems that bring teacher and learner together, optimize dialogue between them, and eliminate consequences of being separated in space. Finally, Verduin and Clark (1991) examine the concept of 'transactional distance' and develop a three-dimensional model including three new variables that affect the learner: dialogue/support, structure/specialized competence, and general competence/self-directedness.

❖ The second group model based on the notions of interaction and communication. These notions emphasize student support offered by the institution in order to reestablish communication and interaction. Baath (1982) argues about the need for two-way communication between the student and the tutor where the tutor is the key to the two-way communication concept. Holmberg's (1983) guided didactical communication model describes interaction as i) a continuous relationship between the student and the tutor/counselor/institution and ii) a simultaneous conversation with the student through the use of prepared learning material. As for Sewart (1981), the role of the mediator is not only necessary, but also the only means available to adapt distance education to the individual needs of the students. Smith's (1983) model recommended that distance education supply students with learning material and allow them to work autonomously. He also encouraged contact between students and staff, with regular group activities.

Several theoretical frameworks have been proposed and have sought to encompass the whole of the activity in distance education. Notable contributions have been made by Otto Peters, Michael Moore, Borje Holmberg, Desmond Keegan, D.R. Garrison (Myra Baynton and Doug Shale), and John Verduin & Thomas Clark. Each of these six perspectives can be transformed into a theory of distance education.

Table 3.1: A comparison of distance education theoretical perspectives

Framework	Central concepts	Primary focus	Apparent influence
Peters	Industrial Post-industrial	Match between societal principles and values	Cultural sociology
Moore	Transactional distance (dialogue, structure) Learner autonomy	Perceived needs and desires of the adult learner	Independent study
Holmberg	Learner autonomy Non-contiguous Communication Guided didactic Conversation	Promotion of learning through personal and conversational methods	Humanist approach to education
Keegan	Reintegration of teaching and learning acts	Recreation of interpersonal components of face-to-face teaching	Framework of traditional pedagogy
Garrison (Shale, Baynton)	Educational transaction Learner control Communication	Facilitation of the educational transaction	Communication theory Principles of adult education
Verduin and Clark	Dialogue / Support Structure / Specialized Competence General Competence / Self-directedness	Requirements of both the learning task and learner	Principles of adult education Structures of knowledge

Source: Desmond Keegan, *Theoretical principles of distance education*, p. 71

A synthesis of distance education perspectives in Table 3.1 above can be categorized as six theoretical frameworks. The definitive feature of distance education ,the separation of teacher and learner, are discussed by Peters, Moore, Holmberg, and Keegan. The theme of distance learning communication is mentioned by Garrison whereas Verduin and Clark discuss the teaching-learning supports.

3.2 SYSTEMS THEORIES OF EDUCATIONAL EFFECTIVENESS

Early institutional effectiveness research aimed to find the factors that caused the distinction between effective and less effective institutions, these were the so-called outlier studies (Brookover, 1979; Edmonds, 1979). Most famous was the five-factor model of Edmonds (1979), which consisted of learning climate, frequent evaluation, achievement orientation, high expectations and direct instruction. Later, this model was criticized from a methodological and conceptual point of view (Scheerens and Creemers, 1989) to distinguish between effective and non-effective institutions. More research, and more survey studies were carried out, enlarging the list of characteristics of effective education, the so-called survey studies. In addition, a conceptual approach was advocated, whereby a framework or theory explained the difference between effective and non-effective institutions. These were the so-called theoretical studies.

Effectiveness is related to goals in education. Criteria for educational effectiveness are proposed in the multiple outcomes by researchers as follows:

- Basic skills and knowledge (Brookover, 1979; Edmonds, 1979) are the traditional outcomes. In the history of education, effectiveness placed a great deal of attention on basic skills and knowledge.
- Compensation for initial attributes (equity) was also an outcome used in the past for educational effectiveness (Brandsma, 1993; Slavenburg and Peters, 1989; Scheerens, 1987).
- Social skills and attitudes concentrate today on social and aesthetic skills, not only on academic and cognitive skills (Lockwood, 1993).

- Higher-order skills, such as problem solving, are useful criteria for educational effectiveness, especially in higher grades (Creemers, 1991; Scheerens, 1991).
- Meta-cognitive knowledge and skills, which refer to learners' knowledge of and control over their cognitive processes by organizing, monitoring and modifying them, including the strategies of how to learn (Stringfield and Slavin, 1992).
- Educational technology, creativity and moral behavior are the new educational goals to be formulated (Brooks and Kann, 1993; Leming, 1993).

The Criteria for educational effectiveness are proposed in the multiple outcomes shown in figure 3.1 as follows:

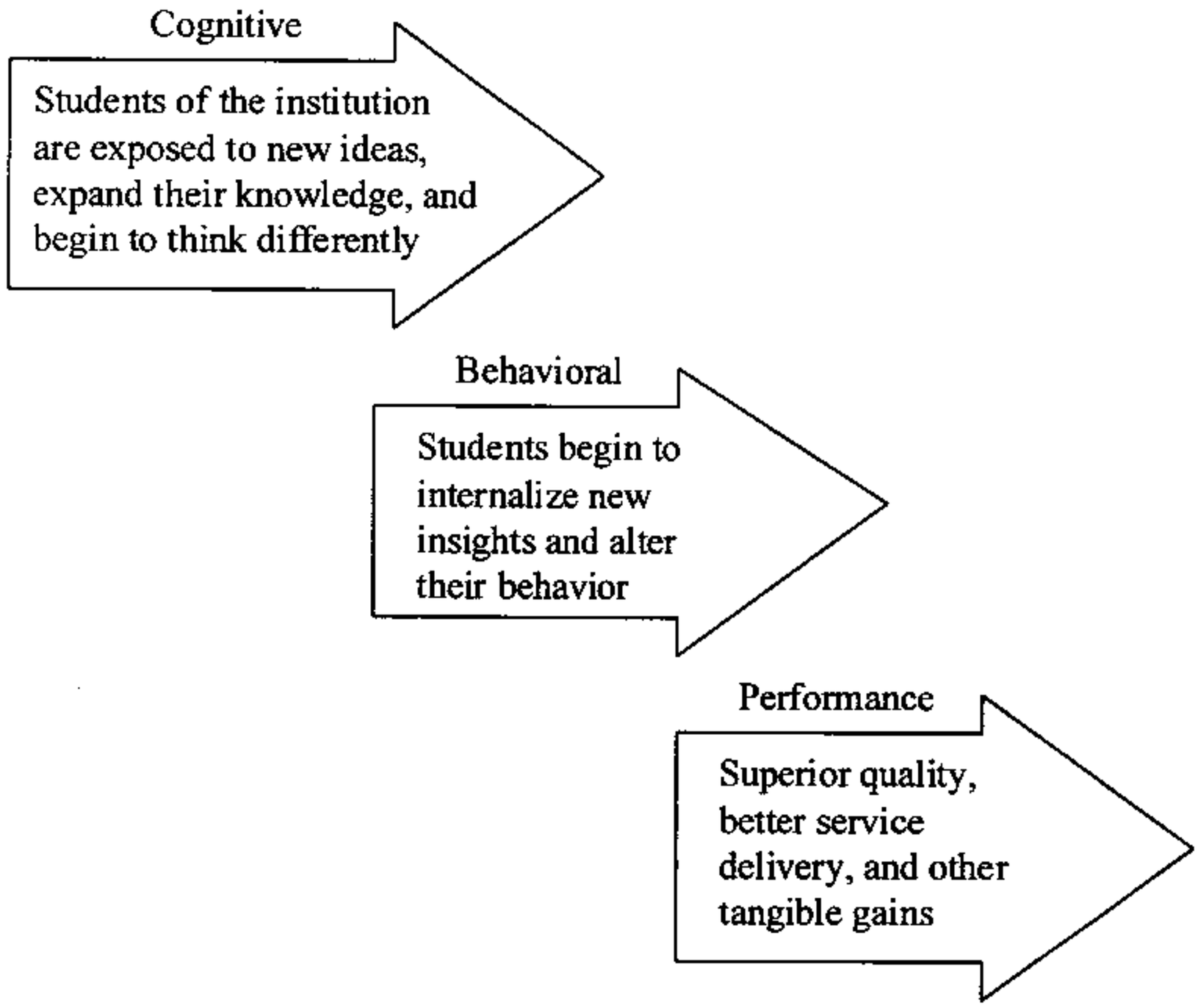

Figure 3.1: The learning process of student's learning behavior

Source: D.R. Garrison, 1989. *Understanding Distance Education: A framework for the future*

3.2.1 Systems Theory with the Educational Multilevel Analysis

Educational effectiveness is an important concept for the effectiveness of institutional administration. Educational effectiveness is distinguished from the concept of educational efficiency, which is concerned with the relationship between the effects of education and the inputs of education, mostly in terms of finance. Educational effectiveness takes into account only a restricted set of outcomes such as basic skills, and knowledge - not in term of money.

A comprehensive analysis of the educational effectiveness takes the different levels of educational system into account as the core of educational science and research. Effectiveness stresses the factors at the different levels of the educational system, and contribute to educational outcomes: the student level, the classroom level, the institutional level and the contextual level. The factors at the various levels are supposed to contribute to the processes at other levels. The educational effectiveness is measured by a set of outcomes: skills and knowledge.

The theory of educational effectiveness can be seen as an integral theory about education, in which the inputs, the processes and the contexts take into account the outcomes of education. The model of educational effectiveness stresses systems theory that is premised upon a relationship between student inputs or institutional processes and student outputs. In a system approach, a distinction is made between the input, context and processes (in addition to outcomes) of education. The input consists of all kinds of variables connected with personnel resources, and the background of students. The context is meant by the socioeconomic, political and educational context of institutions, for example the guidelines for education and the national evaluation system. The most important factors concern the ongoing processes at the classroom and institutional levels.

The results of the three types of studies (outlier studies, survey studies and theoretical studies) have been reviewed. Creemers and Knuver (1989), Creemers and Lugthart (1989), Reynolds (1989, 1991, 1992), Levine and Lezotte (1990), Scheerens (1990, 1992), Stringfield and Schaffer (1991), Creemers (1992a) and Levine (1992), sum up factors that makes a difference between effective and non-effective education within institutions and classrooms.

Systems theory of the educational effectiveness determined in the educational multilevel analysis is illustrated at figure 3.2 as follows:

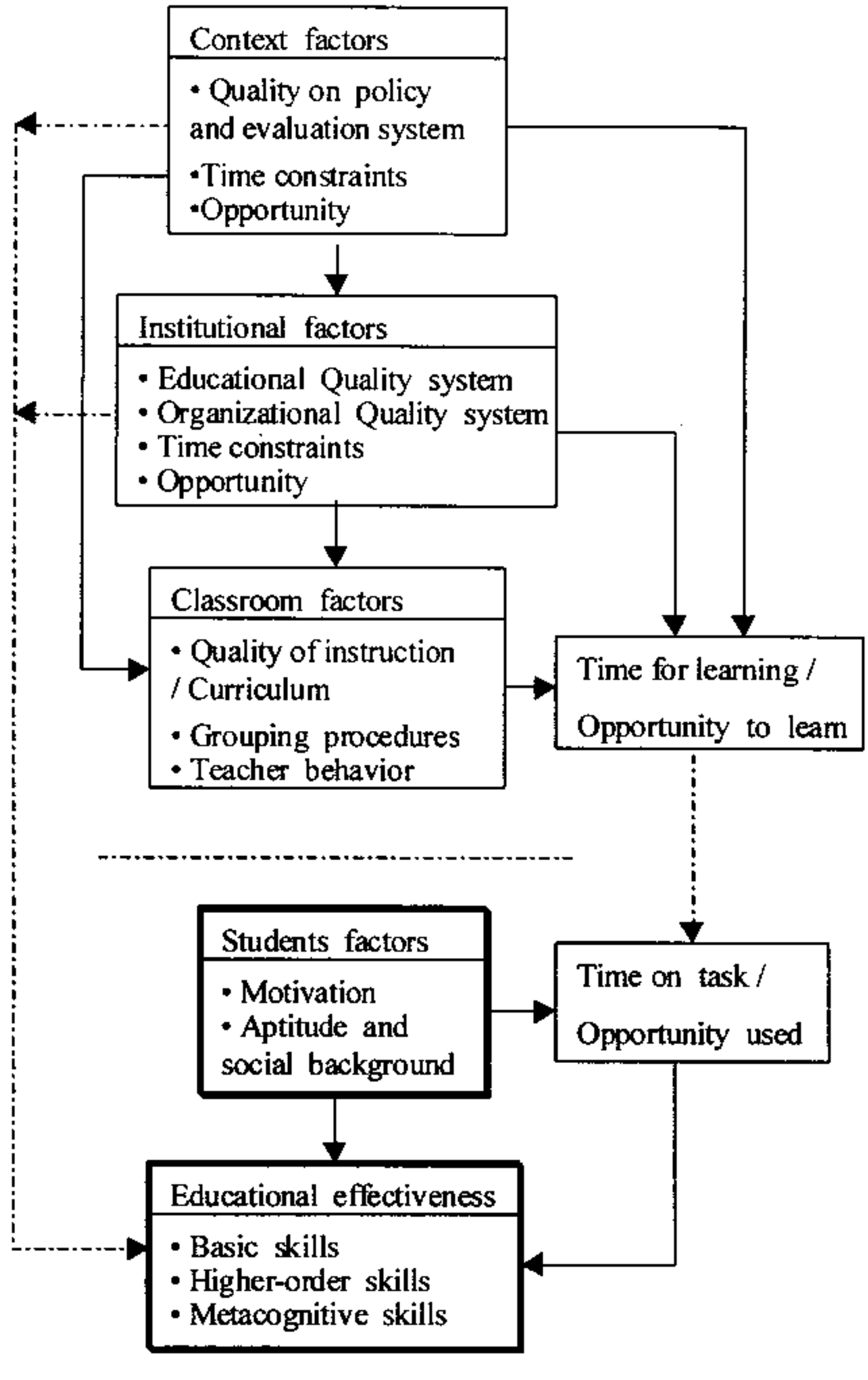

Figure 3.2: A comparison of educational effectiveness with multilevel analysis

Source: Bert Creemers, 1991; Scheerens, 1991; Stringfield and Slavin, 1992

Many correlatives for effectiveness are available, more or less supported by empirical research. The development of a conceptual framework is an important contribution to educational effectiveness research, is shown in figure 3.2 above.

3.2.2 Systems Theory with the Educational Transformation Process

Educational establishments can be described as open systems (see figure 3.3), since they possess most of the attributes originally identified by Katz and Kahn (1966) as characterizing such systems, namely:

> ... the importation of energy from the environment, the throughput or transformation of the imported energy into some product form, which is characteristic of the system, the exporting of that product into the environment, and the re-energizing of the system from sources in the environment.

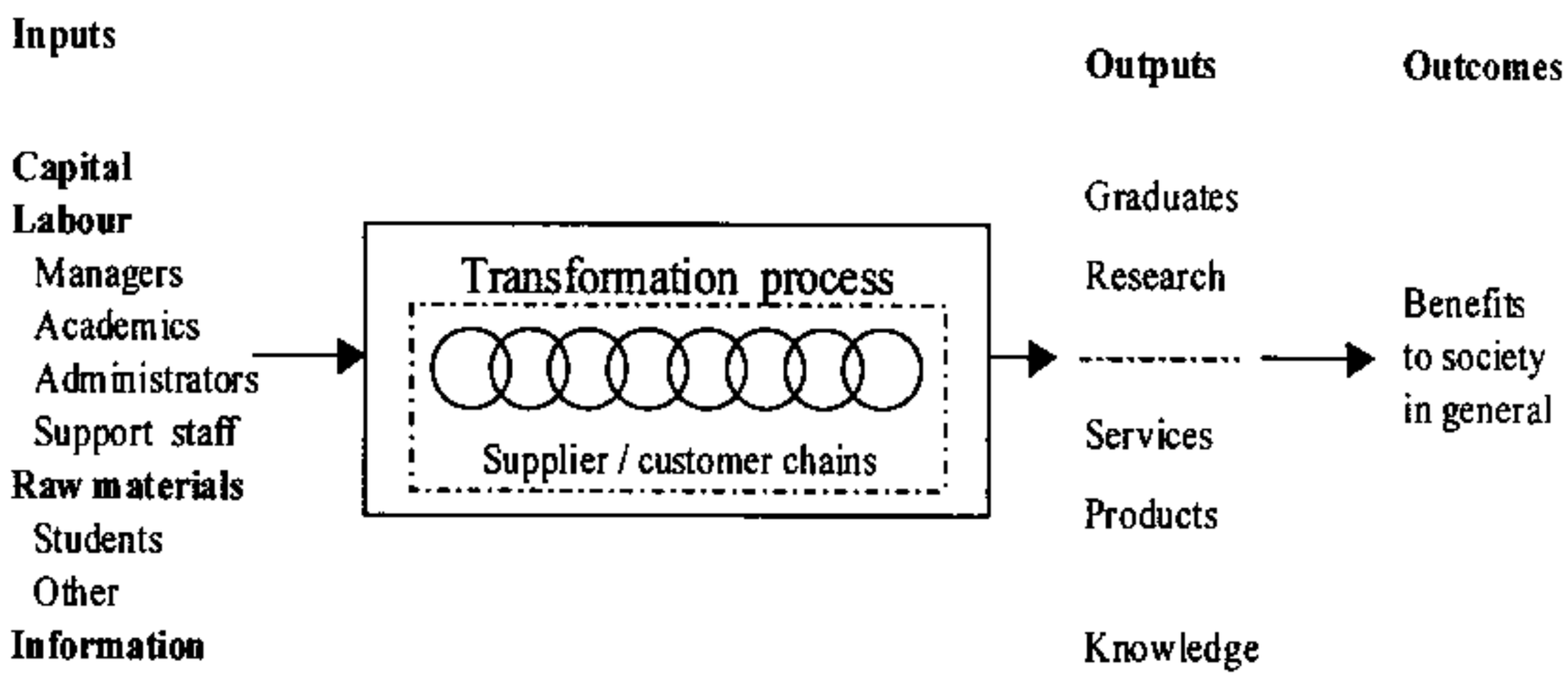

Figure 3.3: An open systems model of higher education[1]

Source: Andrew Taylor and Frances Hill, *Quality management in education*, p. 165

Some complexities are associated with the development of these ideas that students are in one sense raw materials, which become final products, yet in another sense they are customers themselves. Others would argue that the product of education is the learning opportunity.

Educational institutions have traditionally been described in organizational terms as 'professional bureaucracies' (Mintzberg, 1983), located in an operating environment which is complex but stable.

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[1] Andrew Taylor and Frances Hill, "Quality management in education", *Organizational effectiveness and improvement in education*, Open University Press, Buckingham, 1997, pp. 165-170.

The professional bureaucracy is a modified form of bureaucratic structure, which gives a greater degree of autonomy to the professionals, who need to exercise discretion and judgment to be effective. This organizational structure tends to be common in education, hospitals and organizations where the core skills of the professionals are central to the organization's necessary continued existence.

The transformation process can be seen as the processes of educational delivery in academic services and supports to which the customers/students are involved (see figure 3.4). The transformation process consists of pre-delivery, delivery, and post-delivery where curriculum design is an example in the figure.

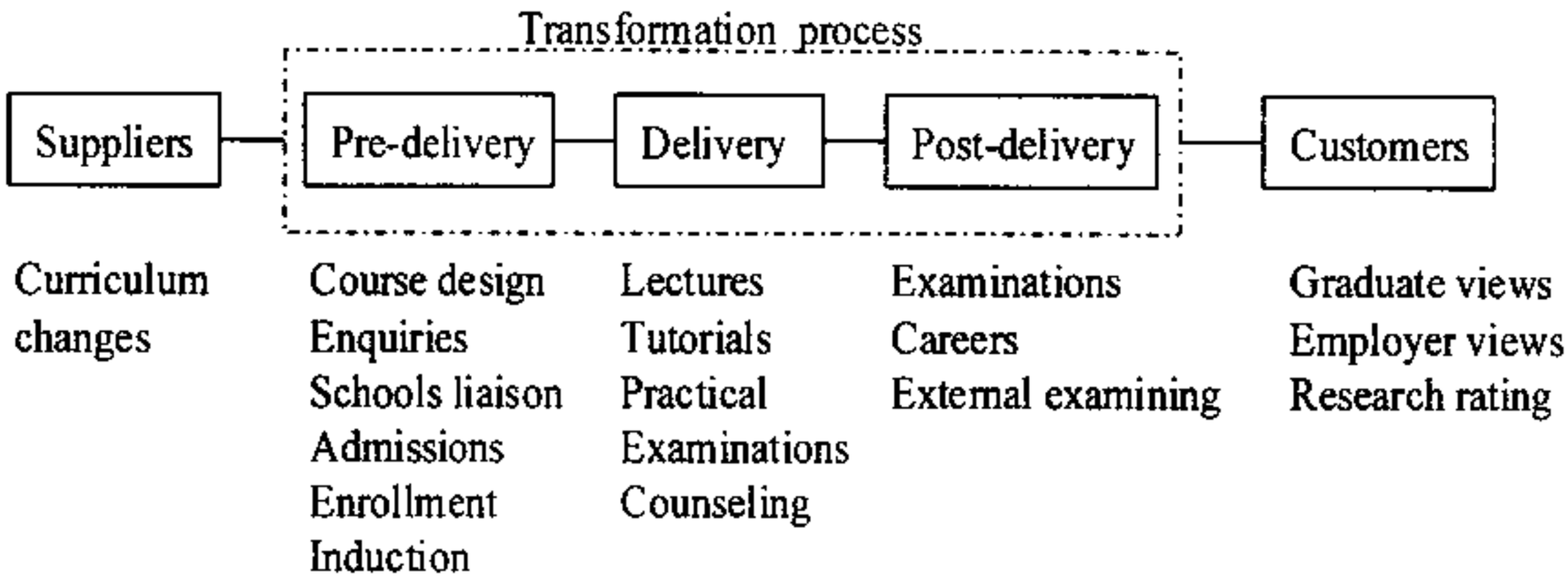

Figure 3.4: A model with the detailed transformation process

Source: Andrew Taylor and Frances Hill, UCCA strategic administration, p. 167

However, today's environment in education has moved to a new position of complexity and relative instability. Structures are also evolving to facilitate more organic, less formalized arrangement, which can react more quickly and even anticipate changes in its environment. A structure akin to andadhocracy' which may be more suitable. Adhocracy, fully described by Mintzberg (1983), is an organizational form, which suits complex environments, and where the tasks are complex and uncertain. Distance learning administration of educational institutions with a variety of information technology utilization, the instructional delivery modes, and widespread educational competition is an example of the adhocracy form in today's vital environment.

3.2.3 The Integration of Systems Theory toward Educational Effectiveness

Educational institutions serve as service organization in which they are currently in a market environment with a greater impact on education where the whole basis of competition has changed and has become more complex. Along with this intra-system competition for resources there is a marked increase in the influence of powerful supplier and customer grouping, which are demanding higher quality and better service. The criteria for the evaluation of organizational performance (Nadler and Tushman, 1980) are summarized as:

- Goal attainment (e.g. how well the organization achieves its strategic objectives)
- Resource utilization (e.g. how well the organization makes use of its available resources)
- Adaptability (e.g. the capacity of the organization to review its performance and changing requirements of its environment)

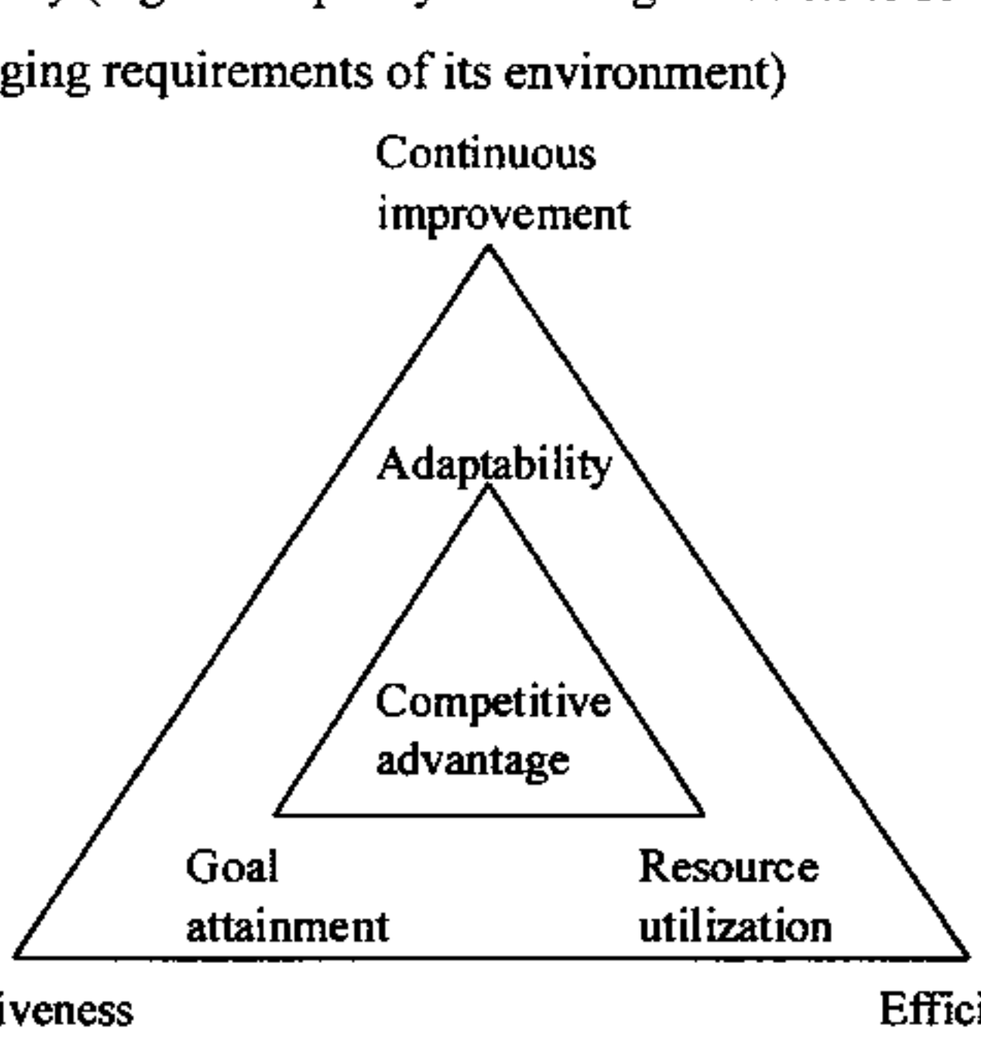

Figure 3.5: An organizational performance with competitive forces

Source: Andrew Taylor and Frances Hill, 1993

Along with the market forces and competition, the organizational performance has to adapt and change to becoming effective, efficiency, and continuous improvement in the quality aspects as shown at figure 3.5

In distance education, the range of possible educational methods differ considerably from those normally used in face-to-face teaching, but in either case the aim must provide 'quality education'. Few attempts are made to state what 'quality' actually means. "Quality in higher education" [means] defining worthwhile goals and enabling students to achieve them" (Sparkes, 1993). The term "worth while" determines academic standards, the demands of employers and professions, the aspirations of students, the expectations of society and the government. All need to be taken into account to a greater or lesser degree (Sparkes[2], 1993: 135).

In any educational provision, the aims of the activity are to enable students to achieve goals, involve creating an effective learning environment, by choosing and using different media and methods effectively, by building on successful experience, and by applying the results of some excellent recent research into *how students learn.*

Resource utilization enhances the efficiency of media, personnel, and technology. Adaptability of education under the market environment and competition proposes continuous improvement for administrative survival in education.

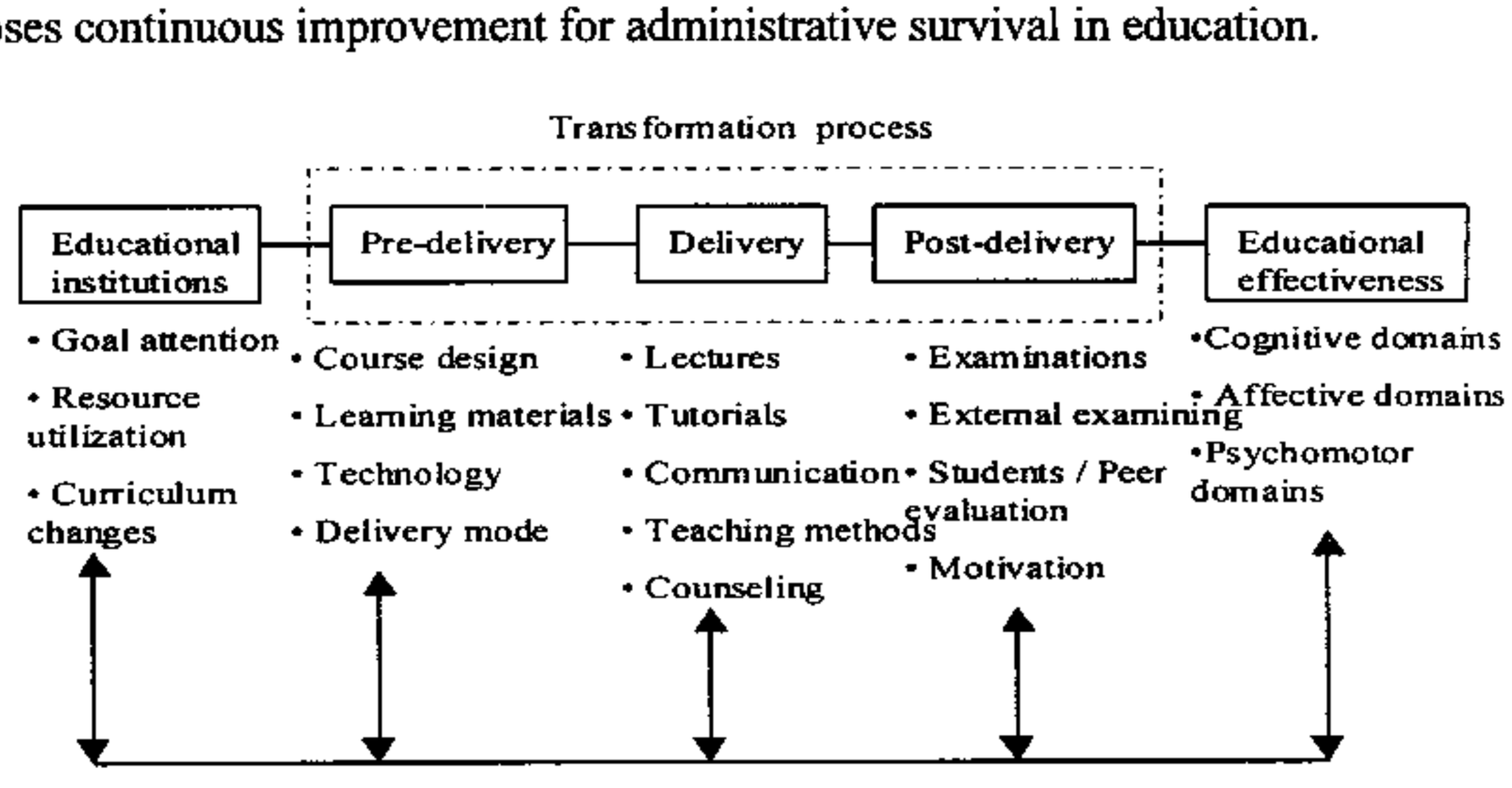

Figure 3.6: An integrated open systems model with feedback

Therefore, the integration of systems theory toward educational effectiveness in distance education, encourages the taxonomy to adopt and comprise knowledge, skills, and understanding in the cognitive domain, attitudes and values in the affective domain; and simulation techniques in psychomotor domain. The synthesis of the educational effectiveness including feedback is illustrated at figure 3.6

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[2] John J. Sparkes, "Matching teaching methods to educational aims in distance education", *Theoretical principles of distance education*, TJ Press (Padstow) Ltd., Great Britain, 1993, p. 135.

3.3 ELEMENTS FOR DISTANCE EDUCATION

Three elements of paramount importance to any successful distance education program include:

- ❖ Instructional design
- ❖ Technology
- ❖ Support

The instructional model affects not only the way in which information is communicated to the student, but also the way in which the student makes sense and constructs new knowledge from the presented information. Willis (1992) describes the instructional development process for distance education, consisting of the customary stages of design, development, evaluation, and revision. In designing effective distance instruction, one must consider the goals, needs, and characteristics of teachers and students, but also content requirements and technical constraints.

The development of modern Information and Communication Technologies (ICTs) has greatly helped the emergence of global distance education systems. The continuing trend toward widespread use of electronics, or digital media provides digital systems. These transmit all information as bit (BInary digits), and can send different types of information (text, numerical data, sound, images) down the same channel at the same time, or across networks that use several different communication channels. Technology provides a wide variety of available devices for distance learning. The number of institutions offering and claiming to deliver their course programs more effectively on a regional or global basis is increasing. The existing institutions are trying to change their teaching strategies in order to compete in the global economic and educational challenges by adopting their online teaching technologies. With the trend toward the convergence of broadcasting, computing, and telecommunications technologies, different devices are being used for courseware delivery and for interpersonal interaction, along with the changing role of the Internet. The educational provision via the Internet is predicted to increase dramatically with the recent growth in e-education in distance education.

Supports are the components of the instructional process where technology is an integral part of distance education. However, any successful program must focus on the instructional needs of the students rather than on the technology itself. It is essential to consider their ages, cultural and socioeconomic backgrounds, interests and experiences, educational levels, and their familiarity with distance education methods and delivery systems (Schamber, 1988).

However, successful distance education systems should involve learning supports such as interactivity between teacher and students, between students and the learning environment, and among students themselves, these in addition to active learning in the classroom. Interactivity takes many forms. It is not just limited to audio and video, or solely to teacher-student interactions. It represents the connectivity the students feel with the distance teacher, the local teachers, aides, and facilitators, and their peers. Garrison (1990) argued that the quality and integrity of the educational process depends upon sustained, two-way communication. Without connectivity, distance learning degenerates into the old correspondence course model of independent study. Effective distance education should not be an independent and isolated form of learning. It should be accompanied by the learning supports with connectivity.

As mentioned, supports are the components of the instructional process. They include curriculum supports, refer to the printed materials, texts, assignments, examination, and grade results; Faculty supports refer to the instructors who take responsibility for teaching and advising, handle the learning materials as well as construct the teaching package. The instructors should be able to handle the technology and know the capability of the technology for delivering instruction. Student supports refer to tutorial and counseling activities. Service supports refer to the news and facilities offered to distance learners, such as postage, newsletters, telephone, facsimile, e-mail and computer usage, library service and also study room; Technological supports refer to the teaching and learning resources availability such as computers, video-conference, Internet, interactive audio, audio- and videotapes, broadcast radio and television and so on.

For more details of these three elements on distance education, the explanation and discussion are described elaborately in the next sections.

3.3.1 The Instructional Design Theory

Instructional technology has been described as "a systematic way of designing, carrying out and evaluating the total process of learning and teaching in terms of specific objectives. These objectives based on research in human learning and communication, and employing a combination of human and non-human resources, bring about more effective instruction" (Commission on Instructional Technology, 1970: 21).

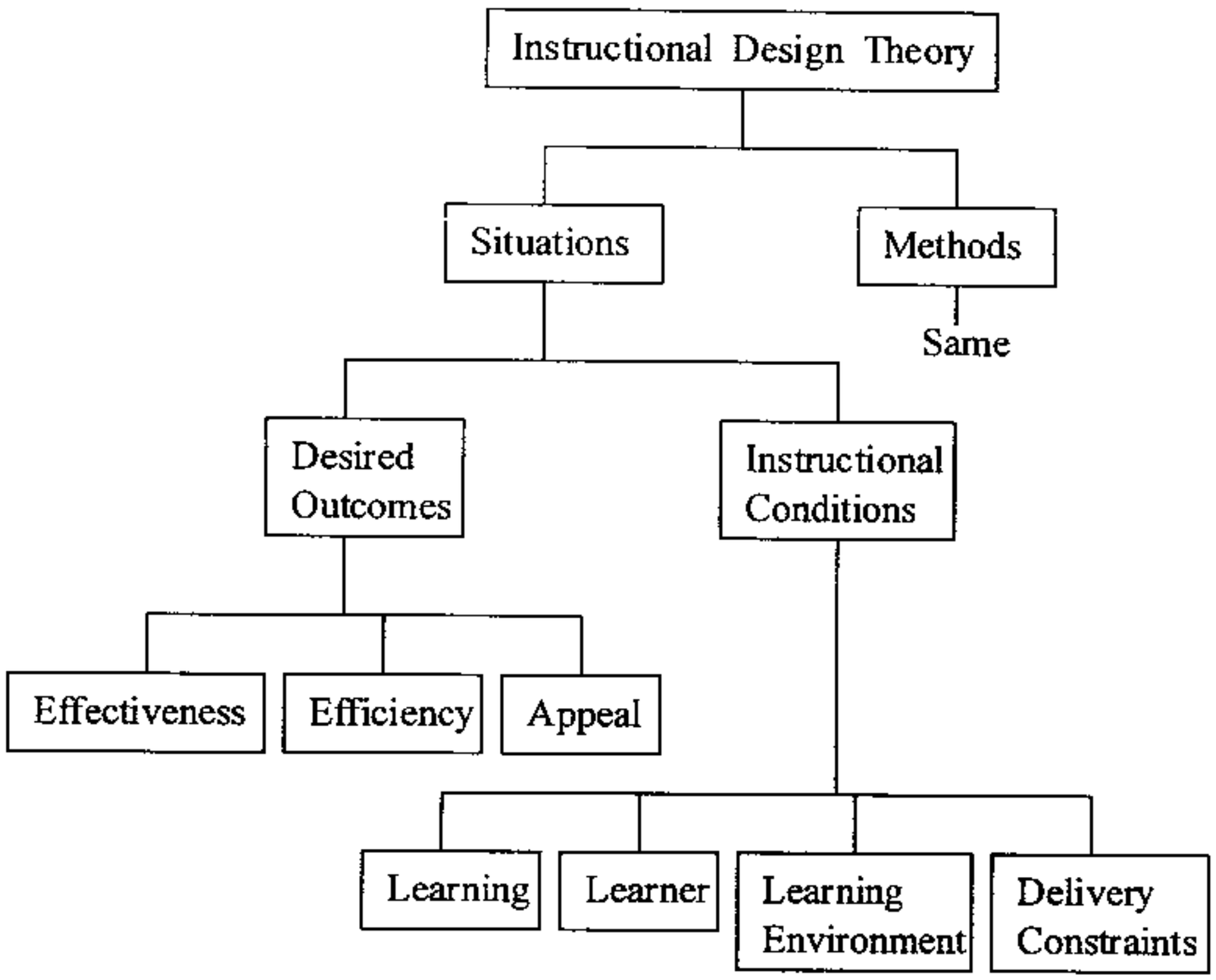

Figure 3.7: The Reigeluth's components of instructional design theory

Source: Reigeluth's, 1999. Available URL: www.aare.edu.au/99pap/jmag99370.htm

Instructional technology and learning are both complex areas of study. The work of Reigeluth (1999), i.e. his model on the instructional design theory (see figure 3.7) has two components for facilitating human learning and development:

- Methods of instruction, which relates to the context in which learning can take place and
- Situations for learning, which affect the methods of instruction.

Nowadays teachers can use many types of teaching resources: books, radio, television, video, computer programs, and telecommunication facilities to deliver the instruction. Perkins (1992) requires that instructional design theory provide:

- Clear information: The descriptions and examples of the goals, knowledge needed, and the performances expected are articulated.
- Thoughtful practice: Opportunities are provided for learners to engage actively in the content.
- Informative feedback: Counsel learners about their performance, helping them to proceed more effectively.
- Strong intrinsic or extrinsic motivation: Activities that are amply rewarded either because they are very interesting and engaging in themselves or because they feed into other achievements that concern the learner.

The framework for implementing on-line units in information technology at Australia Catholic University (ACU) addresses three broad issues with reference to instructional design theory, as shown in figure 3.8

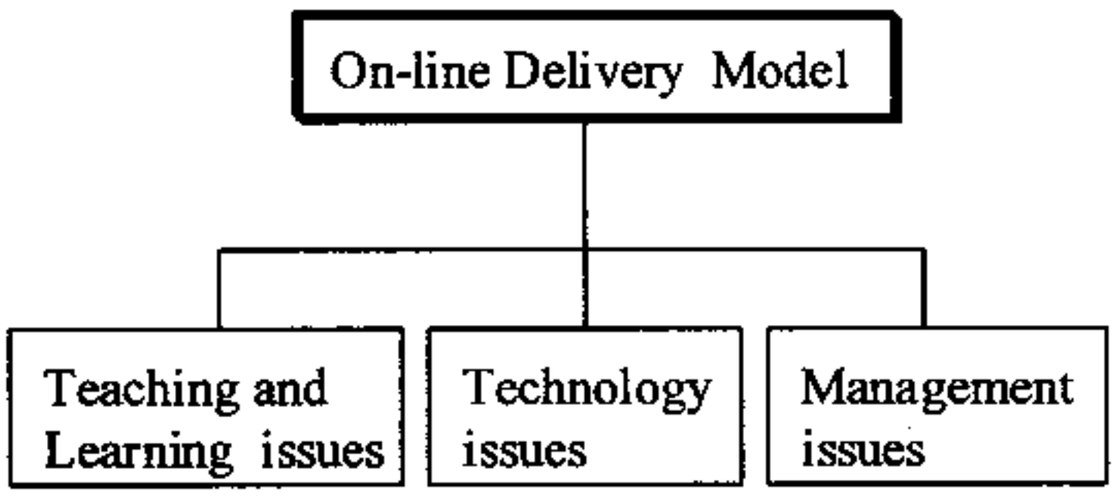

Figure 3.8: The on-line delivery model

Source: Des Matejka & Dr. Martin Maguire, "On-line delivery: A model for successful implementation", http://www.aare.edu.au/99pap

Mayer (1999: 143) reports "Constructivist learning occurs when learners actively create their own knowledge by trying to make sense out of material presented to them". The greater challenge in education ensures that the most appropriate forms of information technology be used to support the diverse learning needs in an on-line environment. These along with management issues are shown in figure 3.8

The framework for implementing on-line educational delivery (figure 3.8) addresses two broad issues (situations and methods) in relation to the instructional design theory, integrated and shown in figure 3.9

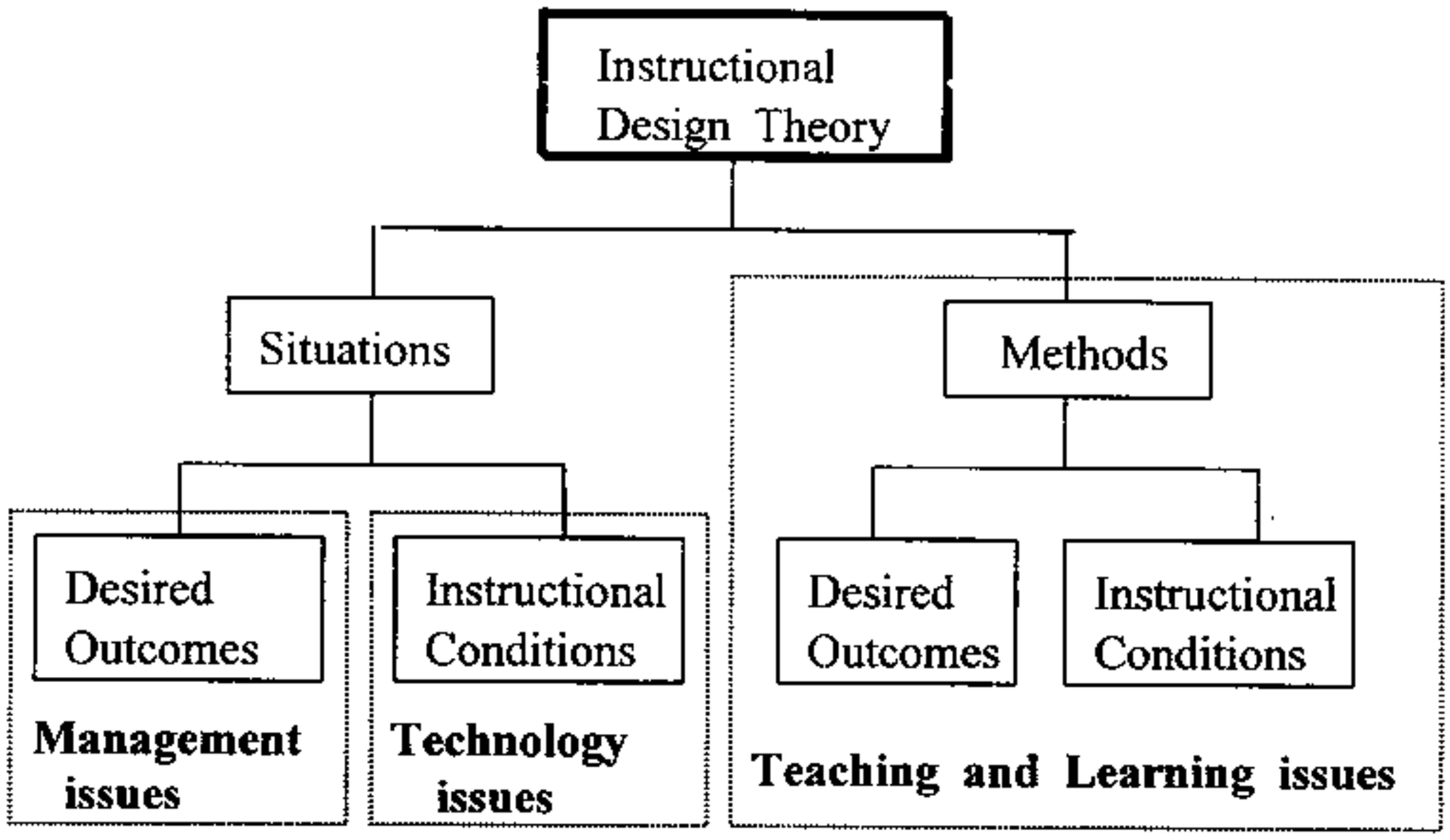

Figure 3.9: On-line delivery issues relating to instructional design theories

Source: Des Matejka & Dr. Martin Maguire, provide at www.aare.edu.au/99pap

Distance education has drawn widespread and growing interest in this decade, an interest resulting in diverse and creative distance education systems. There are many factors that have contributed to this interest and resulting development in distance education. The main factor is the emergence of a sophisticated communications technology. The existing technological infrastructure that facilitates communication and transmits information at a distance awaits imaginative educators to design instruction accessible and supportive to distance education systems.

However, researchers have consistently found that instructional television can motivate and captivate students, and stimulate an interest in the learning process. Ravitch (1987). However, we must be cautioued against the unintended side effects of educational television in particular as well as "edutainment" in general. Reliance on exciting visuals may distort the curriculum by focusing students' attention on the entertaining and provocative features of the presentation rather than encouraging thoughtful analysis of their underlying meaning.

3.3.2 The Educational Technology

Educational technology is a broad concept encompassing teacher and learner, as well as the process and product of learning. Instructional technology is considered a subset of this term because instruction is a subset of education (AECT, 1977).

Communications between learners and instructors in distance education must be provided by technologies. There is a wide variety available, including broadcast radio and television; audio- and videotapes; interactive audio and video teleconferencing; various computer and Internet technologies, and print technologies. Different devices may be used for courseware delivery and for interpersonal interaction, while the backbone technologies along which the signals travel are often the same. For many educational tasks, technologies play analogous roles to those of the educational setting.

The rapid advances in computer and telecommunications capabilities have made possible the development of learning modules that include elements, such as video transmission, e-mail, the Internet, and the World Wide Web. They have provided enormously improved tools for analysis of data and for the presentation of those analyses by a significantly widened group of learners.

In a discussion of computer conferencing, Davie and Wells (1991) support the need for interaction. They describe computer conferencing's most frequently cited characteristics as being its many-to-many capability. Computer conferencing is an ideal communication tool for bridging time and space among those who share similar interests. Lauzon and Moore (1989) note that computer conferencing is "effective in removing the barriers of time and space as constraints on communication" (p. 40). Harasim (1990) observes that because of the democratic openness of the computer conference environment, all students have an equal opportunity to contribute. Although the majority of literature on computer conferencing is positive, Harasim points out several opposing features. She reports that class members have difficulty reading the computer screens and following a variety of online, visual cues.

Nevertheless, learning is an active process. Students need to engage with (read, think about, critically analyze, discuss, consider, reflect on) the appropriate reference materials. Effective interactions involve a discussion among the participants.

3.3.3 The Educational Supports

Traditionally, the educational relationship was seen as an interconnection among teacher, student, and content. With the addition of the three micro-level components (independence, support, and proficiency) to these macro-level components (teacher, student, and content), control is manifested through the interaction and the educational transaction can be viewed as an overlapping triadic relationship, as a result, shown in figure 3.10 below:

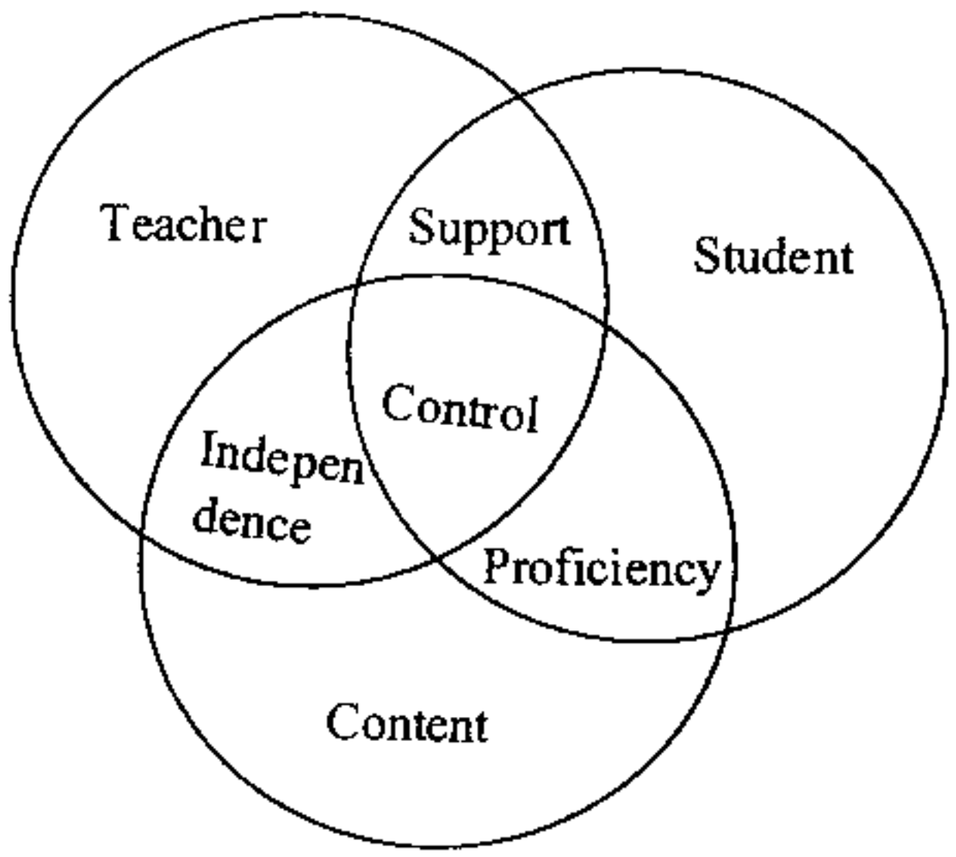

Figure 3.10: The Overlapping triadic control relationships

Source: D.R. Garrison, 1989. *Understanding Distance Education: A Framework for the Future*, p.31.

Figure 3.10 illustrates that each of the control dimensions is determined or influenced more readily by different combinations of the macro components. If we see education as an initiation into and an awareness of a new subject area, then it is conceivable that teacher and content would determine the extent to independence. Similarly, proficiency is primarily concerned with the student's ability to master a specific content area. Finally, support would be largely determined by the teacher's reflecting upon the student's cognitive and affective needs, while keeping content in the background. This analysis is theoretical and general in reality, each situation would be different in the area of interaction, and therefore influence would change accordingly.

At the heart of education is learning, the process of critical reflection and perspective transformation (the acquisition of understanding and knowledge). Brookfield (1985) suggests that there are both internal and external aspects of learning. In an educational sense, internal aspects of learning concern the cognitive (consciousness) changes, while the external aspects concern techniques and skills that enable a student to manage the educational environment. Independence as defined here can be concerned with the external aspects of the educational experience. On the other hand, the internal or cognitive aspects of education are the result of negotiation and dialogue between teacher and student.

In an educational system, control is a flexible and shared feature because both teacher and student and their interrelationship are of crucial importance. The appropriate balance of control in the educational transaction may improve student motivation, self-confidence, the ability to learn, and it may help students overcome previous negative attitudes toward formal education. The crucial importance is also the range of information technologies that can facilitate the educational process. Each component or subsystem, and its interrelationship, will influence the effectiveness of the educational transaction and must, be considered without bias when an educational system is designed.

3.3.3.1 The Curriculum Supports

Distance education courses have to be prepared and well structured. Reed and Woodruff (1995) suggest early communication of expectations also needs to be considered. Most of researches suggest that care must be taken in developing supports to ensure participants do a significant amount of the cognitive processing (e.g. concept mapping, summarizing information for a peer). Redding (1995) comments that cognitive task analysis is needed when developing materials for distance education classes.

Garrison (1990) examined the impact to the learner in audio teleconferencing and found that dialogue, negotiation, and validation of knowledge must be used in order for this tool to be a successful educational delivery method.

Willis (1994) claimed that the success of distance learning relies on the key players: students, faculty, facilitators, support staff, and administration. However, curriculum also plays a crucial role in learning environments

Lawton (1973: 11) noted that the past definitions of the curriculum tended to emphasize the content of teaching program, but now writers on the curriculum define it more in terms of the whole learning situation. There has been a move away from regarding curricula as instructional content to recognizing that it might include all that is learned during the teaching and learning transaction. The features of curriculum are that they are composed of teaching and learning outcomes where teaching might be both overt and covert: the knowledge content is the former and the creation of a climate conducive to learning is the latter type. The learning outcomes are both intended and unintended.

Thus, the model is constructed with these four elements, shown in the table below.

Table 3.2: Teaching and learning outcomes relationship

		Learning outcomes	
		Intended	Unintended
Teaching	Overt	Syllabus	Independent Learning
	Covert	Hidden Syllabus	Reactive Learning

The syllabus is clearly the content, being cognitive, emotive, and psychomotor or attitudinal, which is specified as that that should be taught within the teaching and learning transaction. The other three boxes can be seen as the "hidden curriculum". The learner, who rejects learning as the process of acquiring the knowledge presented by the teacher, constitutes independent learning. The weaker students, who are supported by those who appear more able and socialized in the class or profession, are not hidden from the teacher but are the hidden syllabus. Finally, there is reactive learning, in which the learner responds to a specific teaching situation

However, revision based on feedback from instructors, content specialists, and learners is an ongoing process. Provisions must be made for continually updating courses, which depend on volatile information, to keep the subject matter current and relevant (Porter, 1994).

3.3.3.2 The Faculty Supports

The learner and instructor are the most important factors in distance learning. As the needs of the learner are considered in the planning and organizing stages, faculty needs are also considered. However, faculty development remains a critical issue for distance learning to be a successful delivery method. Willis (1994) suggested that for the success of distance education, "Teachers and administrators must work together on identifying and resolving the issues, policies, and biases that inhabit [the] systematic use of distance education [toward] meeting academic goals" (p. 288).

The planning and organizing of instructional materials for distance education have increased the effectiveness of the delivery process. Instructors who are involved in distance education spend about a semester before the actual transmission to prepare instructional materials for their courses (Omoregie & Jackson, 1996). When an instructor spends this much time for researching, planning, and organizing, the instructional process becomes strengthened. Some distance learning instructors use graphics, video tapes, and printed materials during their lecture to illustrate content areas. Distance learning can also utilize face-to-face instruction with such technological tools as compressed videos and computer desktop video conferencing whereas the support staff must perform tasks accurately and rapidly.

Willis (1993) describes the strategies which are effective in distance learning: namely, developing appropriate methods of feedback and reinforcement, optimizing content and pace, adapting to different student learning styles, using case studies and examples, which are relevant to the target audience, being concise, supplementing courseware with print information, and personalizing instruction.

Progressive teachers who are early adapters of technology can become change agents for their peers (Pacific Mountain Network, 1994). They can support other teachers by planning ahead as a group, and by working with the learning modules and equipment before using them in the classroom. Facilitators can try out learning modules as videotapes, building in interactivity, as it suits the learning styles of their particular students, and then integrating real-time satellite programs into their schedule later on.

The more familiar teachers are with the instructional design and delivery process, the more effective their presentations will be. On a practical note, they need training in instructional message design, strategies for delivering instruction on-camera, methods of diversifying types of presentation for which theyselect various mixes of student-teacher activities and interactions, choosing situations and examples, which are relevant to their students, and assessing the level of learning of distant students. They also need plenty of guided, hands-on practice, developing and delivering courseware using audio, full-motion video, graphics, and text, in front of a live audience (yet still in a non-threatening situation). Strategies such as using fewer overheads and more moving videos, interspersing "talking heads" with videos of sites, using hands-on experiments, incorporating text and graphic art, and other guidelines for effective video production are also valuable (see Willis, 1993, for a synopsis of distance education strategies).

Further it gives consideration to the theory of teaching offered by Holmberg (1986) in such items as student motivation, individual needs, promoting learning pleasure, rapport/climate, accessibility to course content, and the importance of communication between learner and distance educator. The theory takes into consideration some of the key constructs of distance education, such as dialogue/support, structure/specialized competence and general competence/self-directedness.

Finally, research suggests that the effectiveness of distance learning is based on preparation, the educators' understanding the needs of learners, and the instructors' understanding the targeted population and their instructional needs, rather than paying excessive attention to innovation and the delivery systems. Some critics argue that face-to-face instructional process has more credibility than distance education, due to the time students spend with instructors after lecture. Traditional classroom instructors sometimes deliver lectures without notes or instructional materials based strictly on the length of time allowed for teaching the course.

However, the administrator and instructor must actively work to ensure a quality distance learning program. In doing this, they must identify and resolve faculty development issues that might affect the success of the distance learning delivery process.

3.3.3.3 The Student Supports

Dede (1996: 12-13) states that "Access to data does not automatically expand students' knowledge; the availability of information does not intrinsically create an internal framework of ideas that the learner can use to interpret reality. While presentational approaches transmit material rapidly from source to student, often this content evaporates quickly from the learners's minds. To be motivated to master concepts and skills, students need to see the connection of what they are learning to the rest of their lives and to the mental models they already use".

Because all students do not learn at the same rate or respond effectively to the same styles of instruction, educators have for years called for tailoring educational methods to learner needs and abilities so as to deal with these differences. This ideal has not often been reached. Most teachers and universities have tended to provide a common program of instruction for all students with some enrichment for the fastest learners and some remedial attention for the slowest. Tracking students has also provided a crude form of individualization by allowing students of differing skills and interests to be grouped so that a common curriculum and instructional strategy can be developed for these groups.

Educational technology can make an important contribution to the ideal of tailoring education methods more closely to individual learner needs and abilities. It can provide additional special tutoring to those who need more time to master a subject area, both in and outside of school. It can create learning environments that engage large groups of students, freeing teachers for more intensive work with other small groups of students. It can provide enrichment and extended learning opportunities to students who have mastered the core subject area and are anxious to move on to more challenging material. Most important, technology can provide the instructional management systems to support individual student educational programs by allowing teachers to guide the student's learning activities and keep track of the student's mastery of the subject matter.

As active participants in the learning process, students affect the manner in which they deal with the material to be learned. Learners must have a sense of ownership of the learning goals (Savery & Duffy, 1995). They must be both willing and able to receive instructional messages. Salomon's study (as cited in Saettler, 1990), found that the mental effort which a learner will invest in a learning task depends on his own perception of two factors:

- ❖ The relevance of both the medium and the message which it contains
- ❖ His ability to make something meaningful out of the material presented.

3.3.3.4 The Service Supports

Support staff also plays an important role in the success of distance learning. An office should be created to support the instructor in his preparing instructional materials for the learner. Support staff can also play the role of a facilitator or a technical person who makes sure that the equipment is in working order.

Effective distance learning requires extensive preparation, as well as adapting traditional teaching strategies to a new learning environment, which often lacks visual cues. Porter (1994) speaks of the triad consisting of the student, the teacher, and the site facilitator, all of whom must function as a team. Students must quickly become aware of and comfortable with new patterns of communication, learn to manage their time, and take responsibility for their own learning. Teachers must enable students to establish contact with them, as well as interact among themselves. Site facilitators can act as the on-site "eyes" and "ears" of the teacher, stimulating interaction when distant students are hesitant to ask questions or participate in discussions.

Site facilitators, too, benefit from training programs which emphasize hands-on practice with the equipment they are expected to use. Sherry and Morse (1995) found that those who had participated in structured training programs felt comfortable using the equipment, were able to engage their students in the learning process, and had mastered classroom management in a high-tech classroom. Teachers and site facilitators need training in those technologies which they are expected to use (Sherry & Morse, 1995).

3.3.3.5 The Technological Supports

The rapid growth of computer and fax machine usage in educational institutions has increased long-distance communication between faculty and students (Mackwood, 1994). Students can now communicate with their instructors by the use of electronic mail and fax. New computers are manufactured to include audio/visual communication hardware and software packages. Mackwood also claimed that computers have become the preferred long-distance communication tool in distance education. A computer serves as a freestanding or networked workstation that provides tutoring to a student and can be structured to adapt to his or her responses. It can serve as a word processor or to support desktop publishing for reporting the work of students. Electronic mail (E-mail) or voice mail system can facilitate communications between parents and teachers or among students. The possibilities are endless.

Audio/visual equipment and technology tools such as multimedia computers, television, VCRs, laser disc players, telephones, digital cameras, LCD panels, QuickCam, and PC/MAC TV Converters have changed the instructional process in classrooms across the nation. Instructors and students who use these tools have better chances of teaching and learning effectively than those with less technology (Morse, 1991). Computer graphics, electronic print, multimedia software applications, presentation software applications, and electronic mail utilized in distance education make communications and learning easier (Verduin & Clark, 1991).

Teachers also need support in learning about new technology, regardless of their level of classroom experience. Administrators cannot expect teachers to feel comfortable with the technology, to use it effectively, and to maintain it as well, without giving them extra resources and time. Research suggests that distance education preparation should include faculty in-service training, staff support, and administration. Faculty in-service training should include hands-on experience for preparing tests, videos, and graphic instructional materials for the course. In-service training should include the use of technology in the classroom, such as telecommunications, and computing equipment. Training should also include techniques for managing distance learning and understanding the unique need of learners.

Table 3.3: Examples of the Use of Technology in Educational Supports

Type of Educational Activity	Examples of Technology Use
Support for individual learning activities	♦ Stand-alone drill and practice units for particular skills ♦ CD-ROM or Internet-accessed resource bases ♦ Assistance in searching for information ♦ Communication with experts ♦ Computational and writing tools (word processors and spreadsheets) ♦ Simulations that help visualize systems or mathematical or scientific concepts
Support for group learning activities	♦ E-mail supporting group communication ♦ Presentational software to allow group to collaborate on presentation ♦ Video to support presentation of community-based projects ♦ Communication allowing collaboration among universities for collection and analysis of data
Support for instructional management	♦ Integration of curriculum, standards, and assessments ♦ Management of student portfolios and exhibitions ♦ Support for development of individual student instructional plans or contracts
Communications	♦ Communication for remote locations (such as rural campuses) that permit access to expertise, resources, and improved learning environments ♦ Improved communication among students, teachers, and parents
Administrative functions	♦ Support for attendance, accountability functions, and other administrative activities

Computer networks on university campuses are making it possible for distance and traditional students to gain immediate access to the university's resource centers and the libraries. Developing capabilities to make effective use of technology is a major task for education policymakers.

3.4 DISTANCE LEARNING EFFECTIVENESS CRITERIA

Distance education programs could evaluate many criteria. This chapter attempts to synthesize the approaches to research on distance education and the important findings of authors such as Keegan and Rumble (1982), Rumble (1986), Keegan (1986), Holmberg (1989), Verduin and Clark (1991), and Gooler (1979). The detail of dominant criteria are described as following:

3.4.1 Greville Rumble's Outcomes of Distance Learning Effectiveness

Criteria for judging the success or failure of a particular system are evaluating the outcome. The evaluation of distance learning system effectiveness include (Greville Rumble, 1986):

- Opportunity for access to education and training
- Completion and drop-out rates (completion, persistence and graduation rates), the quality of output
- Cost-efficiency and cost-effectiveness

3.4.1.1 Opportunity for Access to Education and Training

It is clear that distance education, by its nature, provides opportunities available to many learners who cannot attend full-time or even part-time campus-based courses.

For the individual, these opportunities stem from the flexible, home- and work-place based nature of the teaching system. However, the emphasis on independent learning is not to everyone's taste, but for those who cannot attend regular courses, distance education may be the only option available. The evidence suggests that many thousands of learners have benefited from their participation in a distance taught course.

For employers, distance education has distinct advantages. It is flexible, and staff do not necessarily have to be released from work in order to participate in a course. The cost savings are a significant result.

For governments, distance education offers the possibility of teaching large numbers of students, rapidly, and relatively cheaply, compared to the costs of traditional forms of education.

The learning needs which can be met through distance education means are also varied, covering formal education courses at the primary, secondary, and tertiary level; vocational and professional education; and non-formal education. Knowledge, skills, and attitudes and beliefs can all be taught by distance means.

Distance learning is an extremely flexible method of teaching. It can be adapted to meet the needs of individual learners, groups of learners within a community setting, and very large populations of learners who, while remote from each other, are following a common course.

Therefore, the access to information is of special interest to education systems in rural areas of the nation. Distance education technologies can help rural schools overcome the disadvantages of geographic isolation by expanding course offerings and learning opportunities, and by connecting teachers (and students) with access to a broader range of resource materials (Barker and Hall: 1993). Bruce O. Barker (1987) states that high school or university administrators in sparsely populated rural areas are showing a great interest in interactive satellite instruction as a way to resolve teacher shortages and meet rigorous state graduation requirements (p. 6). He says that distance learning can achieve the following:

- Provide equity and increase the quality of educational opportunity;
- Provide access to subject matter experts / career role models that are not available in local communities;
- Provide interaction with students in other schools;
- Increase access to information / instructional resources;
- Offer opportunities for staff development / in-service training and;
- Increase school / community linkages (p. 7).

3.4.1.2 Completion and Drop-out Rates

Course completion usually implies success. Conversely, drop-outs are seen as a sign of failure. Hence completion and drop-out rates can be interpreted as a measure of the success of distance education systems. In fact, this is only partly true because many distance students choose to follow a course without planning to submit all the assignments or take the examination. Course completion is simply not a good way of measuring the personal achievement of individual learners.

In general, completion rates are fairly low in the distance education system. Shale (1982) found that half the students enrolled in Athabasca University in 1978 and 1979 fell into this category. Some institutions (e.g. the British Open University) effectively eliminate non-starters from their baseline by registering new students after they have completed two or three months' study. Such practices make direct comparisons between institutions difficult.

Once students embark on a course, success rates vary from system to system. For instance, some 85 per cent of National Technological University students pass the courses they take; 68 to 73 per cent of students on the National Extension College's Technician Training Scheme pass their course examinations; and from 60 to 90 per cent of each cohort taking the Indonesia Banking Development Institute's diploma for loan officers passed the diploma. In the case of the National Extension College, the pass rates on this scheme are slightly higher than those of students who have prepared for the same examinations (BTEC certificates) by traditional means.

Persistence-rates (Paul: 1990) measure the proportion of students who take another course or courses after successfully completing the first one(s). British Open University experience indicates that a significant proportion of undergraduate students (70 to 80 per cent) went on to study a course in the next academic year. However, a number of students dropout for a year, then resume studying.

Graduation rates measure the proportion of students who obtain the final qualifications to which a particular program leads. Graduation rates are usually lower than course completion rates, as students fail to take or pass later courses. Here again, this is the important qualification, which needs to be made in judging the success or failure of the institution.

Studies indicate that drop-outs are a multi-causal phenomenon (Woodley and Parlett, 1983). Students with higher previous educational qualifications tend to do better than those with poorer qualifications. Those who find it difficult to reconcile the conflicting demands of their jobs, family and studies tend to do less well, as do those who find it difficult to direct their own learning. On the other hand, it is too easy for educational institutions to accept low completion rates as a function of students' lack of motivation and ability. While motivated, highly intelligent students will learn even under the most adverse circumstances, provided they have access to satisfactory and appropriate learning materials, the majority of students need some degree of support with their studies. Dropouts can be reduced by:

- Providing excellent study materials;
- Providing proper advice to applicants before they embark on a course, and ensuring that individuals do not start courses which are inappropriate to their needs or for which they are still unprepared;
- Providing rapid, appropriate and effective advice and help to students once they are in the system, making sure that those experiencing study problems are helped to overcome them;
- Creating a climate which encourages students to seek advice and help from tutors, counselors, and each other, and which generates an atmosphere that is supportive and encourages continuing membership of a learning group or 'club' of learners, and thus maintains motivation and interest.

In order to increase the low completion rates, the educational institutions should motivate students by developing interesting, stimulating materials and improving the quality of the social interaction between students and those they interact with within the institution.

In general, distance-learning students take a longer time to graduate than students in traditional full-time courses. This is because large numbers of distance-taught students have jobs. Work-related reasons may be a major cause of dropouts (Phythian and Clements, 1982). Students who fail to progress regularly, year-to-year, and who become dormant for a time, are less likely to succeed than those who keep studying steadily.

3.4.1.3 Cost-efficiency and Cost-effectiveness

Cost effectiveness is not easily measured because it involves many variables, such as student fees, dropout rates, the quality of study materials, the size of the target populations, study progress, etc., while the costs per average student per unit of study are difficult to compare between different programs. Some argue that using communication technology requires too much capital investment, while others counter that technology is less expensive than conventional, labor-intensive methods. Most programs do not necessarily require high technology, and still remain cost-effective if they deliver effectively. In other word, cost-efficiency occurs when the cost-effectiveness is achieved in the educating.

3.4.2 The Knox's Learning outcomes

The new behavioral state (or end product of learning) is actually a goal or objective deemed important to acquire by the instructor or the student or both. Objectives or goals for instruction can be divided into three major areas: cognitive, affective, and psychomotor. Knox (1980) suggests that proficiency is a key construct and is actually the capability to perform effectively in a given situation. This capability usually depends on some combination of student knowledge (the cognitive domain), physical skills (the psychomotor domain), and attitude (the affective domain). Therefore, to enhance a student's proficiencies and capabilities, educators must place the three major domains at the center of instructional thinking and planning for students (Cranton: 1989).

These taxonomies, or category systems of the three domains focus on process and internalization and not subject matter or the content variable. In other words, these three systems are actually free of subject matter in that they can be applied to any subject. Their strength lies in the fact that they combine the factors present in each domain: logical, psychological, and educational, for the cognitive domain; attitudinal and internal for the affective domain; perceptual and motor skills for the psychomotor domain.

3.4.2.1 Cognitive domain: There is one category, knowledge, and five additional categories, skills and abilities to use knowledge (Bloom and others, 1956). The six categories are

1.0 Knowledge

1.10 Knowledge of Specifics

1.11 Knowledge of Terminology

1.12 Knowledge of Specific Facts

1.20 Knowledge of Ways and Means to deal with Specifics

1.21 Knowledge of Conventions

1.22 Knowledge of Trends and Sequences

1.23 Knowledge of Classifications and Categories

1.24 Knowledge of Criteria

1.25 Knowledge of Methodology

1.30 Knowledge of the Universals and Abstractions in a Field

1.31 Knowledge of Principles and Generalizations

1.32 Knowledge of Theories and Structures

2.0 Comprehension

2.10 Translation

2.20 Interpretation

2.30 Extrapolation

3.0 Application

4.0 Analysis

4.10 Analysis of Elements

4.20 Analysis of Relationships

4.30 Analysis of Organizational Principles

5.0 Synthesis

5.10 Production of a Unique Communication

5.20 Production of a Plan, or Proposed Set of Operations

5.30 Derivation of a Set of Abstract Relations

6.0 Evaluation

6.10 Judgments in Terms of Internal Evidence

6.20 Judgments in Terms of External Criteria

The first level of cognition is pure knowledge and deals with the simple knowing of a bit of information from low-level facts to complex theories. The next level is comprehension, indicating that the knowledge defined at the first level is understood by the student and this understanding can be shown in a number of cognitive tasks. After something is known and understood, it can be put to use. Application involves taking the understood and applying it to new situations. Analysis occurs when applied information is broken down into component parts through comparing, contrasting, or distinguishing and reviewing the information itself. Synthesis is the mental transformation of information into a new or different structure, design, pattern, or solution. Evaluation involves the making of a judgment or assessments of information based on some criteria specified beforehand. Thus, the hierarchy presents a continuum from simply knowing something to making precise personal judgments about information confronting the learner. Since it is hierarchical in nature, the lower level must be achieved before later levels are achieved.

3.4.2.2 Affective domain: The affective taxonomy (Krathwohl, Bloom, and Masia, 1964) works primarily with the change or inner growth of learners as they receive, adopt certain attitudes and principles that in turn form selected value judgments. These value judgments begin to have an impact on the learners' behavior. The learners will be characterized by a consistent behavior pattern or way of life upon complete internalization of the value system.

In this system, the formation of attitudes and ultimately the total behavioral characterization begins when an individual receives some external stimuli regarding some phenomenon. These stimuli are introduced in an instructional setting. The first level reflects an awareness of the stimuli. If the stimuli have some personal meaning, the learner will exhibit a willingness to receive them. If the stimuli continue to have meaning for the learner, the individual will give them selected attention. The next level after receiving is responding. The learner will possibly acquiesce in the form of a response, but if continuous meaning is present, the individual will express a willingness to respond and then satisfaction in that response to the phenomenon will occur.

The major levels of the affective domain follow:

1.0 Receiving (Attending)
    1.10 Awareness
    1.20 Willingness to Receive
    1.30 Controlled or Selected Attention
2.0 Responding
    2.10 Acquiescence in Responding
    2.20 Willingness to Respond
    2.30 Satisfaction in Responding
3.0 Valuing
    3.10 Acceptance of a Value
    3.20 Preference for a Value
    3.30 Commitment (Conviction)
4.0 Organization
    4.10 Conceptualization
    4.20 Organization of a Value System
5.0 Characterization by a Value or Value Complex
    5.10 Generalized Set
    5.20 Characterization

If the phenomenon under study takes on more personal meaning and gains in internal importance for the learner, he may begin to value it to some degree. The process of valuing has three steps: accepting the value, preferring the value, and actually having a commitment to the object or event under study because of the value.

Since many values confront learners in learning and other life situations, some ranking or prioritizing may occur. Some values simply are more important to people than others, and thus some conceptualizing and organizing of values into a value system will occur.

A value system develops as the learner's overt behavior begins to reflect some of the more important values held by that individual. This overt behavior is seen as the characterization of the learner, or the way the learner appears to operate consistently in many different situations. The total characterization of the individual is the consistent

overt behavioral state that is affective in nature and governs the individual's responses to a variety of situations in a generally consistent and coherent manner.

The affective domain is interesting and important, but complicated. It will be no easy task to move individuals to new attitudes and values in selected areas of study during the instructional process. Learners have had a long time to formulate their own values and value systems. Learners can gain new cognitive and psychomotor behaviors relatively quickly, but it takes time for them to experience change and inner growth in affective behaviors. The affective domain is omnipresent; stimuli are always present in a learning experience, and learners will react to them in some fashion. In a new learning situation, learners may be excited or discouraged by the subject matter or methodology. When learners are engaging in a cognitive or psychomotor learning experience, they are also going through mental processes that help to establish the value of the experiences. Since the affective stimuli are always presented in all learning experiences, so a close interrelationship of the behavioral domains exists, and it is very important to consider in learning situations.

3.4.2.3 Psychomotor domain: The psychomotor domain (physical skills) is the third major behavioral domain. A significant taxonomic system developed by Simpson (1972) can guide the thinking and activity of distance educators. The major components of this domain are:

1.0 Perception

1.10 Sensory stimulation

1.11 Auditory

1.12 Visual

1.13 Tactile

1.14 Taste

1.15 Smell

1.16 Kinesthetic

1.20 Cue selection

2.0 Set or Readiness

2.10 Mental

2.20 Physical

2.30 Emotional

3.0 Guided response

3.10 Imitation

3.20 Trial and error

4.0 Mechanism

5.0 Complex overt

5.10 Resolution of uncertainty

5.20 Automatic performance

6.0 Adaptation

7.0 Origination

The first step in the hierarchical process is the simple perception of objects, qualities and relations through the sense organs, and then, the learner decides what cue to respond to in order to satisfy the requirements of the task at hand. When perception is complete, the learner moves to step two – set or readiness – for a particular kind of action or experience. Set includes mental readiness, physical readiness or making anatomical adjustments, and emotional readiness where a favorable attitude towards the motor acts is taking place.

Guided response is the next level, the learner begins to make an overt behavioral move to learn the particular psychomotor activity, either under the guidance of an instructor or on the basis of a model or some criteria. A guided response could be carried out through imitation or by trial and error.

At the mechanism level, the learned response has become habitual. The learner has achieved a degree of confidence and proficiency in the performance of the act. The learned act is part of the behavior of the learner and can be used when various situations demand it.

The complex overt response enters with the development of more sophisticated psychomotor behavior. When the learner has attained a high degree of skill, the learner can perform without hesitating and form a mental picture of the task sequence to achieve resolution of uncertainty. Automatic performance is achieved when the learner performs a finely coordinated motor skill with a great deal of muscle control and ease.

Adaptation comes when the learner alters personal motor activities to meet the demands of new problem situations requiring a physical or motor skill. The ultimate psychomotor behavior, origination, comes into play when the learner can create new motor acts or ways of manipulating materials out of his abilities, understanding, and skills developed in the psychomotor domain.

The use of the three behavioral domains in distance education is manifold and lends a good level of sophistication to the entire instructional process. Since everything in the educational process is contingent upon goals, a precise goal statement in behavioral terms at whatever level will give a good indication of what the terminal behaviors (outcomes) of the instruction will be.

Since these three behavioral domains are so sophisticated and varied, depending upon the individual learning program, the criteria of the learning effectiveness are difficult to measure accurately and precisely. Therefore, this dissertation prefers to exploit the Gooler's seven criteria as explained in next section.

3.4.3 Gooler's Seven Criteria

Gooler (1979: 46-50) listed seven criteria, relevant to distance education programs. These criteria, or general program goals, set the stage for determining the effectiveness of a distance education effort. Other findings are also included to provide a wide range of evidence regarding the effectiveness of distance education for administration (e.g. acceptability).

Gooler's (1979) seven criteria[3] appear significant and useful in the evaluation process. Seven criteria include access, relevancy to needs and expectations, the quality of the program offered, learner outcomes, effectiveness and efficiency, impact, and generation of knowledge. These criteria encourage the development of the goals of distance education and they can be applied in summative evaluations to present a holistic picture of the program. Acceptability has been added besides Gooler's seven criteria.

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[3] John R. Verduin, Jr. and Thomas A. Clark (1991), *Distance Education: The Foundations of Effective Practice*, Jossey-Bass Publishers, San Francisco, U.S.A., pp. 186-193.

Eight criteria are described as follows:

- Access is the first criteria. Access may be easy to measure if registration for courses is required, but it will be difficult to measure in open learning situations, such as mass audience telecourses. Access is evaluated by assessing the participation of target populations, in which programs have been developed. The means to widen access have to be evaluated: promotion through mass media and other campaigns, availability of media needed for student participation and study centers, gauging the extent of geographic coverage. Access also involves climate of class participation. It requires that the students' study schedule not conflict with learners' work schedule or leisure time, and that the distance courses are appropriate to their interests or working job (Brey and Grigsby, 1984), Furthermore, this distance education has created employment, training people with critical skills needed to address important social needs (Holdampf, 1983). Learner background, telecommunication infrastructure, and the cost of access should be considered. Learner access to learning resources is often inequitable (Sullins and others, 1987). Whereas library systems require computer access and literacy use. Programs may focus on serving graduate or professional students or using high-technology methods to serve elite populations at home or at the center where rural and minority students study at low educational levels, which often cannot pay for their schooling. At-home access to distance education depends on the availability of particular media to a given target audience in a given area. The pervasiveness of television, radio, telephone, and audiocassette players all recommend the use of these media in distance education. Some new media, such as computer and videodisc, are not easily accessible to most students. In this research, access will examine all appropriate media for a given course, available to all students for their use at all times, the awareness of students in studying, and the class size and learning climate.

- Relevancy to needs and expectations are the most critical aspects of program evaluation. These involve the societal and individual factors that relate to employment, the needs of students and the need for market research. Some research involves the opinions on employment prospects, professional development, the specific degree offered, delivery modes, program and curriculum design (Curtis and Bakshi, 1984). While administrators at Athabasca University in Canada engaged in strategic planning and marketing, quality assurance, and accountability measures (Murgatroyd and Woudstra, 1989). The research will examine the needs and expectations of students related to their societal community expectations, knowledge and employment.
- Quality of program is a function of many factors. Since distance education relies heavily on self-study material so the quality of these learning materials is very important. To assess overall quality of the total educational experience of students and the impact on their lives is also important. Quality of learning materials, provision of education versus instruction, and the inter-subjectivity of learning at a distance are all criteria to measure quality of program (Keegan and Rumble, 1982). This research will examine the instruction, learning materials, involving the satisfaction with students' learning achievements.
- Learner outcomes in higher education have been researched intensively for many years. The numbers of graduates in relation to the numbers of students entering a course or program (the output/input ratio), and the amount of time students take to complete the studies, the repetition rates, and dropouts, all are important indicators of learning outcomes. These indicators should be carefully interpreted because the factors are complicated and misleading since some students just want to learn more about a subject and do not really care about getting course credit or a diploma. Finally, the time taken to complete a program could vary because of the differences in students' needs and goals. According to Gooler's, the criteria for all forms of positive learner outcome characterized as the result of the development of student talent, whether they are measured solely in terms of outcome or level of development, the student is taken into account as the value-added approach (affective skills).

Learner outcomes are recognized in three major skill areas: cognitive skills, psychomotor skills, and affective skills. These three skills are used to measure the students' educational effectiveness as a distance learning, as described more detail in this research.

- Effectiveness and efficiency are criteria used to measure the outcomes of distance education administration. Effectiveness is demonstrated that an organization is effective in the way that it produces outputs that are relevant to the needs and demands of its clients. If effectiveness is the extent to which real outputs match ideal or desired outputs, then efficiency refers to the cost of reaching these effective outputs (Rumble, 1986: 211). Keegan and Rumble (1986) list indicators of effectiveness and efficiency as cost effectiveness, cost efficiency, and cost benefits for distance education. Essentially, efficiency means nothing if desired output is not reached. In term of education, effectiveness is a measure of the extent to which outputs are meeting the needs and demands of students and society, while efficiency refers to the cost of achieving these outputs. Cost is an issue since administrators need to know the cost per average student per unit of study. Cost calculations are complicated since variations exist in the amount the student pays, dropout rates, the quality of the program, the kinds of media used, and the population reached (Verduin & Clark, 1991: 188). Because quality is difficult to evaluate, cost effectiveness is as well. Keegan and Rumble (1982) suggest measuring not only the quality of the output but the quality or value added to the students .
- Impact or overall success of the program is gauged in terms of outcomes relating to students, graduates, employers, other educational institutions, and society. Both monetary and non-monetary impacts can be assessed. The impact or success of a program should be based on long-term as well as short-term measures. Impact will not be measured in this research since the short-term and long-term evidences are complicated and require longitude measurement. Students' learning barriers will be examined instead.

- Generation of knowledge is an important consideration. Better understanding of the problems and issues in this field and new practices should result from research on current distance education programs. It behooves the professional administrators and evaluators to seek out new directions and ideas.
- Acceptability refers to the status or recognition afforded learning based on perceptions of its quality (Keegan, 1986). This broader term refers not only to status, or perceptions of educational quality on the part of those outside the institution, but also to attitudes toward specific distance education applications. Acceptability also refers to the degree of recognition towards distance education held by students, faculty, and administrators, whether or not they participate in the programs. Keegan and Rumble (1982) list the following indicators of status: a) acceptance of credits earned at the universities by other educational institutions when students transfer, b) acceptance of the degrees and diploma awarded as qualifying students to go on to higher-level studies, c) recognition of the awards by employers and community. Attitudes toward distance education also play a large role in status. The key to greater acceptability is to encourage the educator and administrator to become more knowledgeable and move toward some implementation activities.

Within these broad, general program goals, the educator should state sub-goals or objectives that are more precise and measurable, and that will give direction to program development activities. Program evaluation is a critical aspect of the administration of distance education. If this alternative form of education is to continue to grow and meet the needs of learners, educators must have evidence to its effectiveness. Program evaluation can move distance education from a trial-and-error effort to one with more sophistication (Verduin, 1980: 183).

3.5 EVALUATION PROCESS

Evaluation is the process of making judgments or applying values in a given situation (Verduin and Clark, 1991: 183). Evaluation is the collection of, analysis and interpretation of information about any aspect of an educational or training program. These works are part of the recognized process of judging its effectiveness, its efficiency and any other outcomes it may have (Thorpe: 1988)[4]. Evaluation and assessment often are interchangeable, and refer to different levels of investigation. Evaluation is concerned with the macro or holistic level of the learning event. It takes into account the context of learning and all the factors that go with it, whereas assessment can be seen as the measurement of student learning and is one of the elements that goes into the evaluation. Evaluation is used in every kind of formal education such as teacher evaluation, curriculum evaluation, materials evaluation, student evaluation, and organizational evaluation,

There are two distinct approaches to evaluation[5] (Crompton, 2000):

- The agricultural / botanical or scientific approach
- The social / anthropological or illuminative approach

The scientific approach is concerned with the measurement of the effects of specific variables against the resultant outcomes. It seeks to examine the achievement of stated goals in relation to a learner's pre-knowledge and skills. The approach is geared towards the measurement of the efficiency of the educational intervention as well as the effectiveness of the learning outcomes.

The illuminative approach on the other hand seeks to examine and explore the process of the educational intervention. The techniques are more qualitative and more subjective in nature as they call on personal judgments.

Although these approaches appear to be at either end of a continuum, it is possible to make use of both within the complexity of the educational research. It is common to use a mix of techniques from both approaches combined in an evaluation.

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[4] Mary Thorpe, *Handbook of Education Technology*,

[5] Philip Crompton, *Learning Technology Dissemination Initiative* (LTDI), 2000, http://www.icbl.hw.ac.uk/itdi /implementing-it/

3.6 THE PROPOSED MODEL FOR ANALYSIS

Successful distance education systems involve interaction between teachers and students, between students and the learning environment, and among students themselves, as well as active learning in the classroom. Interactivity takes many forms, not just limited to audio and video, nor solely to teacher-student interactions. The Office of Technology Assessment stresses the importance of interactivity that distance learning allows students to hear and perhaps see teachers, as well as allowing teachers to react to their students' comments and questions (US. Congress, 1988).

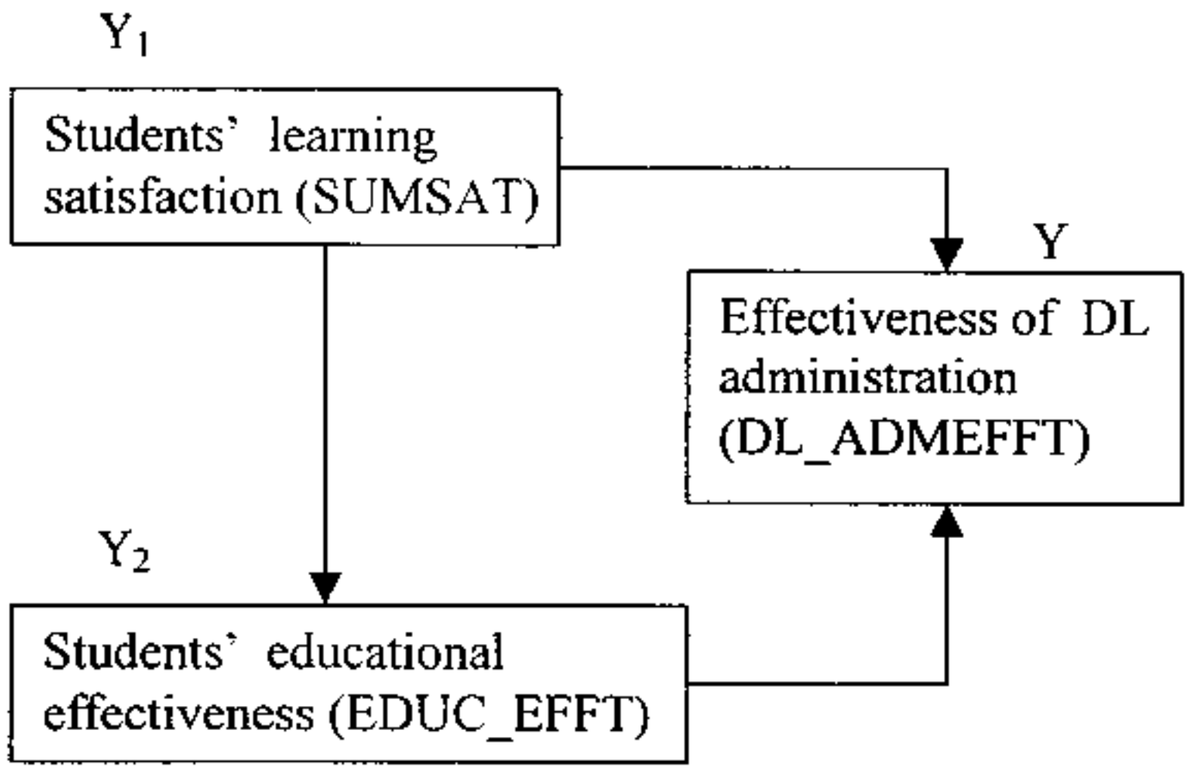

Figure 3.11: The integrated conceptual framework on the effectiveness of distance learning administration as the outcome

From the section 3.2, many approaches of systems theory that involve the input, process, output, and environment, are employed to construct the proposed model of the dissertation. This model is constructed under the concept of systems theory with the various influential factors. The integrated conceptual framework represents the two independent variable domains, as the outputs of distance learning effectiveness, those are students' learning satisfaction (SUMSAT) and students' educational effectiveness (EDUC_EFFT), influencing the dependent variable: the effectiveness of distance learning administration (DL_ADMEFFT) as the outcome of the study. This integrated conceptual framework is shown in figure 3.11

As mentioned, the conceptual framework is constructed under the systems theory concept. Thus, this framework composes of various influential factors such as academic and technological supports, information technology (IT) utilization, learning environment, and the bio-data of students.

The overall independent variable domains effect the two dimensions of dependent variables (SUMSAT and EDUC_EFFT), separating into students' learning satisfaction (SUMSAT) and students' educational effectiveness (EDUC_EFFT). These two dimensions of variables again influence directly and indirectly to the dependent variable: Effectiveness of Distance Learning Administration (DL_ADMEFFT) which is considered as the outcome, shown in figure 3.12.

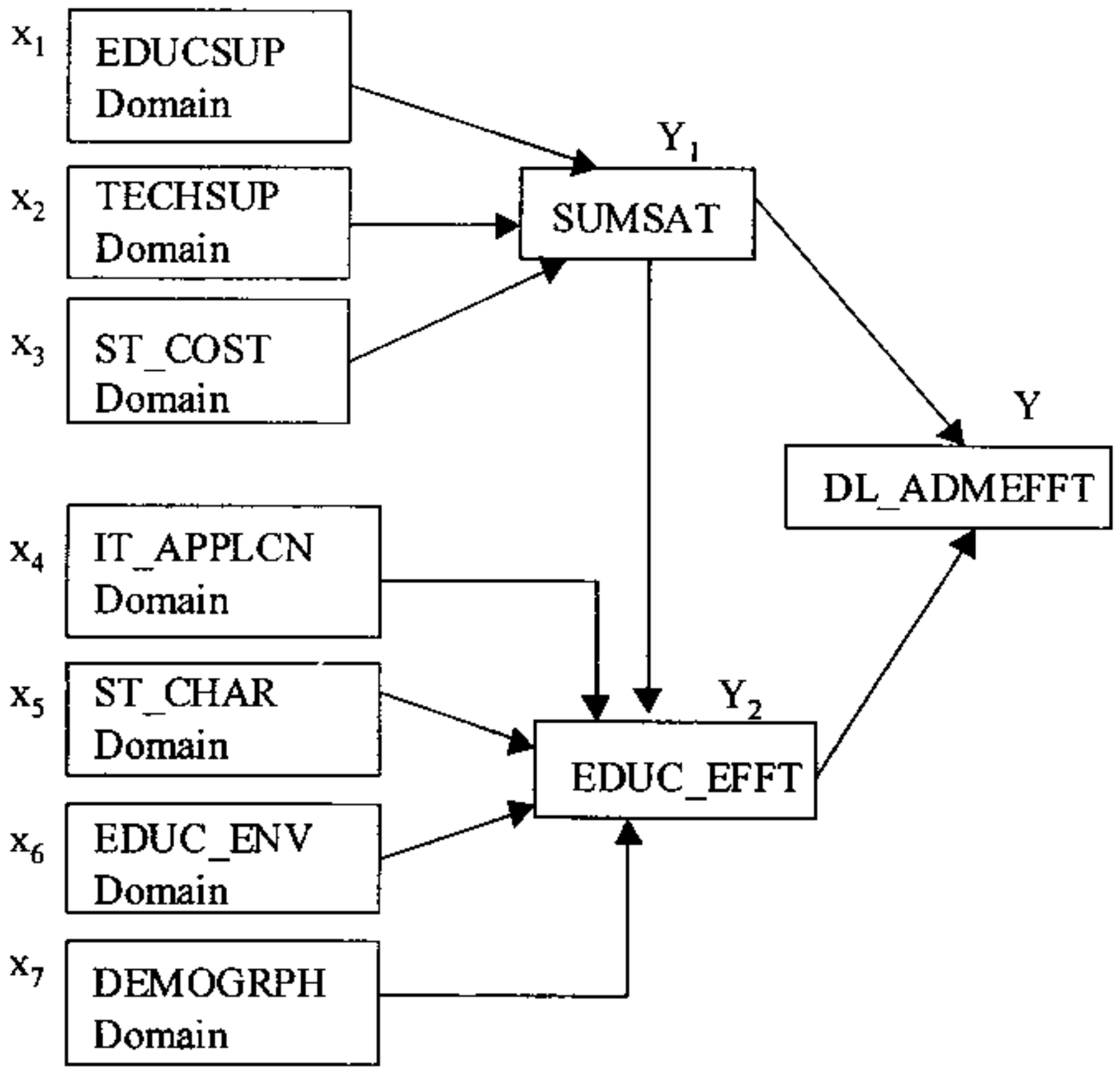

Figure 3.12: The influential domains of the conceptual framework

From the figure 3.12, there are three independent domains influence the dependent variable (SUMSAT) and four independent domains influence the dependent variable (EDUC_EFFT). The details of these seven independent domains will be described in the chapter 5.

3.6.1 Domains affecting Students' Learning Satisfaction

There are three domains affecting students' learning satisfaction. The independent variables are contained in three domains. These three domains are:

- EDUCSUP Domain refers to the students' educational supports. This domain represents the supports for education, including curriculum supports, faculty supports, student supports, and service and staff supports. These independent variables are the essential factors that support the education and influence the learning satisfaction.

- TECHSUP Domain refers to the students' technological supports. This domain includes instructional delivery modes, computer-mediated communication, human-computer interaction, and technological utilization. These independent variables are important factors that influence the distance educational system on the instructional design and delivery. Thus, the independent variables lead to the learning satisfaction.

- ST_COST Domain refers to the students' educational costs and time spent. This domain concerns the expense on study, time travel to study, and time spent on study and examination preparation. These independent variables can lead to decrease learning satisfaction.

According to figure 3.12, The overall conceptual framework composes of seven independent domains that affect two dependent sub-frames, namely students' learning satisfaction (SUMSAT) and students' educational effectiveness (EDUC_EFFT). These two sub-frames become the independent variables affecting the effectiveness of distance learning administration (DL _ADMEFFT) as the dependent variable.

The independent variables are the factors affecting the dependent variable: students' learning satisfaction (SUMSAT). The framework contains three independent domains as described, shown in figure 3.13 as follows:

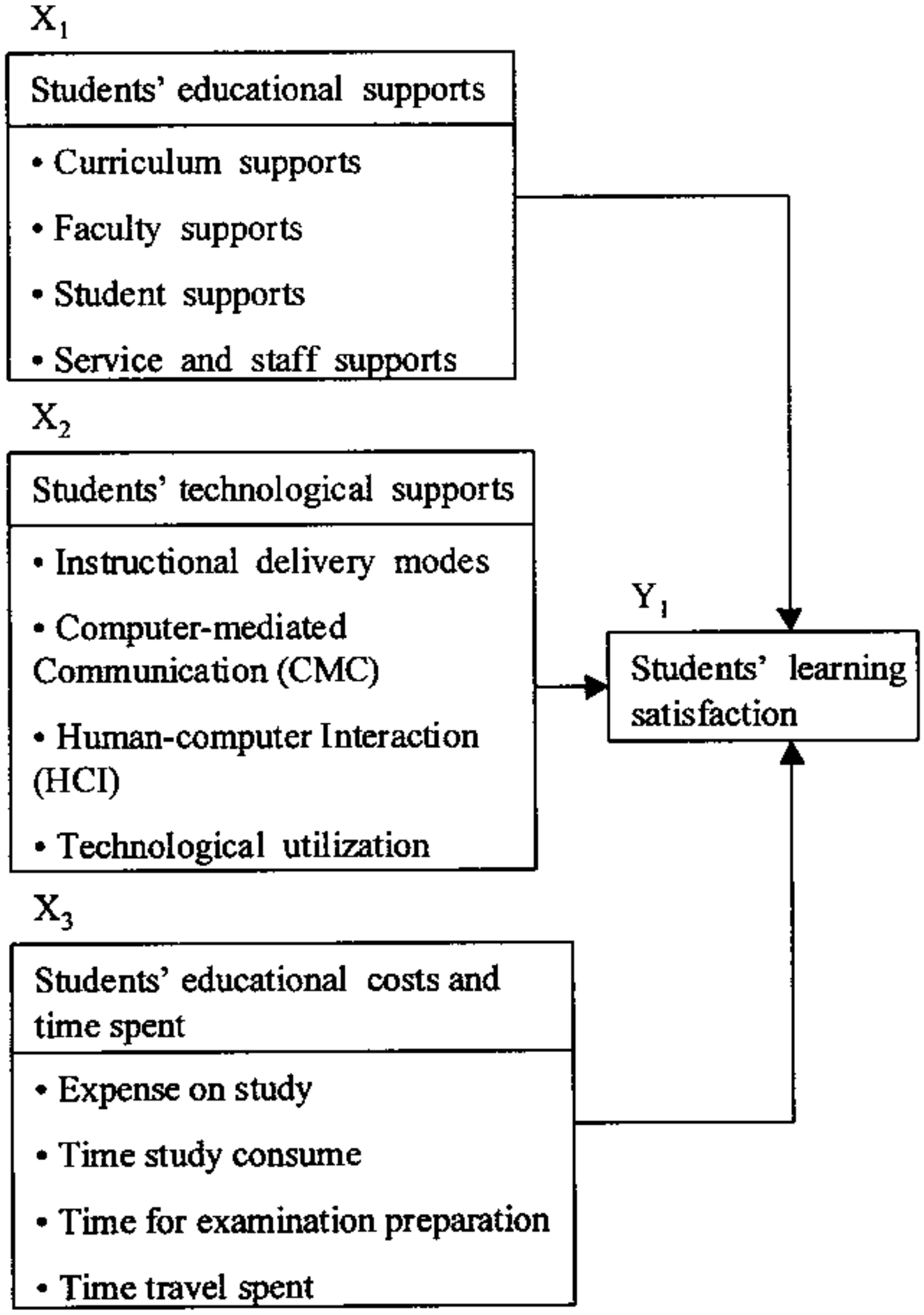

Figure 3.13: The framework of factors affecting students' learning satisfaction.

3.6.2 Domains affecting Students' Educational Effectiveness

There are four domains affecting students' educational effectiveness. These four domains are described as follow:

- IT_APPLCN Domain refers to the information technology (IT) application for education. It contains independent variables, indicating the ability and efficiency of technology for education. The factors involve educational accessibility, cost effectiveness, and technological efficiency. These independent variables lead to the educational effectiveness.

- ST_CHAR Domain refers to the students' characteristics. The independent variables are students' needs and learning barriers. These independent variables may lead to decrease the educational effectiveness.

- EDUC_ENV Domain refers to the students' educational environment. This domain includes learning climate, achievement orientation, students' expectation, learning evaluation, and context of instruction. These independent variables certainly affect the educational effectiveness at some degree.

- DEMOGRPH Domain refers to the students' personal information. The domain includes students' background and status such as age, revenue, number of dependent, grade point average, and number of re-examination. These independent variables may or may not affect the educational effectiveness.

The independent variables are the factors affecting the dependent variable: students' educational effectiveness (EDUC_EFFT). The framework contains four influential domains as described, shown in figure 3.14 as follows:

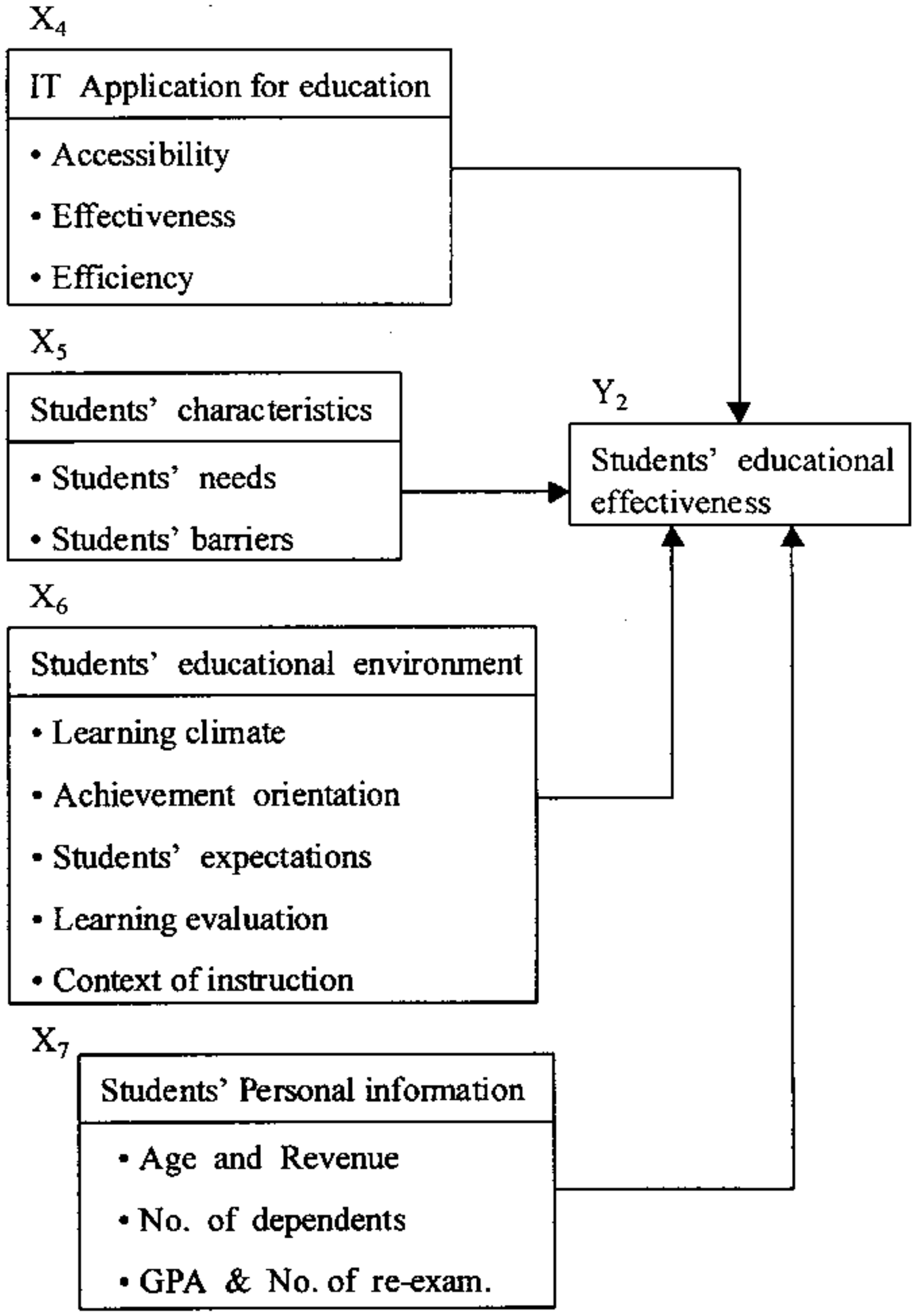

Figure 3.14: The framework of factors affecting students' educational effectiveness

The overall conceptual framework includes two sub-frames that affect the effectiveness of distance learning administration (DL_ADMEFFT), shown as follows:

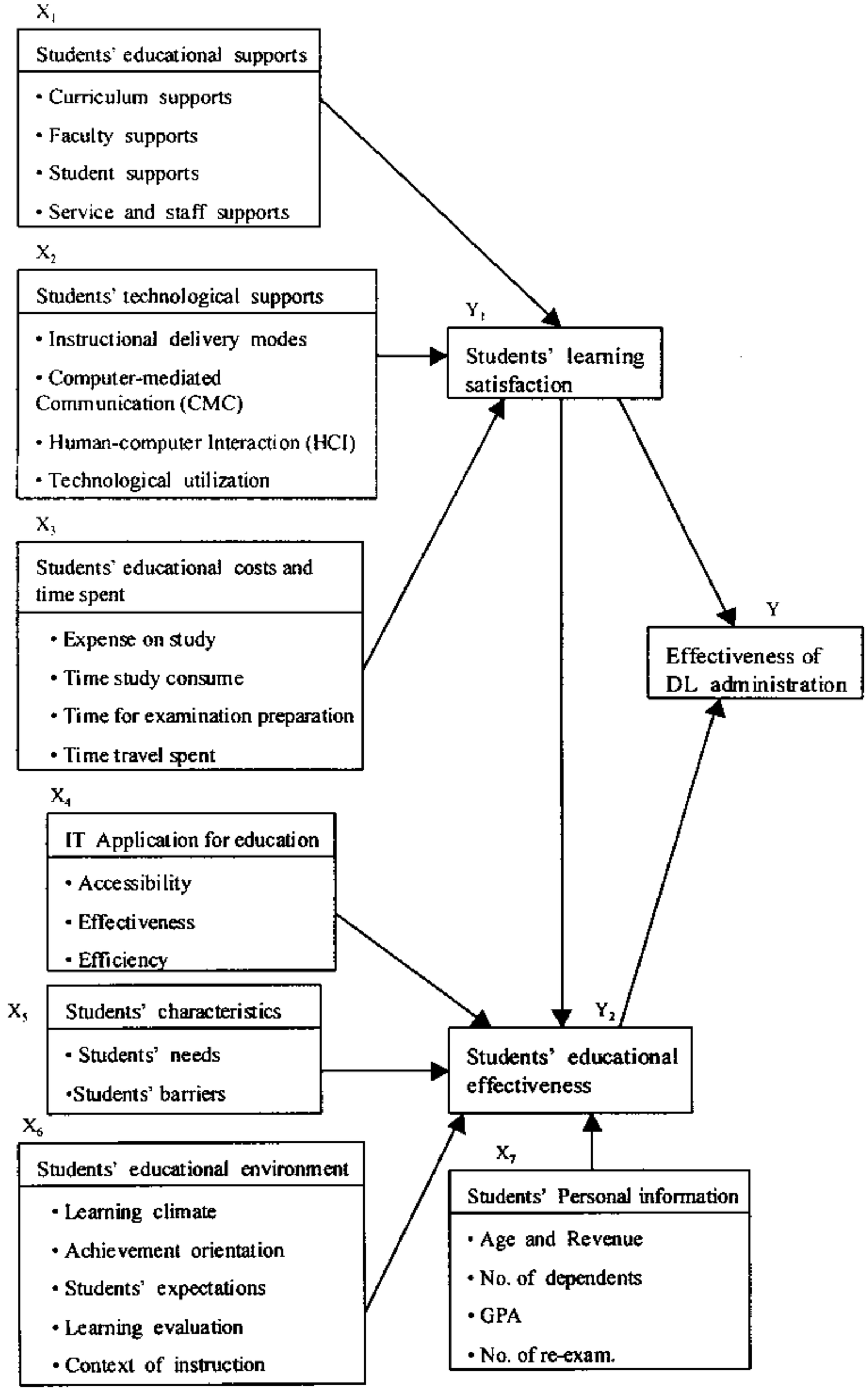

Figure 3.15: The overall conceptual framework of the effectiveness of DLA

3.7 HYPOTHESES OF THE STUDY

The research proposes to study the influential factors affecting the effectiveness of DL administration, and also study the causal relationship in the model with direction. The following hypotheses represent both RU and STOU studies at the undergraduate and graduate levels:

H1: Students' educational supports (curriculum, faculty, student, service and staff) lead to increasing the students' learning satisfaction.

H2: Students' technological supports (instructional delivery modes, CMC, HCI, and IT utilization) lead to increasing the students' learning satisfaction.

H3: Students' educational costs and time spent (study expense and time spent) lead to decreasing the students' learning satisfaction.

H4: IT applications to the distance learning administration (accessibility, effectiveness, and efficiency) leads to increasing the students' educational effectiveness.

H5: Students' needs or motivation lead to increasing the students' educational effectiveness.

H6: Students' barriers lead to decreasing the students' educational effectiveness.

H7: Students' educational environment (learning climate, achievement orientation, students' expectations, learning evaluation, and context of instruction) leads to increasing the students' educational effectiveness.

3.8 CONCLUSION

Education is experiencing a shift from formal, centralized, and segmented operations to increasingly complex, decentralized, and integrated levels of organization. Cross (1987) stated that education continues to expand and share resources. The increased interest in distance education and other non-traditional forms of education is a manifestation of greater differentiation within the educational sector.

The natural progression toward increased system-ness will require a sharing of information and channels of communication to maintain the coordination of functions and the integration of subsystems (control). In education, the complement to the information society is the learning society. Lifelong learning is becoming necessity if people are to keep up with the information explosion. The control revolution in education is a result of the increased use of communication technology to provide extended access to education and support for learning. Increased access to information and knowledge through the use of communications technology in education offers the promise of greater control for all individuals in their learning activities and in their lives.

In recent years, researchers have studied the effectiveness of distance learning and its delivery methods. Willis (1994) contended that researchers have attempted to study distance learning effectiveness by exploring such variables as student demographics, motivation, attrition, cognitive style, gender, and achievement. Eiserman and Williams (1987) conducted a study exploring the comparative effectiveness of distance and traditionally delivered instruction, which also agreed with Willis's variables. In the study, they concluded that distance-delivered instruction could be as effective as traditional instruction, if the delivery methods were based on the background and experience level of the students. The content examples should be relevant to individual learners' experiential and cultural background. In a similar study by Omoregie & Jackson (1996), variables such as age, gender, environment, educational level, experience, computer usage, graphic presentations, and video presentations were used to determine the effectiveness of a distance learning course.

The study also revealed that learner environment and lifetime experience had an important role in the planning and organization of an effective distance learning delivery system.

Distance teaching is defined as the "family of instructional methods" in which the teaching behaviors are executed apart from learning behaviors, including those that are in a contiguous situation that would be performed in the learner's presence. Therefore, the communication between the teacher and the learner must be facilitated by print, electronic, mechanical or other devices (Moore, 1973: 664). This definition suggests that a "family of instructional methods" is appropriate to distance education.

The term 'distance education' covers both teaching at a distance and learning at a distance. Teaching at a distance refers to course design and student support activities, whereas learning at a distance describes learning activities that occur far from the teaching institution or the teacher. The communications between learners and teachers in distance education must be provided by technologies where there is a wide variety available. They include broadcast radio and television; audio- and videotapes; interactive audio and video teleconferencing; various computer and Internet technologies, and print technologies.

In this chapter, we can see that communication is oriented to the future. It involves exchange, implies participation and adaptation, and includes sharing. For this reason, teaching involves the very essence of the communication process, and the communication process involves teaching. So sharing and influencing, teaching and learning, are about the communication involved.

The role of information technology (IT) in the constructivist-learning environment (as Mayer (1999) described in section 3.3.1) is as a means of communication and also as a tool for learning. The role of the learner in relation to information technology can be as a user of the technology or as a producer of technology or media for others to use. Different roles can be discerned for information technology, depending on the role of the learner. Thus, the use of information technologies in education has allowed diverse learning needs to be met and new methodologies for using information systems are now possible. With this challenge, it ensures that the most appropriate forms of information technology (IT) are used to support the diverse learning needs in an on-line environment.

Hence, information technology (IT) can be both the medium for communication and the subject of learning itself. It has reshaped learning environments from preschool to university and challenges our approaches to teaching and learning at distance.

As mentioned in this chapter, the approach and organization of educational technology has many associations with systems theory. The systems approach takes a holistic view of the complex transaction involving various educational supports. Whereas self-correcting or feedback mechanisms are built in and therefore, communication and control are essential features of the system design.

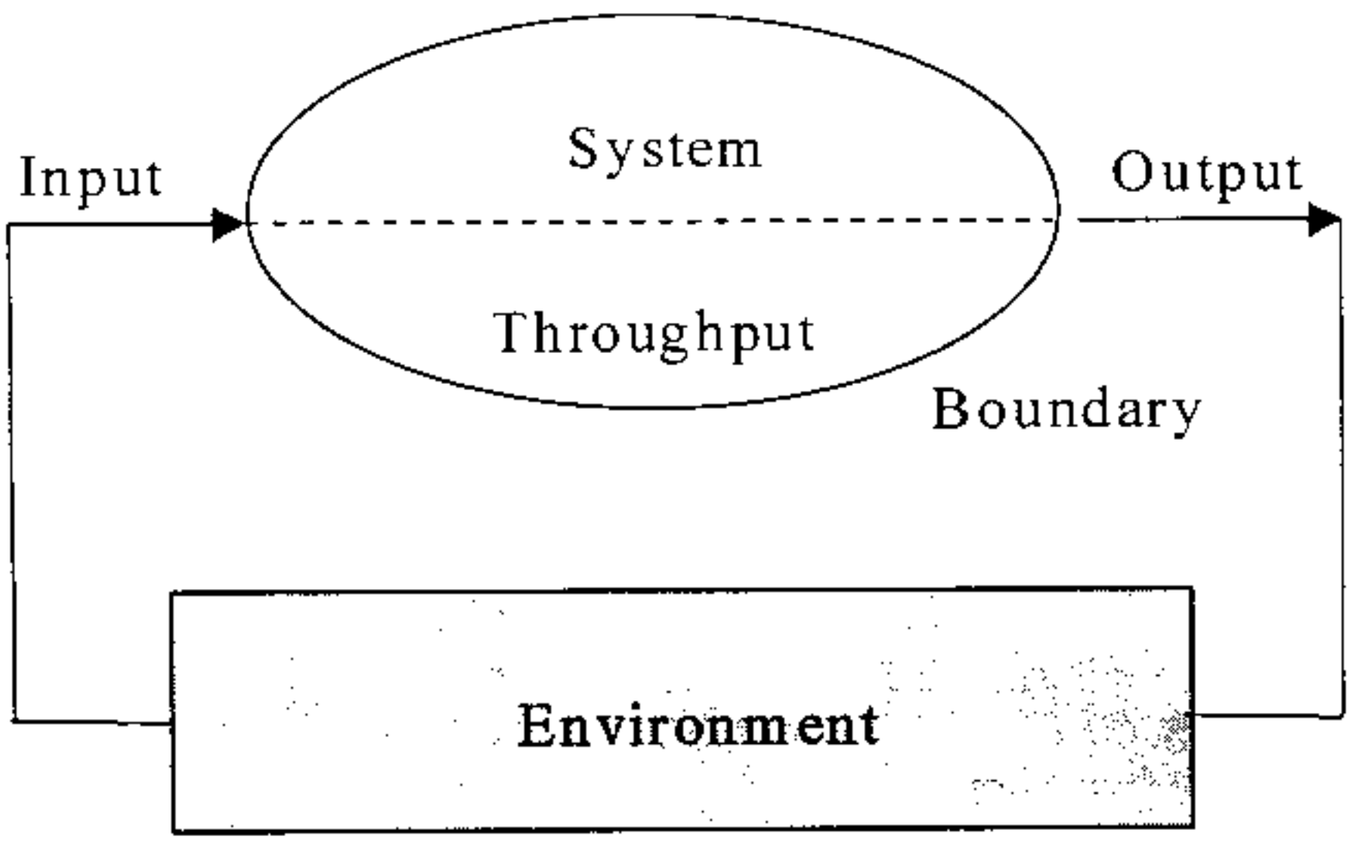

Figure 3.16: System in interaction with its environment

Source: Principia Cybernetica Project, *Systems Theory*, Department of Medical Cybernetics and AI, University of Vienna, Austria.

The peculiarity of open systems is that they interact with other systems outside of themselves. This interaction has two components: input, what enters the system from the outside, and output, what leaves the system for the environment. System and environment are in general separated by a boundary. The transformation of input into output by the system is usually throughput. Figure 3.16 shows all the basic components of a system theory.

The educational transaction is seen as a communication process, where two-way communication between teacher and student represents the most basic element of the educational transaction. The educational transaction can be seen as the interaction in the systems theory and the mutual interactions of the component systems need to design new educational paradigm in order to capture the capabilities of all existing communications technology. The interactions in the systems theory are demonstrated at figure 3.17[6] below:

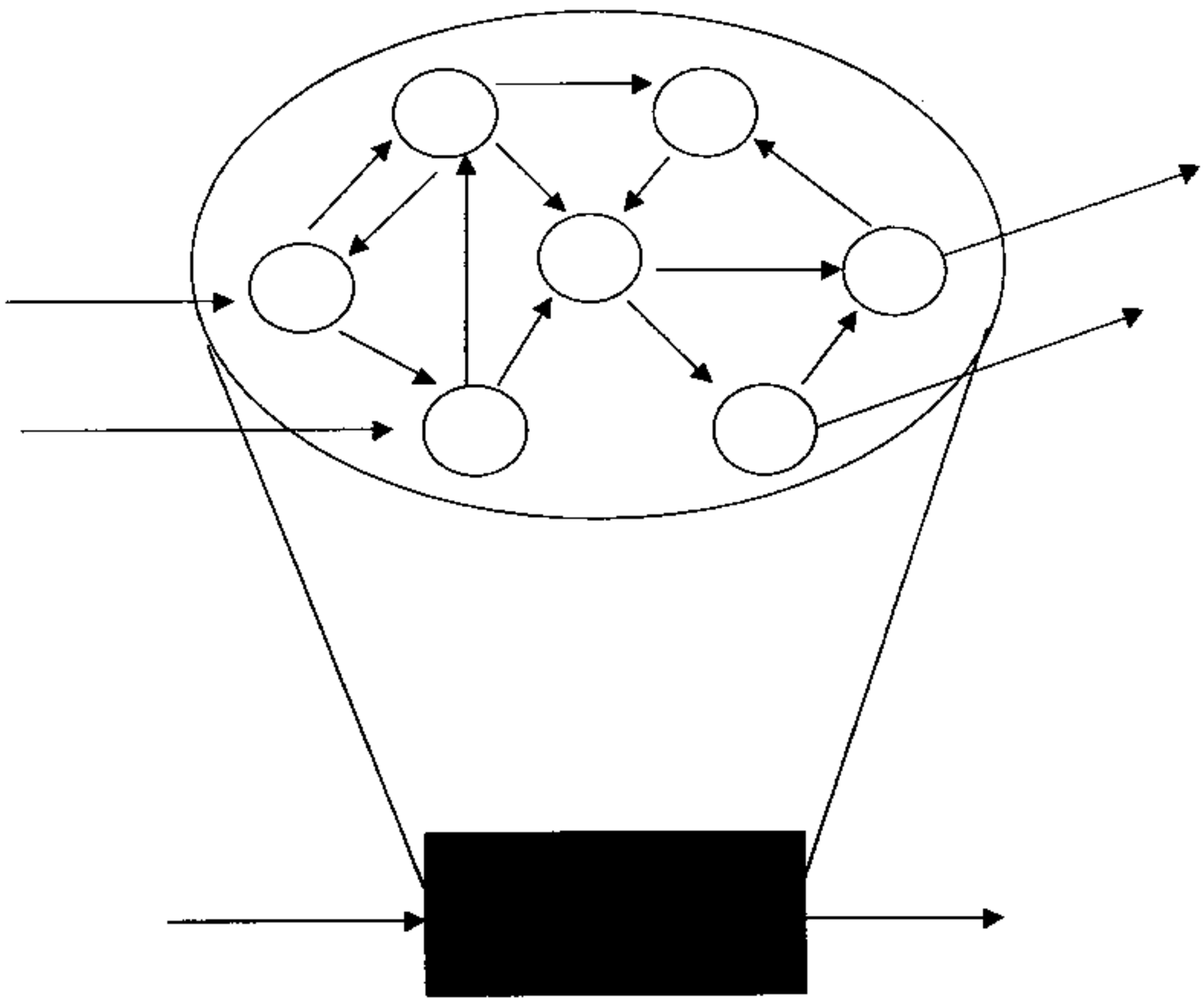

Figure 3.17: Systems as a "white box", containing a collection of interacting subsystems and as a "black box", without observable components

The mutual interactions of the component systems glue together into a whole, the parts are seen as subsystems. The system contains the "white" box with the clear interaction and the "black" box with the unseen interaction components.

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[6] Principia Cybernetica Project, *Systems Theory*, Department of Medical Cybernetics and AI, University of Vienna, Austria.

With respect to the parts, the whole is seen as a supersystem. If we look at the supersystem as a whole, we can again just look at its total input and total output without worrying which part of the input goes to which subsystem. This point of view considers the system as a "black box", something that takes in input, and produces output, without us being able to see what happens in between. The transmission and process of the information technology (IT) in the distance education system is an example of "black" box. In contrast, if we can see the system's internal processes, we might call it a "white box". The teaching and learning interaction is an example of "white" box where teacher and learner can discuss each other interactively by either at synchronous or asynchronous modes.

These two complementary views, "black" and "white", of the same system illustrate a general principle where systems are structured hierarchically. They consist of different levels. At the higher level, we get a more abstract, encompassing view of the whole, without attention to the details of the components or parts. At the lower level, we see a multitude of interacting parts but without understanding how they are organized to form a whole.

Communication is the interface between teaching and learning. Technology represents the interface between structure (e.g. organization) and process. Thus, educational technology is the science of integrating structure and process. The importance of educational technology in distance education is not only to recognize the necessity of technological structure for mediated communication, but also maintain an appropriate balance between it and the process or transaction of the educational phenomena. In other words, education is a socially recognized activity that is realized through interaction – not independence.

The conceptual framework of this dissertation employed the systems concept to describe the input elements (instructional design, technology, and supports), process of instructional delivery which includes the efficiency of technology, and output that represents the learning satisfaction and the educational effectiveness of students. However, the effectiveness of distance learning administration is the outcome which contains the students' learning satisfaction and students' educational effectiveness as the influential components.

CHAPTER 4

RAMKHAMHAENG UNIVERSITY (RU) AND SUKHOTHAI THAMMATHIRAT OPEN UNIVERSITY (STOU)

This chapter presents the history and the educational strategies of Ramkhamhaeng University (RU) and Sukhothai Thammathirat Open University (STOU) - in terms of distance learning and open learning system characteristics, media and instructional delivery modes, and academic and technological supports. Since there is no unique way of organizing and providing for distance education, we turn our attention to the concept of open learning systems and a provision of flexibility. The chapter also includes a history of knowledge, the various meanings of open learning and distance education systems and perspectives, and typology of institutions.

4.1 HISTORY OF KNOWLEDGE

The traditional approach to education, stemming from the Greeks, has assumed that education is about the transmission of knowledge from one generation to its successors with growth in knowledge accompanying continuing education. Because education has been equated with knowledge, so has it almost been taken for granted that curriculum content is synonymous with knowledge, and curriculum content is always wider than the cognitive dimension alone.

The concept of knowledge has occupied the minds of philosophers throughout the history of the discipline. The English philosopher Hirst (1974: 33) suggested that "knowledge is achieved when the mind attains its own satisfaction or good by corresponding to objective reality" and he states, in the same paper (pp. 40-41), that man has objectified conceptual schema over millennia so that forms of human knowledge have been achieved.

It is significant that Hirst utilizes the idea of objectification, whereas Paterson (1979: 69) regards knowledge as objective and that all adult education is about the expansion of individual knowledge that is the acquisition of objective knowledge. While Hirst uses the term objectification, he actually appears to treat knowledge as if it is objective and he suggests seven kinds of knowledge: mathematics, the physical sciences, the human (social) sciences, history, religion, literature and the fine arts, and philosophy.

Knowledge is not a static entity; it is constantly growing and changing. Scheler (1980: 76) also suggested that there are seven categories of knowledge: myth and legend, knowledge implicit in natural language, religious knowledge, mystical knowledge, philosophical-metaphysical knowledge, positive knowledge of mathematics and the natural sciences, and technological knowledge. The latter types of knowledge are regarded as artificial since they change "from hour to hour". However, rapidly changing knowledge has a profound effect upon curriculum content especially in relation to the expansion of professional continuing education.[1]

4.2 OPEN LEARNING SYSTEM

Open learning systems are not equivalent to Open Universities or to distance education. Distance learning systems are largely concerned with reducing geographical barriers. On the other hand open learning systems are concerned with reducing geographical, socioeconomic and psychological barriers. Openness refers not only to maximizing access to education in terms of time and place, but also to supporting the learning process through choice of method and mode of communication.

Open learning systems will mostly benefit the majority of adult learners who are seen as self-directed, such systems will also benefit informal and formal methods of organizing the educational transaction. An open learning system suggests a creative mix of distance and conventional methods. In short, open learning systems represent the means of achieving a fully integrated form of 'living and learning'.

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[1] P. Jarvis, "Content, Purpose, and Practice" in *Lifelong Education for Adults: An International Handbook*, U.S.A. pp. 22-28.

Open learning systems provide a full range of support relationships, depending upon content requirements, individual learning needs, and situational constraints. Thus, the open learning system is a conscious, rational approach to increasing diversity and choice in learning and education, with regard to both access and support, while maintaining a coordinated interrelationship among its subsystems, such that it serves society as a well functioning totality.

4.2.1 Meanings of Open Learning

Dr. Samuel B. Gould (1971), Chancellor Emeritus of the State University of New York, defines open learning as the working criteria within areas of education:

- Students catered to at the present time for some reason or other (e.g. remoteness, disadvantage, handicapped, etc)
- Courses are outside full-time formal education, but related to some important national purpose and having a substantial following.
- Learning systems having some element of 'newness' whether in curriculum, organization, course development and delivery, assessment or support (as group study).
- Attainment leading to some recognized qualification.
- Efficacy: attempting some form of assessment beyond the gaining of a bachelor degree or certificate.

The National Association of Educational Broadcasters in 1974 (The professional association linking all educational broadcasting practitioners in the United States of America) published a report on Open Learning systems. This aimed to look ahead, to see in what direction Open Learning might be expected to go.

The NAEB report identified the following essential characteristics of open learning systems as follows:

- The system must guide a student by eliciting, interpreting and analyzing goals at the beginning and throughout the student's contact with the program of instruction.

- The system must formulate learning objectives in such a way that they serve as the basis for making decisions in instructional design, including evaluation, and in such a way so that they will be fully known, accepted and capable of modification by students.
- The system must facilitate the participation of learners without imposing traditional academic entry requirements, without the pursuit of an academic degree or other certification as the exclusive reward.
- To provide the flexibility required to satisfy a variety of individual needs, the system should make it operationally possible to employ sound, television, film and print as options for mediating learning experiences.
- The system should use testing and evaluation principally to diagnose and analyze the extent in which specified learning objectives have been accomplished. In other words, the system should be competence-based.
- The system must be able to accommodate distance between the instructional staff resources and the learner, employing the distance as a positive element in the development of independence in learning.

In the main text, the report states that open education is not a variant form of traditional education but the opposite of it. However, a concept has many traditional features. The NAEB report drew much of its inspiration from a different source; the thinking and experimentation had been exploring 'non-traditional' forms of education in the United States since 1960.

Non-traditional study is more an attitude than a system and thus can never be defined. This attitude puts the students first and the institution second, concentrating more on the formers' need than the latter's convenience. It encourages diversity of individual opportunity rather than uniform prescription, and de-emphasizes time, space, and even course requirements in favor of competence and performance. It has concern for the learner in enriching life through constant, periodic or occasional study. This attitude[2] can stimulate exciting and high-quality educational progress and can also lessen academic rigor and even to charlatanism.[3]

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[2] Commission on Non-Traditional Study, *University by Design*, p.15 San Francisco, Calif. Jossey-Bass, 1973.

4.2.2 Open Learning instructional delivery

The material to be conveyed inside an open learning system involves either physical transfer – the postal services or substitutes – or the communications media. There are several distinguishable characteristics in correspondence education in different parts of the world. Basically, it is taken to denote teaching using written materials. "Teaching by mail", which is a common synonym for correspondence education., refers to the fact that the teaching and learning system has relied on postal communications. The texts used in correspondence education are so-called self-instructional texts. For the postal service to be satisfactory for open learning, it must satisfy five criteria:

1. Universality: It must reach everybody enrolled.
2. Reliability: It must never fail.
3. Uniformity: The delivery times must be uniform.
4. Speed: It must be swift enough to ensure that the student receives back his tutor's comments in time to affect his future work.
5. Cost: The cost to the student must not cripple him.

Failure at any one of these points can limit the 'reach' of the system and reduce the effectiveness of the work of tutors. When the postal services are underdeveloped or erratic, substitutes involving combinations of rail, road and bicycle transport, can be devised.

The material is conveyed in the outward direction will be the bulk of the printed course material, sent well in advance. There will be the student's work, in inward direction, to be sent to the point in the system where it is to be marked and assessed.

When media other than those involving print grew in importance in education, the concept of correspondence education was broadened and diversified. The explosion of technology in education, particularly broadcasting and other types of inexpensive teaching and learning aids, affected correspondence education profoundly. Nevertheless, it should be noted here that whether correspondence courses are offered in written, televised or taped form, the two-way channel of communication between student and instructor remains always one of its essential elements.

The teaching methods as seminars (a group critiques and comments on a prepared paper or presentation) or case studies (group exchange ideas on how to explain or deal with a problem situation) are traditionally implemented in small or medium-sized groups, led by skilled and experienced 'facilitators'. Much of the success of these teaching methods is ascribed to the facilitators and the skill with which they focus discussion, guide the approaches adopted by the participants, use the natural group dynamics to stimulate interest, encourage participation and deep involvement, pull together what has been learned in the final debriefing discussion, and so on.

Table 4.1 compares the different characteristics of instruction and conversation with various paradigms.

Table 4.1: Instruction vs. Conversation

Paradigm	"Instruction"	"Conversation"
OBJECTIVES: (OUTPUT) (why ?)	specific pre-defined products standard	general negotiable processes variable
MESSAGES: (INPUT) (what?) (when?) (who?) (whom?)	designed pre-prepared instructor one-to-many	created on-line participants many-to-many
INTERACTION: (PROCESS) (focus) (analysis) (feedback) (complexity)	behaviors criterion-ref corrective one-layer thick	ideas contents/structure constructive interwoven layers
DISTANCE EDUCATION: (example)	Correspondence courses	Teleconferencing Videoconferencing
	Computer-mediated Communication (CMC)	

Source: Alexander J. Romiszowski, 1990. "Use of Hypermedia and Telecommunications for Distance Education", in *Open and Distance Learning Today* (1995).

To start with the theory, it may help to compare and contrast two alternative paradigms for teaching: the instructional and the conversational paradigms. These are summarized in tabular form in table 4.1

- ❖ The instructional paradigm is the one that has driven much of the research and development of the past thirty years, under the label of educational (or instructional) technology.
- ❖ The conversational paradigm may be seen as the basis of much of the work done on small group work; group dynamics; experiential learning.

The effective implementation of group discussion, or "conversational", methodologies on electronic telecommunications networks focuses on the fairly developed technology of the design, development and delivery of self-study material in different (including electronic) media.

In relation to distance teaching specifically, one may note at the bottom of table 4.1 that the conventional correspondence course model may serve as a good example of the instructional paradigm. Teleconferencing, both audio- and video-based, is on the other hand a good example of the conversational paradigm in action. So is computer-conferencing, as it is most commonly practiced. Computer-Mediated Communication (CMC) is, however, able to support both conversational and instructional procedures. This 'versatility' of CMC is a potential advantage as asynchronous communication. It has the ability to attract more and richer comments and contributions from students, a permanent record of study, including student comments and annotations, non-linear study, random access and so on.

Nevertheless, personal contacts between student and teacher, and between student and student are accepted elements at all levels of education that the need for them in open learning systems is liable to go unexamined. Particularly in large distance learning systems, this necessity must be carefully considered because providing such contact is organizationally complicated and costly. The telephone offers a form of effective personal contact that links an individual student to the local tutor or counselor.

4.3 DISTANCE EDUCATION SYSTEM

The transformation of correspondence education into distance education was the realization of the Open University in 1971. The success of the Open University has generated increased interest in distance education and marked the beginning of a new era, in which degree-giving distance-teaching universities, with full degree programs, sophisticated courses, new media and systematic systems evaluation crop up in various parts of the world and confer prestige on distance education (Holmberg, 1986: 29).

Correspondence education has existed in many countries and had been used to deliver virtually any subject, but 'the prestige of correspondence education was never commensurate with its beneficial impact on individuals and society' (Daniel & Stroud, 1981: 146).

Instruction at a distance characterizes the phenomenon by pointing at a difference from face-to-face education; the apartness of teacher and learner. It stresses the physical distance between them, which does not allow direct interaction (Holmberg, Borje: 1991, 50). A number of different designations of "distance education" in various languages, are offered in the following meanings:

- Correspondence study, the concept of the teacher and the learners, who send letters instead of talking to each other, was in the foreground. The most important association attached to this designation is the teacher who instructs by writing and the student who learns by reading. This popularized a new teaching and learning behavior.
- Open learning is opposite to the "closeness" of learning in traditional schools. It stresses that access to this kind of learning is easier (open access) and that the students are allowed to operate with a degree of autonomy and self-direction. This does not refer only to decisions with regard to the place, time, duration and circumstances of their learning but in some cases also with regard to the curriculum as the students are free to select from pre-planned curricula or to develop curricula of their own.

- Home study suggests that the teaching and learning does not take place in the class or lecture room but at home. It generates pleasant feelings connected to one's home; privacy, familiarity, coziness – as opposed to the often unpleasant experiences at schools or colleges; publicity, the necessity to deal with many (unknown or not well-known) persons, the uncomfortable rooms, the impersonality.
- Self-study refers to a highly valued learning behavior of advanced higher education. The term minimizes the difference between distance education and teaching and learning at a university. As it is the tacit goal of higher education to produce scholars who work independently and mainly self-study by themselves. Much of post-graduate work is done in this way with only occasional guidance by a professor. Thus, distance education is interpreted as being this particular kind of work.
- Distance education is distinguished from conventional teaching and learning in the sense of physical separation. The interaction between teacher and learner is one of physical, geographical separation. Keegan (1986: 49-50) identifies seven principal characteristics, regarded as essential for any comprehensive definitions:
  - The separation of teacher and student
  - The influence of an educational organization
  - The use of technical media
  - The provision of two-way communication
  - The absence of group learning, with students taught largely as individuals
  - Participation in the most industrialized form of education
  - The privatization of learning (learning occurs away from the group)
- Study without leaving production concentrated the possibility that students can study with continuing their work. It shows how much work in the production is valued and how much the products of the working force are needed. This designation is, indeed, telling. It is easy to see that this designation was coined in a socialistic country namely USSR. There is no other designation for distance study which points to its economic advantage so bluntly.

4.4 DISTANCE LEARNING vs. OPEN UNIVERSITY

The terms "distance education" and "open learning" have been used with a variety of different meanings. "Distance education" has referred to the educational process where a significant proportion of the teaching is conducted by someone, removed in space or time from the learner; and where programs use a combination of educational media varying from print to audio to TV broadcasts, video recordings and computers and microprocessors. Opportunities for face-to-face study as well as learning from recorded materials are included. The strength of distance education programs is the rich and often changing mix of media and meeting.

"Open learning" has referred to the process of making learning readily available to learners regardless of situation or station. In some countries "open learning" is synonymous with the use of distance education methods to reach and educate learners. In other countries a mixture of methods, including chalk and talk, and face-to-face learning experiences, are used to educate the masses.

In the context of "open" universities, "open" implies usage of distance learning techniques to convey lessons to students in the distance. The term "open university" means universities, which teach distance students using currently available distance education techniques and media. In some countries such as the U.K. and Israel, the word "open" is used to mean "open" access to the university. Access universities do not have any matriculation prerequisites where everyone can register to be a student.

4.4.1 Open University Perspectives

In the developed countries, Open universities have been found to satisfy the educational needs of disadvantaged people, those for whom it is difficult to leave home, for example, handicapped people, prisoners, and women who work in the home. In many countries such as Australia, Canada, and Thailand, open universities are provided only for students of higher education where there are interested people living in remote and sparsely populated areas.

The British Open University has set the pattern for open universities and there are other patterns of open learning establishments, which have emerged in the last two decades. The different types can be grouped into the following categories:

- "Stand alone" universities;
- Dual mode models;
- "Stand together" universities;
- "Parasitic" institutions/agencies.

4.4.1.1 "Stand Alone" Universities

The British Open University (UKOU) is the prime example of this category. Since its inception in 1969 this OU has been instrumental by assistance and example for the birth of similar "stand alone" open universities in Europe, the Middle East and Asian countries. They are independent academic institutions with formal structures. They establish the curricula, create the courses, and provide the materials for students, the support services for student learning conduct, the monitoring and assessments of student performance and the awarding the qualifications. Academic staffs teach, develop, and write curricula and have research responsibilities. Non–academic staff administer, provide human support programs, run assessments and examinations, run publishing services including fully independent printing operations. Some open universities have their own private operations or arrangements for media material development both audio and video. The mode of teaching is often termed multi-media. This is especially true in the UKOU and open universities in more established and developed countries where transmission of lessons over the air and through TV occurs regularly. In poorer countries where possession of or access to media hardware is difficult and media transmission operations not as sophisticated, there is a high dependence if not total dependence on print materials.

Thus, among the "stand alone" open universities there is a range of institutions from sophisticated academic institutions, using the latest media methods including computer technology for teaching subjects at the forefront of academic development to large but modest institutions, which because of resource and financial constraints teach thousands of students using time-honored methods of correspondence, along with face-to-face student support services. Sukhothai Thammathirat Open University (STOU) is the example of "stand alone" open university in Thailand.

4.4.1.2 Dual Mode Models

The dual mode model is in existence in some countries like Australia, Canada and Thailand. Examples are the Deakin and Laurentian Universities, where the same faculty staffs who teach classroom courses develop the distance learning courses. This is the basis for the "dual mode" (conventional and distance instruction). Ramkhamhaeng University (RU) is an example of the dual mode model in Thailand.

4.4.1.3 "Stand Together" Universities

The "stand together" concept is in many ways implemented along the lines of a co-operative venture. One concept such co-operation is practiced in British Columbia Canada where the Open University admits students, conducts distance learning courses, and has in co-operation with the three conventional universities, provided support and facilities for the provision and delivery of the degree courses. A newer variation of the concept is in operation in the UK where the Open Polytechnic was established to cater to the increasing number of school leavers. Twenty-one of the 33 UK polytechnics are "share holders" in this institution, which uses existing infrastructure for effective delivery of services and existing staff for development of instructional materials. Their co-operative concepts are very recent, novel and economical. Whether they succeed will depend much on the ability of the participants firstly, and secondly the institutions ability to work collectively and to agree to priorities in course standards and participation.

4.4.1.4 "Parasitic" Institutions/Agencies

The term "parasitic" aptly describes the fourth type of open learning institution. Because of the expected lower-cost nature of institutions they are growing at a rapid rate. Among "parasitic" institutions, are again different methods of operating:

- Two organizations make a contract where the first partner (normally the more established institution) develops, produces, and examines courses and then lends its name to the awarding of the degree; while the second partner designs and delivers a support system. A good example of this partnership exists between the Open Learning Agency of British Columbia and the Distributed education College of Malaysia.
- The two organizations contract to purchase courses from each other. They then adapt and change these for delivery to their students and act as their own examining and awarding body. Two such organizations are the Open Learning Institute of Hong Kong and the Open College of the University of East Asia, Macao.
- Two or more organizations contract to design and deliver courses, which are used in their separate institutions independent of each other. A further enlargement of this concept is that of the free marketing of distance learning materials as a commodity, which is then contractually purchased by the delivering institutions. The latter adapts and modifies these courses whose origins can be as far south as New Zealand and north as Holland. There is no direct relationship between the organizations. Many open learning agencies are moving in this direction. The Commonwealth institution, which promoted co-operation in distance learning in 1988, has stated that its first key function will be in the assisting in the acquisition and delivery of teaching/learning materials and more generally facilitating access to them. There is now in existence throughout the world a range of distance education materials covering a broad spectrum of subjects and available in different media. Sharing, whether through co-operation or contractual purchase, could create greatly increased learning opportunities in a cost-effective manner.

4.4.2 Open University in Asian Perspectives

It is necessary for the Asian countries to consider educational systems, such as the open universities that are now in operation, and to choose the type which best suits the given country within the range of options and their own strengths and weaknesses.

Over the last 40 years, interest in distance education has grown and its use expanded. The establishment of the British Open University in 1969 was a landmark occasion, one which gave distance education a new legitimacy. The creation of this new, highly respected academic institution has set a path to the birth of open universities in various parts of the world.

Distance education will be considered at the post secondary school level (at college and university levels). Asian "open universities" such as Ramkhamhaeng University (RU) and Sukhothai Thammathirat Open University (STOU) in Thailand, Indira Gandhi National Open University (IGNOU) in India, University Terbuka (UT) in Indonesia and the Allama Iqbal Open University (AIOU) in Pakistan, have much experience in the effective delivery of humanities and art-based subjects through distance education. In addition, Singapore and Malaysia are the most recent to start along the path to establish their own open universities.

However, if distance education is to focus on quality improvement of education, the issues of size, clientele, content and modes of delivery must be addressed. In an economic world, the cost effectiveness of distance education programs cannot be ignored and must be an important consideration in Asian countries where financial resources are limited.

The choice for each Asian country may well be a "mix and match" one or a new open university of the UK Open University stature and tradition. The former may be cheaper the latter needs more financial resources, but it ensures continuity and possibly quality. Whatever the choice the decision will not be an easy one for the planning country. There is much available information and expertise today for assistance in this decision-making process, and we would do well to learn from the experiences of those who have walked and worked like-paths earlier. The challenge to educators in Asia is to design a system and learning packages which meet the priorities of their countries and maximize learning resources available in a cost-effective way.

4.5 TYPOLOGY OF INSTITUTIONS

The organization of distance education was to create order from the diversity of delivery systems and methods. Keegan (1986) provides the typologies of distance education into five types: autonomous, mixed, independent study, the consultation model, and the Australian integrated mode (on and off-campus study) institutions.

Rumble (1986) identified three different modes of administration under the operation of the distance learning system

The first model, the institution and its administration, has distance education as its sole responsibility. . The institutions and their faculty are involved in all the production and teaching processes, the distance education program comes under the direction of a single administrative unit as a single-purpose institution. Autonomy and control of the program rest with the institution. This mode can be effective because it allows a focus on the distance students and they do not need to be shared by other faculties and administrations as in multipurpose institutions. Sukhothai Thammathirat Open University (STOU) is an example of single-purpose educational institution.

The second model is the mixed mode administrative design, the institution has both distance and conventional education characteristics. Administration of distance education in this design involves working with faculty who are part of both programs, and this might ensure that the distance student's learning experiences are comparable to those of the campus-based students. The advantage of this mixed mode is that it can draw upon the considerable resources of resident faculty and others to conduct the distance teaching. Ramkhamhaeng University is an example of the mixed mode administration.

The consortium of institutions is the third model design; the number of distance consortia involves mostly conventional educational institutions engaged in cooperative distance education activities, such as audio conferencing and videoconferencing. The complications of consortia may make this form of administration difficult.

4.6 RAMKHAMHAENG UNIVERSITY (RU)

Ramkhamhaeng University (RU) is the first Open University in Thailand whose aim is to provide equality in higher education to all people in the Kingdom. Ramkhamhaeng University (RU) was established in 1971, under the situation called "a crisis in the quest for higher education" because of the huge number of high school graduates seeking admission to the universities. The problem, finally, was solved by the parliament to pass a law authorizing the establishment of Ramkhamhaeng University.

4.6.1 RU History and Background

Ramkhamhaeng University (RU) took its name from King Ramkhamhaeng the Great, a name deemed most appropriate for an institution venturing to provide quality education for all. King Ramkhamhaeng the Great, the third king of the Sukhothai period, was renowned for his invention of the Thai alphabet. He is called *Poh Khun*, meaning in Thai as "Father Lord", for his benevolence, leniency, and thoughtfulness toward his people. When people ran into any difficulty or conflict, which they could not solve among themselves, they could ring the bell which was hung in front of the King's palace, the King would then personally hear the cases and judge for himself.

The university campus covered an area of 125 acres at Huamark in the eastern suburb of Bangkok. With the growing number of enrolled students, Ramkhamhaeng University (RU) expanded to another campus in 1979 to an area of 60 acres, about 25 kilometers away from the main campus, called RAM2. Starting class at RAM2 in 1984, freshmen classes continue to be held at this campus (RAM2), while classes for upper level students remain at Huamark.

Ramkhamhaeng University (RU) started with only four faculties in the social sciences. The university is now operating with eight faculties and a graduate school in both the social and applied sciences.

The Ramkhamhaeng University (RU) provided four study programs in 1971:

Faculty of Law

Faculty of Business Administration

Faculty of Humanities

Faculty of Education

In 1974, three more faculties were added:

Faculty of Science

Faculty of Political Science

Faculty of Economics.

The Faculty of Engineering, with an examination for admission, was provided in 1996. Beginning in 1989, the university expanded its horizon and introduced four different programs of study at the graduate levels, namely Geography, Applied Chemistry, Political Science and Economics. The university now offers 25 graduate programs in seven faculties. Moreover, Ramkhamhaeng University (RU) has expanded its undergraduate studies as a distance learning system at regional areas in 1995 and in graduate studies in the academic year 1996.

4.6.2 RU Missions and Objectives

Since education is the essence of development, higher education should be both widespread and with equal opportunity in all growth and development segments for Thai society. With this in mind, Ramkhamhaeng University's Specific Objectives are:

1. To disseminate knowledge equally in order to emphasize strong individual ability, potential, and freedom, which is geared toward self-development and self-advancement.
2. To encourage research toward development of all aspects.
3. To develop and utilize technology into practical training and academic excellence.
4. To contribute knowledge, along with virtue.
5. To become internationalized.

4.6.3 RU Admission Policy

Ramkhamhaeng University (RU) has played a vital role in solving the problems of shortage of seats for the university admission in the country by accepting an unlimited number of the students at the undergraduate level. Therefore, Ramkhamhaeng University (RU) functions as an ***academic market*** where the admissions are unlimited to qualified entrants, with no entrance examination and non-mandatory class attendants. The tuition fees are as low as possible. The university emphasizes strongly the principle of educational equality, where everyone is welcome to study at RU, regardless of race, religion, age, sex, income, occupation, nationality or disability. This is the greatest opportunity for the people toward higher education. Admissions were open not only to students pursuing bachelor degrees, but also to those individuals seeking non-degree continuing education. Ramkhamhaeng University (RU) is committed to the concept of providing quality education, both at the undergraduate and graduate levels. The university strives to achieve academic excellence, its goal, with no sacrifice to . Now-a-days Ramkhamhaeng University (RU) has become one of the important learning resources for the whole nation, where each person has an equal right and opportunity for study in higher education, and with the government's assurance of the university's educational policy.

4.6.4 RU Administration

Administration of Ramkhamhaeng University is under the responsibility of the Rector, assisted by a number of Vice-Rectors and an Advisory Board. he Rector must report to and seek the Ramkhamhaeng University (RU) Council's approval for the implementations of any major policies. Administration of the Regional Campus is under the responsibility of a Vice Rector for each regional center.

4.6.5 RU Regional Campuses

The important trends in the use of information technology (IT) for education in Thailand are networking and tele-education. Networking, the one implemented by NECTEC, namely "Thaisarn" via the "Thaicom" satellite, is aimed at linking major universities into a single network, such that anyone in any university can directly communicate, with others either intra-campus or inter-campus, by electronic mail or the telecommunication infrastructure. The use of teleconference, or tele-education, just began in Thailand in 1994.

With the availability of access to satellite and via the fiber optics, Ramkhamhaeng University (RU) has now utilized successfully the capacity of IT for tele-education with a two-way communication system at the several regional campuses in all parts of Thailand. Ramkhamhaeng University (RU) is growing rapidly both in the academic market and in academic excellence to serve the society in education locally and regionally.

Ramkhamhaeng University (RU) has been progressively developed and has served the publics as one of Thailand's foremost institutions for higher education. To celebrate the 50th Anniversary (Golden Jubilee) of the Reign of His Majesty King Bhumibhol Adulyadej in 1995, RU provided an academic distance learning program at the regional campuses - called Ramkhamhaeng University, Regional Center -- in Honor of His Majesty the King – offering four undergraduate programs at Uthai Thanee, Prachin Buri, and Nakhon Si Thammarat provinces with the following degrees:

Bachelor of Law

Bachelor of Business Administration

Bachelor of Arts (Mass Communications)

Bachelor of Arts (Public Administration)

and three graduate programs at Uthai Thanee, Pracheen Buri, Amnad Chareon, and Nakhon Si Thammarat province with the graduate programs culminating in a

Master of Business Administration (M.B.A.)

Master of Education (Educational Administration)

Master of Arts (Political Science)

The distance education programs were developed and popularized rapidly. There were 13 regional campuses in 2000 - at Uthai Thanee, Pracheen Buri, Amnad Chareon, Nakhon Si Thammarat, RAM2, Prea, Nakorn Phanom, Nakorn Ratchasima, Sukhothai, Sri Sakhet, Khon Khaen, Lopburi, and Trang.

RU also provided examination centers for undergraduates in 25 provinces at Chiangmai, Chiangrai, Prea, Phitsanulok, Phetchaburi, Udon Thani, Khon Khaen, Roi Et, Nakorn Ratchasima, Surin, Ubol Rajchathanee, Nakorn Phanom, Amnad Chareon, Uthai Thanee, Suphan Buri, Nakorn Sawan, Rajchaburi, Pracheen Buri, Chanthaburi, Prachob Keereekhan, Surat Thanee, Nakhon Si Thammarat, Trang, Songkhla, and Chumporn.

4.6.6 RU Instructional System

The instructional system used is a combination of on-campus instruction and distance learning through mail, radio, television, and other modern telecommunication facilities. Students may choose any mode of instruction to fit themselves. Textbooks, learning materials, recorded audio and video lessons are available to students to study at home. RU Internal Television (RUITV) is also available for widespread news and lectures on campus.

4.6.6.1 RU Academic Service through Radio and Television

Ramkhamhaeng University (RU) provides academic services through radio and television with the purposes of disseminating knowledge, news, and general information in areas of interest to the public. The programs are distributed through radio and television as follows:

- Two academic programs through the Thai Radio Station at Bangkok for eleven hours a day;
- Twenty eight stations through the Thai Radio Station at the regional parts of Thailand for one hour a day;
- Fourteen stations through the Regional Military stations for two hours a day;

- ❖ One station through the Thai Mass Media Station for one and half hours per day.
- ❖ The academic programs have also been transmitted through the Thai Television channel 9 on Mondays to Fridays between 4.30-5.30 p.m. since 1977, one more station through the Thai Television channel 7 in 1980 until now. Today RU also contributes academic news through Thai Television channel 11 on Saturday mornings.
- ❖ RU home page and RU website are recognized as the educational and public relations station.

4.6.6.2 RU Distance Educational Media

Globalization means the efficient flow of boundless information via technology. Information technology (IT) is not only an important technology for business, but it also leads to effectiveness in education, and brings to a new dimension of global educational delivery. The Ramkhamhaeng University (RU) administrators consider utilizing information technology (IT) to produce the quality of human resources and academic excellence in order to serve the demand of the workforce and to conquer the economic crisis to survive.

Today, Ramkhamhaeng University (RU) serves the educational delivery mode by three methods: face-to-face in classroom, self-study where students can either read the texts at home or study via communications media - radio and television - and distance learning at regional campuses through one- and two-way communication. Moreover, Ramkhamhaeng University (RU) provides information technology (IT) in various systems, such as an electronic library, E-mail and Internet search engines, Home page, Computer Based Training, Computer Assisted Instruction (CAI), Multimedia Language Learning, videoconferences, and courses on demand. Facsimile and telephone facilities are also provided for students to contact the instructors in addition to mail. Ramkhamhaeng University (RU) administrators also plan to teach Thai through the RU Internet, starting at the beginning of 2001.

4.6.6.3 RU on IT Utilization

There are three approaches by the Ramkhamhaeng University (RU) administration on the utilization of IT application

- Utilization of IT application on Academic Administration
- Utilization of IT application on Academic Services
- Utilization of IT application on Academic Support

1) Utilization of IT application on Academic Administration

Ramkhamhaeng University Boards has decided to install information infrastructures to serve the increasing amount of incoming students with several database system development programs in academic administration. They are

- The Undergraduate studies database system development program.
- The Graduate studies database system development program.
- The RU Personnel database system development program.
- The RU Building Architecture system development program.
- The RU Budgetary database system development program.
- The RU Inventory database system development program.
- The Undergraduate Curriculum database system development program.
- The Graduate Curriculum database system development program.
- Examination Information and Grading Reports on all levels of the studies database system development program.
- The RU Financial database system development program.
- The RU Accounting database system development program.
- The RU Vehicles and Maintenance database system development program.
- The RU Students Activities database system development program.
- The RU Texts and Documents database system development program.
- The RU Research and Development database system development program and etc.

2) Utilization of IT application on Academic Services

As Academic Services, Ramkhamhaeng University (RU) provides several development programs to support advanced technology in the future. They are

- INTRANET network for RU development programs.
- Information network and backbone structures development program.
- Personnel Training and recruiting programs for supporting and maintaining the RU-Net network system.
- The RU INTERNET network development program.
- The Host Computer Supply program.
- The Information Communication system development program in Internet both inter- and intra-university.
- Video Conferencing with C-Band frequency on the one-way communication system in undergraduate studies via satellite for distance learning.
- Video Conference\ing with the two-way communication system in graduate studies via fiber optics for distance learning.
- Course on demand services development program.
- Smart card provides the student card development program.
- The Personnel Training development program for supporting automatic system users.
- Examination results services and RU news development system through mobile phones and pagers.
- Information Technology (IT) utilization in classroom development programs.

3) Utilization of IT application on Academic Support

The academic support on research and development is provided as follows: -

- The computer laboratory development program for every Faculty.

- The RAMLINET network system development program, which provides library service on the Internet.
- The IT Service center establishment program.

4.6.6.4 RU Computers and Facilities

The RU Computer Office is equipped with VAX 6510, VAX 4000, accompanied with 200 microcomputers and other connected peripherals. It maintains an array of software packages for performing the many computes related administrative functions of the university, assisting staff members with research activities involving complex computations and intricate data processing, academic administration, and providing tools of instruction for the Computer Science courses. Moreover, computers are installed at every faculty in the main campus, RAM2, and regional campuses, at least 50 computers for each site in order to serve the faculty, staff, and students for use in their studies and research with the Intranet and Internet searching.

The Information Technology (IT) center is located at the main campus, serving both training and education in order to provide the students and university staff using computers for improving their skills. The RU Computer Office also provides the computer training courses for RU students to prepare themselves for the workforce after graduation, for the university staff to improve their skills and enhance new knowledge, and for people outside the university to fulfill social needs in technological advancement, to achieve access to educational equity.

4.6.6.5 RU Library and Publication Services

In an open-admission environment like Ramkhamhaeng University where class attendance is non-mandatory, the Central Library plays a vital role as an indispensable learning resource. The library's main objectives are to provide materials and services to support course offerings and to foster independent study and research. It houses approximately 495,000 books, in Thai and foreign languages, classified according to the Library of Congress classification system.

The Ramkhamhaeng University, also having its own printing house, publishes textbooks, handbooks and supplementary books for all courses offered. It also publishes a weekly newsletter, the *RU Newsletter*, which serves as communication between the university and the students, and the *RC Journal* for the faculty to present their research and scholarly works for various academic issues.

4.6.6.6 RU Health, Student Guidance and Facilities

A university Health and Medical Center is located on the main campus and RAM2. The university has a team of medical doctors and nurses, who are responsible for student health and medical needs. All the services are available to staff, university personnel and their families as well as to students, throughout the academic year.

The student Counseling, Career Planning and Placement Services Center (SCPC) was established for the purpose of providing guidance and assistance to students seeking educational help, financial, career, family or personal aid. The university also provides counseling staff for students in each faculty so that they can get advice regarding their academic development towards completing their respective degrees.

RU Subscribes to the principle that financial aid is to provide assistance to the student, who lacks funds, and as a result, who would be unable to attend the university. Financial aid is awarded according to individual need and/or academic performance. Awards may include scholarships, grants and fee waivers. Some scholarships are funded by private companies, banks and foundations. Each year the university makes available more than 1,000 scholarships.

The university provides a variety of activities for the students to encourage them to cultivate special interests and aptitudes, and also to develop leadership and initiative. Students can participate in both university affairs and student political affairs. They can also have an opportunity to participate in the Thai political process. Moreover, the university encourages students to participate in many kinds of sports and to enter both domestic and international competitions. The students who win first prize in a sporting event will be granted a scholarship from the University Sports Star Program. Many Ramkhamhaeng student's clubs also provide community activities.

4.6.7 RU Regional Academic Service Centers

To assist students residing in the provinces with their studies, the university, with corporations from provincial public libraries, has set up twenty-five Regional Academic Service Centers (RASC) at public libraries in major provinces throughout the country. At the RASC, students will find current information from the university, textbooks and recorded lectures of all the courses offered and documents of registration and examination. Also available are such services as grade report, distribution of the schedule of classes and handling of requests for recommendations, financial aid, and all kinds of educational records.

4.6.8 Ramkhamhaeng University Today

The number of new students, who want to study at Ramkhamhaeng University (RU), has been increasing rapidly. There are about 80,000–100,000 students every year since 1979. The total number of RU students is 473,808 in 1998.

The Ramkhamhaeng University (RU) is now offering 3 Diploma courses, 48 Bachelor degree courses, and 27 Master degree courses under the supervision of 8 faculties and two departments as follow:

Faculty of Law (Cert., B.A., M.A.)

Faculty of Business Administration (B.A., M.B.A., X-MBA, Y-MBA)

Faculty of Humanities (B.A., M.A.)

Faculty of Education (B.A., M.Ed.)

Faculty of Science (B.S., M.S.)

Faculty of Ppolitical Science (B.A., M.A.)

Faculty of Economy (B.Econ.,M.Econ.)

Faculty of Engineering (B.S.)

Graduate school

Institute of International studies

4.7 SUKHOTHAI THAMMATHIRAT OPEN UNIVERSITY (STOU)

Sukhothai Thammathirat Open University (STOU) employs distance education to enable students to study by themselves in their spare time, without having to enter conventional classes. Sukhothai Thammathirat Open University (STOU) was established in 1978, providing education through the use of teaching media different from those used by other conventional universities. This distance teaching and learning system does not require class attendance as ever before. The University has been able to provide greater opportunities for the general public to acquire knowledge in all areas in Thailand.

Sukhothai Thammathirat Open University (STOU) encourages the "lifelong education" philosophy or reinforces the concept of self-direction to Thai society acceptances. As known, the attitudes of Thai people towards traditional education have been acknowledged for a very long time and it will take quite a long time to change. This is because skills appropriate for self-directedness in learning have never been seriously emphasized at any level of instruction in Thai society. Having been accustomed to traditional learning, Thais need some time to appreciate the underlying philosophy of STOU.

4.7.1 STOU History and Background

The establishment of Sukhothai Thammathirat Open University (STOU) was an important step in the history of the development of the country's higher educational system through the use of distant teaching. The university employs correspondence media, radio broadcasts, television programs, and other methods, which enable students to study on their own without entering a conventional classroom.

Sukhothai Thammathirat Open University (STOU) is located at Packkred district, Nonthaburi province. The university occupies 135 rai (54 acres) on which the following 21 buildings have been constructed: Administration Building, Service Building I, Service Building II, Academic Building I, Academic Building II, Academic Building III, Documentation and Information Building, Educational Broadcasting

Production Center, Conference Hall, Water Purification Building, O.B. Van Parking Building, Seminar Center I, Seminar Center II, Lecture Theater, Training Center, Printing and Educational Services Building, Sukhosamoson Staff Club, Warehouse, University Symbolic Pavilion, Tri Sorn Pavilion, and the Security Center.

4.7.2 STOU's Missions and Objectives

Sukhothai Thammathirat Open University (STOU), in response to individual and societal needs, adheres to the principle of lifelong education and aims to develop the quality of life of the general public by upgrading the level of knowledge of working people and expanding the educational opportunities for secondary-school graduates. The policy of Sukhothai Thammathirat Open University (STOU) is to aim at academic excellence in the distance education system. Therefore, the objectives of Sukhothai Thammathirat Open University (STOU) are:

1. To emphasize the development of educational quality, curricula, course packages, educational media, and graduate studies as well as using information technology to obtain the maximum benefit.
2. To discover, pursue, and develop knowledge for the academic progress of the various STOU Schools and the country.
3. To support STOU faculty members and staff who conduct research by providing opportunities to improve their research knowledge and skills.
4. To disseminate research results for the development of Thailand.
5. To promote internationalization through bi-lateral and multi-lateral collaboration with overseas institutions and organizations.

4.7.3 STOU Admission Policy

Sukhothai Thammathirat Open University (STOU) uses the semester system and the distance learning system to transfer knowledge and experience to its students. Curricula are organized into course blocks containing no less than six semester credits. One course block contains fifteen units. Each unit requires approximately twelve

hours of study time per week and each semester has approximately 15 weeks. Students are required to register for at least one course block, but not more than three course blocks per semester. Students must complete their studies in no more than three times the amount of time stated in the curriculum.

Sukhothai Thammathirat Open University (STOU) offers the three following undergraduate programs:

1. Four-year Bachelor's degree programs
2. Two and three-year Bachelor's degree programs
3. One-year Certificate programs

Qualifications of STOU graduates from all programs are endorsed by the Office of the Civil Service Commission and are considered equivalent to the qualifications held by graduates of other universities. They will be employed as civil servants, in the same posts, with the same rate of salary as graduates from other universities. Since STOU'S educational system allows students to use their free time to study independently, rather than having to enter a traditional classroom setting, they may also enroll simultaneously at other institutions.

As a result of its successful organization of a distance education system at the Bachelor's degree level, and having achieved the same academic standard as restricted enrollment universities, STOU has developed Master's degree programs. These programs accommodate graduate students, who are not able to leave their professional or responsibilities to study at traditional education institutes.

In 1993, the University admitted the first group of graduate students. There are three programs of study: Curriculum and Instruction, Educational Administration, and Educational Technology and Communication.

Each course block contains 5 credits. The Master's degree programs operate on a semester basis with each semester comprising at least 15 weeks. Students must enroll for at least five, but no more than ten credits per semester.

In 1995, the University received the application for admission of the second group of graduate students in the Schools of Educational Studies and has expanded to offer graduate programs at other schools. In response to the needs of these people for graduate studies, the University developed programs and materials to suit their needs.

In addition, Sukhothai Thammathirat Open University (STOU) is to prepare itself to offer doctoral degree programs in the Ninth Educational Development Plan (2002-2006).

4.7.4 STOU Administration

Administration of Sukhothai Thammathirat Open University (STOU) is under the responsibility of the President, assisted by a number of Vice-Presidents and an Advisory Board. The President must report to and seek the Sukhothai Thammathirat Open University (STOU) Council's approval for the implementations of any major policies. The administrations of all state universities are operating individually, in which the institutions must be controlled by either the academic quality or curricula under the rules and regulations of Ministry of University Affairs.

4.7.5 STOU Instructional System

Sukhothai Thammathirat Open University (STOU) has introduced multi-media educational materials to transfer knowledge and experience to its undergraduate and graduate students, including printed materials, audiovisual materials, electronic media and other mass media, which are designed to integrate different academic areas into specific related categories. Each year, the need for printed and audio-visual materials has increased owing to STOU's growth. Because of the higher numbers of courses offered in the various schools, the period of one year preparation and production of multi-media packages seems to be popularized and inadequate.

Sukhothai Thammathirat Open University (STOU) provides an opportunity for students living in remote areas to improve their knowledge through various teaching media as follows:

- Main Media: educational materials and printed matter sent by post, including textbooks and workbooks.
- Supplementary Media: educational radio and television programs and courseware by computer assisted instruction (CAI).

Apart from these media, students are able to attend tutorials at Study Centers located in various provinces throughout the country. Students can also study other educational media at the STOU center in the provincial public libraries. Some courses require students to conduct laboratory experiments at designed times and locations in order to complete research, study and work assignments. Prior to graduation, students are required to attend a professional experience workshop.

It is assumed that every person has a natural inclination to want to learn and that they will continue their motivation to learn throughout their life, unless conditions do not allow them to do so. If students have opportunities to learn, they therefore should make decisions by themselves about what is to be learned as well as how and when to study. Gagne (1985) specifies that motivation for achievement in a developmental sequence should rank more highly. He adds that when the learner is self-motivated, the successful mastery of more and more difficult tasks becomes a source of self-satisfaction and generates a desire for greater improvement (Gagne, 1985: 306).

Self-motivation, in this case, is likely to be created when the learner is provided with information that enables him to judge his own success and failure.

Rowntree also gave practical advice about the design of OU teaching materials and originated the concept of a tutorial-in-print (Rowntree,1973). The tutorial-in-print is simply a simulation of the tutorial process in print (Lockwood, 1995). Rowntree comments that :

> These tutorials-in-print simulate a dialogue between tutor and student, with frequent requests for the student to make a personal response and the author then continuing with a discussion of possible answers and where they might lead. (Rowntree,1974 :119)

4.7.5.1 STOU Text Materials

The main media for courses offered by STOU are printed materials, when a high literacy rate in Thailand makes printed materials much more easily accessible to a large number of people. Another advantage of printed materials is that they can be provided without heavy investment. Each year, there are approximately 3,500,000 printed materials published for the academic purposes of STOU.

These include textbooks, workbooks, examination papers, official forms, handbooks, curricula, and STOU newsletters. The STOU University Press is responsible for all of these.

STOU textbooks are the major item among various kinds of printed materials. Textbooks are designed in a special format in order to help the students to study as effectively as possible on their own. One textbook is divided into 15 units. Each unit requires approximately 12 hours of study weekly. The students are given guidance at the beginning of each unit about the topic, concepts, objectives, activities and self-evaluation methods.

The actual content is broken down into sections. There are activities provided in each section in order for the students to check their understanding in the given workbook. There is also a pre-test and a post-test available with answer keys to give feedback to the students.

For some courses with difficult content, printed materials are accompanied by cassette tapes. The tape is considered as a brief textbook. It is presented in the form of an outline and summary of the important points from the actual content of the printed materials. Generally, the forms used in cassette tapes are lecture, discussion and conversation.

A STOU textbook, which basically consists of programmed text and accompanying workbook, is interactive in nature. The students can evaluate their own performance and receive feedback to indicate the progress of their studies. STOU textbooks are not presently used only by its students, but they have been used by many conventional universities and institutions. This demonstrates that STOU textbooks are widely accepted in the academic community.

To provide self-instructional texts, more than 4,000 specially qualified individuals from the Thai academic community were invited to serve as course writers. STOU course writers are also appointed from the academic staff from various schools within STOU. These people work together as a course team to produce multi-media packages. The STOU course team consists of course writers both from inside and outside the University (as many as needed), an educational technologist, a test specialist from the Office of Registration, Records & Evaluation, an editor and a course team, and secretary.

4.7.5.2 STOU Distance Educational Media

Sukhothai Thammathirat Open University (STOU) students can receive their education through various forms of educational media, as follows:

1. Materials sent through the postal service: workbooks, textbooks, tapes and others.
2. Television and radio programs designed specifically for STOU courses.
3. Tutorials given by STOU professors at Study Centers around the country.
4. Self-study at STOU Comers in Provincial Public Libraries and in Bangkok.

There are several distinguishable characteristics in correspondence education at different parts of the world, being taken to denote teaching, using written materials. Correspondence education refers to the fact that the teaching and learning system has relied on postal communications, and are the so-called self-instructional texts.

The advantages of self-instructional materials (F.R. Jevons, 1982: 126)[4] are:

1. Self-instructional materials provide consistent quality of instruction. Unlike lecturers, learning materials do not have "off" days.
2. The use of self-instructional materials is a good educational practice because lecturers can encourage learning through activities, just as they wanted their students to do when students go out into school.
3. Staff radicals saw the new modes as liberation. Students are liberated from the constraints of the traditional lecture and tutorial system. Staff is also liberated from the lecturing grind and free to teach in more interactive ways.

There are two constituent elements of correspondence education, namely: the teaching exposition and the non-contiguous communication, both of which are dependent on a supporting organization, such as the school or university. When media other than those involving print grew in importance in education, the concept of correspondence education was broadened and diversified.

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[4] F.R. Jevons, 1982. "How Different is the Distance Students?", in *Learning at a Distance: A World Perspective*, Athabasca University / International Council for Correspondence Education, pp. 126-128.

The explosion of technology in education, particularly involving broadcasting and other types of inexpensive teaching and learning aids, affected correspondence education profoundly. Nevertheless, it should be noted here that whether correspondence courses are offered in written, televised or taped form, the two-way channel of communication between student and instructor remains always one of its essential elements.

4.7.5.3 STOU Academic Service through Radio and Television

Sukhothai Thammathirat Open University (STOU) provides academic service to society through radio and television programs, referred to as "Radio and Television Programs for Society." The programs target the general public. Their purpose is to disseminate knowledge, new entertainment, and general information in those areas of interest to the public, such as science and technology, environmental preservation, health, arts and culture, law, music, current events, world news and international documentaries. Prior to the production of public service programs, the producers presented their ideas and plans to the Radio and Television Programs for Society Review Committee to analyze and review the program plan. Portions of the program receive cooperation from various government and private organizations.

Radio and television programs constitute the two major support media of the STOU teaching system. The programs are produced at its Educational Broadcasting Production Center. Sukhothai Thammathirat Open University (STOU) produces a large number of educational programs to serve its students as well as the general public. An average of 7,800 radio programs and 1,100 television programs are produced, annually.

For each course, a total of 10 radio programs are offered. Each radio program lasts 20 minutes. They are broadcast daily. Like the radio programs, STOU television programs are also broadcast daily. Three television programs are offered per course. Each program lasts 30 minutes.

Apart from the production work for STOU, the Office of Educational Technology also provides a service to the general public. The Office also has to produce the programs for Educational and Professional Counseling Services.

The Educational Guidances for radio programs are broadcast twice weekly on Saturday and Sunday. The Educational Guidances for television programs are broadcast once a month.

In the area of broadcasting production, there are 40 educational technologists with academic status, 40 media producers, 100 technical staff, and more than 40 administrative staff working for the Office of Educational Technology.

After being broadcast, the master programs of radio and television are kept at the Educational Broadcasting Production Center of STOU. Every program is copied and sent to the STOU library at its headquarters and 10 other centers in the larger provinces of the country. These are for the use of the students and the general public. The programs are updated every three years.

For more information, Sukhothai Thammathirat Open University (STOU) provides academic services using telecommunications via radio and television programs. The purpose of these programs are to provide information about STOU course blacks in various forms, such as make-up situations, drama, discussions, interviews, and conversation.

❖ **Radio Programs**

STOU produces the radio program broadcasting on the educational network in Thailand at 1467khz (Am):

- Social Services Programs
  - -"Sarasip"
  - -"Fakwang Thang Sawang "
- Continuing Education Programs
- Education Counseling Programs
- "STOU Time"

❖ **Television Programs**

STOU produced the following television programs which were broadcast on television of Thailand (channel 11), the Public Relations Department:

- Law for the Public
- Educational Counseling
- Social Services
- "STOU Time"

4.7.5.4 STOU Computers and Facilities

Sukhothai Thammathirat Open University (STOU) is a university that employs the distance education system, which relies on one-way communication. Therefore, the course content and correspondence materials must be both clear and complete in themselves. Stringent research and quality testing of the distance educational materials are necessary to ensure a high quality of instructional material, which is necessary for independent learning in order to provide knowledge according to course objectives.

The Office of Computer Services has produced Computer-Assisted-Instruction (CAI) courses for students and interested persons to improve their knowledge. Users do not require any computer knowledge and do not pay any expenses. The CAI services centers have been set up at the following location: STOU main campus, the ten regional distance education centers and the Police Cadet Academy in Nakhon Pathom Province.

The Computer-Assisted-Instruction (CAI) Center provides services to students who are interested in using Computer-Assisted-Instruction (CAI) package. Sukhothai Thammathirat Open University (STOU) has established CAI services at STOU Campus and the following STOU Study Centers:

- Southern Area Resource Center in Nakorn Si Thammarat
- Maha Vachiravudth School in Songkhla
- Silpakorn University, Sanamchan Campus in Nakorn Pathom
- Chonkanyanukul School in Chonburi
- Benjamarachutis School in Chanthaburi

- Satree Nakorn Sawan School in Nakorn Sawan
- Boonvadvitayalai School in Lampang
- Yuparajvityalai School in Chiang Mai
- Rajchasrimavityalai School in Nakorn Rajchasrima
- Khonkaenvitayayon School in Khon Kaen
- Nareenukul School in Ubon Ratchathani

In 1985, the Computer-Assisted-Instruction Center began to develop a system of producing Computer-Assisted-Instruction (CAI) course blocks using the Vital/Thai program as follow:

1. Science and Society
2. Mathematics for Sociology
3. Economic Statistics and Business

Currently, the Center produces Computer-Assisted-Instruction course blocks on programs that operate on "Windows" software. The following CAI course blocks were produced on "Windows" software:

1. Mathematics and Statistics
2. Statistics, Research and Evaluation in Education
3. Basic English
4. Government Accounting, Funds Accounting, and Specialized Accounting

The following CAI course blocks are currently being produced:

1. Introduction to Computers
2. Fundamentals of Accounting
3. Basic Science for Home Economics
4. Marketing Management
5. Principles of Accounting

Moreover, Sukhothai Thammathirat Open University (STOU) provides the following information services in order to publish STOU news and link students with the university:

- "International Information Services" the Office of Computer Services created the STOU website "http//www.stou.ac.th" to disseminate university news and information through the internet.

- "Info-Voice information" -- The Office of computer Services installed info-Voice information telephone services to enable students to make inquiries about examination dates, sites and other related information.

4.7.5.5 STOU Tutorial Supports

Tutorials are organized for STOU students. They are to provide a greater degree of face-to-face interaction between the students and instructors. The tutorial sessions are held in regional, local and special study centers throughout the country on Saturdays and Sundays. It is optional rather than compulsory for the students to attend. Each course offers about 10 hours per semester of face-to-face instruction. In certain courses, the tutorial content is supplemented by videotape or film.

Academic tutors for STOU tutorials are usually faculty members from the University. However, most of the time qualified academic staff from higher education institutions in the capital as well as in the regions are invited to serve as STOU tutors for its tutorial sessions.

As a new institution employing new methods in teaching and learning, STOU needed some time to familiarize Thai society with its philosophy. First of all, its requirements are different from those of conventional universities. Personnel must be well-trained and re-oriented from the traditional educational from which they have been accustomed to the new system. Existing resources and communications facilities have to be used in the most efficient manner. STOU has been successful in maximizing existing resources both in personnel and organizational forms. The good co-ordination and co-operation between the University and the Communications Authority of Thailand has led to the success of its delivery system. In terms of its academic standards, approximately 3,000 specialists from various institutions and agencies have been invited to act as course producers and tutors for the University.

Conversely, various agencies have co-operated with STOU in setting up special programs for the improvement of personnel, the cooperation of regional institutions throughout the country, tutorials can be easily arranged and library services can be widely provided to all students. Apart from that, Sukhothai Thammathirat Open

University (STOU) has cooperated with various organizations and institutions all over the world to exchange information and develop itself.

4.7.5.6 STOU Library and Publication

The Office of Documentation and Information provides library and information services at the following three levels:

❖ **Central Services**

The Office of Documentation and Information offers library and information services, using the Virginia Tech Library System (VTLS). This library automation system was installed to assist STOU faculty members, personnel and students in the bachelor's or master's degree programs who come the University to complete academic assignments required by their curriculum. The Office also offers services to doctoral students studying under the cooperative project between Sukhothai Thammathiral Open University (STOU) and Charles Sturt University.

❖ **Regional Services**

The Office provides library and information services to STOU students and the local community at ten STOU Regional Distance Education Centers and six Graduate Educational Resource Centers, in cooperation with the National Library, the Department of Non-formal Education, the Bangkok Metropolitan Administration (BMA) and the Department of General Education.

❖ **Provincial Services**

The University, in cooperation with the Department of Non-formal Education, Ministry of Education, has set up 75 STOU Corners in provincial libraries. The University has also set set up STOU Corners in the Phuket Municipal Public library, in four Bangkok Metropolitan Libraries (Lumpini, Soi Phra-Nang, Phasi-charoen, and Bangkhen), in Tinsulanonda Library, Songkhla province and in Bang Kwang Prison, Nonthaburi province to serve inmates who are STOU students.

Bangkok Public Libraries are located at the following sites:

1. Suan Lumpini Public Library
2. Soi Phra Nang Public Library
3. Phasi Charoen Public Library
4. Bangkhen Public Library

Some courses require students to take part in laboratory activities, research and other activities at designated STOU sites.

With regard to media, there are three offices in STOU that are responsible for its production system, namely the Office of Academic Affairs, the Office of Educational Technology and the office of the University Press. The functions of each office can be summarized as follows:

- The Office of Academic Affairs
  - preparing manuscripts for course teams
  - providing training for outside writers
  - organizing workshops for course writers
- The Office of Educational Technology
  - producing radio programs
  - producing television programs
  - preparing films, audio-tapes and videotapes
- The Office of the University Press
  - printing textbooks and workbooks
  - printing examination papers

In 1988, Sukhothai Thammathirat Open University (STOU) began publishing the Sukhothai Thammathirat Open University (STOU) journal, which contains a wide range of information including general articles, academic research and book reviews. The STOU journal publishes three issues each year.

Nowadays, 50 per cent of printed materials are printed by STOU's University Press. The rest are printed by a commercial publishing company. All radio and television programs are produced at the Educational Broadcasting Production Center (EBPC) of STOU, located at STOU headquarters. Being well equipped, EBPC is considered one of the best educational production centers in South-East Asia. Its capacity, approximately 10,000 radio and 2,000 television programs, per year.

4.7.5.7 STOU Health, Students Guidance and Facilities

Sukhothai Thammathirat Open University (STOU) provides a first aid clinic on the STOU main campus. The clinic was established in 1988 and is located at the STOU Training Center. STOU's clinic provides first aid services for STOU personnel and students. Visiting personnel may also receive treatment when they are at the University. Moreover, the University organizes medical examinations for personnel and also provides a physician available for consultation on Monday, Wednesday, and Friday at the posted office hours in the afternoon. The clinic also opens on holidays for students who attend workshops at STOU. Sukhothai Thammathirat Open University (STOU) has provided the medical cabinets located at various points in the University.

Organization of Sukhothai Thammathirat Open University (STOU) undergraduate and graduate programs are based on the distance education system, which enables students to study independently by themselves under the guidance of instructors with whom the students may arrange appointments for educational consultations. The University arranges many academic activities for its undergraduate and graduate students including: orientation of new graduate students, academic seminars, intensive thesis courses, independent study courses and professional experience training. The University also provides Area Resource Centers, Regional Study Centers and Provincial Study Centers to serve undergraduate and graduate students upcountry, and throughout the Kingdom. The University also conducts exhibitions and public relations through STOU mobile units, which provide new information, and respond to inquiries and problems related to the educational system of STOU.

Student activities are an educational process used by Sukhothai Thammathirat Open University (STOU) to provide students with an opportunity to consult, get to know each other, and to participate in academic activities, which are beneficial to their study. Various experiences gained from these student activities will be useful for their lives in the future. Academic, vocational and practical knowledge are all considered being necessary for a graduate.

Since 1985, the Sukhothai Thammathirat Open University (STOU) has supported the establishment of Student Clubs in every province throughout the country.

❖ **Student Clubs**

Student Club advisors are appointed to each Club to offer academic counseling and to participate in the Club's activities as follows:

1. Academic activities including tutorials by appointment and academic counseling.
2. Activities to disseminate knowledge and public relations news.
3. Activities to encourage relationships between the Club members and recreational activities between Clubs.
4. Activities to promote an understanding between the Club members and the University and activities designed to raise STOU's acclaim and prestige, such as, orientation for new students and other social events.

❖ **STOU Association**

The STOU Association received permission to be established from the Cultural Committee Office on March 20, 1984 and was placed under the patronage of His Royal Highness Crown Prince Maha Vajiralonkorn on June 24, 1989. Its objectives are:

1. Promote unity and maintain members' dignity.
2. Promote the exchange of academic knowledge and ideas among its members.
3. Promote and support STOU's activities.
4. Perform public services for the benefit of society.

❖ **STOU Alumni Clubs**

STOU Alumni Clubs were set up to promote and support the STOU Association's activities by being its provincial representative and by being a meeting center. At present, there are Alumni Clubs throughout the country and personnel have been appointed to coordinate between the Association and the provincial STOU Alumni Clubs and also between these Clubs via the national network.

For more information, The Office of Documentation and Information provides on-line search services. Users can search from the computer network, both inside and outside the University, through Online Public Access Catalog (OPAC) or search from the Web Site of the Office of Documentation and Information at http://www.odi.stou.ac.th or the Home page of the Sukhothai Thammathirat Open University (STOU) at http://www.stou.ac.th.

4.7.6 STOU Academic Service Centers

Sukhothai Thammathirat Open University (STOU) offers educational services to society by organizing the following projects and services to upgrade the quality of the general public, disseminate knowledge and understanding: Continuing Education Service Programs, Training Service Programs, Research Service Programs, Conferences and Academic Discussions, and Academic Cooperation.

4.7.6.1 Continuing Education Service Programs

Continuing Education Programs have been offered since 1980 to provide knowledge to people of all ages who are interested in expanding their academic and professional knowledge and improving their work performance and quality of life. These programs enable students, regardless of experience and qualifications, to study on their own through STOU distance education courses. Each semester, students are given a four month period to study and prepare for their examinations, which are held at local Study Centers throughout the country.

One objective of the Continuing Education Programs is to provide students with an opportunity to assess their ability to study through the STOU distance education system. Should they become interested in enrollment as a regular student, the credits earned can also be transferred to the program of their choice. Upon successfully passing the examination, students receive a Certificate of Achievement.

4.7.6.2 Training Service Programs

Since 1990, the Office of Continuing Education organizes various training programs to offer a broad range of academic services to society. The training courses are offered and conducted for the general public by STOU personnel and personnel from outside agencies.

During 1999 – June 2000, the Office of Continuing Education conducted training courses as follows:

- Short training courses in professional knowledge and fine arts
- Various training courses for developing work performance

4.7.6.3 Research Service Programs

Sukhothai Thammathirat Open University (STOU) has its own research and a researchers database in the on-line information services system provided for the University administration purposes. It is available from the on-line computer at the University.

Research is categorized as follows:

- **Academic Research**

Academic Research develops knowledge in different academic fields. There are academic research projects that belong to the university and also to individuals.

- **Institutional Research**

Administrators in decision-making to formulate work procedures use institutional Research results. It is also used for solving various problems.

- **Educational Media Research**

Educational Media Research examines the quality of media to ascertain whether it is suitable, or if it should be improved. It also includes searching for educational media suitable for distance education.

The university encourages and supports its staff with sufficient funds to conduct high quality developmental research in a convenient manner. The research

conducted by STOU staff is directed toward improving the university's learning and teaching methods,its administration and operations.

4.7.6.4 Conferences and Academic Discussions

The University hosted and co-hosted with outside agencies conferences, seminars, lectures, and various academic discussions on a variety of topics including education, politics, economics, health. culture, etc..

4.7.6.5 Academic Cooperation

To fulfill the University's mission, increase educational opportunities and upgrade the quality of life of the general public, the University has cooperated with domestic and international organizations to conduct the following activities:

- **Cooperation with Domestic Organizations**
  - Ministry of the Interior

Sukhothai Thammathirat Open University (STOU), in cooperation with the Ministry of Interior, has organized distance education and training courses in order to increase knowledge and to develop the potential in work efficiency.

Examples of these courses are:

- District Administration course
- Land and Property Certificate Course(2 year)
- Local Government Certificate Course (1 year)

- Ministry of Education
  - Project for Providing an Education via the Distance Education System for Thais Living Overseas

Sukhothai Thammathirat Open University (STOU), the Department of Non-Formal Education of the Ministry of Education and the Department of Information Services, Ministry of Foreign Affairs have endorsed a Cooperative Agreement to provide higher education for Thais living abroad. This project not only provides these

Thais with an opportunity to study in Thai . but also to receive a certificate or a degree. It will not only strengthen their loyalty to the King, country and religion, but also make them feel proud to be Thai, which may encourage them to return and make a valuable contribution to Thailand in the future.

This project is scheduled to start operation as a pilot project in the academic year 2000 at the Distance Education Center, Cairo, Egypt, where courses, without a practical component, will be offered. An administration committee has been set up to coordinate the future activities for this project.

- **The Association Of Private Vocational Education Schools Of Thailand**

The Sukhothai Thammathirat Open University (STOU), in cooperation with the Association of Private Vocational Education Schools of Thailand, offers a one-year certificate program for 40,000 teachers from member schools of the Association. These courses aim to increase knowledge and teaching qualification in accordance with the National Education Act 1999.

- **Cooperation with International Institutions**

Sukhothai Thammathirat Open University (STOU), has cooperated with various international institutions in the following ways:

- Sent personnel overseas to attend conferences, seminars, and on study visits.
- Arranged projects to request assistance to develop quality of teaching and learning in the distance education system to the highest level.
- Joined various international academic and vocational associations in order to enable the University's faculty members and personnel to have an opportunity to broaden their vision, improve their professional knowledge and arouse their interest in other related fields.

4.7.7 Sukhothai Thammathirat Open University (STOU) Today

Sukhothai Thammathirat Open University (STOU) can be considered to have been successful in getting itself accepted by society. It can relieve the pressure of increasing demand in higher education as well as in-service professional training. Its academic standards have been well recognized among the Thai academic community. STOU textbooks are well known and are used by many conventional institutions. This has helped the University to enhance its reputation in the eyes of the public. The large number of students from all over the country who enroll in Sukhothai Thammathirat Open University (STOU) each year is a good indicator of success. In addition, another factor that has greatly contributed to an increase in the public's recognition of STOU is that it provides equal opportunity in education to everybody, without causing the problem of the over-production of graduates.

In 2000, over the past 22 years, The University has produced a total of 220,000 high quality graduates and at present there are a total of 268,831 student in the system. Sukhothai Thammathirat Open University (STOU) offers certificate, undergraduate and graduate degree programs through its ten academic Schools. These programs are as follows:

- School of Liberal Arts (Cert., B.A.)
- School of Educational Studies (Cert., B.Ed., M.Ed.)
- School of Management Science (B.B.A.)
- School of Law (L.L.B.)
- School of Health Science (Cert., B.P.H., B.N.)
- School of Economics (B. Econ.)
- School of Home Economics (B.H.Econ.)
- School of Political Science (B.S. (Pol.Sc.))
- School of Agricultural Extension and Cooperatives (B.S. (Ag.Ext.Coop))
- School of Communication Arts (Cert., B.S.)

4.8 CONCLUSION

The future of learning and education will evolve around the concept of lifelong learning and its manifestation as open learning systems with regard to access and support. Access without support is empty and deceiving. Providing appropriate support for the purposes of control over an educational experience is established through communication with a teacher or facilitator and learners.

The utilization of television broadcasts for education in Thailand dates back in 1964 when the Ministry of Education, in cooperation with the Bangkok Metropolitan Authority, launched an instructional television project to broadcast lessons to primary schools in Bangkok. This first pilot project aimed at alleviating the shortage of well-trained teachers in primary education. In addition to the television broadcasts, school radio was also initiated to offer instructional programs for various schools in the country.

Another major development of instructional radio and television began in 1978 when the Ministry of Education launched the Radio-Correspondence Project to provide distance education programs from primary education to pre-university level for the scattered out-of-school population throughout the country. The project utilized radio broadcasts, printed instructional texts and other supported media to convey self-instructional lessons to the distance learners. Trained group organizers or facilitators were hired to conduct group meetings and tutorial sessions for the registered learners in each locality. Since the inception of the project, the annual enrolment of distance learner has increased steadily and reached over 812,000 in 1993.

To meet the increasing demand for radio and television broadcasts in education, the Government of Thailand approved the establishment of the National Education Radio Network in 1979 and the Education Television Station (Channel 11) in 1985. Both the radio network and the television station are administered by the Public Relations Department and the airtimes are shared by several institutions and agencies including Ramkhamhaeng University (RU) and Sukhothai Thammathirat Open University (STOU). These two open universities also utilize radio and television broadcasts intensively to support self-learning texts, which are designed to be the main medium of distance education courses.

In recognition of the need to upgrade infrastructure for modern telecommunication and information dissemination, the Government of Thailand granted a concession to Shinawatra Computer and Communications Co., Ltd. to launch the THAICOM Satellite Project. The first three satellites THAICOM I, THAICOM II and THAICOM III, had been launched into the Geostationary Orbit in December 1993, October 1994 and April 1997 respectively. The first two satellites are the HS-376 model, which takes the shape of a cylinder and achieves their stability in space by rotating around their axis. Each of the first two THAICOM satellites has 10 C-Band transponders and 2 Ku-Band transponders. The coverage of C-Band transmission includes most countries in East and South-East Asia. The Ku-Band transmission is focused on Thailand and adjacent countries in Indo-china. THAICOM III is the Spacebus 3000 model, which is much bigger and more effective than the first two satellites. It has 24 C-Band transponders and 14 KU-Band transponders. The coverage of C-Band transmission includes 4 continents, namely Asia, Europe, Australia and Africa. The Ku-Band Spot Beam is focused on Thailand and adjacent countries in Indo-China whereas Ku-Band Steerable Beam can be moved anywhere within the four mentioned continents.

Applications and utilization of the THAICOM satellites include distribution, relay and live broadcasting of radio and television, satellite telephony, satellite communications network and a very small aperture terminal, with the very high frequency of Ku-Band transmission (14 GHz and 12 GHz). Direct-to-home (DTH) television broadcasting system can be established to deliver television programs to very household and remote communities that install the receiver sets. In support of the policy to utilize modern communication and information technologies for education, Ramkhamhaeng University (RU) employed the capacity of THAICOM satellite and the advance development of information technology (IT) to provide successfully one-way communication for the undergraduate level and two-way communication for the graduate level at the regional campuses in 1995 and 1996 respectively. This distance and virtual education tends to go smoothly and successfully on serving rural education. In addition, Sukhothai Thammathirat Open University (STOU) also utilizes the telecommunication in order to deliver instruction via Wang Khai Kung Won School, Prachuab Kee Lee Khun province, recently. The program is developing its procedure.

The THAICOM satellite utilized the relay and live broadcasting of radio and television, the satellite communications with the very high frequency, to the new paradigm of the educational diversity. Direct-to-home (DTH) television broadcasting system disseminates information which yields the educational advantages globally. The THAICOM satellite is displayed in figure 4.1

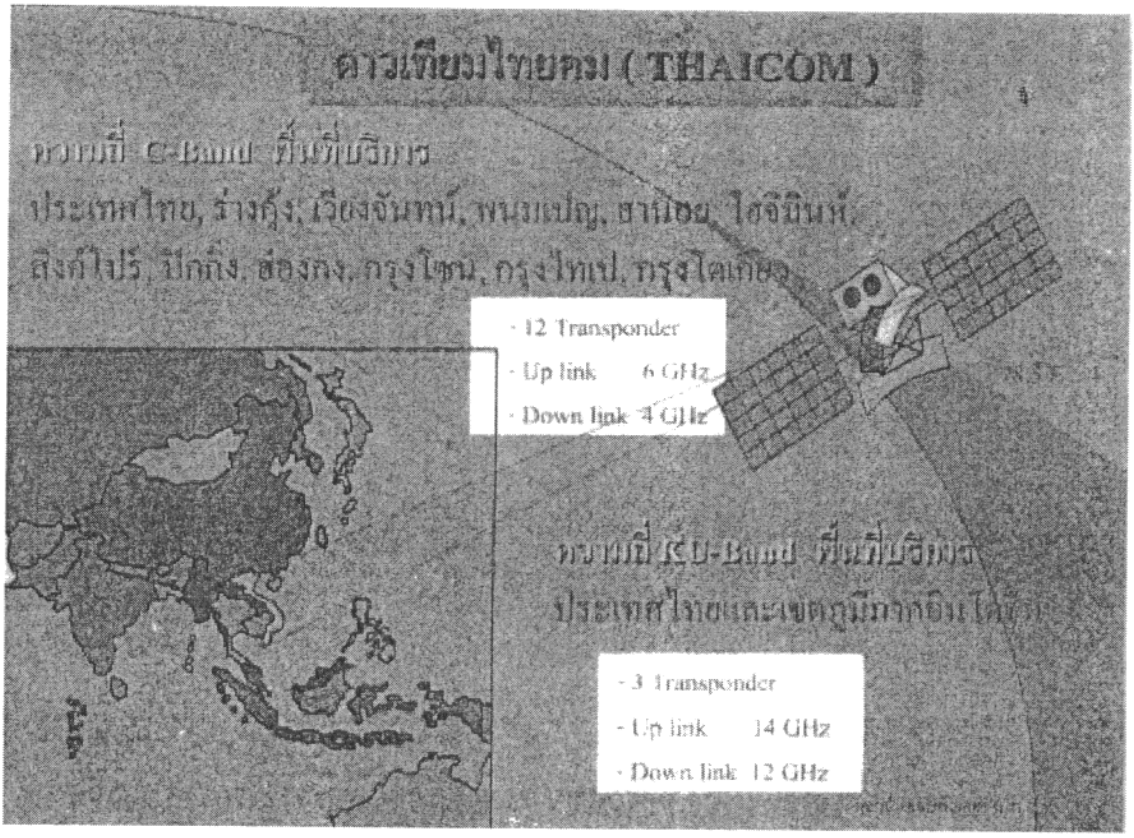


Figure 4.1: The THAICOM satellite demonstration

Source: The RU 28th anniversary Report, 1999.

The Ramkhamhaeng University (RU) utilized THAICOM satellite to deliver the education towards various distant campuses for both undergraduate and graduate levels of education. The THAICOM satellite is also used to communicate information via telecommunication network for education and training, teleconferencing, seminar at real time, and variety of facilities for distance. The figure 4.2 and 4.3 show the RU distance education IT utilization and the various RU Regional campuses in 1998 respectively.

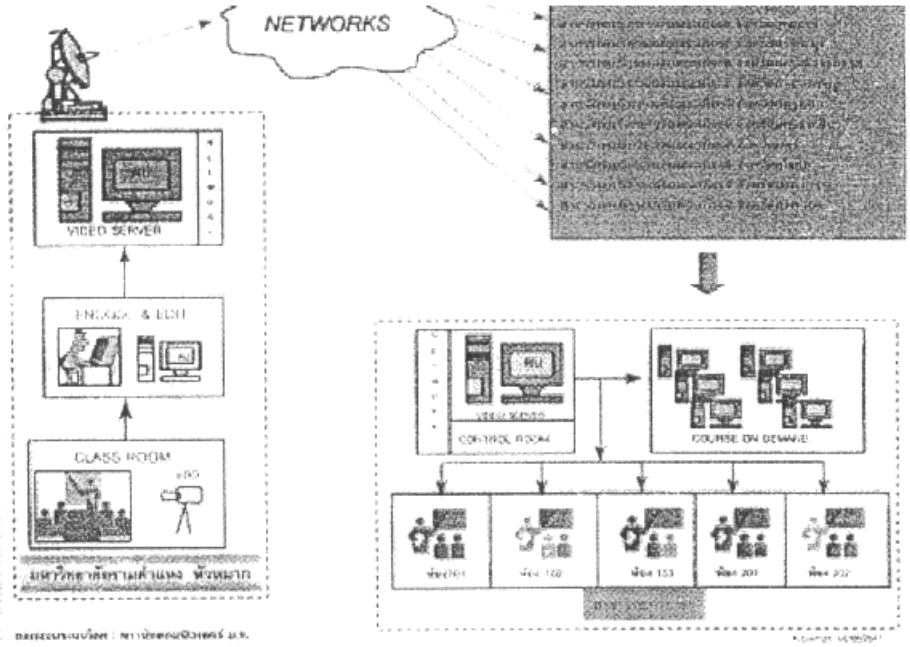
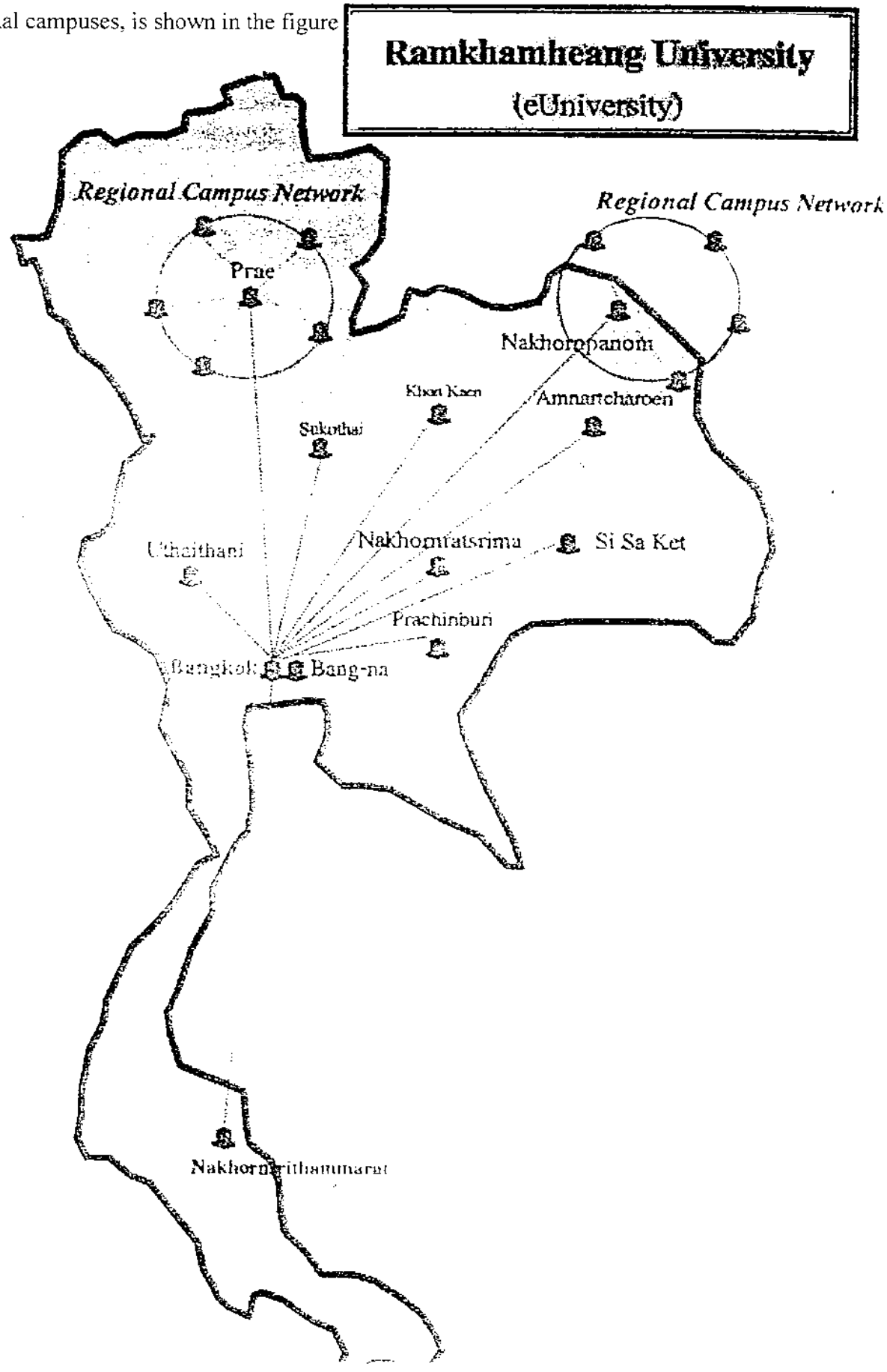


Figure 4.2: The RU distance education demonstration

Source: The RU 28th anniversary Report, 1999.

The widespread of satellite dissemination for the RU distance education to regional campuses, is shown in the figure



CHAPTER 5

RESEARCH METHODOLOGY

This chapter describes the research methodology and questionnaire design used to explore the distant students' learning satisfaction and perspectives of their studies. The research is based on the educational activities and delivery modes of instruction for higher education in Thailand, it also includes the information and instructional technology utilization towards both graduate and undergraduate students of RU and STOU. Therefore, this research addressed to analyze the educational supports; technological supports; information technology (IT) application for education; students' educational environments such as learning climate, achievement orientation; students' expectation, learning evaluation and so on, as well as students' problems, learning barriers, and their biodata towards the effectiveness of distance learning administration on RU and STOU.

Ramkhamhaeng University (RU) and Sukhothai Thammathirat Open University (STOU) are two open universities in Thailand. These two universities serve different distance education systems to aspired and adult students at remote areas on the provision of equality and accessibility in the education. For the promotion of equity and access, Jee-Peng Tan[1] and Alain Mingat (1992) view as the distribution of resources and access to education which are the principal concerns.

This study emphasizes cross-university analysis, highlighting differences of educational technology utilization, instructional delivery modes, academic and service supports. The questions are addressed as following: How much of students' satisfactions and perceptions in relation to the teaching materials, the instructional delivery modes, the technology application arrangement? What do the criteria concern with the educational effectiveness? What options exist for improvement? and so on.

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[1] Jee-Peng Tan and Alain Mingat, 1992. "Education in Asia: A Comparative Study of Cost and Financing", *The International Bank for Reconstruction and Development / The World Bank report*, Washington, D.C. p. 3.

The chapter is divided into six major sections:

1. Research design
2. Operational definitions
3. Sampling procedures
4. Data collection
5. Questionnaire design
6. Conclusion

5.1 RESEARCH DESIGN

The research describes the convergence of qualitative and quantitative methodologies used in the study. The data analysis is explained by the descriptive statistics and analyzed by the inferential statistics on the causal models of study. The soundness of the research design and some issues of the research design are discussed in the conclusion section of this chapter. A non-experimental research design and empirical approach were chosen. It started with the secondary data obtained from the RU and STOU documents of distance education, and the depth interviews conducted to the RU and STOU staff and administrators. The data are also received from the Office of Records and Admission both of RU and STOU. In addition, the primary data are obtained from the questionnaires that were launched to both RU and STOU graduate and undergraduate students at the remote areas. However, both qualitative and quantitative techniques are adopted in the combination, with the assumption that both techniques would provide more reliable and valid information for data analysis according to the hypotheses setting. The hypotheses were testified, confirming with the correlation matrices and degree of explanation, by the multiple regression and path analysis. The proposed causal models are analyzed in next chapter.

Furthermore, the study was conducted on two aspects: the students' learning satisfaction and the students' educational effectiveness which both yields the effectiveness of distance learning administration as the result of outcome. The questions cover eight criteria of educational effectiveness administration, and all variables concerning satisfaction and perceptions of students.

5.2 OPERATIONAL DEFINITIONS

The operational definition is required for each variable in order to transform the abstract or conceptual framework into the concrete variables of both qualitative and quantitative data which are the important for measurement techniques (Prasith-rathsint, 1993: 94). Additionally, measurement is concerned with the methods used to provide quantitative descriptions of the properties of variables (Ghiselli, Campbell, and Zedeck, 1981). This section explains the measure of dependent and independent variables used in the study.

5.2.1 Dependent Variables: Effectiveness of DL administration

Effectiveness of Distance Learning Administration is the dependent variable that composes of the students' learning satisfaction and the students' educational effectiveness, measuring with the Gooler's seven criteria and acceptability criterion.

Gooler (1979) proposed criteria that encourage the development of the distance education goals in the summative evaluation to present a holistic picture of the educational program. Gooler's (1979) seven criteria[2] appear significant and useful in the evaluation process regarding the effectiveness of distance education for administration. These criteria which set the stage for determining the effectiveness of distance education effort, are measured by rating on evaluation of 10-point scale. Eight criteria are:

- Access
- Relevance to needs and expectations
- Quality of program
- Learner outcomes
- Effectiveness and efficiency
- Impact
- Generation of knowledge, and Acceptability (Keegan and Rumble: 1982).

The questions for evaluation are:

1. How much do you evaluate your institution on access in education (hours of service at learning center), geographical coverage, ease of access to university, and media availability?
2. How much do you evaluate your institution on the awareness to students, media accessibility at home, and students' skill to accessibility?
3. How much do you evaluate your institution on service related to needs and expectations of students, social context, labor market?
4. How much do you evaluate your institution on the quality of education and training?
5. How much do you evaluate that IT applications provide the educational efficiency?
6. How much do you evaluate that IT applications provide the cost effectiveness?
7. How much do you evaluate your institution on the learner outcomes?
8. How much do you evaluate your institution on the effectiveness of academic success, social demands and students learning needs, and information technology efficiency?
9. How much do you evaluate your institution on the overall impact of education to society and earning power?
10. How much do you evaluate your institution on the generation of knowledge in terms of new practice, ideas, and direction?
11. How much do you evaluate your institution on the acceptability of credit transferable, and employment acceptance?

5.2.1.1 The students' learning satisfaction is measured by rating on the learning satisfaction of students on 10-point scale, with the questionnaire related to the academic and technological supports. The questions will investigate on

1. How much of your satisfaction with the distance learning system?
2. How much of your satisfaction with the overall academic context?
3. How much of your satisfaction with the advanced educational media supports?
4. How much of your satisfaction with the overall service supports?
5. How much of your satisfaction with the educational administration?
6. How much of your satisfaction with the technological utilization and services?
7. How much of your satisfaction with the instructional delivery system?
8. How much of your satisfaction with the learning environment?
9. How much of your satisfaction with the learning access?
10. How much of your satisfaction with the quality of faculty's instruction?

5.2.1.2 The students' educational effectiveness is recognized as the learner outcomes. All forms of positive learner outcome are characterized as the result of development of student talent.

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[2] John R. Verduin, Jr. and Thomas A. Clark (1991), *Distance Education: The Foundations of Effective Practice*, Jossey-Bass Publishers, San Francisco, U.S.A., pp. 186-193.

Learner outcomes in higher education have been researched intensively for many years and are recommended educational effectiveness in three major skill areas- cognitive or basic, higher-order, and metacognitive skills - as following:

- Cognitive or basic skills comprise knowledge, skills, and understanding (Desmond Keegan, 1993: 137) such as knowledge in reading, mathematics and language are the traditional outcomes (Brookover, 1979; Edmonds, 1979). Understanding comprises a mixture of knowledge and skills to form know-how concept which is an alternative problem-solving capability.
- Higher-order skills such as problem solving, are the criteria for educational effectiveness. Problem solving methods are studied in forms: independence or dependence (Savard, Mitchell, Abrami & Corso, 1995), holist or analytic dimension (Riding & Rayner, 1995), sensory preferences (Riding & Rayner, 1995; Crosby 1994)
- Metacognitive skills refer to learners' knowledge of and control over their cognitive processes by organizing, monitoring and modifying them, and includes strategies of how to learn.

The students' educational effectiveness (Harris, Bennett, Preedy, 1997: 115-120; Verduin and Clark, 1991: 88-100) is evaluated by scoring on the student's knowledge, skills, understanding, and conceptual knowledge on 10-point scale, related to the educational and technological supports in terms of cognitive, affective, and psychomotor domain.

The questions are

1. How much do you gain knowledge on subject matter?
2. How much do you increase your skills after take course?
3. How much do you increase your understanding the concept of subject matter?
4. How much can you conceptualize new idea?
5. How much can you explain subject matter to your classmate?
6. How much can you apply knowledge to your job?
7. How much can you initiate or create your new products or practice?
8. How much can you understand by self-study without any advice?
9. How much can you apply your knowledge to problem solving?

The characteristics of the dependent variables are summarized in the table 5.1 and table 5.2 in terms of variable description, operational definition, question number, and measurement level as following pages:

Table 5.1: The Measurement Level and Operational Definition of Research Variables

Variables	Description	Data Sources	Operational Definition	Measurement Level
Dependent Variable				
DL_ADMEFFT	- The Effectiveness of Distance Learning Administration, considering as the outcome, is evaluated by two outputs of the dependent variable components, they are (SUMSAT) and (EDUC_EFFT). - The Gooler's seven criteria of distance education are used to evaluate, including acceptability.		DL_ADMEFFT is the summation of (ACCS, NEED, QUAL, OUT, EFF, IMP, NEW, ACP) (see section 5.2.1)	- A ten-point score was used, where score 10 represents the highest score evaluation of the effectiveness
• Access	- The ability of student to reach the education on various geographic coverage, regarding to media availability and other services.	Q.116.1 - 116.8	- Consider how much of the students' evaluation to their university on educational access, regarding to the geographical coverage, ease of access to university, service hours available, and media available. It contains eight questions to evaluate. Therefore, the value of access is $ACCS = \sum_{i=1}^{8} (ACCS_i)$	- Interval scale; A ten-point score was used.

Table 5.1: The Measurement Level and Operational Definition of Research Variables (con't)

Variables	Description	Data Sources	Operational Definition	Measurement Level
Dependent Variable				
• Relevance to Needs and Expectations	- The ability of administrators to provide curricula related to students' needs and expectation, also regarding to societal and workforce requirements.	Q.117.1 - 117.4	- Consider the students' evaluation to their university on their needs, the need of community, workforce, and educational development. $NEED = \sum_{i=1}^{4} (NEED_i)$	- Interval scale; A ten-point score was used.
• Quality of Program	- The quality of educational program includes the quality of texts, learning materials, and other facilities.	Q.118.1 - 118.4	- Consider the quality of university administration, quality of administrators, quality of education, and quality of training and workshop. $QUAL = \sum_{i=1}^{4} (QUAL_i)$	- same as above

Table 5.1: The Measurement Level and Operational Definition of Research Variables (con't)

Variables	Description	Data Sources	Operational Definition	Measurement Level
Dependent Variable				
• Learner Outcomes	- The outcome of learning measures on knowledge, skill, moral, and vision for working of the students after graduation.	Q.119.1 - 119.4	- Consider the students' evaluation on their study in the ability to work, regarding to knowledge, skill, moral, and their vision to work and behave. $OUT = \sum_{i=1}^{4} (OUT_i)$	- Interval scale; A ten-point score was used.
• Effectiveness and Efficiency	- The ability of administrators to manage university effectively and provide the efficiency of technology and services on education.	Q.120.1 - 120.6	- Consider the students' evaluation to their university administrators on the effectiveness of administration, on the equity and the supports of educational excellence as well as IT application efficiently for cost-effectiveness. $EFF = \sum_{I=1}^{6} (EFF_i)$	- same as above

Table 5.1: The Measurement Level and Operational Definition of Research Variables (con't)

Variables	Description	Data Sources	Operational Definition	Measurement Level
Dependent Variable				
• Impact	- The impact of distance education influences the students on their career opportunity, community development, and cost expense on study.	Q.121.1 - 121.3	- Consider the students' evaluation on their study in terms of job opportunity, community benefits, and cost investment. $IMP = \sum_{i=1}^{3} (IMP_i)$	- Interval scale; A ten-point score was used.
• Generation of knowledge	- The distance education creates generation of knowledge into the new practice, new vision, and new direction.	Q.122.1 - 122.3	- Consider the students' evaluation on their distance education in knowledge generation of new practice, new thought, and new direction of study. $NEW = \sum_{i=1}^{3} (NEW_i)$	- same as above

Table 5.1: The Measurement Level and Operational Definition of Research Variables (con't)

Variables	Description	Data Sources	Operational Definition	Measurement Level
Dependent Variable				
• Acceptability	- The possibility of other universities to accept in transferring credits earned of the students for continue studying.	Q.123.1 - 123.2	- Consider the students' evaluation on the acceptance of transferring their credits earned to the other universities for their continuing study, and the acceptance of the labor force. $ACP = \sum_{i=1}^{2} (ACP_i)$	- Interval scale; A ten-point score was used.

Table 5.2: The Measurement Level and Operational Definition of Research Variables

Variables	Description	Data Sources	Operational Definition	Measurement Level
Dependent Variables				
SUMSAT	- The students' learning satisfaction (SUMSAT) is the dependent variable, considering as the output. It was evaluated by three independent domains: EDUCSUP domain, TECHSUP domain, and ST_COST domain. These three domains are described at table 5.3 through table 5.5	Q #63 to Q #72	SUMSAT is the summation of (SAT49 .. to .. SAT58) (see section 5.2.1.1) - Consider how much of the students' satisfaction to their university on distance education system, regarding to the academic contexts, media, technology and service supports, as well as the accessibility to the university and quality of teaching. Therefore, SUMSAT is computed as following: $SUMSAT = \sum_{i=49}^{58} (SAT_i)$	- A ten-point score was used, where score 10 represents the highest score of students' learning satisfaction

Table 5.2: The Measurement Level and Operational Definition of Research Variables (con't)

Variables	Description	Data Sources	Operational Definition	Measurement Level
Dependent Variables				
EDUC_EFFT	- The students' educational effectiveness (EDUC_EFFT) is the dependent variable, considering as the output. EDUC_EFFT was evaluated by four independent domains: IT_APPLCN, ST_CHAR, EDUC_ENV, and DEMOGRPH domains. These four domains are described at table 5.6 through table 5.9	Q#115.1 to Q#115.10	EDUC_EFFT is the summation of (PERC73 .. to .. PERC82) (see section 5.2.1.2) - Consider how much of the students' perceptions on their evaluation for educational effectiveness. The evaluations are based upon the improvement of knowledge, skills, understanding, conceptual creativity, regarding to the applied knowledge, diversity of thoughts, problem solving ability, as well as knowledge with morality. Therefore, EDUC_EFFT is obtained from: $\text{EDUC\_EFFT} = \sum_{i=73}^{82} (\text{PERC}_i)$	- A ten-point score was used, where score 10 represents the highest score of students' perception on evaluation of the educational effectiveness.

5.2.2 Independent variables involves in the conceptual framework are students' educational supports, students' technological supports, students' educational environment, students' characteristics, information technology applications for education, and students' educational costs and time spent. The independent variables are accumulated by 10-point score of evaluation, or by the ratio scale that related to the educational, administrative, and technological issues at various domains that are displayed in the conceptual framework. The questions related to these domains are described as following:

5.2.2.1 Students' educational supports compose of curriculum, faculty, student, service and staff support, rating on 10-point score. The questions are:

1. How much do you satisfy with the curriculum?
2. How much do you satisfy with the subject matter context?
3. How much do you satisfy with the clear explanation of the instructors?
4. How much do you satisfy with the advice of the academic coordinators?
5. How much do you satisfy with the learning materials? e.g. Textbooks, workbooks, supplementary material (newspapers & magazines), reference books, duplicated materials, programmed learning materials (audiocassette, videocassette, diskettes, CD-ROM, etc)
6. How much do you satisfy with the teaching methods? e.g. radio programs, television programs, motion picture, slides, overhead transparencies, videotapes, tape recording, programmed learning presentation, two-way communication, face-face, and self-study
7. How much do you satisfy with the guest speakers or professional lecturers?
8. How much do you satisfy with the library resources?
9. How much do you satisfy with the computer utilization?
10. How much do you satisfy with the registration service?
11. How much do you satisfy with the administrators' educational policy?
12. How much do you satisfy with the service of regional staffs?
13. How much do you satisfy with the learning schedule at class
14. How much do you satisfy with the learning schedule via radio at home?
15. How much do you satisfy with the learning schedule via ITV at home?
16. How much do you satisfy with the learning schedule via ITV at learning center?
17. How much do you satisfy with the learning equipment at learning center?
18. How much do you satisfy with the examination grade?
19. How much do you satisfy with the faculty contact?
20. How much do you satisfy with the information service in newsletter?

5.2.2.2 Students' technological supports domain composes of instructional delivery modes, computer-mediated communication (CMC), human-computer interaction (HCI), and the technological utilization. The learning satisfaction is accumulated by rating on 10-point score with the following questions:

1. How much do you satisfy with the contact with instructors? by what means
   a. letter b. telephone c. facsimile
   d. teleconferencing e. e-mail f. face-face
2. How much of your satisfaction with using the computer software e.g. MS-word, excel, power point, statistic package, application program, e-mail, Internet, and games and how often?
3. How much of your satisfaction with using library access service and how often?
4. How much of your satisfaction with discussing via teleconference with educators?
5. How much of your satisfaction with the information and academic news on Intranet?
6. How much of your satisfaction with the (clear) communication via satellite?
7. How much of your satisfaction with the speed of grade report?
8. How much of your satisfaction with the increasing numbers of campus?
9. How much of your satisfaction with the comfortable access on Internet?

5.2.2.3 Students' educational environment composes of learning climate, achievement orientation, student's expectation, learning evaluation, and context of instruction (Edmonds, 1993). By rating 10-point score on students' perception and agreement towards the educational effectiveness with the following questions:

1. How much do you agree with the class size?
2. How much do you agree with the class environment? e.g. air condition, clean room, clean air, clean toilets, comfortable seats, and pleasant place
3. How much do you agree with the learning climate? e.g. tutoring, group papers, group participation, and discussion
4. How much do you agree with the learning activities? e.g. presentation, seminar, meeting, and cultural ceremony
5. How much do you agree with the achievement orientation? e.g. final seminar, comprehensive tutoring, academic seminar, and workshop orientation
6. How much do you agree with the learning access by correspondence?
7. How much do you agree with the learning access by face-face?
8. How much do you agree with the learning access by telecommunication?
9. How much do you agree that teachers teach exactly the assigned context?
10. How much do you agree that the explanation of educators are clear and understood?
11. How much do you agree that educator is qualified?
12. How much do you agree that educator encourages discussion?
13. How much do you agree that the context is up-to-date?
14. How much do you agree that DE is the self-directed learning?
15. How much do you agree with the computer utilization on study?
16. How much do you agree with the computer training service?
17. How much do you agree with the teaching evaluation?

18. How much do you agree with the teaching-faculty oriented?
19. How much do you agree with the learning-center oriented?
20. How much do you agree with the learning materials improvement?
21. How much do you agree with the academic texts improvement?
22. How much do you agree with the academic curriculum improvement?
23. How much do you agree with the instructional delivery mode improvement
24. How much do you agree that the education should emphasize problem-solving?

5.2.2.4 Information technology (IT) applications for education consists of accessibility, effectiveness, and efficiency that influence the educational effectiveness. The 10-point score are evaluated by students on the IT beneficial properties. The questions are following:

1. How much do you agree that IT applications serve the mass of students ?
2. How much do you agree that IT applications influence distance education covering various geographic areas ?
3. How much do you agree that IT applications reduce expense on study ?
4. How much do you agree that IT applications lessen study distance ?
5. How much do you agree that IT applications lessen communication distance ?
6. How much do you agree that IT applications reduce communication time ?
7. How much do you agree that IT applications create new alternation of education ?
8. How much do you agree that IT applications create equality ?
9. How much do you agree that IT applications provide speedily global information ?
10. How much do you agree that IT applications provide information exchange
11. How much do you agree that IT applications create new modern services ?
12. How much do you agree that IT applications create e-commerce efficiently
13. How much do you agree that IT applications provide knowledge from access ?
14. How much do you agree that IT applications create academic interdiscipline development ?
15. How much do you agree that IT applications are utilized efficiently in distance learning ?
16. How much do you agree that IT applications provide quality of instruction?
17. How much do you agree that IT applications provide quality of information
18. How much do you agree that distance learning should employ IT applications ?
19. How much do you agree that distance learning require the quality of administrators, instructors, instruction, texts/supplementary, learning materials, education or training, academic seminar, workshops, technological equipment, data and information, computer hardware and software, and telecommunication infrastructure

5.2.2.5 Students' characteristics are independent variables, including needs and barriers which are influential factors to the educational effectiveness. The variables are investigated by rating the students' needs and motivation including learning barriers on 10-point scale regarding to the students' perception and agreement in the following questions:

1. How much do you agree that knowledge you learned can be apply to your current job?
2. How much do you agree with the moral education?
3. How much do you agree that education increases self-moral?
4. How much do you agree that education makes your work successfully?
5. How much do you agree with life long learning?
6. How much do you agree that education makes your social life more powerfully?
7. How much do you agree that education enhances self-actualization?
8. How much do you agree that education encourages social dependency?
9. How much do you agree that education increases your income?
10. How much do you agree that education initiates wisdom?
11. How much do you agree that education wastes the pleasant time?
12. How much do you agree that education broke the family institution?
13. How much do you agree that knowledge should couple with moral?
14. How much do you agree that education increases quality of your life?
15. How much do you agree that distance education provides cost effectiveness on study?

Please, rank the following questions according to the significant where
1 = least significant and 10 = most significant 0 = no comment/no relevance

16. Reasons for enrolling in distance learning system, rank and score them
    a. To acquire diploma
    b. To improve job position
    c. To be accepted in society
    d. To get more political votes
    e. To enhance prior knowledge
    f. To get ahead in present status
    g. For hobby
    h. Better vision
    i. Transition to new position / job
17. What did you get from studying, rank and score the following
    a. Critical thinking
    b. Knowledge
    c. Applied knowledge
    d. Technical skills
    e. Concepts and theories
    f. Social acceptance
    g. Self-actualization and self-reliance
    h. Accountability
    i. Reliability
18. Can your studying apply to your job by, rank and score the following
    a. Skills
    b. Experience
    c. Understanding
    d. Problem-solving
    e. Quality control
    f. Technological utilization
    g. Creativity
    h. Control and monitor crisis
    i. New products design or new service

19. Prioritize your opinion on the educational impact to social and score them
    a. Income distribution to community
    b. Community participation
    c. Knowledge dissemination
    d. Equity and access
    e. Opportunity to learn
    f. Opportunity on task
    g. Social dependency
    h. Literacy capacity
    i. Moral development
20. Prioritize your needs on the educational issues, rank and score them
    a. Curriculum development
    b. Subject matter development
    c. Faculty's awareness
    d. Faculty's capability of explanation
    e. Service support on academic
    f. Service support on learning materials
    g. Service support on library resources
    h. Computer availability
    i. Instructional delivery mode
21. What types of instructional delivery mode you prefer?
    a. Face-to Face
    b. One way communication e.g. radio and TV
    c. Two way communication e.g. teleconferencing
    d. Corresponding study
    e. Telephone or facsimile
    f. Self-study
    g. Self-study and learning material supplementary
    h. Face-face and one way communication
    i. Face-face and two way communication

5.2.2.6 Students' educational costs and time spent domain includes expense on study, as well as time study consume, time for examination preparation, time travel spent, etc. The questions are

1. How much you spend money for studying (exclude tuition fee) a month?
2. How much you spend money for family expense a month?
3. How long you take time for studying in a week?
4. How long you take time for preparing the examination?
5. How long you take time for travelling to campus?
6. What is your GPA score?
7. How many re-examination you taken?
8. How long will you graduate (years, month)?
9. Are you studying at other universities else?
10. How many your dependents?
11. How many your studying dependents?
12. How many credits you earned?
13. How many years you have worked?

5.2.2.7 Students' barriers are measured by students themselves, learning issues, educational background, and technological efficiency. The questions are asking for ranking the critical barriers, they are:

1. Prioritize your study as following:
   a. Curriculum (specify) .....
   b. Instructors (specify) .....
   c. Grade point average (GPA) (specify) .....
   d. Teaching media availability (specify) .....
   e. Communication with instructors (specify) .....
   f. Subject matter context is not congruent to job description
   g. Regulations and rules (specify) .....
2. Prioritize your own barriers as following:
   a. Travel distance (specify) .....
   b. Study time (specify) .....
   c. Study expense (specify) .....
   d. Family support (specify) .....
   e. Superior / Boss support (specify) .....
   f. Motivation (specify) .....
   g. Lack of educational background (specify) .....
3. Prioritize your learning center surrounding as following:
   a. Learning center location is uncomfortable or not easy to attend
   b. Dirty room and hot air condition
   c. No place for rest or study
   d. Lack of coordination with learning center staff
   e. Lack of coordination with technicians
   f. Disturb noise
   g. Parking lot is not available
4. Prioritize your technological utilization as following:
   a. Lack of Computer background
   b. No room for learning equipment support to study
   c. Lack of learning facility equipment
   a. Lack of computer hardware and software
   b. Inefficiency telecommunication
   c. Library electronic access unavailability
   d. Lack of utility facilities e.g. telephone, fax

The table 5.3, table 5.4, and table 5.5 represent the characteristic of the independent variables towards the students' learning satisfaction (SUMSAT). The table 5.6, table 5.7, table 5.8, and table 5.9 represent the independent variable characteristics that lead to the students' educational effectiveness (EDUC_EFFT). The tables are shown in the following pages.

Table 5.3: The Measurement Level and Operational Definition of Research Variables

List of Variables	Description	Data Sources	Operational Definition	Measurement Level
Independent Variables Students' Educational Supports (EDUCSUP) Domain	- The students' educational support is an independent domain. This domain is the crucial supports for distance education because it provides the essential substances for study.		- The educational support of distance education includes curriculum, faculty, student, service and staff supports. (see section 5.2.2.1)	- A ten-point score was used, - Score of 10 represents the highest score of learning satisfaction.
• Curriculum supports (CURSUP)	- The curriculum supports refer to the contents of curricula that offer for the distance education, including the context of instruction.	Q# 33, Q# 34	- Consider how much of the students' satisfaction to their studies, regarding to the content of curriculum and the context of subject matter	- Interval scale; A ten-point score was used
• Faculty supports (FACSUP)	- The faculty supports refer to the ability of faculty's explanation, the methods of instructional delivery, etc.	Q# 35, Q# 39, Q# 43, Q# 51, Q#53.5, Q# 56	- Consider how much of the students' satisfaction to their studies, regarding to the clear explanation of teacher, the ways of teaching, the ease of contact, and the fair discussion.	- same as above

Table 5.3: The Measurement Level and Operational Definition of Research Variables (con't)

List of Variables	Description	Data Sources	Operational Definition	Measurement Level
Independent Variables				
• Student supports (STSUP)	- The student supports refer to the learning material and facilities, providing to distant students. Counseling and tutorials are also included.	Q#37.1 -37.5, Q# 50	- Consider how much of the students' satisfaction to their studies, regarding to the text, learning material and service, as well as grade report.	- Interval scale; A ten-point score was used.
• Service and staff supports (SERVSUP)	- The service and staff supports refer to the educational service, including computer utilization and library accessibility.	Q# 36, Q# 40, Q# 42, Q# 44, Q# 45, Q# 49, Q# 52, Q# 55, Q# 60, Q# 61	- Consider how much of the students' satisfaction to their studies, regarding to the learning facilities such as library service, computer accessibility, staff service, educational service, university news and activities, Internet searching, e-mail, and so on.	- same as above

Table 5.4: The Measurement Level and Operational Definition of Research Variables

List of Variables	Description	Data Sources	Operational Definition	Measurement Level
Independent Variables Students' Technological Supports (TECHSUP) Domain	- The technological support is independent domain. The domain involves the interactivity to deliver the instruction. This domain is important support to the distance education.		- The students' technological supports include instructional delivery modes, computer-mediated communication, human-computer interaction, and technological utilization. (see section 5.2.2.2)	- A ten-point score was used, - Score of 10 represents the highest score of learning satisfaction.
• Instructional delivery modes (INSTECH)	- The instructional delivery modes refer to the means of instructional delivery and correspondence.	Q#38.1 –38.11, Q# 53.1 Q# 53.2	- Consider how much of the students' satisfaction to their studies, regarding to the methods of teaching, and interactivity.	- Interval scale; A ten-point score was used
• Computer-Mediated Communication (CMC)	- The support refers to deliver the instruction to students via the computer communication network	Q#53.4, Q# 58, Q# 62	- Consider how much of the students' satisfaction to their studies, regarding to computer utilization, either e-mail or Internet.	- Interval scale; A ten-point score was used.

Table 5.4: The Measurement Level and Operational Definition of Research Variables (con't)

List of Variables	Description	Data Sources	Operational Definition	Measurement Level
Independent Variables				
• Human-Computer Interaction (HCI)	- The human-computer interaction refers to the interactivity between teacher and students in distance education. The domain involves transferring the instruction via the communication network.	Q#53.3, Q# 57	- Consider how much of the students' satisfaction to their studies, regarding to the teaching via communication network or real time study.	- Interval scale; A ten-point score was used.
• Technological utilization (USETECH)	- The technological utilization support refers to the utilization of computer and the telecommunication.	Q# 41, Q# 46, Q# 47, Q# 48, Q# 54, Q# 59	- Consider how much of the students' satisfaction to their studies, regarding to the utilization of computer, the advantages of radio and television broadcasting, the efficiency of technology, etc.	- same as above

Table 5.5: The Measurement Level and Operational Definition of Research Variables

List of Variables	Description	Data Sources	Operational Definition	Measurement Level
Independent Variables Students' Educational Costs and Time spent (ST_COST) Domain	- The students' educational cost and time spent for study is the independent domain. The domain concerns student individual burden. The domain can be considered as the problem lead to decrease learning satisfaction or the drop out rate problem.		- The students' educational cost and time spent domain involves the expense on study, time study consume individually, time spent for examination preparation, and time spent for driving to study.	
• Expense on Study (EXPS)	- The expenses for education of student refer to the expense of the registration fee and the individual expense.	Q# 11, Q# 12	- The expense on study includes the registration expense and the individual expense. Usually the registration fee is the same rate of the same university but for another reasons the registration fee may vary because of number of credit registered individually. EXPS = REG_EXPS + IND_EXPS	- Ratio scale.

Table 5.5: The Measurement Level and Operational Definition of Research Variables (con't)

List of Variables	Description	Data Sources	Operational Definition	Measurement Level
Independent Variables				
• Time Study Consume (HRREAD)	- The study time is another independent variable that may influence the learning satisfaction.	Q# 19	- Consider the students' learning satisfaction with regarding to the time spent on study. Since most distant students are adult and they are working, so time is also their constraint.	- Ratio scale.
• Time for Examination Preparation (HR_EX)	- The time for preparing the examination is influential factor that influences the grade and morale of student.	Q# 20	- Consider the students' learning satisfaction with regarding to the time of examination preparation.	- Ratio scale.
• Time Travel spent (HRFAR)	- The time travel spent to study is the independent variable to encourage or discourage the students to study.	Q# 14	- Consider the students' learning satisfaction with regarding to the time of travel to study.	- Ratio scale.

Table 5.6: The Measurement Level and Operational Definition of Research Variables

List of Variables	Description	Data Sources	Operational Definition	Measurement Level
Independent Variables IT Application for Education (IT_APPLCN) Domain	- The information technology (IT) is now the necessary and important tool for distance education, besides of the correspondence.		- The information technology (IT) for distance education should provide the special characteristics such as the accessibility, effectiveness, and efficiency. (see section 5.2.2.4)	- A ten-point score was used, - Score of 10 represents the highest score of the perception on evaluation in the educational effectiveness.
• Accessibility (ITACCSS)	- The accessibility of IT is the essential characteristic for distance education because the students are distant and separated apart from teacher and students themselves.	Q#110.1 - Q#110.2, Q#110.8	- Consider how much of the students' perception to evaluate the educational effectiveness, regarding to the accessibility of IT at various remote areas. ITACCSS = PERC43 + PERC44 + PERC50	- Interval scale; A ten-point score was used

Table 5.6: The Measurement Level and Operational Definition of Research Variables (con't)

List of Variables	Description	Data Sources	Operational Definition	Measurement Level
Independent Variables				
• Effectiveness (ITEFFT)	- The IT effectiveness refers to the capability of IT in distance education. IT effectiveness considers cost and benefit analysis, the new alternative direction of education, and the equality in education.	Q#110.3 - Q#110.7, Q#110.16 – Q#110.17	- Consider how much of the students' perception to evaluate the educational effectiveness, regarding to cost-effectiveness, time reduction in travel, study and communication. It serves the new alternatives and creates equity on education	- Interval scale; A ten-point score was used.
• Efficiency (ITEFFCY)	- The IT efficiency affects the global changes in variety of business and education. IT provides quality and new services to distance efficiently. .	Q#110.9 – Q#110.15	- Consider how much of the students' perception to evaluate the educational effectiveness, regarding to the boundless information, e-commerce advantage, Internet searching, distance education diversity, and quality of information and teaching.	- Interval scale; A ten-point score was used.

Table 5.7: The Measurement Level and Operational Definition of Research Variables

List of Variables	Description	Data Sources	Operational Definition	Measurement Level
Independent Variables Students' Characteristics (ST_CHAR) Domain	- The students' characteristics involve the students' needs and the students' barriers. Their needs and barriers based on the distance education system and learning activity.		- The students' characteristics refer to the personal need and individual barriers. The students' expectations as well as barriers are investigated.	- A ten-point score was used, - Score of 10 represents the highest score of the perception on evaluation in the educational effectiveness.
• Students' needs (NEEDPERC)	- Students' needs vary on their expectation, work opportunity, and future trends based on students' learning preferences.	Q#108.1 - Q#108.8	- Consider how much of the students' perception to evaluate the educational effectiveness, regarding to the students' needs on education and learning advantages.	- Interval scale; A ten-point score was used
• Students' barriers (ST_BARIER)	- Students' barriers based on individual problem on education. - Student's barrier that affect their education and family (STBAR). - Number of students' learning problems and barriers are counted (SUMBAR).	Q# 105 - Q# 107 Q# 29 - Q# 32	- Consider how much of the students' perception to evaluate the educational effectiveness, regarding to their problems of education. ST_BARIER = SUMBAR + STBAR	- Interval scale; A ten-point score was used

Table 5.8: The Measurement Level and Operational Definition of Research Variables

List of Variables	Description	Data Sources	Operational Definition	Measurement Level
Independent Variables Students' Educational Environment (EDUC_ENV) Domain	- The students' educational environment domain includes learning climate, achievement orientation, students' expectations, learning evaluation, and context of instruction.		- The students' educational environment refers to the atmosphere of studying, the achievement activities, and the learning evaluation of students. (see section 5.2.2.3)	- A ten-point score was used, - Score of 10 represents the highest score of the perception on evaluation in the education effectiveness.
• Learning climate (LCLMT)	- The learning climate refers to the surroundings of learning such as class size, fresh air, clean classroom, etc.	Q# 75 - Q# 78, Q# 81	- Consider how much of the students' perception to evaluate the educational effectiveness, regarding to the learning environment.	- Interval scale; A ten-point score was used
• Achievement orientation (ACHV)	- The achievement orientation refers to the academic encouragement such as academic seminar, workshop, and the educational orientation.	Q# 79, Q# 80, Q# 82, Q# 83, Q# 84	- Consider how much of the students' perception to evaluate the educational effectiveness, regarding to the orientation of academic and workshop.	- Interval scale; A ten-point score was used

Table 5.8: The Measurement Level and Operational Definition of Research Variables (con't)

List of Variables	Description	Data Sources	Operational Definition	Measurement Level
Independent Variables				
• Students' expectations (STEXPCT)	- The students' expectations refer to the results of education in order to obtain better life and living.	Q# 99 - Q#104 Q#112- Q#114	- Consider how much of the students' perception to evaluate the educational effectiveness, regarding to the quality of life and work, etc.	- Interval scale; A ten-point score was used.
• Learning evaluation (LEVAL)	- The learning evaluation involves the ability of teachers' teaching, the teachers' qualification, the production of education, and so on.	Q# 88- Q# 92	- Consider how much of the students' perception to evaluate the educational effectiveness, regarding to the ability of teacher's teaching, educational advantage for life and work, etc.	- same as above
• Context of instruction (INSTXT)	- The context on instruction refers to the teaching quality and the quality of texts.	Q# 85 - Q# 87 Q#93 - Q#98	- Consider how much of the students' perception to evaluate the educational effectiveness, regarding to the applied and modern knowledge, the clear explanation, and the quality of instruction, etc.	- same as above

Table 5.9: The Measurement Level and Operational Definition of Research Variables

List of Variables	Description	Data Sources	Operational Definition	Measurement Level
Independent Variables				
Students' Personal Information (DEMOGRPH) Domain	- The students' personal information refers to the students' background such as age, revenue, etc.		- The information about students that may lead to the students' educational effectiveness.	
• Age (AGE)	- The student's actual age	Q# 7	- Age is an independent variable that may lead to the educational effectiveness because the older students have more experience but less memory capacity to remember and to learn.	- Ratio scale.
• Revenue (REVN)	- The student's income	Q# 9	- Revenue can be the factor of learning success or failure because to study is to spend money for tuition fee and extra expense.	- Ratio scale
• Grade Point Average (GPA)	- The grade point average calculated from the starting to the end of education	Q# 16	- Grade point average is an independent variable leading to the educational effectiveness.	- Ratio scale

Table 5.9: The Measurement Level and Operational Definition of Research Variables (con't)

List of Variables	Description	Data Sources	Operational Definition	Measurement Level
Independent Variables				
• Number of dependents (DEP)	- Number of dependents means number of children belonging to the learning student.	Q# 6.2	- Number of children is the independent variable that leads to the student's problem and barrier to study.	- Ratio scale
• Number of educating dependents (DEP_EX)	- Number of educating dependents means number of children who are studying. .	Q# 6.3	- Number of educating children is the independent variable that leads more to the student's problem and barrier to study.	- Ratio scale
• Number of re-examination (RE_EX)	- Number of examination that the student retake because the examination result that was taken, is not satisfied.	Q# 17	- Number of re-examination is the independent variable that may discourage student to continue his/her study, which leads to the educational effectiveness of student.	- Ratio scale

5.3 SAMPLING PROCEDURES

The study adopted a sampling procedure by random, for both RU and STOU undergraduate and graduate students at the different locations and faculties or schools, is discussed in the following sections.

5.3.1 Target Population and Unit of Analysis

The target population of this study was the graduate and undergraduate students of RU and STOU living at the remote areas. The conceptual framework of the effectiveness of distance learning administration is measured and compared in terms of the learning satisfaction and the educational effectiveness based on the educational and the technological supports; learning environments; with regarding to students' perceptions, satisfaction, and evaluation.

5.3.2 Sample Selection

The samples were gathered from the RU students of graduate and undergraduate studies at the thirteen regional campuses and STOU students of graduate and undergraduate studies at the various regional parts in Thailand.

The samples were gathered with a very difficulty because the students are scattering in many areas. Moreover, there are some students confront with the drop-out and withdraw situations, regarding to their preferences, individual reasons, and problems. Thus, the samples were selected cautiously with the specific qualification. With the specific qualification, the last year students of RU were only selected and the STOU students, who are going to graduate from the education, were sampled only.

Ignoring the unsuccessful ones, can lead to measure the effectiveness of distance learning systems concretely and objectively because the personal bias of attitude, perception, and evaluation were deleted. Therefore, the actual data and information were obtained.

The target population was recently collected from the RU and STOU records of the Office of Admission and Records shown in table 5.10 (updated in 1999) whereas the responsed samples were also shown:

Table 5.10: Comparison of RU and STOU samples with the response rate (%)

University Students	Population	Distributed Numbers	Responsed Samples	Response Rate (%)
❖ RU				
• Graduate	6,856	700	409	58.43
• Undergraduate	14,134	300	115	38.33
❖ STOU				
• Graduate	1,729	500	186	37.20
• Undergraduate	88,347	300	183	61.00

The RU and STOU respondents were surveyed during January to April 2001. The questionnaires were edited during March through April 2001. The data were processed urgently after the editing completion. The data analysis was described in detail in the next chapter.

5.4 DATA COLLECTION

The data were undertaken over a period of year, beginning with the pretest at Kunming, China on May 25-29, 1999. This pretest examined the international professors' attitude on students' learning behaviors and the administrative problems on education. The results of survey indicated that 85% of the professors from the United States and Canada claimed that financial aid is the major problem of education while the Asian professors urged that the quality of education and technology are the crucial problems for education. In addition, the Chinese professors agreed that English language is also the Chinese students' problems.

The pretest was also undertaken with the RU graduate distant students at the regional campus of Nakhon Si Thammarat province. The questionnaire was the open-ended design, involving the learning satisfaction, the learning barriers, and the students' needs and expectations. The results of finding indicated that most students satisfied the teaching climate and technology. However, the students' barriers are time constraints and working hours because most students are working and they have to manage time for working and studying as well as time for family.

5.4.1 Documentary Research and Secondary Data

Since the acquisition of reliable and valid empirical data is the most important requirement for research, thus this study use the combination of documentary data, questionnaire, and structured interviews. The research accomplished by data that were gathered from interviews, questionnaires, and documentation analysis.

Data from documentation are mainly from the university bulletins and newsletter as well as the university annual reports. The records of students are obtained by the Office of Admission and Records of RU and STOU and also from the RU Computer Center.

5.4.2 Structured Interviews

The data and information are gathered from interviewing the executive administrator, concerning the university policy, executive opinion, and the educational activities. The face-to-face interview the university administrators, enable to get current information and future plan of education and administrative strategies. However, the structured interviews assist in the design of questionnaire as well as secondary data. In addition, the interviews had the advantage of rendering the respondents more comfortable with sharing their feelings and insights verbally than they would have been with a written questionnaire (Rea & Parker, 1992). Despite the mentioned advantages, the interviews were costly in time, and there was the threat of interviewers bias (Rea & Parker, 1992).

To reduce these limitations, the written questionnaires are requested to fill out by other university administrators and students. The interviews are also gathered randomly from the university students, involving the attitude and perception of their study.

5.4.3 Questionnaires

The RU and STOU graduate and undergraduate students are responded to the questionnaires, concerning the educational and technological supports and academic services as well as the learning barriers. The geographic information was gathered accordingly.

5.5 QUESTIONNAIRE DESIGN

The questionnaire was designed by using the guidelines recommended by Creemers (1991); Scheerens (1991); Stringfield and Slavin (1992); Cameron (1978); Frank (1974); and Keegan (1993). The questionnaire was reviewed by the Research Methodology Dissertation Committee. The questionnaire design based on the samples of study (see appendix B and C).

The open-ended questionnaire was tested on the international conference "International Consortium on Inter-University Exchange and Cooperation in the 21st Century" held at University of Yunan, Republic of China, on May 25-29, 1999. This questionnaire covered three parts, asking for the opinions of university executives on educational administration, problems and proposed solutions (see appendix A).

The pre-test questionnaire was also submitted to the RU graduate distant students at Nakhon Si Thammarat regional center. This questionnaire was the semi-open-ended questions. Thus, the questionnaire package was introduced and constructed by using the pre-test questionnaire as the guideline (see appendix A).

The questionnaire package contained a letter, asking for filling out the questionnaire with great appreciation, enclosed with the letter signed by the chair committee (see appendix B).

The questionnaire emphasized the purpose of the research study on distance learning system in terms of academic supports and services as well as the technological utilization on teaching and instructional delivery. The questions scoped on the learning satisfaction and the criteria of educational effectiveness.

The questionnaire was arranged into six parts:

Part 1: This part covered the personal information of respondents such as age, career, revenue, expense, number of dependents and number of educating dependents, GPA, time for study and travel, number of re-examination, and so on.

Part 2: This part dealt with the requirement of students as well as the beneficial learning outcomes in which the students obtained. The questions asked for prioritizing the important issues that are relevant to the students' needs.

Part 3: This part concerned with the students' learning barriers on study and learning environment by prioritizing the significant matters.

Part 4: This part involved the learning satisfaction by scoring the satisfaction from the least satisfaction score to the most satisfaction score ascending in one to ten score. This part also included the information of the utilization of IT in games playing, word processing, electronic mailing, programming, Internet searching in terms of time spent on using computer.

Part 5: This part asked for the students' perception on learning by scoring the agreement of their interests, from one to ten according to the degree of their attitude and agreement. Score one represented the least degree of agreement while score ten meant the highest degree of agreement.

Part 6: This part involved the learning evaluation of students in the educational effectiveness criteria provided by the university administrators. The evaluation is scored from one to ten depending on the degree of students' evaluation. Score one meant the lowest degree of evaluation and score of ten represented the highest degree of evaluation on the educational effectiveness.

5.6 MEASUREMENT OF VARIABLES

Variables in this research were developed based upon the concepts in the reviewed literature. Each set of the domain contains multiple dimensions or items. The indexes have been used to measure the variables. The pilot test, factor analysis, and the construct validity and reliability of the measurement scales were employed to justify the appropriateness.

5.6.1 Pilot Test

The questionnaire was pilot-tested on respondents similar to those sampled in the main study. The main objective of the pilot test was to check the format of wording as well as to measure the reliability of questionnaires.

5.6.2 Factor Analysis

Principle components factor analysis with Varimax rotation was used to define the fundamental dimensions assumed to underlie the construct and to examine the validity of a measurement scale. The rotation was used to achieve a more meaningful factor pattern and interpretability. The Varimax method was used widely because it has proved very successful as an analytic approach (Hair, 1987; Tabachnick and Fidell, 1989). The Varimax rotation is not only employed to identify the underlying structure of the concepts being measured but it also determine the weight of an individual variables, which are included, in the scale.

The results of factor analysis obtained with a minimum eigenvalue of 1. An eigenvalue is the amount of variance accounted for by a factor. Factor analysis of the RU and STOU graduate and undergraduate distant students, separating by students' learning satisfaction domain and students' educational effectiveness domain, are summarized in the table 5.11 through table 5.18 respectively.

Table 5.11 represents the factor analysis of RU at the graduate studies level of the students' learning satisfaction domain as following:

Table 5.11: Factors Analysis of Graduate RU students' learning satisfaction

Variables	Contents	Factors Loading		
		I	II	III
FACTOR I	INSTRUCTIONAL DELIVERY MODES			
SAT12	- Motion movie presentation	.815		
SAT29	- TV broadcasting at home	.787		
SAT28	- Radio broadcasting schedule	.755		
SAT10	- Radio broadcasting delivery	.744		
SAT16	- Learning by Tape cassette	.730		
SAT20	- Self-study	.713		
SAT17	- Computer program presentation	.707		
SAT14	- Teaching by transparences	.644		
SAT13	- Teaching by slide projection	.611		
SAT11	- ITV broadcasting delivery	.559		
SAT18	- Two-way tele-teaching	.557		
SAT19	- Teaching Face-to-Face in classroom	.520		
SAT15	- Teaching by video recorder	.485		
SAT47	- Expanded coverage of campuses	.479		
FACTOR II	STUDENT SUPPORTS			
SAT8	- Copied Supplementary support		.778	
SAT7	- Reference Texts support		.767	
SAT6	- Supplementary texts support		.719	
SAT5	- Texts		.691	
SAT21	- Guest speakers		.596	
SAT9	- Learning materials		.589	
SAT4	- Facilitators' advice		.544	
SAT3	- Faculties' clear explanation		.506	
FACTOR III	COMPUTER-MEDIATED COMMUNICATION			
SAT41	- Electronics Library Searching			.702
SAT48	- Internet facility			.674
SAT40	- Application programs availability			.627
SAT44	- University electronic newsletter			.604
SAT38	- Interaction with teacher by e-mail			.550
SAT35	- Correspondence by postal mail			.502
SAT36	- Communication by telephone, fax			.460
SAT46	- Grade report feedback			.379

Table 5.11: Factors Analysis of Graduate RU students' learning satisfaction (con't)

Variables	Contents	Factors Loading				
		IV	V	VI	VII	VIII
FACTOR IV	HUMAN-COMPUTER INTERACTION					
SAT37	- Teleconferencing interaction	.721				
SAT39	- Face-to-Face interaction	.686				
SAT43	- Two-way discussions	.589				
SAT42	- Classroom discussion	.581				
SAT45	- Clear two-way telecommunication	.498				
SAT34	- Newsletter service	.425				
FACTOR V	SERVICE & STAFF SUPPORTS					
SAT26	- Regional staff service		.748			
SAT27	- Classroom schedule		.660			
SAT24	- Registration service		.637			
FACTOR VI	FACULTY SUPPORTS					
SAT25	- Administrators' policy			.641		
SAT33	- Ease to contact faculty			.355		
FACTOR VII	CURRICULUM SUPPORTS					
SAT1	- Curriculum availability				.857	
SAT2	- Context of subject matter				.813	
FACTOR VIII	TECHNOLOGICAL UTILIZATION					
SAT30	- TV learning available at regional campus / center					.778
SAT22	- Texts available in library					.725
SAT31	- Learning material available at regional campus / center					.657
SAT23	- Computers provided for students					.653
SAT32	- Examination grade result					.432

Factor analysis of RU graduate students at the students' learning satisfaction can be classified into eight components: curriculum supports, faculty supports, student supports, service and staff supports, instructional delivery modes, computer-mediated communication, human-computer interaction, and technological utilization. These dimensions contain variables with weight scale, influencing variety degrees of learning satisfaction. The highest weight scale is curriculum availability, with the scale of 0.857

Table 5.12 represents STOU at the graduate studies level of the students' learning satisfaction domain, divided into eight components as shown following:

Table 5.12: Factors Analysis of Graduate STOU students' learning satisfaction

Variables	Contents	Factors Loading			
		I	II	III	IV
FACTOR I	HUMAN-COMPUTER INTERACTION				
SAT41	- Electronics Library Searching	.915			
SAT44	- University electronic newsletter	.911			
SAT48	- Internet facility	.875			
SAT23	- Computers provided for students	.660			
SAT43	- Two-way discussions	.654			
SAT42	- Classroom discussion	.620			
SAT45	- Clear two-way telecommunication	.506			
SAT47	- Expanded coverage of campuses	.471			
FACTOR II	INSTRUCTIONAL DELIVERY MODES				
SAT14	- Teaching by transparences		.907		
SAT10	- Radio broadcasting delivery		.904		
SAT20	- Self-study		.833		
SAT13	- Teaching by slide projection		.826		
SAT11	- ITV broadcasting delivery		.816		
SAT12	- Motion movie presentation		.788		
SAT16	- Learning by Tape cassette		.776		
SAT15	- Teaching by video recorder		.770		
SAT17	- Computer program presentation		.749		
SAT19	- Teaching Face-to-Face in classroom		.691		
SAT18	- Two-way tele-teaching		.691		
FACTOR III	CURRICULUM SUPPORTS				
SAT1	- Curriculum availability			.848	
SAT2	- Context of subject matter			.841	
SAT5	- Texts			.782	
SAT3	- Faculties' clear explanation			.698	
SAT34	- Newsletter service			.664	
SAT33	- Ease to contact faculty			.624	
SAT22	- Texts available in library			.501	
FACTOR IV	COMPUTER-MEDIATED COMMUNICATION				
SAT38	- Interaction with teacher by e-mail				.877
SAT29	- TV broadcasting at home				.840
SAT28	- Radio broadcasting schedule				.837
SAT35	- Correspondence by postal mail				.833
SAT36	- Communication by telephone, fax				.831
SAT37	- Teleconferencing interaction				.795

Table 5.12: Factors Analysis of Graduate STOU students' learning satisfaction (con't)

Variables	Contents	Factors Loading			
		V	VI	VII	VIII
FACTOR V	STUDENT SUPPORTS				
SAT8	- Copied Supplementary support	.920			
SAT7	- Reference Texts support	.909			
SAT6	- Supplementary texts support	.899			
SAT9	- Learning materials	.828			
FACTOR VI	SERVICE & STAFF SUPPORTS				
SAT46	- Grade report feedback		.682		
SAT24	- Registration service		.599		
SAT26	- Regional staff service		.533		
SAT32	- Examination grade result		.472		
FACTOR VII	TECHNOLOGICAL UTILIZATION				
SAT31	- Learning material available at regional campus / center			.882	
SAT30	- TV learning available at regional campus / center			.847	
SAT40	- Application programs availability			.363	
FACTOR VIII	FACULTY SUPPORTS				
SAT21	- Guest speakers				.620
SAT39	- Face-to-Face interaction				.615
SAT4	- Facilitators' advice				.538
SAT25	- Administrators' policy				.522
SAT27	- Classroom schedule				.421

Since STOU graduate students are self-directed learners so that the dominant factor analysis is human-computer interaction (HCI) domain. The electronic library searching is the major activity of study with the weight of 0.915, while the electronic newsletter, interaction with teacher by e-mail, and Internet facilities are also the essential activities for self-directed study with the weight of 0.911, 0.877 and 0.875 respectively. However, the STOU graduate students have chance to take courses in classroom as face-to-face seminar for 2-3 times per semester in order to catch up the subjects matter and conceptualize the idea and opinion of lessons.

According to the factor analysis, the supplementary document is the crucial variable for self-study because it comes with the highest weighting scale of 0.920. Self study with the weight scale of 0.833 accordingly.

Table 5.13: Factors Analysis of Graduate RU students' educational effectiveness

Variables	Contents	Factors Loading				
		I	II	III	IV	V
FACTOR I	IT EFFICIENCY					
PERC53	- New modern service styles	.859				
PERC51	- Rapid global information	.831				
PERC56	- Diverse educational development	.828				
PERC52	- Information interchange	.799				
PERC55	- Data searching knowledge	.797				
PERC57	- Improve DE system	.789				
PERC54	- Electronics Commerce	.778				
FACTOR II	IT EFFECTIVENESS					
PERC49	- Diversity of education		.817			
PERC47	- Distance comm. reduction		.800			
PERC48	- Timeliness reduction		.798			
PERC46	- Distance education reduction		.776			
PERC59	- Quality of information		.737			
PERC45	- Cost-effectiveness		.693			
PERC58	- Quality of teaching		.690			
FACTOR III	IT ACCESS					
PERC44	- Coverage of various areas			.688		
PERC43	- Mass learners			.645		
PERC50	- Equity in education			- .032		
FACTOR IV	LEARNING EVALUATION					
PERC15	- Clear & Understanding teaching explanation				.721	
PERC14	- Covered learning contents				.715	
PERC18	- Modern context of study				.705	
PERC16	- Qualified faculty				.646	
PERC17	- Opinion encouragement				.620	
PERC20	- Better quality of life				.607	
PERC19	- Applied knowledge to job				.601	
PERC21	- Expense study reduction				.455	
FACTOR V	STUDENTS' NEEDS					
PERC41	- Teaching methods improve					.800
PERC40	- Curricula improvement					.765
PERC34	- Computer training courses					.746
PERC38	- Learning materials improve					.717
PERC39	- Texts improvement					.644
PERC35	- Faculty evaluation required					.566
PERC36	- Faculty rotation					.493
PERC37	- Locations rotation					.412

Table 5.13: Factors Analysis of Graduate RU students' educational effectiveness (con't)

Variables	Contents	Factors Loading				
		VI	VII	VIII	IX	X
FACTOR VI	STUDENTS' EXPECTATION					
PERC28	- Education enhances your power	.800				
PERC29	- Education increases your proud & more respect from others	.725				
PERC71	- Education creates wisdom	.714				
PERC30	- Education increases your income	.680				
PERC27	- Education helps your job success	.663				
PERC70	- Education create social self-reliance	.658				
PERC25	- Education should come with moral	.655				
PERC72	- Education is life long learning	.617				
PERC24	- Education focuses problem solving	.599				
PERC26	- Education improves students' moral	.446				
FACTOR VII	LEARNING CLIMATE					
PERC3	- Clean and enough toilets		.802			
PERC2	- Clean and fresh air classroom		.767			
PERC4	- Learning facilities available in class		.739			
PERC7	- Respect teacher custom preserve		.602			
PERC1	- Class size is satisfied		.554			
FACTOR VIII	ACHIEVEMENT ORIENTATION					
PERC10	- Workshop requirement			.759		
PERC9	- Examination & theses orientation			.746		
PERC5	- Academic group establishment			.722		
PERC6	- Group participation and meetings			.607		
PERC8	- Academic seminar			.579		
FACTOR IX	CONTEXT OF INSTRUCTION					
PERC23	- Education should use computer				.615	
PERC22	- Distance education is self-study				.523	
PERC11	- Correspondence by postal mail				.501	
PERC12	- Face-to-Face teaching in classroom				.414	
PERC13	- Teaching by telecommunication				.406	
FACTOR X	STUDENTS' BARRIERS					
PERC33	- Education makes people selfish					.823
PERC32	- Education causes family separated					.813
PERC31	- Education wastes funny time					.330

Factor analysis of RU graduate students at the students' educational effectiveness dimension was classified into ten components. The new and modern service styles of education is the major factor of distance education for the RU graduate students' perception required, with the highest weighting scale of 0.859 as well as the agreement about the global information speedy with the weight of 0.831

Table 5.14: Factors Analysis of Graduate STOU students' educational effectiveness

Variables	Contents	Factors Loading				
		I	II	III	IV	V
FACTOR I	IT EFFICIENCY					
PERC53	- New modern service styles	.907				
PERC52	- Information interchange	.904				
PERC51	- Rapid global information	.893				
PERC54	- Electronics Commerce	.881				
PERC56	- Diverse educational development	.792				
PERC57	- Improve DE system	.739				
PERC55	- Data searching knowledge	.600				
FACTOR II	IT ACCESS					
PERC44	- Coverage of various areas		.894			
PERC43	- Mass learners		.885			
PERC50	- Equity in education		.625			
FACTOR III	IT EFFECTIVENESS					
PERC47	- Distance comm. reduction			.854		
PERC45	- Cost-effectiveness			.853		
PERC46	- Distance education reduction			.849		
PERC48	- Timeliness reduction			.846		
PERC58	- Quality of teaching			.718		
PERC49	- Diversity of education			.667		
PERC59	- Quality of information			.526		
FACTOR IV	STUDENTS' NEEDS					
PERC40	- Curricula improvement				.868	
PERC35	- Faculty evaluation required				.815	
PERC38	- Learning materials improve				.792	
PERC36	- Faculty rotation				.768	
PERC39	- Texts improvement				.768	
PERC41	- Teaching methods improve				.744	
PERC34	- Computer training courses				.550	
PERC37	- Locations rotation				.488	
FACTOR V	STUDENTS' BARRIERS					
PERC32	- Education causes family separated					.832
PERC31	- Education wastes funny time					.780
PERC33	- Education makes people selfish					.776

Factor analysis of STOU graduate students at the students' educational effectiveness dimension was classified into ten components. The new and modern service styles of education is also the major factor of distance education required, with the weighting scale of 0.907 while the clean and fresh air classroom is required by the STOU students with the highest scale of 0.922

Table 5.14: Factors Analysis of Graduate STOU students' educational effectiveness (con't)

Variables	Contents	Factors Loading				
		VI	VII	VIII	IX	X
FACTOR VI	LEARNING EVALUATION					
PERC16	- Qualified faculty	.828				
PERC15	- Clear & Understanding teaching explanation	.825				
PERC14	- Covered learning contents	.805				
PERC17	- Opinion encouragement	.671				
PERC19	- Applied knowledge to job	.577				
PERC18	- Modern context of study	.574				
PERC24	- Education focuses problem solving	.528				
PERC20	- Better quality of life	.491				
FACTOR VII	LEARNING CLIMATE					
PERC2	- Clean and fresh air classroom		.922			
PERC3	- Clean and enough toilets		.919			
PERC4	- Learning facilities available in class		.874			
PERC8	- Academic seminar		.821			
PERC6	- Group participation and meetings		.815			
PERC7	- Respect teacher custom preserve		.804			
PERC5	- Academic group establishment		.772			
PERC1	- Class size is satisfied		.574			
FACTOR VIII	ACHIEVEMENT ORIENTATION					
PERC9	- Examination & theses orientation			.901		
PERC10	- Workshop requirement			.836		
PERC11	- Correspondence by postal mail			.815		
PERC12	- Face-to-Face teaching in classroom			.616		
FACTOR IX	STUDENTS' EXPECTATION					
PERC21	- Expense study reduction				.831	
PERC26	- Education improves students' moral				.769	
PERC25	- Education should come with moral				.700	
PERC70	- Education create social self-reliance				.686	
PERC28	- Education enhances your power				.664	
PERC71	- Education creates wisdom				.630	
PERC72	- Education is life long learning				.575	
PERC23	- Education should use computer				.569	
PERC27	- Education helps your job success				.553	
PERC30	- Education increases your income				.474	
PERC29	- Education increases your proud & more respect from others				.423	
FACTOR X	CONTEXT OF INSTRUCTION					
PERC13	- Teaching by telecommunication					.423
PERC22	- Distance education is self-study					.388

At the undergraduate studies level of RU and STOU students, the factor analysis was classified into two dimensions: students' learning satisfaction and students' educational effectiveness. The factor analysis was summarized in the tables 5.15 through table 5.18 as illustrated following:

Table 5.15: Factors Analysis of Undergraduate RU students' learning satisfaction

Variables	Contents	Factors Loading			
		I	II	III	IV
FACTOR I	HUMAN-COMPUTER INTERACTION				
SAT38	- Interaction with teacher by e-mail	.850			
SAT36	- Communication by telephone, fax	.841			
SAT37	- Teleconferencing interaction	.781			
SAT35	- Correspondence by postal mail	.709			
SAT43	- Two-way discussions	.614			
SAT39	- Face-to-Face interaction	.601			
SAT33	- Ease to contact faculty	.564			
SAT18	- Two-way tele-teaching	.505			
FACTOR II	FACULTY SUPPORTS				
SAT42	- Classroom discussion	.805			
SAT3	- Faculties' clear explanation	.708			
SAT4	- Facilitators' advice	.564			
FACTOR III	CURRICULUM SUPPORTS				
SAT1	- Curriculum availability		.746		
SAT2	- Context of subject matter		.717		
FACTOR IV	STUDENT SUPPORTS				
SAT6	- Supplementary texts support				.722
SAT25	- Administrators' policy				.694
SAT23	- Computers provided for students				.637
SAT24	- Registration service				.630
SAT7	- Reference Texts support				.624
SAT5	- Texts				.605
SAT22	- Texts available in library				.588
SAT47	- Expanded coverage of campuses				- .536
SAT8	- Copied Supplementary support				.500
SAT9	- Learning materials				.499

Factor analysis of RU undergraduate students at the learning satisfaction dimension was classified into eight components: curriculum supports, faculty supports, student supports, service and staff supports, instructional delivery modes, computer-mediated communication, human-computer interaction and technological utilization.

Table 5.15: Factors Analysis of Undergraduate RU students' learning satisfaction (con't)

Variables	Contents	Factors Loading			
		V	VI	VII	VIII
FACTOR V	SERVICE & STAFF SUPPORTS				
SAT34	- Newsletter service	-.785			
SAT26	- Regional staff service	.764			
SAT27	- Classroom schedule service	.703			
FACTOR VI	INSTRUCTIONAL DELIVERY MODES				
SAT14	- Teaching by transparences		.816		
SAT29	- TV broadcasting at home		.743		
SAT28	- Radio broadcasting schedule		.724		
SAT20	- Self-study		.723		
SAT13	- Teaching by slide projection		.720		
SAT17	- Computer program presentation		.638		
SAT10	- Radio broadcasting delivery		.572		
SAT12	- Motion movie presentation		.502		
SAT21	- Guest speakers		.492		
SAT15	- Teaching by video recorder		.479		
SAT11	- ITV broadcasting delivery		.494		
SAT16	- Learning by Tape cassette		.469		
FACTOR VII	COMPUTER-MEDIATED COMMUNICATION				
SAT41	- Electronics Library Searching			.792	
SAT48	- Internet facility			.686	
SAT40	- Application programs availability			.684	
SAT44	- University electronic newsletter			.597	
FACTOR VIII	TECHNOLOGICAL UTILIZATION				
SAT30	- TV learning available at regional campus / center				.819
SAT32	- Examination grade result				.747
SAT31	- Learning material available at regional campus / center				.704
SAT45	- Clear two-way telecommunication				.699
SAT19	- Teaching Face-to-Face in classroom				.441
SAT46	- Grade report feedback				.368

The interaction with teacher by e-mail, is the highest weight scale of 0.850, influences the students' learning satisfaction. Meanwhile the expanded coverage of campuses and the newsletter service of university are opposed to the students' learning satisfaction because they come with the minus weighting scale of –0.536 and –0.785. However, the satisfaction on TV broadcasting at regional campus is satisfied at high scale of 0.819 as well.

Table 5.16: Factors Analysis of Undergraduate STOU students' learning satisfaction

Variables	Contents	Factors Loading		
		I	II	III
FACTOR I	HUMAN-COMPUTER INTERACTION			
SAT44	- University electronic newsletter	.823		
SAT41	- Electronics Library Searching	.797		
SAT43	- Two-way discussions	.777		
SAT40	- Application programs availability	.759		
SAT45	- Clear two-way telecommunication	.757		
SAT38	- Interaction with teacher by e-mail	.691		
SAT37	- Teleconferencing interaction	.667		
SAT42	- Classroom discussion	.608		
SAT48	- Internet facility	.564		
FACTOR II	INSTRUCTIONAL DELIVERY MODES			
SAT13	- Teaching by slide projection		.781	
SAT14	- Teaching by transparences		.761	
SAT12	- Motion movie presentation		.728	
SAT15	- Teaching by video recorder		.709	
SAT35	- Correspondence by postal mail		.685	
SAT19	- Teaching Face-to-Face in classroom		.660	
SAT20	- Self-study		.652	
SAT17	- Computer program presentation		.651	
SAT36	- Communication by telephone, fax		.624	
SAT16	- Learning by Tape cassette		.536	
SAT18	- Two-way tele-teaching		.480	
SAT39	- Face-to-Face interaction		- .424	
FACTOR III	SERVICE & STAFF SUPPORTS			
SAT27	- Classroom schedule service			.732
SAT26	- Regional staff service			.636
SAT30	- TV learning available at regional campus / center			.573
SAT25	- Administrators' policy			.564
SAT31	- Learning material available at regional campus / center			.557
SAT23	- Computers provided for students			.541
SAT24	- Registration service			.537
SAT22	- Texts available in library			.528
SAT29	- TV broadcasting at home			.459
SAT28	- Radio broadcasting schedule			.402

Factor analysis of STOU undergraduate students at the learning satisfaction dimension was classified into seven components: curriculum supports, faculty supports, student supports, service and staff supports, instructional delivery modes, computer-mediated communication, and human-computer interaction.

Table 5.16: Factors Analysis of Undergraduate STOU students' learning satisfaction (con't)

Variables	Contents	Factors Loading			
		IV	V	VI	VII
FACTOR IV	COMPUTER-MEDIATED COMMUNICATION				
SAT11	- ITV broadcasting delivery	.764			
SAT10	- Radio broadcasting delivery	.727			
SAT34	- Newsletter service	.633			
SAT32	- Examination grade result	.526			
FACTOR V	STUDENT SUPPORTS				
SAT5	- Texts		.836		
SAT6	- Supplementary texts support		.781		
SAT9	- Learning materials		.674		
SAT8	- Copied Supplementary support		.637		
SAT7	- Reference Texts support		.450		
FACTOR VI	FACULTY SUPPORTS				
SAT3	- Faculties' clear explanation			.773	
SAT21	- Guest speakers			.746	
SAT4	- Facilitators' advice			.711	
SAT46	- Grade report feedback			.476	
SAT33	- Ease to contact faculty			.474	
SAT47	- Expanded coverage of campuses			.306	
FACTOR VII	CURRICULUM SUPPORTS				
SAT1	- Curriculum availability				.593
SAT2	- Context of subject matter				.456

Since there is no the technological equipment such as computers, fax, etc. provided for the undergraduate STOU students at the regional distance education centers, so there is no technological utilization (USETECH) dimension appeared in the factors analysis for undergraduate STOU students at the learning satisfaction domain.

Moreover the value of the variable SAT39, in factors analysis, represents "Face-to-Face interaction" shows minus value (- 0.424). This confirms that distance education of undergraduate STOU students is self-study education and face-to-face interaction will occur only when the amount of the students requested.

With the self-directed learning characteristic, we can see that text is the main learning satisfaction factor of STOU students with the highest weighting scale of 0.836 while the university electronic newsletter is the next high weighting scale.

Table 5.17 shows the factor analysis of RU undergraduate students at the educational effectiveness domain. The factor analysis was classified into ten components. The IT efficiency for improving distance education system is the major factor of students' perceptions and agreements with the highest weighting scale of 0.896, as shown following

Table 5.17: Factors Analysis of Undergraduate RU students' educational effectiveness

Variables	Contents	Factors Loading				
		I	II	III	IV	V
FACTOR I	IT EFFICIENCY					
PERC57	- Improve DE system	.896				
PERC56	- Diverse educational development	.853				
PERC55	- Data searching knowledge	.816				
PERC52	- Information interchange	.690				
PERC51	- Rapid global information	.662				
PERC53	- New modern service styles	.659				
PERC54	- Electronics Commerce	.604				
FACTOR II	IT EFFECTIVENESS					
PERC58	- Quality of teaching		.835			
PERC48	- Timeliness reduction		.783			
PERC59	- Quality of information		.763			
PERC45	- Cost-effectiveness		.740			
PERC47	- Distance comm. reduction		.731			
PERC46	- Distance education reduction		.730			
PERC49	- Diversity of education		.576			
FACTOR III	IT ACCESS					
PERC50	- Equity in education			.759		
PERC44	- Coverage of various areas			.674		
PERC43	- Mass learners			.641		
FACTOR IV	STUDENTS' NEEDS					
PERC38	- Learning materials improve			.811		
PERC39	- Texts improvement			.806		
PERC40	- Curricula improvement			.773		
PERC36	- Faculty rotation			.773		
PERC41	- Teaching methods improve			.750		
PERC34	- Computer training courses			.530		
PERC35	- Faculty evaluation required			.497		
PERC37	- Locations rotation			.486		
FACTOR V	STUDENTS' BARRIERS					
PERC32	- Education causes family separated				.816	
PERC33	- Education makes people selfish				.733	
PERC31	- Education wastes funny time				.635	

Table 5.17: Factors Analysis of Undergraduate RU students' educational effectiveness (con't)

Variables	Contents	Factors Loading				
		VI	VII	VIII	IX	X
FACTOR VI	ACHIEVEMENT ORIENTATION					
PERC10	- Workshop requirement	.787				
PERC9	- Examination &theses orientation	.778				
PERC6	- Group participation and meetings	.772				
PERC8	- Academic seminar	.715				
PERC5	- Academic group establishment	.714				
FACTOR VII	LEARNING CLIMATE					
PERC3	- Clean and enough toilets		.841			
PERC2	- Clean and fresh air classroom		.833			
PERC4	- Learning facilities available in class		.805			
PERC1	- Appropriated class size		.750			
PERC7	- Teacher respect ceremony		.564			
FACTOR VIII	LEARNING EVALUATION					
PERC14	- Covered Teaching contents			.707		
PERC18	- Context of study is modern			.698		
PERC15	- Clear & Understanding teaching explanation			.657		
PERC16	- Qualified faculty	.559				
PERC21	- Expense study reduction	.517				
PERC17	- Opinion encouragement	.508				
PERC19	- Applied knowledge to job	.497				
FACTOR IX	STUDENTS' EXPECTATIONS					
PERC71	- Education creates wisdom				.864	
PERC70	- Education initiates social self-reliance				.828	
PERC72	- Education is life long learning				.733	
PERC27	- Education helps your job success				.720	
PERC28	- Education enhances your power				.630	
PERC29	- Education increases your proud & more respect from others				.591	
PERC26	- Education improves students' moral				.587	
PERC30	- Education increases your income				.458	
FACTOR X	CONTEXT OF INSTRUCTION					
PERC23	- Education should use computer					.787
PERC11	- Correspondence by postal mail					.586
PERC25	- Education should come with moral					.572
PERC20	- Better quality of life					.541
PERC12	- Face-to-Face teaching in classroom					.488
PERC13	- Teaching by telecommunication					.486
PERC24	- Education focuses problem solving					.482
PERC22	- Distance education is self-study					.254

Table 5.18: Factors Analysis of Undergraduate STOU students' educational effectiveness

Variables	Contents	Factors Loading				
		I	II	III	IV	V
FACTOR I	IT EFFECTIVENESS					
PERC49	- Diversity of education	.876				
PERC47	- Distance comm. reduction	.858				
PERC58	- Quality of teaching	.815				
PERC59	- Quality of information	.812				
PERC46	- Distance education reduction	.778				
PERC48	- Timeliness reduction	.774				
PERC45	- Cost-effectiveness	.701				
FACTOR II	IT ACCESS					
PERC50	- Equity in education		.825			
PERC43	- Mass learners		.789			
PERC44	- Coverage of various areas		.747			
FACTOR III	IT EFFICIENCY					
PERC51	- Rapid global information			.830		
PERC56	- Diverse educational development			.813		
PERC57	- Improve DE system			.802		
PERC53	- New modern service styles			.796		
PERC52	- Information interchange	.787				
PERC55	- Data searching knowledge	.776				
PERC54	- Electronics Commerce	.663				
FACTOR IV	STUDENTS' NEEDS					
PERC39	- Texts improvement				.812	
PERC38	- Learning materials improve				.802	
PERC35	- Faculty evaluation required				.779	
PERC40	- Curricula improvement				.752	
PERC36	- Faculty rotation				.737	
PERC41	- Teaching methods improve				.719	
PERC37	- Locations rotation				.676	
PERC34	- Computer training courses				.523	
FACTOR V	STUDENTS' BARRIERS					
PERC33	- Education makes people selfish					.890
PERC32	- Education causes family separated					.880
PERC31	- Education wastes funny time					- .394

Factor analysis of STOU undergraduate students' perceptions at the educational effectiveness domain shows that education makes people selfish with the highest weighting scale of 0.890 and 0.876 represents the perception of diversity in education is required.

Table 5.18: Factors Analysis of Undergraduate STOU students' educational effectiveness (con't)

Variables	Contents	Factors Loading				
		VI	VII	VIII	IX	X
FACTOR VI	LEARNING CLIMATE					
PERC2	- Clean and fresh air classroom	.875				
PERC4	- Learning facilities available in class	.842				
PERC3	- Clean and enough toilets	.834				
PERC1	- Appropriated class size	.794				
PERC6	- Group participation and meetings	.609				
PERC8	- Academic seminar	.530				
PERC7	- Teacher respect ceremony	.408				
FACTOR VII	STUDENTS' EXPECTATIONS					
PERC71	- Education creates wisdom		.806			
PERC28	- Education enhances your power		.778			
PERC30	- Education increases your income		.756			
PERC72	- Education is life long learning		.724			
PERC70	- Education initiates social self-reliance		.683			
PERC29	- Education increases your proud & more respect from others		.615			
PERC27	- Education helps your job success		.528			
PERC21	- Expense study reduction		.492			
PERC20	- Better quality of life		.430			
FACTOR VIII	LEARNING EVALUATION					
PERC15	- Clear & Understanding teaching explanation	.697				
PERC16	- Qualified faculty	.657				
PERC18	- Context of study is modern	.650				
PERC14	- Covered teaching contents	.526				
PERC17	- Opinion encouragement	.427				
FACTOR IX	ACHIEVEMENT ORIENTATION					
PERC11	- Correspondence by postal mail				.762	
PERC9	- Examination &theses orientation				.725	
PERC12	- Face-to-Face teaching in classroom				.649	
PERC5	- Academic group establishment				.568	
PERC10	- Workshop requirement				.405	
PERC13	- Teaching by telecommunication				.351	
FACTOR X	CONTEXT OF INSTRUCTION					
PERC19	- Applied knowledge to job					.787
PERC23	- Education should use computer					.606
PERC24	- Education focuses problem solving					.532
PERC25	- Education should come with moral					.474
PERC26	- Education improves students' moral					.458
PERC22	- Distance education is self-study					.434

5.6.3 Validity and Reliability

The measurements for all variables used in the research conduct are essential, especially the validity and reliability. Validity refers to the degree to which a scale performs the function it was designed to perform. In the other hand, validity requires that measurement measures what to be measured pertain directly to the main points of the research. Reliability requires that all measurements provide at least consistent results (Prasith-rathsint, 1993).

The concepts related to the validity of the operationalization of the dependent variable include content validity, criterion-related validity, and construct validity (Ghiselli, Campbell and Zedeck, 1981; Kerlinger, 1973). Content validity is concerned with item adequacy, that is, the extent to which a specific set of items reflects a content domain of dependent variable. The questionnaire design was developed in order to increase the content validity of the measure by using Gooler's seven criteria of educational effectiveness administration.

The validity of the questionnaire was also established by reviewing relevant academic literature, the empirical data from researches, and the comments and suggestions of the specialist and expert.

Reliability refers to dependability, stability, consistency, predictability and accuracy of the measurement. Some variables were measured by using multiple items to improve reliability (Kerlinger, 1986; Simon and Burstein, 1985). To test the reliability of the questionnaire, Cronbach alpha coefficients were used to determine the internal consistency of a measure (Churchill, 1979; Kerlinger, 1973; Devellis, 1991).

Cronbach alpha coefficient is used to determine the RU and STOU undergraduate and graduate students at the learning satisfaction domain and the educational effectiveness domain. The details of the measurement scales of each domain, separating in the undergraduate level and the graduate level.

Table 5.19 and table 5.20 represent the reliability coefficients of graduate RU and STOU students with two domains: the learning satisfaction and the educational effectiveness.

Table 5.19: Reliability Coefficients of Variable Domains for RU Graduate Students

N = 409

Variables	Contents	Cronbach's Alpha	Number of Items
DL_ADMEFFT	- Overall Effectiveness of DL Adm.	.9376	34
SUMSAT	- Overall Learning Satisfaction	.8796	10
EDUCSUP Domain	- Overall Educational Supports	.8716	15
CURSUP	- Curriculum supports	.8389	2
FACSUP	- Faculty supports	.4851	2
STSUP	- Student supports	.8309	8
SERVSUP	- Service and Staff supports	.7234	3
TECHSUP Domain	- Overall Technological Supports	.9182	33
INSTECH	- Instructional delivery modes	.8882	14
CMC	- Computer-Mediated Communication	.8054	8
HCI	- Human-Computer Interaction	.8015	6
USETECH	- Technological utilization	.6641	5
EDUC_EFFT	- Overall Educational Effectiveness	.9001	10
IT_APPLCN Domain	- Overall IT Application	.8878	17
ITACCSS	- IT Accessibility	.4771	3
ITEFFT	- IT Effectiveness	.9125	7
ITEFFCY	- IT Efficiency	.7520	7
ST_CHAR Domain	- Overall Students Characteristics	.7738	11
NEEDPERC	- Students' needs	.8136	8
ST_BARIER	- Students' barriers	.5713	3
EDUC_ENV Domain	- Overall Educational Environment	.9129	33
LCLMT	- Learning Climate	.7808	5
ACHV	- Achievement Orientation	.6452	5
STEXPCT	- Students' Expectations	.8357	10
LEVAL	- Learning Evaluation	.8906	8
INSTXT	- Context of Instruction	.6374	5

The calculated Cronbach's alpha values for RU graduate students, in the table 5.19, ranging from .6641 to .8882 in the learning satisfaction when the overall of this domain value is .8796. The educational effectiveness domain includes the values ranging from .6374 to .9125 while the overall of educational effectiveness value is .9001. However, the value on the overall of the effectiveness of distance learning administration is .9376 which is very high reliability.

Table 5.20: Reliability Coefficients of Variable Domains for STOU Graduate Students

N = 186

Variables	Contents	Cronbach's Alpha	Number of Items
DL_ADMEFFT	- Overall Effectiveness of DL Adm.	.9161	34
SUMSAT	- Overall Learning Satisfaction	.8340	10
EDUCSUP Domain	- Overall Educational Supports	.8652	20
CURSUP	- Curriculum supports	.8982	7
FACSUP	- Faculty supports	.3861	5
STSUP	- Student supports	.9287	4
SERVSUP	- Service and Staff supports	.6357	4
TECHSUP Domain	- Overall Technological Supports	.8959	28
INSTECH	- Instructional delivery modes	.8349	11
CMC	- Computer-Mediated Communication	.8465	6
HCI	- Human-Computer Interaction	.9086	8
USETECH	- Technological utilization	.7487	3
EDUC_EFFT	- Overall Educational Effectiveness	.7952	10
IT_APPLCN Domain	- Overall IT Application	.9002	17
ITACCSS	- IT Accessibility	.8912	3
ITEFFT	- IT Effectiveness	.6888	7
ITEFFCY	- IT Efficiency	.9543	7
ST_CHAR Domain	- Overall Students Characteristics	.8074	11
NEEDPERC	- Students' needs	.8430	8
ST_BARIER	- Students' barriers	.7427	3
EDUC_ENV Domain	- Overall Educational Environment	.9009	33
LCLMT	- Learning Climate	.8787	8
ACHV	- Achievement Orientation	.8522	4
STEXPCT	- Students' Expectations	.8899	11
LEVAL	- Learning Evaluation	.8464	8
INSTXT	- Context of Instruction	.2413	2

The Cronbach's Alpha value of the overall on the effectiveness of distance learning administration of STOU graduate students is .9161 while the overall Cronbach's Alpha values of the learning satisfaction and the educational effectiveness are .8340 and .7952 respectively. The values are ranging from .3861 to .9543 while the variable (INSTXT) is deleted because its lowest value of .2413

Table 5.21: Reliability Coefficients of Variable Domains for RU Undergraduate Students

N = 115

Variables	Contents	Cronbach's Alpha	Number of Items
DL_ADMEFFT	- Overall Effectiveness of DL Adm.	.9473	34
SUMSAT	- Overall Learning Satisfaction	.9094	10
EDUCSUP Domain	- Overall Educational Supports	.0828	18
CURSUP	- Curriculum supports	.8639	2
FACSUP	- Faculty supports	.4640	3
STSUP	- Student supports	.8244	10
SERVSUP	- Service and Staff supports	- .0067	3
TECHSUP Domain	- Overall Technological Supports	.8980	30
INSTECH	- Instructional delivery modes	.8583	12
CMC	- Computer-Mediated Communication	.8109	4
HCI	- Human-Computer Interaction	.8644	8
USETECH	- Technological utilization	.4059	6
EDUC_EFFT	- Overall Educational Effectiveness	.7339	10
IT_APPLCN Domain	- Overall IT Application	.9570	17
ITACCSS	- IT Accessibility	.8394	3
ITEFFT	- IT Effectiveness	.9054	7
ITEFFCY	- IT Efficiency	.9259	7
ST_CHAR Domain	- Overall Students Characteristics	.8804	11
NEEDPERC	- Students' needs	.8838	8
ST_BARIER	- Students' barriers	.8194	3
EDUC_ENV Domain	- Overall Educational Environment	.9062	33
LCLMT	- Learning Climate	.7322	5
ACHV	- Achievement Orientation	.8719	5
STEXPCT	- Students' Expectations	.8060	8
LEVAL	- Learning Evaluation	.8470	7
INSTXT	- Context of Instruction	.7289	8

The Cronbach's Alpha values are calculated shown in table 5.21 The Cronbach' Alpha value on the overall of effectiveness of distance learning administration is .9473 which is high reliability. The Cronbach's Alpha values of the overall learning satisfaction and the educational effectiveness are .9094 and .7339 respectively.

Table 5.22: Reliability Coefficients of Variable Domains for STOU Undergraduate Students

N = 183

Variables	Contents	Cronbach's Alpha	Number of Items
DL_ADMEFFT	- Overall Effectiveness of DL Adm.	.9288	34
SUMSAT	- Overall Learning Satisfaction	.8881	10
EDUCSUP Domain	- Overall Educational Supports	.7807	23
CURSUP	- Curriculum supports	.1011	2
FACSUP	- Faculty supports	.4383	6
STSUP	- Student supports	.7266	5
SERVSUP	- Service and Staff supports	.7386	10
TECHSUP Domain	- Overall Technological Supports	.9273	25
INSTECH	- Instructional delivery modes	.8698	12
CMC	- Computer-Mediated Communication	.6969	4
HCI	- Human-Computer Interaction	.9238	9
USETECH	- Technological utilization	-	-
EDUC_EFFT	- Overall Educational Effectiveness	.6444	10
IT_APPLCN Domain	- Overall IT Application	.9703	17
ITACCSS	- IT Accessibility	.8713	3
ITEFFT	- IT Effectiveness	.9321	7
ITEFFCY	- IT Efficiency	.9420	7
ST_CHAR Domain	- Overall Students Characteristics	.8273	11
NEEDPERC	- Students' needs	.8936	8
ST_BARIER	- Students' barriers	.5530	3
EDUC_ENV Domain	- Overall Educational Environment	.8941	33
LCLMT	- Learning Climate	.8917	7
ACHV	- Achievement Orientation	.7199	6
STEXPCT	- Students' Expectations	.8585	9
LEVAL	- Learning Evaluation	.4744	5
INSTXT	- Context of Instruction	.6752	6

The reliability measured by Cronbach's Alpha, shown in the table 5.22, represents the values ranging from .1011 to .9420 while the value on the overall of effectiveness of distance learning administration is .9288. The values represent the reliability on the overall of the learning satisfaction and the educational effectiveness are .7807 and .6444 respectively.

5.7 CONCLUSION

The soundness of research design was described in this chapter. The research employed the qualitative design and the quantitative design. The qualitative design emphasized the context of the study while the quantitative design stressed on the precision and procedure with the statistical methods in order to explain the characteristics of variables. The combination of both methods is a way to integrate the context of the overall study.

The operational definitions explained the overall conceptual framework of the research. Sampling procedure and data collection described the process of data obtained. Questionnaire is also included in order to explain each part of the questions.

Finally, the reliability criteria were used for quantitative methods (Campbell, 1979) in order to measure the consistency and validity of the samples as well as factor analysis. Tables were separated into the two educational levels: the graduate level and the undergraduate level of both RU and STOU with the learning satisfaction domain and educational effectiveness domain.

CHAPTER 6

OUTPUT AND IMPACT OF DISTANCE LEARNING

This chapter presents the findings from output and impact analysis of distance learning system in the dimension of students' learning satisfaction and the dimension of students' educational effectiveness. The chapter provides the general description and meaning of data processing results using the descriptive statistics analysis. Partial correlation analysis, regression analysis, and path analysis are also utilized to analyze the relationship among output data.

According to the inferential statistics, regression analysis enables us to ascertain the relationship between a dependent or response variable, and one or more independent, or predictor variables. The statistical analysis and interpretation of the research results are included in this chapter as well as the hypotheses testing. The chapter contains following five sections:

1. Data characteristics
2. Descriptive statistics analysis
3. Causal models analysis
4. Hypotheses testing
5. Conclusion

6.1 DATA CHARACTERISTICS

Data obtained from survey questionnaire were processed based on the measurement level. The demographic characteristics include sex, marital status, number of dependents, number of educating dependents, age, career, revenue, total family expense, individual expense, registration and tuition fee expense, are described in table 6.1

Table 6.1: Description and Measurement Level of Demographic and Basic Information Variables

Variable	Description	Measurement Level
SEX	Gender of the respondent	1 = Male 2 = Female
STAT	Marital status of the respondent	1 = Single 2 = Married 3 = Divorce 4 = Widow(er)
DEP	Number of dependents	Ratio scale
DEP_ED	Number of educating dependents	Ratio scale
AGE	Age of the respondent	Ratio scale
CAREER	Profession of respondent	1 = Civil Officer 2 = State Enterprise 3 = Private employee 4 = Business Owner 5 = Politician 6 = Freelance 7 = Others
REVN	Income of respondent	Ratio scale
EXPS	Total of family expense	Ratio scale
IND_EXPS	Individual expense	Ratio scale
REG_EXPS	Registration and tuition fee	Ratio scale
HRREAD	Number of hours for studying	Ratio scale
HR_EXM	Number of hours for re-exam preparation	Ratio scale
GPA	Grade point average	Ratio scale

Basic information characteristics of respondents' learning such as distance of driving to study, number of hours taken for travelling and for studying, and time taken for re-examination preparation, grade point average, are also explained in the table 6.1. However, the characteristics of the respondent's requirement, benefit, and learning barriers obtained from study, examined in the questionnaire, shown in table 6.2 as following:

Table 6.2: Description and Measurement of Requirement, Benefit and Barriers Variables

Variable	Description	Measurement
VAR22-01 VAR22-02 VAR22-03	♦ Prioritize the respondent's needs in three level where VAR22-01 is the most significant of need	Ordinal scale
VAR23-01 VAR23-02 VAR23-03	♦ Prioritize the respondent's benefit from study in three levels of priority where VAR23-01 is the most significant of benefit	Ordinal scale
VAR24-01 VAR24-02 VAR24-03	♦ Prioritize the respondent's knowledge applied to job in three levels of priority where VAR24-01 is the most significant of issue	Ordinal scale
VAR25-01 VAR25-02 VAR25-03	♦ Prioritize the benefit to community in three levels of priority where VAR25-01 is the most significant issue	Ordinal scale
VAR26-01 VAR26-02 VAR26-03	♦ Prioritize the requirement to educational improvement in three levels of priority where VAR26-01 is the most significant of requirement	Ordinal scale
VAR27-01 VAR27-02 VAR27-03	♦ Prioritize the requirement to instructional delivery modes in three levels of priority where VAR27-01 is the most significant of benefit	Ordinal scale
BAR29-01 BAR29-02 BAR29-03	♦ Prioritize the respondent's learning barriers in three level where BAR29-01 is the most significant issue	Ordinal scale
BAR30-01 BAR30-02 BAR30-03	♦ Prioritize the respondent's self barrier in three levels of priority where BAR30-01 is the most significant of issue	Ordinal scale
BAR31-01 BAR31-02 BAR31-03	♦ Prioritize the respondent's study location problems in three levels of priority where BAR31-01 is the most significant of issue	Ordinal scale
BAR32-01 BAR32-02 BAR32-03	♦ Prioritize the respondent's IT skill in three levels of priority where BAR32-01 is the most significant issue	Ordinal scale

6.2 DESCRIPTIVE STATISTICS ANALYSIS

Data obtained from the respondents were analyzed by using descriptive statistical analysis. Separate analyses were performed and compared in the subgroup of RU and STOU graduate and undergraduate studies level, as shown in table 6.3:

Table 6.3: Comparison of RU and STOU data process in descriptive analysis

Respondents	Mean	Std. Dev.	Min.	Max.
RU Graduate				
◆ Age	35.54	7.40	0	59
◆ Revenue	25,714.25	20,808.15	1,000	200,000
◆ No. of dependents	0.84	1.10	0	6
◆ No. of educating Dependents	0.68	1.02	0	4
◆ Expense	15,753.50	14,900.53	1,500	100,000
◆ Individual exp.	4,640.83	6,022.57	0.00	56,000
◆ GPA	3.2815	1.6576	0.00	4.00
RU Undergraduate				
◆ Age	21.80	6.79	0	50
◆ Revenue	6,923.48	6,690.22	1,500	50,000
◆ No. of dependents	0.11	0.49	0	3
◆ No. of educating Dependents	0.0783	0.38	0	2
◆ Expense	2,907.83	3,262.71	500	20,000
◆ Individual exp.	2,025.83	1,374.40	150	10,000
◆ GPA	2.5018	0.3379	1.54	3.20
STOU Graduate				
◆ Age	39.23	8.26	0	69
◆ Revenue	38,967.53	29,743.13	5,000	200,000
◆ No. of dependents	1.09	1.08	0	6
◆ No. of educating Dependents	0.81	0.91	0	3
◆ Expense	25,335.48	19,674.96	1,000	150,000
◆ Individual exp.	7,902.15	7,469.19	200	70,000
◆ GPA	3.3987	0.5526	0.00	4.00
STOU Undergraduate				
◆ Age	30.74	6.38	0	51
◆ Revenue	17,051.53	24,448.29	4,000	300,000
◆ No. of dependents	0.62	0.86	0	3
◆ No. of educating Dependents	0.44	0.80	0	3
◆ Expense	11,478.80	20,142.91	1,000	250,000
◆ Individual exp.	2,163.66	2,971.92	100	23,500
◆ GPA	2.3717	0.3853	1.14	4.00

The requirements of respondents are analyzed by prioritizing the respondent's needs in three levels where VAR22-01 is the first priority of significant need. The comparison between RU and STOU graduate and undergraduate students are illustrated in table 6.4:

Table 6.4: Comparison between RU and STOU on the students' needs from the study

Requirements of students' needs	Numbers of RU students			Numbers of STOU students		
	1st priority	2nd priority	3rd priority	1st priority	2nd priority	3rd priority
Graduate level						
Students' needs from study						
1. Diploma	90	52	57	26	14	21
2. Career advance	103	134	58	38	49	30
3. Social acceptance	9	38	73	6	20	61
4. Political vote support	2	3	17	2	47	21
5. Enhanced knowledge	167	86	56	88	39	23
6. Increased opportunity	29	68	76	17	12	10
7. Hobby	1	3	7	6	-	10
8. Family honor	4	15	35	-	1	5
9. Career transition	3	9	26	3	2	3
Undergraduate level						
Students' needs from study						
1. Diploma	54	27	9	55	31	41
2. Career advance	8	25	12	46	52	17
3. Social acceptance	5	12	20	6	12	32
4. Political vote support	2	2	2	-	1	4
5. Enhanced knowledge	35	23	19	57	35	45
6. Increased opportunity	6	11	16	8	29	20
7. Hobby	-	2	2	-	2	4
8. Family honor	4	9	21	3	7	6
9. Career transition	-	2	3	7	12	10

From table 6.4, we can conclude that the first and second priority of RU and STOU graduate students' needs from study are the same which are enhanced knowledge and career advance. While the RU and STOU undergraduate students' needs are diploma and enhanced knowledge respectively.

The requirements of respondents are analyzed by prioritizing the respondent's needs for university improvement where VAR26-01 is the first priority of significant need. The comparison between RU and STOU graduate and undergraduate students are illustrated in table 6.5:

Table 6.5: Comparison between RU and STOU on the students' needs from the university improvement

Requirements of students' needs	Numbers of RU students			Numbers of STOU students		
	1st priority	2nd priority	3rd priority	1st priority	2nd priority	3rd priority
Graduate level						
Students' needs from university improvement						
1. Curriculum	79	41	36	9	6	7
2. Academic context	63	92	37	12	12	5
3. Teacher's conscious	17	21	32	3	3	9
4. Explanation ability	68	40	34	11	6	5
5. Academic service	76	60	77	7	10	6
6. Learning materials	25	53	44	5	5	1
7. Library service	46	43	53	7	6	14
8. Computer service	14	42	41	3	6	4
9. Teacher media service	21	16	50	7	9	10
Undergraduate level						
Students' needs from university improvement						
1. Curriculum	13	2	2	51	24	24
2. Academic context	13	15	12	41	50	17
3. Teacher's conscious	7	3	12	4	4	8
4. Explanation ability	12	9	5	9	11	9
5. Academic service	24	21	14	39	28	34
6. Learning materials	9	26	17	7	20	16
7. Library service	4	13	15	7	6	13
8. Computer service	17	9	15	15	17	23
9. Teacher media service	12	10	13	8	18	33

From table 6.5, we can conclude that the curriculum improvement is the first priority of RU graduate students' and STOU undergraduate students' requirements. Academic context improvement is required from RU graduate students and STOU both graduate and undergraduate students as the second priority. Academic service and learning materials service are the first and the second priority for RU undergraduate students' requirements.

The opinions of students are prioritizing, according to the students' outcomes of study. The comparison between RU and STOU graduate and undergraduate students are illustrated in table 6.6

Table 6.6: Comparison between RU and STOU on the students' opinions, prioritizing on the outcomes of study obtained

Significant outcomes of students' opinions	Numbers of RU students			Numbers of STOU students		
	1st priority	2nd priority	3rd priority	1st priority	2nd priority	3rd priority
Graduate level						
Students' opinions from the outcomes of study						
1. Critical concepts	61	45	61	45	10	29
2. Knowledge	195	95	46	40	84	20
3. Applied knowledge	91	141	81	62	51	46
4. Technical skills	3	16	23	26	14	36
5. Concepts and Theories	37	65	78	11	16	30
6. Social acceptance	7	22	31	-	6	6
7. Self-respect / Self-dependence	10	11	45	1	3	12
8. Reliability	2	10	22	1	-	6
9. Accountability	3	4	21	-	2	1
Undergraduate level						
Students' opinions from the outcomes of study						
1. Critical concepts	5	4	8	6	5	12
2. Knowledge	84	12	3	126	22	10
3. Applied knowledge	2	41	19	22	76	38
4. Technical skills	3	5	10	5	11	15
5. Concepts and Theories	7	11	22	6	34	34
6. Social acceptance	2	7	11	5	13	21
7. Self-respect / Self-dependence	9	26	16	10	18	32
8. Reliability	-	2	7	1	4	14
9. Accountability	2	2	9	2	-	6

From table 6.6, we can conclude that knowledge and the applied knowledge to job are the first and the second priority on outcomes of study obtained for RU graduate students' opinion, as well as for RU and STOU undergraduate students' opinions. While the STOU graduate students' opinions on the outcomes of study are switching in priority with others.

The opinions of students are prioritizing, according to the students' knowledge applied to job. The comparison between RU and STOU graduate and undergraduate students are illustrated in table 6.7

Table 6.7: Comparison between RU and STOU on the students' opinions, prioritizing the knowledge applying to a job

Significant knowledge of students' opinions	Numbers of RU students			Numbers of STOU students		
	1st priority	2nd priority	3rd priority	1st priority	2nd priority	3rd priority
Graduate level						
Students' opinions from the knowledge applying to job						
1. Increased skills	39	48	43	10	30	8
2. Increased experience	123	95	45	53	48	17
3. Increased understanding	68	67	67	58	15	35
4. Problems solving	63	75	83	16	30	40
5. Quality control	22	33	25	1	20	8
6. Technological utilization	5	12	26	-	19	12
7. Creativity / Initiation	77	55	77	48	17	48
8. Crisis control	7	19	27	-	7	11
9. New products / new services	4	3	12	-	-	-
Undergraduate level						
Students' opinions from the knowledge applying to job						
1. Increased skills	21	10	10	25	19	20
2. Increased experience	35	26	11	60	43	40
3. Increased understanding	11	17	20	36	47	39
4. Problems solving	23	22	17	32	41	25
5. Quality control	4	5	9	10	11	14
6. Technological utilization	-	3	2	1	1	3
7. Creativity / Initiation	6	8	17	15	16	32
8. Crisis control	1	5	3	2	3	4
9. New products / new services	-	-	1	1	1	2

From table 6.7, we can conclude that increased experience is the first and second priority of the knowledge applying to the job for RU and STOU at both studies levels. However, increased understanding is also the higher priority of the knowledge applied to job for the students as well as problem solving and creativity / initiation.

The opinions of students are prioritizing to the benefits to community, according to the expansion of distance education. The comparison between RU and STOU graduate and undergraduate students are illustrated in table 6.8

Table 6.8: Comparison between RU and STOU on the students' opinions, prioritizing on the benefits to community

Benefits to community at students' opinions	Numbers of RU students			Numbers of STOU students		
	1st priority	2nd priority	3rd priority	1st priority	2nd priority	3rd priority
Graduate level						
Students' opinions for the benefits to community						
1. Income distribution	46	10	31	12	12	20
2. Community participation	20	56	49	30	36	24
3. Knowledge dissemination	111	93	119	55	37	38
4. Equity on education	108	133	57	39	48	36
5. Learning opportunity	117	98	104	44	44	38
6. Career opportunity	4	16	39	6	7	23
7. Community dependence	2	2	1	-	-	1
8. Literacy ability	-	1	4	-	-	1
9. Moral development	1	-	3	-	-	-
Undergraduate level						
Students' opinions for the benefits to community						
1. Income distribution	12	4	5	7	2	8
2. Community participation	12	14	10	8	10	11
3. Knowledge dissemination	37	26	22	35	40	48
4. Equity on education	21	26	24	52	62	38
5. Learning opportunity	29	37	27	71	52	32
6. Career opportunity	-	3	13	10	15	32
7. Community dependence	2	-	1	-	1	5
8. Literacy ability	-	-	1	-	1	2
9. Moral development	-	-	1	-	-	5

From table 6.8, almost all students asserted that moral development and literacy ability are not the benefits to communities. However, learning opportunity, knowledge dissemination, and equity on education are the foremost priorities.

The learning barriers of students' opinions are prioritizing, according to the students' studies. The comparison between RU and STOU graduate and undergraduate students are illustrated in table 6.9

Table 6.9: Comparison between RU and STOU on the students' learning barriers, prioritizing on their studies

Barriers to the students' studies	Numbers of RU students			Numbers of STOU students		
	1st priority	2nd priority	3rd priority	1st priority	2nd priority	3rd priority
Graduate level						
Students' barriers for the studies						
1. Curriculum / Texts	147	51	45	74	25	11
2. Lecturers	29	62	40	9	37	33
3. Grade Point Average	37	28	43	13	7	23
4. Learning media	57	83	49	23	69	25
5. Communication with lecturers	85	87	85	40	21	47
6. Context of subject is not related to job	27	57	54	2	9	12
7. Law /Regulations	19	24	68	11	4	14
Undergraduate level						
Students' barriers for the studies						
1. Curriculum / Texts	32	12	15	39	18	21
2. Lecturers	15	17	11	17	23	8
3. Grade Point Average	11	9	11	25	26	33
4. Learning media	13	34	17	22	32	29
5. Communication with lecturers	18	12	11	42	40	27
6. Context of subject is not related to job	4	4	5	6	8	9
7. Law /Regulations	1	-	4	13	5	13

From table 6.9, the barrier from curriculum is the first priority problem of RU and STOU graduate students, and also to the RU undergraduate students. The learning media and the communication with lecturers are the second priority problems to all students. However, communication with lecturers is the major problems of STOU undergraduate students because they show at the first and second priority of problems.

The learning barriers of students' opinions are prioritizing, according to the students' own problems. The comparison between RU and STOU graduate and undergraduate students are illustrated in table 6.10

Table 6.10: Comparison between RU and STOU on the students' learning barriers, prioritizing on their own problems

Barriers to the students' studies on their own problems	Numbers of RU students			Numbers of STOU students		
	1st priority	2nd priority	3rd priority	1st priority	2nd priority	3rd priority
Graduate level						
Students' barriers for their own problems						
1. Distance to study	82	56	56	45	15	24
2. Time devoted to study	129	94	57	39	53	29
3. Expense on study	72	68	55	22	29	46
4. Family supports	4	26	32	25	35	21
5. Superior supports	24	48	57	15	23	23
6. Lack of Motive	27	56	73	23	3	13
7. Lack of educational background	60	40	41	5	8	5
Undergraduate level						
Students' barriers for their own problems						
1. Distance to study	29	12	10	33	48	21
2. Time devoted to study	23	22	13	89	35	20
3. Expense on study	24	23	12	17	22	40
4. Family supports	1	2	6	4	10	14
5. Superior supports	-	4	2	5	7	14
6. Lack of Motive	3	11	11	6	19	16
7. Lack of educational background	12	9	16	11	9	11

From table 6.10, the first priorities of RU and STOU graduate students' learning barriers are time devoted to study and the distance to study respectively. While the expense on study and the lack of motive are the third priority problems of STOU and RU graduate students. For RU and STOU undergraduate students; distance to study, time devoted to study, and expense on study, are their major problems. However, lack of educational background is another barrier to RU undergraduate students.

The learning barriers of students' opinions are prioritizing, according to the students' IT utilization. The comparison between RU and STOU graduate and undergraduate students are illustrated in table 6.11

Table 6.11: Comparison between RU and STOU on the students' learning barriers, prioritizing on their IT utilization

Barriers to the students' studies on their IT utilization	Numbers of RU students			Numbers of STOU students		
	1st priority	2nd priority	3rd priority	1st priority	2nd priority	3rd priority
Graduate level						
Students' barriers on their IT utilization						
1. Lack of computer background	117	15	17	59	14	7
2. No study room for VDO watching	98	101	48	32	47	27
3. Lack of study equipment supports	84	89	56	27	38	32
4. No computer service	13	21	25	14	36	36
5. Distance learning telecomm. Ineffective	36	52	70	25	14	30
6. No electronic library	21	55	55	6	6	13
7. No facilities for contacting teacher	25	49	94	2	2	5
Undergraduate level						
Students' barriers on their IT utilization						
1. Lack of computer background	38	8	3	58	7	13
2. No study room for VDO watching	16	21	12	35	46	11
3. Lack of study equipment supports	12	14	15	17	20	25
4. No computer service	14	8	12	11	30	27
5. Distance learning telecomm. Ineffective	10	18	11	14	16	26
6. No electronic library	1	8	9	9	13	19
7. No facilities for contacting teacher	5	9	13	15	15	19

From table 6.11, the first priority of all RU and STOU students' barriers is the lack of computer background. While the second priority of all students is no study room for VDO watching. However, the third priority of RU students' learning barriers is lack of study equipment supports such as copier machine and so on, while the third priority of STOU students' problems is no computer service.

6.3 CAUSAL MODELS ANALYSIS

Multiple regression analysis is used to predict the response variable from knowledge of the independent variables. Any given data typically have multiple causal origins, the regression analysis is recognized by the percentage of variance accounted in the use of statistical procedures. Multiple regression analysis is applied to explain the causal model of this research in order to analyze the relationship among relevant variables.

6.3.1 The Overall Causal Model of Analysis

The total causal effects on the overall effectiveness of distance learning administration (DL_ADMEFFT) as the outcome, is shown at figure 6.1, as following:

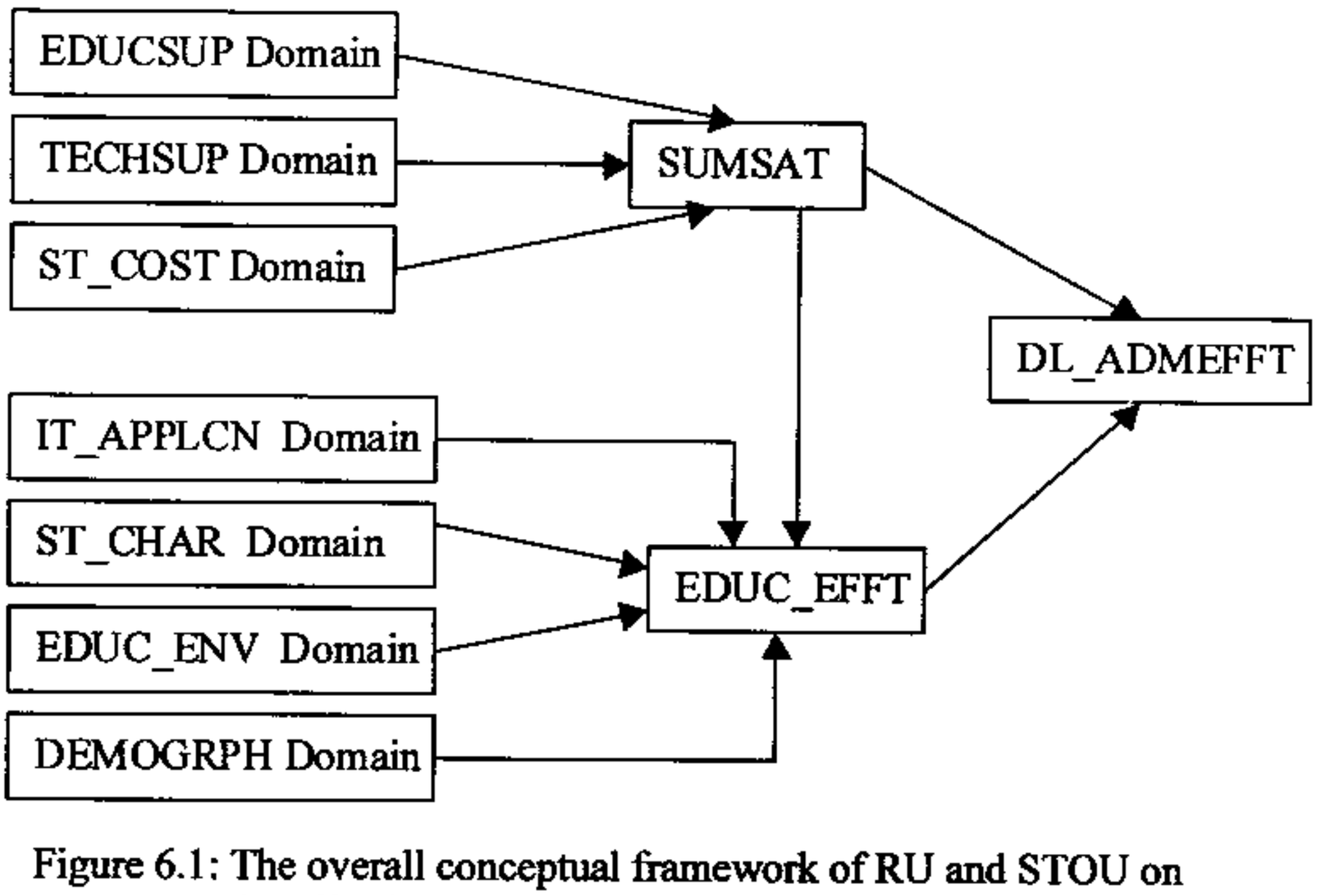

Figure 6.1: The overall conceptual framework of RU and STOU on the effectiveness of distance learning system

There are seven domains of independent variables, influencing the dimensions of dependent variables: the learning satisfaction (SUMSAT) and the educational effectiveness (EDUC_EFFT). These two outputs dependent dimensions are again independent domains, influencing the effectiveness of distance learning administration.

The seven domains of independent variables are described as follow:

- EDUCSUP Domain is the students' educational supports domain. This domain includes curriculum supports, faculty supports, student supports, and service and staff supports. This domain refers to the crucial supports of education.
- TECHSUP Domain is the students' technological supports. This domain consists of instructional delivery modes, computer-mediated communication, human-computer interaction, and technological utilization. This domain describes the instructional delivery with technological utilization as well as the educational interactivity.
- ST_COST Domain is the students' educational costs and time spent domain. This domain refers to the students' personal problems or barriers to study.
- IT_APPLCN Domain is the information technology (IT) application for education domain. This domain concerns with the capability of IT in terms of accessibility, effectiveness, and efficiency.
- ST_CHAR Domain is the students' characteristics domain. This domain includes students' needs and barriers. This domain is the factor that may influence students' educational effectiveness.
- EDUC_ENV Domain is the students' educational environment domain. This domain includes learning climate, achievement orientation, students' expectations, learning evaluation, and context of instruction. This domain also influences the students' educational effectiveness.
- DEMOGRPH Domain is the students' personal information domain. This domain describes the individual information such as age revenue, number of dependents, number of educating dependents, GPA, and number of re-examination.

There are three domains of the independent variables, influencing the students' learning satisfaction, namely EDUCSUP domain, TECHSUP domain, and ST_COST domain. Four domains of the independent variables that cause the students' educational effectiveness are IT_APPLCN domain, ST_CHAR domain, EDUC_ENV domain, and DEMOGRPH domain (see figure 6.1).

From figure 6.1, the integrated relationships between the independent variables and dependent variable of research framework are classified into two dimensions of the independent variables:

- Students' learning satisfaction (SUMSAT) and
- Students' educational effectiveness (EDUC_EFFT)

And the dependent variable which is the outcome in term of the effectiveness of distance learning administration (DL_ADMEFFT), is shown at figure 6.2

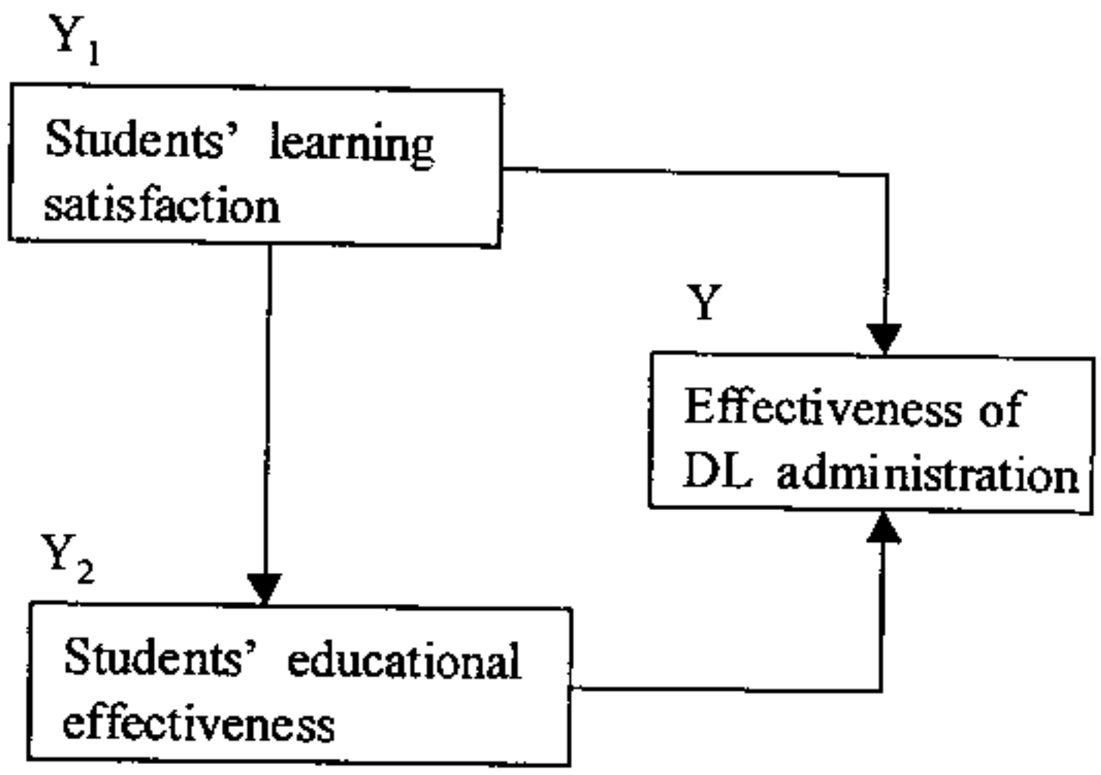

Figure 6.2: The integrated conceptual framework of the effectiveness of distance learning system

The estimation of total causal effects on the overall effectiveness of distance learning systems was accomplished and separated by universities (RU and STOU) within graduate and undergraduate studies levels. The learning satisfaction dimension and the educational effectiveness dimension are provided into the eight sub models, namely:

- RU Graduate of learning satisfaction
- RU Graduate of educational effectiveness
- RU Undergraduate of learning satisfaction
- RU Undergraduate of educational effectiveness
- STOU Graduate of learning satisfaction
- STOU Graduate of educational effectiveness
- STOU Undergraduate of learning satisfaction
- STOU Undergraduate of educational effectiveness

The two dependent variables: SUMSAT (Y_1) and EDUC_EFFT (Y_2) become again independent variables in the integrated framework (see figure 6.2). The integrated framework is predicted and assessed by the relationship among independent (Y_1), moderated variables (Y_2) and the dependent variable Y (DL_ADMEFFT).

To examine both the determinants and the moderator of the effectiveness of distance learning administration, an analysis outlined in this study was done by using Moderated Regression Analysis – MRA (Cohen and Cohen, 1983; Sharma, Durand, & Gur-arie, 1981; Zedeck, 1971). MRA[1] is an analytical approach used to identify moderator variables by examining an interaction term in a regression model (Sharma, Durand & Gur-arie, 1981).

In applying MRA, a regression equation was used to assess the effects of the predictor and the moderator variables as follow:

$$Y = a + b_iX_i + cZ + d_iX_iZ$$

Where Y = dependent variable

X_i = predictor variables

Z = moderator variable

The MRA regression was used to test hypotheses, by examining the coefficients of the interaction of the moderator with each predictor. Therefore, the effectiveness of distance learning administration (DL_ADMEFFT) is determined by the SUMSAT (Y_1) and EDUC_EFFT (Y_2) such that the regression equation is:

$$\text{DL\_ADMEFFT (Y)} = a_0 + b_1 \text{(SUMSAT)} + b_2 \text{(EDUC\_EFFT)} + b3 \text{(SUMSAT) (EDUC\_EFFT)}$$

The parameters in regression are interpreted in the standard manner as:

1. a_i is the Y intercept, indicates the mean of the distribution of Y when $X_i = 0$
2. b_k ($k = 1, 2, \ldots\ldots, p-1$) indicates the change in Y when X_k increases by one unit while the other independent variables remain constant.

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[1] Lorsuwannarat, Tippawan 1996. Multi-Theoretical Explanations of Innovation Adoption and Implementation: Cases of Local-Area Networks in the Thai Public Sector. Thesis for the degree of PH.D. Ontorio: York University, 113-114.

The causal model of the students' learning satisfaction was analyzed by the structural equation of the relevant variables on the framework, as shown in figure 6.3

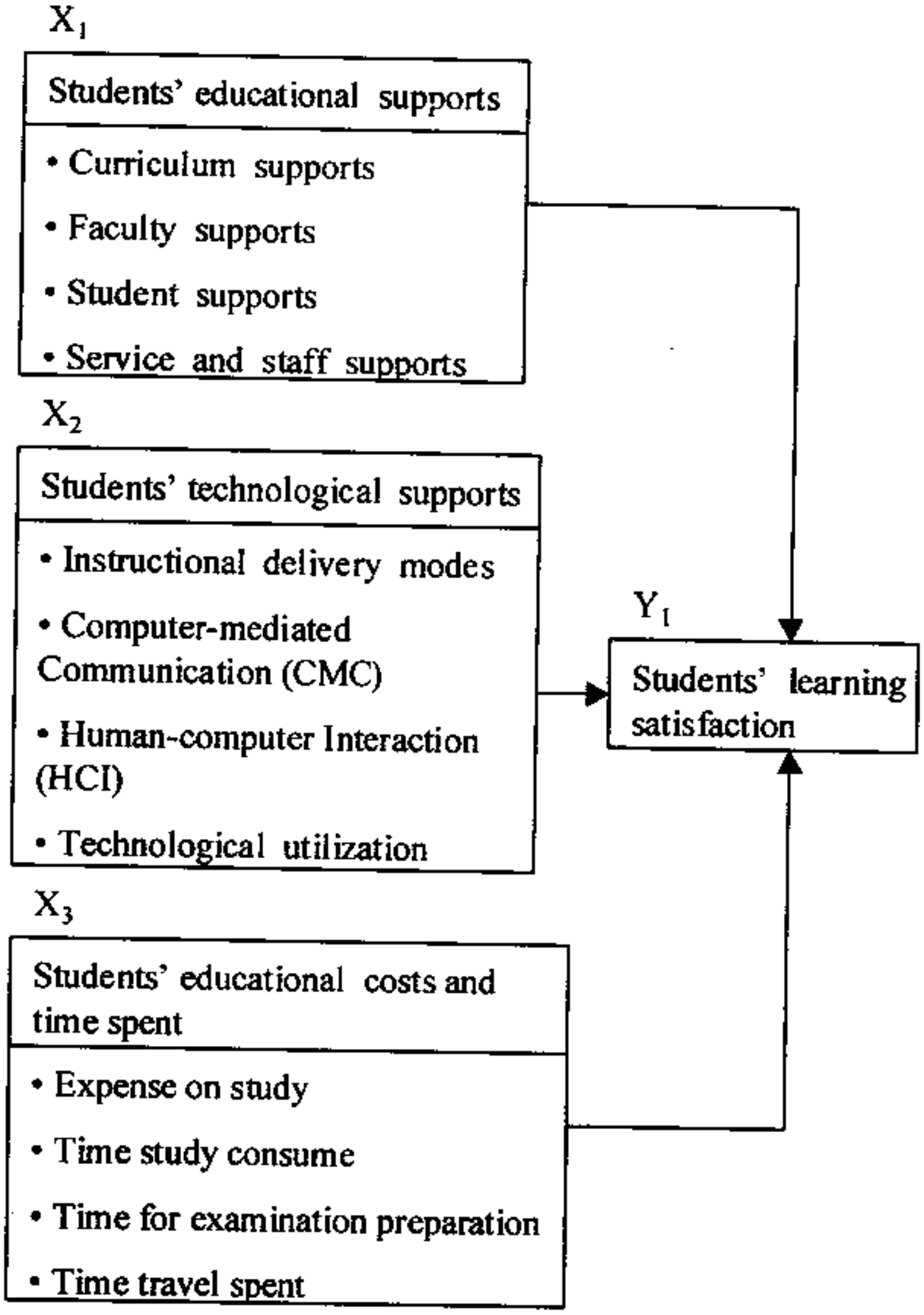

Figure 6.3: The conceptual framework of factors directly affecting students' learning satisfaction (Y_1)

The relationships between independent and dependent variables are expressed by the structural equation:

$$SUMSAT\ (Y_1) = a_2 + b_4\ (EDUCSUP) + b_5\ (TECHSUP) + b_6\ (ST\_COST)$$

Where SUMSAT = Students' learning domain

EDUCSUP = Educational supports domain

TECHSUP = Technological supports domain

ST_COST = Students' educational costs and time spent domain

The causal model was analyzed by the relevant variables of framework on the students' educational effectiveness, as shown in the figure 6.4

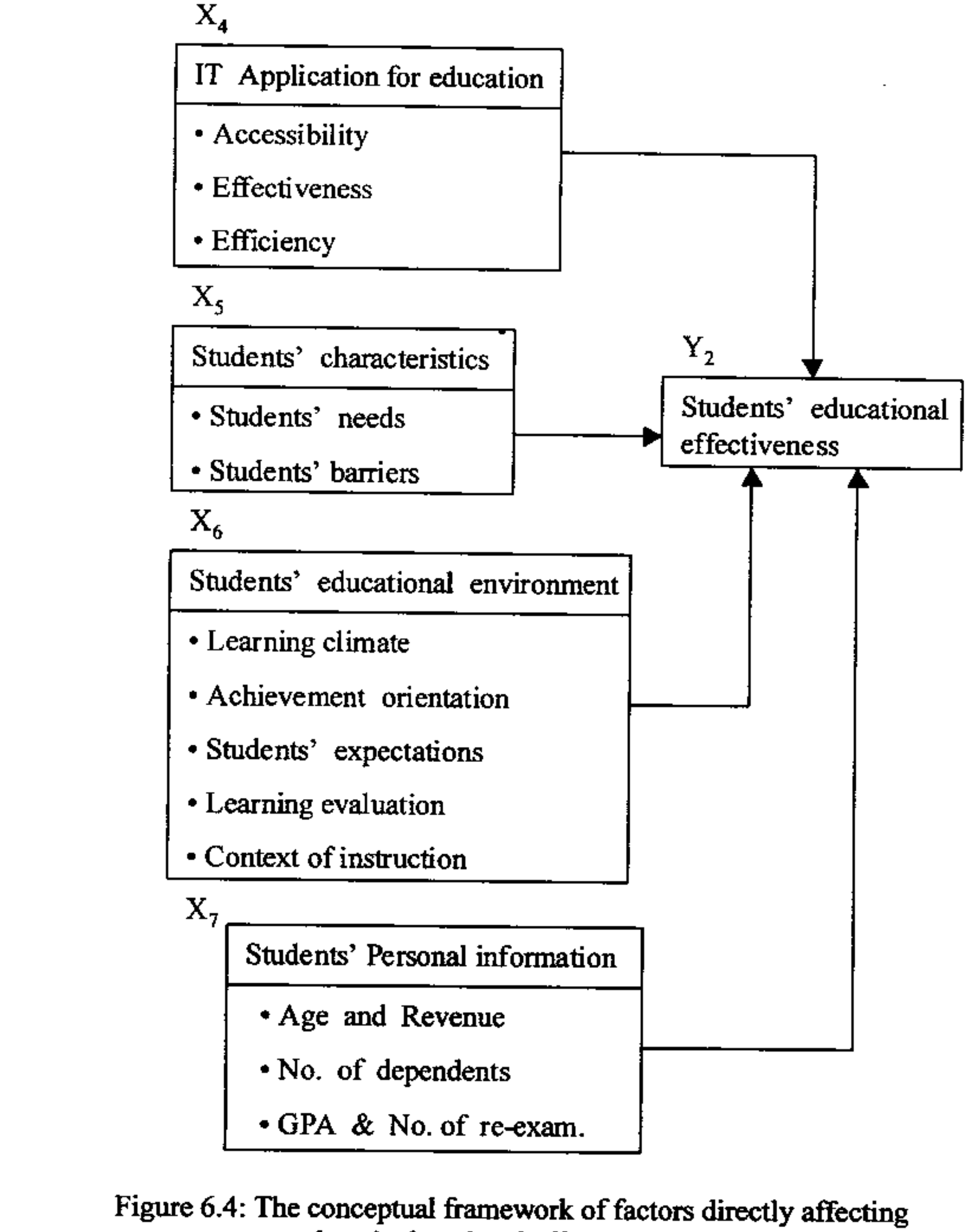

Figure 6.4: The conceptual framework of factors directly affecting students' educational effectiveness (Y_2)

The structural equation of the conceptual framework is expressed by

$$EDUC\_EFFT\ (Y_2) = a_3 + b_7\ (IT\_APPLCN) + b_8\ (ST\_CHAR) + b_9\ (EDUC\_ENV) + b_{10}\ (DEMOGRPH)$$

6.3.2 The Partial Correlation Analysis

Partial Correlation Coefficient Analysis is a technique for measuring the linear association between two variables while adjusting for the linear effects of one or more additional variables. The interpretation of multiple regression results often requires information about the coefficients of correlation between pairs of the variables in the study because the correlation analysis confirms the relationships between independent and dependent variables.

The simple correlation coefficients are presented in the form of the correlation matrices, shown at table 6.12 through table 6.19.

The presentation of the tables are described as following:

Table 6.12 represents the correlation matrix between domain of dependent variable (SUMSAT) and the independent variables for RU graduate students.

Table 6.13 represents the correlation matrix between domain of dependent variable (SUMSAT) and the independent variables for STOU graduate students.

Table 6.14 represents the correlation matrix between domain of dependent variable (EDUC_EFFT) and the independent variables for RU graduate students.

Table 6.15 represents the correlation matrix between domain of dependent variable (EDUC_EFFT) and the independent variables for STOU graduate students.

Table 6.16 represents the correlation matrix between domain of dependent variable (SUMSAT) and the independent variables for RU undergraduate students.

Table 6.17 represents the correlation matrix between domain of dependent variable (SUMSAT) and the independent variables for STOU undergraduate students.

Table 6.18 represents the correlation matrix between domain of dependent variable (EDUC_EFFT) and the independent variables for RU undergraduate students.

Table 6.19 represents the correlation matrix between domain of dependent variable (EDUC_EFFT) and the independent variables for STOU undergraduate students.

These tables are displayed in the next pages respectively.

Table 6.12: The Correlation Matrix between dependent variable (SUMSAT) and independent variables for RU-Graduate level

Variables	SUMSAT	CURSUP	FACSUP	STSUP	SERVSUP	INSTECH	CMC	HCI
SUMSAT	1.000							
CURSUP	.327**	1.000						
FACSUP	.538**	.363**	1.000					
STSUP	.401**	.388**	.470**	1.000				
SERVSUP	.489**	.330**	.570**	.539**	1.000			
INSTECH	.289**	.050	.273**	.374**	.239**	1.000		
CMC	.474**	.124*	.445**	.384**	.292**	.511**	1.000	
HCI	.650**	.285**	.537**	.479**	.426**	.393**	.608**	1.000
USETECH	.420**	.172**	.411**	.517**	.394**	.428**	.509**	.490**

** Correlation is significant at the 0.01 level
* Correlation is significant at the 0.05 level

N = 409 (RU Graduate students)

Abbreviation: SUMSAT = Students' Learning Satisfaction

CURSUP = Curriculum support
FACSUP = Faculty support
STSUP = Student support
SERVSUP = Services support
INSTECH = Instructional delivery modes
CMC = Computer-Mediated Communication
HCI = Human-Computer Interaction
USETECH = Technological utilization

Table 6.13: The Correlation Matrix between dependent variable (SUMSAT) and independent variables for STOU-Graduate level

Variables	SUMSAT	CURSUP	FACSUP	STSUP	SERVSUP	INSTECH	CMC	HCI
SUMSAT	1.000							
CURSUP	.720**	1.000						
FACSUP	.680**	.640**	1.000					
STSUP	.115	.127	.187*	1.000				
SERVSUP	.610**	.598**	.558**	.074	1.000			
INSTECH	.211**	.257**	.284**	.395**	.235**	1.000		
CMC	.232**	.204**	.260**	.172*	.186*	.433**	1.000	
HCI	.640**	.633**	.515**	.086	.704**	.289**	.334**	1.000
USETECH	.186*	.234**	.178*	.039	.234**	.215**	.541**	.361**

** Correlation is significant at the 0.01 level
* Correlation is significant at the 0.05 level

N = 186 (STOU Graduate students)

Abbreviation: SUMSAT = Students' Learning Satisfaction

CURSUP = Curriculum support
FACSUP = Faculty support
STSUP = Student support
SERVSUP = Services support
INSTECH = Instructional delivery modes
CMC = Computer-Mediated Communication
HCI = Human-Computer Interaction
USETECH = Technological utilization

Table 6.14: The Correlation Matrix between dependent variable (EDUC_ EFFT) and independent variables for RU-Graduate level

Variables	EDUC_ EFFT	LCLMT	ACHV	STEXPCT	LEVAL	INSTXT	ITACCSS	ITEFFT	ITEFFCY	NEED PERC
EDUC_ EFFT	1.000									
LCLMT	.228**	1.000								
ACHV	.401**	.276**	1.000							
STEXPCT	.656**	.347**	.457**	1.000						
LEVAL	.556**	.513**	.436**	.666**	1.000					
INSTXT	.400**	.216**	.473**	.582**	.509**	1.000				
ITACCSS	.321**	.177**	.149**	.433**	.353**	.222**	1.000			
ITEFFT	.588**	.281**	.311**	.591**	.539**	.343**	.554**	1.000		
ITEFFCY	.546**	.246**	.266**	.525**	.476**	.279**	.486**	.732**	1.000	
NEEDPERC	.378**	.105*	.194**	.382**	.205**	.300**	.290**	.398**	.380**	1.000
STBARIER	.106*	.015	.212**	.150**	.025	.281**	- .037	.021	.010	.141**

** Correlation is significant at the 0.01 level
* Correlation is significant at the 0.05 level
N = 409 (RU Graduate students)

Abbreviation: EDUC_ EFFT = Students' Educational Effectiveness
LCLMT = Learning Climate
ACHV = Achievement Orientation
STEXPCT = Students' expectations
LEVAL = Learning Evaluation
INSTXT = Context of Instruction
ITACCSS = IT Accessibility
ITEFFT = IT Effectiveness
ITEFFCY = IT Efficiency
NEEDPERC = Students' needs
STBARIER = Students' barriers

Table 6.15: The Correlation Matrix between dependent variable (EDUC_ EFFT) and independent variables for STOU-Graduate level

Variables	EDUC_ EFFT	LCLMT	ACHV	STEXPCT	LEVAL	INSTXT	ITACCSS	ITEFFT	ITEFFCY	NEED PERC
EDUC_ EFFT	1.000									
LCLMT	.162*	1.000								
ACHV	.214**	.257**	1.000							
STEXPCT	.597**	.069	.226**	1.000						
LEVAL	.629**	.134	.313**	.585**	1.000					
INSTXT	.399**	.101	.131	.209**	.371**	1.000				
ITACCSS	.566**	.074	.149*	.692**	.474**	.289**	1.000			
ITEFFT	.514**	.037	.142	.523**	.432**	.582**	.626**	1.000		
ITEFFCY	.634**	.059	.170*	.761**	.510**	.316**	.896**	.633**	1.000	
NEEDPERC	.311**	.123	.139	.332**	.314**	.347**	.325**	.333**	.339**	1.000
STBARIER	- .018	.091	.041	- .011	- .022	.146*	- .007	- .046	- .043	.173*

** Correlation is significant at the 0.01 level
* Correlation is significant at the 0.05 level
N = 186 (STOU Graduate students)

Abbreviation: EDUC_ EFFT = Students' Educational Effectiveness
LCLMT = Learning Climate
ACHV = Achievement Orientation
STEXPCT = Students' expectations
LEVAL = Learning Evaluation
INSTXT = Context of Instruction
ITACCSS = IT Accessibility
ITEFFT = IT Effectiveness
ITEFFCY = IT Efficiency
NEEDPERC = Students' needs
STBARIER = Students' barriers

Table 6.16: The Correlation Matrix between dependent variable (SUMSAT) and independent variables for RU-Undergraduate level

Variables	SUMSAT	CURSUP	FACSUP	STSUP	SERVSUP	INSTECH	CMC	HCI
SUMSAT	1.000							
CURSUP	.421**	1.000						
FACSUP	.344**	.390**	1.000					
STSUP	.530**	.479**	.437**	1.000				
SERVSUP	.095	.123	.179	- .024	1.000			
INSTECH	.187*	.185*	.333**	.608**	- .039	1.000		
CMC	.382**	.180	.338**	.505**	.119	.497**	1.000	
HCI	.311**	.157	.517**	.551**	.071	.617**	.712**	1.000
USETECH	.334**	.223*	.218*	.444**	.013	.387**	.396**	.367**

** Correlation is significant at the 0.01 level
* Correlation is significant at the 0.05 level

N = 115 (RU Undergraduate students)

Abbreviation: SUMSAT = Students' Learning Satisfaction

CURSUP = Curriculum support
FACSUP = Faculty support
STSUP = Student support
SERVSUP = Services support
INSTECH = Instructional delivery modes
CMC = Computer-Mediated Communication
HCI = Human-Computer Interaction
USETECH = Technological utilization

Table 6.17: The Correlation Matrix between dependent variable (SUMSAT) and independent variables for STOU-Undergraduate level

Variables	SUMSAT	CURSUP	FACSUP	STSUP	SERVSUP	INSTECH	CMC	HCI
SUMSAT	1.000							
CURSUP	.120	1.000						
FACSUP	.502**	.088	1.000					
STSUP	.508**	.112	.393**	1.000				
SERVSUP	.513**	.074	.446**	.538**	1.000			
INSTECH	.459**	- .011	.384**	.465**	.627**	1.000		
CMC	.502**	.098	.374**	.363**	.403**	.438**	1.000	
HCI	.525**	.003	.388**	.418**	.562**	.631**	.365**	1.000
USETECH	-	-	-	-	-	-	-	-

** Correlation is significant at the 0.01 level
* Correlation is significant at the 0.05 level

N = 183 (STOU Undergraduate students)
* Remark: There is no any correlation of USETECH shown

Abbreviation: SUMSAT = Students' Learning Satisfaction
CURSUP = Curriculum support
FACSUP = Faculty support
STSUP = Student support
SERVSUP = Services support
INSTECH = Instructional delivery modes
CMC = Computer-Mediated Communication
HCI = Human-Computer Interaction
USETECH = Technological utilization

Table 6.18: The Correlation Matrix between dependent variable (EDUC_ EFFT) and independent variables for RU-Undergraduate level

Variables	EDUC_ EFFT	LCLMT	ACHV	STEXPCT	LEVAL	INSTXT	ITACCSS	ITEFFT	ITEFFCY	NEED PERC
EDUC_ EFFT	1.000									
LCLMT	.343**	1.000								
ACHV	.211*	.360**	1.000							
STEXPCT	.390**	.566**	.387**	1.000						
LEVAL	.368**	.720**	.374**	.583**	1.000					
INSTXT	.287**	.527**	.526**	.605**	.587**	1.000				
ITACCSS	.601**	.386**	.136	.327**	.374**	.377**	1.000			
ITEFFT	.626**	.367**	.180	.413**	.405**	.446**	.798**	1.000		
ITEFFCY	.559**	.346**	.306**	.393**	.381**	.418**	.718**	.832**	1.000	
NEEDPERC	.405**	.287**	.449**	.456**	.224*	.435**	.392**	.365**	.445**	1.000
STBARIER	.129	.075	.422**	.303**	.099	.335**	.024	.043	.075	.451**

** Correlation is significant at the 0.01 level
* Correlation is significant at the 0.05 level
N = 115 (RU Undergraduate students)

Abbreviation: EDUC_ EFFT = Students' Educational Effectiveness
LCLMT = Learning Climate
ACHV = Achievement Orientation
STEXPCT = Students' expectations
LEVAL = Learning Evaluation
INSTXT = Context of Instruction
ITACCSS = IT Accessibility
ITEFFT = IT Effectiveness
ITEFFCY = IT Efficiency
NEEDPERC = Students' needs
STBARIER = Students' barriers

Table 6.19: The Correlation Matrix between dependent variable (EDUC_ EFFT) and independent variables for STOU-Undergraduate level

Variables	EDUC_ EFFT	LCLMT	ACHV	STEXPCT	LEVAL	INSTXT	ITACCSS	ITEFFT	ITEFFCY	NEED PERC
EDUC_ EFFT	1.000									
LCLMT	.329**	1.000								
ACHV	.338**	.576**	1.000							
STEXPCT	.584**	.377**	.354**	1.000						
LEVAL	.239**	.403**	.407**	.324**	1.000					
INSTXT	.256**	.233**	.205**	.300**	.243**	1.000				
ITACCSS	.387**	.211**	.354**	.479**	.145*	.204**	1.000			
ITEFFT	.482**	.271**	.431**	.565**	.237**	.258**	.871**	1.000		
ITEFFCY	.492**	.307**	.451**	.590**	.292**	.268**	.802**	.904**	1.000	
NEEDPERC	.398**	.480**	.450**	.550**	.346**	.171*	.453**	.509**	.518**	1.000
STBARIER	- .117	- .052	.054	.002	- .012	- .037	.128	.066	.056	.001

** Correlation is significant at the 0.01 level
* Correlation is significant at the 0.05 level
N = 183 (STOU Undergraduate students)

Abbreviation: EDUC_ EFFT = Students' Educational Effectiveness
LCLMT = Learning Climate
ACHV = Achievement Orientation
STEXPCT = Students' expectations
LEVAL = Learning Evaluation
INSTXT = Context of Instruction
ITACCSS = IT Accessibility
ITEFFT = IT Effectiveness
ITEFFCY = IT Efficiency
NEEDPERC = Students' needs
STBARIER = Students' barriers

6.3.3 Multiple Regression Analysis for the Causal Models

The total causal effects on the effectiveness of distance learning administration were analyzed by multiple regression analysis. The models are analyzed separately into eight sub-models with the two dimensions: the students' learning satisfaction (SUMSAT) and the students' educational effectiveness (EDUC_EFFT).

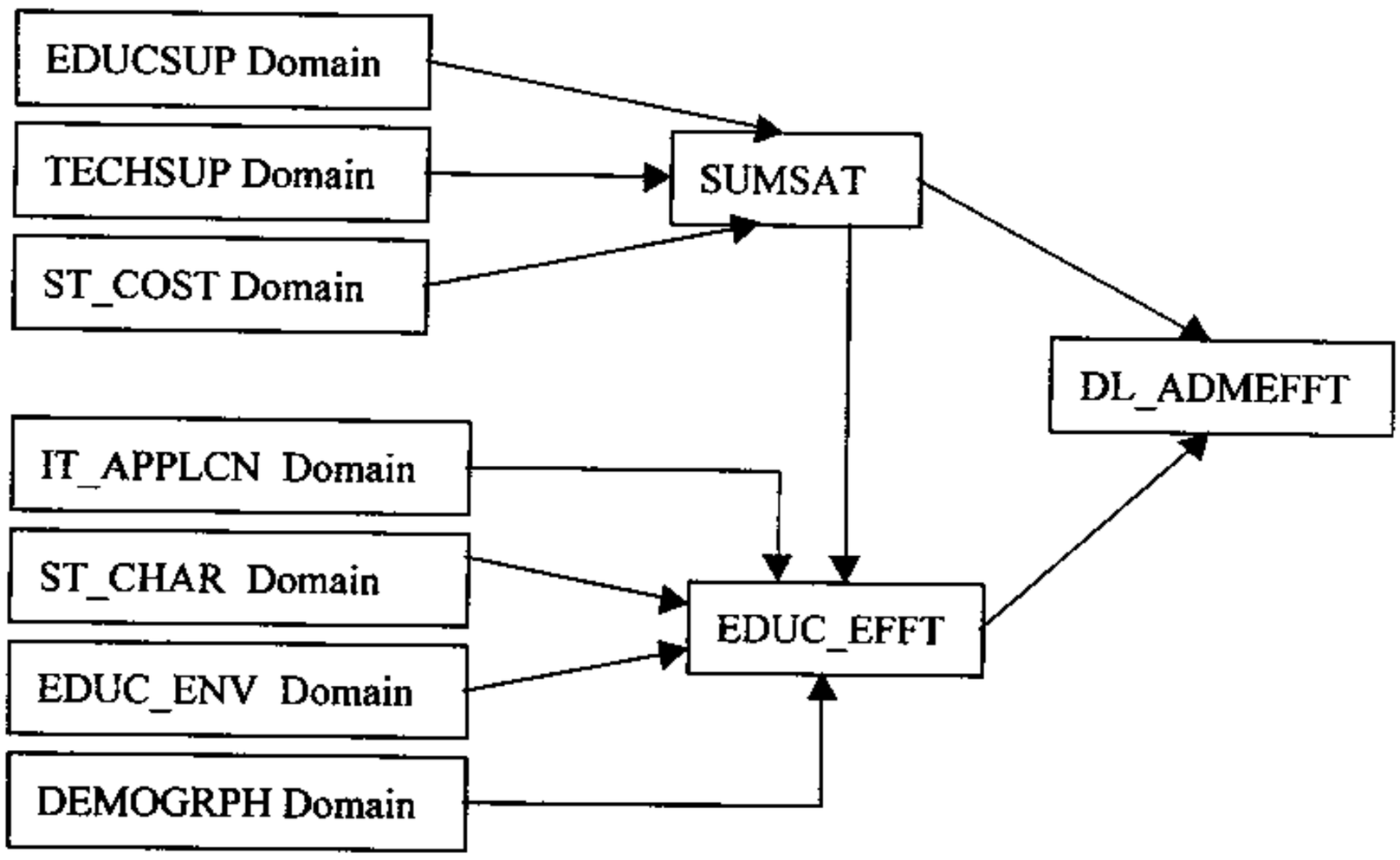

Figure 6.5: The overall conceptual framework of RU and STOU on the effectiveness of distance learning systems

The first four sub-models are separated by RU and STOU at the graduate studies level into the students' learning satisfaction dimension and the students' educational effectiveness dimension, as following:

- Three domains of independent variables influence the RU graduate students' learning satisfaction (SUMSAT)
- Three domains of independent variables influence the STOU graduate students' learning satisfaction (SUMSAT)
- Four domains of independent variables influence the RU graduate students' educational effectiveness (EDUC_EFFT)
- Four domains of independent variables influence the STOU graduate students' educational effectiveness (EDUC_EFFT)

6.3.3.1 Multiple Regression Analysis at the Graduate Studies Level

The students' learning satisfaction (SUMSAT) is influenced by all independent variables: curriculum supports (Cursup), faculty supports (Facsup), student supports (Stsup), service and staff supports (Servsup), instructional delivery modes (Instech), computer-mediated communication (CMC), human-computer interaction (HCI), technology utilization (Usetech), expense (Exps), time study (Hrread), time for examination preparation (Hr_ex), and time travel spent (Hrfar).

The relationships among these variables are statistically examined. Multiple regression analysis is utilized to analyze the model. The results of findings between RU and STOU are illustrated at the table 6.20

Table 6.20: Regression Analysis of RU and STOU graduate learning satisfaction

Model	SUMSAT = a + b (EDUCSUP) + c (TECHSUP) + d (ST_COST)
Results of Analysis for RU Graduate studies	SUMSAT = 17.189*** + {0.510(Servsup)*** + 0.573(Facsup)** + (4.653) (3.995) (2.899) 0.519 (Cursup)*} + {0.616(HCI)*** + 0.09528(CMC)*} + 0 (2.284) (8.559) (2.143) R^2 = 0.506 Adj R^2 = 0.500 F = 82.459*** Sig. = 0.000
Results of Analysis for STOU Graduate studies	SUMSAT = - 8.550 + {0.726(Cursup)*** + 1.001(Facsup)***} (-1.671) (5.361) (5.532) + {0.286(HCI)***} + 0 (4.216) R^2 = 0.635 Adj. R^2 = 0.629 F = 105.508*** Sig. = 0.000

*** P < 0.001 ** P < 0.01 * P < 0.05

The regression analysis indicates that for every 1 unit change in predictor variable, the value of dependent variable will change equal to the regression coefficient value.

At the RU graduate studies, the regression equation of the RU students' learning satisfaction (SUMSAT) is influenced by the independent variables of educational supports domain are Servsup, Facsup, Cursup, and technological supports domain are CMC and HCI. Table 6.20 shown that for every 1 unit of Servsup changed then the value of SUMSAT will change 0.510 units. For every 1 unit of Facsup changed, the value of SUMSAT changes 0.573 units where 1 unit of Cursup changed, the value of SUMSAT changes 0.519. For every 1 unit of HCI changed, the value of SUMSAT change 0.616 units and for every 1 unit of CMC changed, the value of SUMSAT change 0.095 units. From this equation, the independent variables can explain the variance on dependent variable about 50.60 percent

At the STOU graduate studies, the regression equation of the STOU students' learning satisfaction (SUMSAT) is influenced by the independent variables of educational supports domain are Facsup, Cursup, and technological supports domain is HCI. Table 6.20 shown that for every 1 unit of Cursup changed then the value of SUMSAT will change 0.726 units. For every 1 unit of Facsup changed, the value of SUMSAT changes 1.001 units whereas every 1 unit of HCI changed, the value of SUMSAT changes 0.286 units. From this equation, the independent variables can explain the variance on dependent variable about 63.50 percent. Since the initial value of learning satisfaction, which is the constant value (-8.550), is minus. This assumes that there is no learning satisfaction at the beginning of study for STOU graduate students.

In summary, the regression equations of both RU and STOU graduate students' learning satisfaction show that all relevant independent variables influence positively to the dependent variable (SUMSAT). This means that each of these independent variables leads to increase the students' learning satisfaction. However, path analysis will also be utilized to confirm the causal effects of the framework in order to test the hypotheses.

From the students' educational effectiveness point, the students' educational effectiveness (EDUC_EFFT) is influenced by all independent variables: IT accessibility (Itaccss), IT effectiveness (Itefft), IT efficiency (Iteffcy), students' needs (Needperc), students' barriers (St_barier), learning climate (Lclmt), achievement orientation (Achv), students' expectation (Stexpct), learning evaluation (Leval),

context of instruction (Instxt), age (Age), revenue (Revn), number of dependents (Dep), number of educating dependents (Dep_ed), number of re-examination (Re_ex), and grade point average (Gpa).

The relationships among these variables are statistically examined. Multiple regression analysis is utilized to analyze the causal model. The results of findings between RU and STOU are illustrated at the table 6.21

Table 6.21: Regression Analysis of RU and STOU at the graduate educational effectiveness

Model	EDUC_EFFT = a + b (IT_APPLCN) + c (ST_CHAR) + d (EDUC_ENV) + e (DEMOGRPH)
Results of Analysis for RU Graduate studies	EDUC_EFFT = 6.500 + {0.258(Itefft)** + 0.178(Iteffcy)** (1.791) (3.391) (3.046) – 0.211 (Itaccss)*} + {0.114(Needperc)**} + {0.153(Achv)* (-2.260) (2.719) (2.327) – 0.253(Lclmt)** + 0.398(Stexpct)*** + 0.241(Leval)**} (-2.819) (6.474) (3.387) + {1.464(Dep)**} (3.073) R^2 = 0.547 Adj. R^2 = 0.537 F = 53.505*** Sig. = 0.000
Results of Analysis for STOU Graduate studies	EDUC_EFFT = 18.534 + {0.419(Iteffcy)***} (4.585) (6.930) + {0.440(Leval)*** + 0.05965(Instxt)*} + {0.976(Dep)*} (6.083) (2.158) (2.058) R^2 = 0.554 Adj. R^2 = 0.544 F = 55.864*** Sig. = 0.000

*** P < 0.001 ** P < 0.01 * P < 0.05

At the RU graduate studies, the regression equation of the RU students' educational effectiveness (EDUC_EFFT) is influenced by the independent variables of IT application for education domain are Itaccss, Itefft, and Iteffcy; the students' characteristics domain is Needperc; the educational environment domain are Lclmt, Achv, Stexpct, Leval; and the students' personal information domain is Dep.

Table 6.21 shown that for every 1 unit of Itefft changed then the value of EDUC_EFFT will change 0.258 units. For every 1 unit of Itaccss changed, the value of EDUC_EFFT will change 0.211 units decreasingly as well as for every 1 unit of Lclmt changed then the value of EDUC_EFFT will change 0.253 units decreasingly. For every 1 unit of Iteffcy changed, the value of EDUC_EFFT will change 0.178 units. For every 1 unit of Stexpct changed, the value of EDUC_EFFT will change 0.398 units. For every 1 unit of Leval changed, the value of EDUC_EFFT will change 0.241 units accordingly. For every 1 unit of Needperc changed, the value of EDUC_EFFT will change 0.114 units. For every 1 unit of Achv changed, the value of EDUC_EFFT will change 0.153 units. However, we can conclude that number of dependents (Dep) greatly affects to the educational effectiveness because for every 1 unit of Dep changed, the value of EDUC_EFFT will change 1.464 units. This means that the number of dependents influences strongly to the effectiveness of education for RU graduate students. From this equation, the independent variables can explain the variance on dependent variable about 54.70 percent.

At the STOU graduate studies, the regression equation of the STOU students' educational effectiveness (EDUC_EFFT) is influenced by the independent variables of IT application for education domain is Iteffcy; the educational environment domain are Leval and Instxt; and the students' personal information domain is Dep.

Table 6.21 shown that for every 1 unit of Iteffcy changed then the value of EDUC_EFFT will change 0.419 units. For every 1 unit of Leval changed, the value of EDUC_EFFT will change 0.440 units as well as for every 1 unit of Instxt changed, the value of EDUC_EFFT will change 0.060 units. However, the number of dependents (Dep) also affects greatly (as the same as RU graduate students' educational effectiveness) to the STOU educational effectiveness because for every 1 unit of Dep changed, the value of EDUC_EFFT will change 0.976 units. This means that the number of dependents influences strongly to the effectiveness of education for STOU graduate students as well. From this equation, the independent variables can explain the variance on dependent variable about 55.40 percent.

In summary, the regression equation of RU graduate students' educational effectiveness shows that all independent variables influence with both positive and negative values to the dependent variable (EDUC_EFFT). For the regression equation of STOU graduate students' educational effectiveness shows that each independent variable affects to increase the students' educational effectiveness.

From the integration of the causal models (see figure 6.2) at the graduate studies level of both RU and STOU. The multiple regression analysis is utilized to analyze the causal model. The results of findings between RU and STOU graduate students is illustrated at the table 6.22

Table 6.22: Regression Analysis of RU and STOU at the graduate studies level

Model	DL_ADMEFFT = a + b (SUMSAT) + c (EDUC_EFFT) + d (SUMSAT) (EDUC_EFFT)
Integrated Results of Analysis for RU Graduate studies	DL_ADMEFFT = 64.570 + 0.791 (SUMSAT)*** (6.810) (7.074) + 1.673 (EDUC_EFFT)*** + 0 (13.668) R^2 = 0.493 Adj. R^2 = 0.490 F = 197.194*** Sig. = 0.000
Integrated Results of Analysis for STOU Graduate studies	DL_ADMEFFT = 89.816 + 0 + 2.002 (EDUC_EFFT)*** + 0 (4.262) (7.350) R^2 = 0.229 Adj. R^2 = 0.225 F = 54.023*** Sig. = 0.000

*** P < 0.001 ** P < 0.01 * P < 0.05

From the multiple regression analysis in the table 6.22, we can conclude that the dimension of students' learning satisfaction affects the effectiveness of distance learning administration with the less influence than the dimension of students' educational effectiveness, especially the STOU graduate students because there is no learning satisfaction significance.

For RU graduate students, table 6.22 shown that for every 1 unit of SUMSAT changed, the value of DL_ADMEFFT will change 0.791 units whereas for every 1 unit of EDUC_EFFT changed, the value of DL_ADMEFFT changes 1.673 units accordingly. For STOU students, every 1 unit of EDUC_EFFT changed, the value of DL_ADMEFFT change 2.002 units and there is no effect from the students' learning satisfaction (SUMSAT).

From table 6.22, we can conclude that the learning satisfaction (SUMSAT) and the educational effectiveness (EDUC_EFFT) are the crucial factors, strongly influencing the effectiveness of distance learning administration for RU graduate students. While there is only the educational effectiveness (EDUC_EFFT) influencing to the effectiveness of distance learning administration for STOU graduate students. However, the table 6.22 indicates that the RU graduate students more satisfy on the educational and technological supports, which were variables in the dimension of the learning satisfaction (SUMSAT), than those of the STOU graduate students.

From this equation, the domains of independent variables can explain the variance on dependent variable about 49.30 percent for RU graduate students and about 22.90 percent for STOU graduate students.

6.3.3.2 Multiple Regression Analysis at the Undergraduate Studies Level

The other four sub-models are separated by RU and STOU at the undergraduate studies level into the students' learning satisfaction dimension and the students' educational effectiveness dimension, as following:

- Three domains of independent variables influence the RU undergraduate students' learning satisfaction (SUMSAT).
- Three domains of independent variables influence the STOU undergraduate students' learning satisfaction (SUMSAT).
- Four domains of independent variables influence the RU undergraduate students' educational effectiveness (EDUC_EFFT).
- Four domains of independent variables influence the STOU undergraduate students' educational effectiveness (EDUC_EFFT).

The students' learning satisfaction (SUMSAT), at the undergraduate studies level, is influenced by all independent variables. Those are in the educational supports domain, namely curriculum supports (Cursup), faculty supports (Facsup), student supports (Stsup), service and staff supports (Servsup); The technological supports domain, which are instructional delivery modes (Instech), computer-mediated communication (CMC), human-computer interaction (HCI), technology utilization (Usetech); and the students' educational costs and time spent domain which includes expense (Exps), time study (Hrread), time for examination preparation (Hr_ex), and time travel spent (Hrfar).

The relationships among these variables are statistically examined. The multiple regression analysis is utilized to analyze the causal model. The results of findings between RU and STOU undergraduate students are illustrated at the table 6.23

Table 6.23: Regression Analysis of RU and STOU undergraduate learning satisfaction

Model	SUMSAT = a + b (EDUCSUP) + c (TECHSUP) + d (ST_COST)
Results of Analysis for RU Undergraduate studies	SUMSAT = 22.133 + {0.577(Stsup)*** + 0.880 (Cursup)*} (3.242) (4.715) (2.055) + {-0.197(Instech)** + 0.428(CMC)**} + 0 (-2.773) (2.699) R^2 = 0.398 Adj. R^2 = 0.376 F = 18.046*** Sig. = 0.000
Results of Analysis for STOU Undergraduate studies	SUMSAT = 26.414 + {0.410(Stsup)** + 0.276(Facsup)**} (5.716) (3.232) (2.992) + {0.212(HCI)*** + 0.559(CMC)***} + {0.02571(Hr-ex)* (4.861) (4.299) (2.101) + 0.0007822(Exps)*} (2.445) R^2 = 0.515 Adj. R^2 = 0.498 F = 30.261*** Sig. = 0.000

*** P < 0.001 ** P < 0.01 * P < 0.05

At the RU undergraduate studies, the regression equation of the RU undergraduate students' learning satisfaction (SUMSAT) is influenced by the independent variables of educational supports domain are Stsup, and Cursup, and technological supports domain are CMC and Instech. Table 6.23 shown that for every 1 unit of Stsup changed, the value of SUMSAT will change 0.577 units where every 1 unit of Cursup changed, the value of SUMSAT changes 0.880 units. For every 1 unit of CMC changed, the value of SUMSAT change 0.428 units. For every 1 unit of Instech changed then the value of learning satisfaction (SUMSAT) will change decreasingly 0.197 units. From this equation, the independent variables can explain the variance on dependent variable about 39.80 percent

At the STOU undergraduate studies, the regression equation of the STOU undergraduate students' learning satisfaction (SUMSAT) is influenced by the independent variables of educational supports domain are Stsup, and Facsup; The technological supports domain is HCI and CMC; and the educational costs and time spent domain are Hr_ex and Exps.

Table 6.23 shown that for every 1 unit of Stsup changed then the value of SUMSAT will change 0.410 units. For every 1 unit of Facsup changed, the value of SUMSAT changes 0.276 units whereas every 1 unit of HCI changed, the value of SUMSAT changes 0.212 units and every 1 unit of CMC changed, the value of SUMSAT changes 0.559 units. However, for every 1 unit of Hr_ex changed then the value of SUMSAT will change 0.026 units. From this equation, the independent variables can explain the variance on dependent variable about 51.50 percent. From the correlation matrix of STOU undergraduate students of learning satisfaction, there is no technological utilization domain (see table 6.17) exists. This is because the students study at home and the university does not provide any computer for students. Thus, there is no any relationship of USETECH.

In summary, the regression equations of both RU and STOU undergraduate students' learning satisfaction show that all independent variables influence positively to the dependent variable (SUMSAT) except the instructional delivery modes of RU undergraduate students that affect negatively to SUMSAT at 0.197 units when every 1 unit of Instech changed. This can explain that the instructional delivery modes yields to less learning satisfaction.

From the students' educational effectiveness view, the students' educational effectiveness (EDUC_EFFT) is influenced by all independent variables: IT accessibility (Itaccss), IT effectiveness (Itefft), IT efficiency (Iteffcy), students' needs (Needperc), students' barriers (St_barier), learning climate (Lclmt), achievement orientation (Achv), students' expectation (Stexpct), learning evaluation (Leval), context of instruction (Instxt), age (Age), revenue (Revn), number of dependents (Dep), number of educating dependents (Dep_ed), number of re-examination (Re_ex), and grade point average (Gpa).

The relationships among these variables are statistically examined. The correlation matrice were displayed at table 6.18 and table 6.19. The multiple regression analysis is utilized to analyze the causal model. The results of findings between RU and STOU are illustrated at the table 6.24

Table 6.24: Regression Analysis of RU and STOU at the undergraduate educational effectiveness

Model	EDUC_EFFT = a + b (IT_APPLCN) + c (ST_CHAR) + d (EDUC_ENV) + e (DEMOGRPH)
Results of Analysis for RU Undergraduate studies	EDUC_EFFT = 9.245 + {0.551 (Itefft)** + 1.022 (Itaccss)*} (1.358) (3.257) (2.416) + {0.197 (Needperc)*} + {11.291 (Dep_ed)**} (2.284) (2.898) $R^2 = 0.487$ Adj. $R^2 = 0.468$ $F = 25.818^{***}$ Sig. = 0.000
Results of Analysis for STOU Undergraduate studies	EDUC_EFFT = 21.497 + {0.321(Itefft)**} (3.122) (3.278) + {0.724(Stexpct)***} - {0.346(Stbarier)*} (6.362) (-2.247) $R^2 = 0.392$ Adj. $R^2 = 0.382$ $F = 38.099^{***}$ Sig. = 0.000

*** P < 0.001 ** P < 0.01 * P < 0.05

At the RU undergraduate studies, the regression equation of the RU students' educational effectiveness (EDUC_EFFT) is influenced by the independent variables of IT application for education domain are Itefft and Itaccss; the students' characteristics domain is Needperc; and the students' personal information domain is Dep_ed.

For RU undergraduate students, Table 6.24 shown that for every 1 unit of Itefft changed, the value of EDUC_EFFT will change 0.551 units and for every 1 unit of Itaccss changed, the value of EDUC_EFFT will change 1.022 units. For every 1 unit of Needperc changed, the value of EDUC_EFFT will change 0.197 units. For every 1 unit of Dep_ed changed, the value of EDUC_EFFT will change 11.291 units. We can notice that number of educating dependents influences strongly to the educational effectiveness for RU undergraduate students. From this equation, the independent variables can explain the variance on dependent variable about 48.70 percent.

At the STOU undergraduate studies, the regression equation of the STOU students' educational effectiveness (EDUC_EFFT) is influenced by the independent variables of IT application for education domain is Itefft; the educational environment domain are Stexpct; and the students' characteristics domain is Stbarier.

For STOU undergraduate students, table 6.24 shown that for every 1 unit of Itefft changed, the value of EDUC_EFFT will change 0.321 units as well as for every 1 unit of Stexpct changed, the value of EDUC_EFFT will change 0.724 units. However, the students' barriers variable (Stbarier) affects negatively to the STOU educational effectiveness. That is every 1 unit of Stbarier changed, the value of EDUC_EFFT will change 0.346 units decreasingly. From this equation, the independent variables can explain the variance on dependent variable about 39.20 percent.

In summary, the regression equations of RU and STOU undergraduate students' educational effectiveness show that most independent variables are affecting positively to the dependent variable (EDUC_EFFT), except students' barriers (Stbarier) which affects decreasingly to the STOU undergraduate students' educational effectiveness. However, the number of educating dependents (Dep_ed) influences strongly to the students' educational effectiveness (EDUC_EFFT) with the value of coefficients of 11.291 for RU undergraduate students. This can be explained that since most undergraduate RU students are single so the students who have the children learning at school, have to try to graduate their education as soon as possible. This leads to increase the educational effectiveness.

From the integration of the causal models (see figure 6.2) at the undergraduate studies level of both RU and STOU. The multiple regression analysis is utilized to analyze the causal model. The results of findings between RU and STOU undergraduate students is illustrated at the table 6.25.

Table 6.25: Regression Analysis of RU and STOU at the undergraduate studies level

Model	DL_ADMEFFT = a + b (SUMSAT) + c (EDUC_EFFT) + d (SUMSAT) (EDUC_EFFT)
Integrated Results of Analysis for RU Undergraduate studies	DL_ADMEFFT = 63.999 + 1.303 (SUMSAT)*** + 1.234 (EDUC_EFFT)*** + 0 (3.505) (7.018) (6.850) R^2 = 0.489 Adj. R^2 = 0.480 F = 53.177*** Sig. = 0.000
Integrated Results of Analysis for STOU Undergraduate studies	DL_ADMEFFT = 98.083 + 0.917 (SUMSAT)*** + 1.136 (EDUC_EFFT)*** + 0 (6.998) (6.072) (7.763) R^2 = 0.461 Adj. R^2 = 0.455 F = 76.180*** Sig. = 0.000

*** P < 0.001 ** P < 0.01 * P < 0.05

For RU undergraduate students, table 6.25 shown that for every 1 unit of SUMSAT changed, the value of DL_ADMEFFT will change 1.303 units whereas for every 1 unit of EDUC_EFFT changed, the value of DL_ADMEFFT changes 1.234 units. For STOU undergraduate students, for every 1 unit of SUMSAT changed, the value of DL_ADMEFFT will change 0.917 units and every 1 unit of EDUC_EFFT changed, the value of DL_ADMEFFT change 1.136 units.

From table 6.25, we can conclude that the learning satisfaction variable and the educational effectiveness variable are both influential factors affecting the effectiveness of distance learning administration for both RU and STOU undergraduate students. From this equation, the domains of independent variables can explain the variance on dependent variable about 48.90 percent for RU and 46.10 percent for STOU at the undergraduate studies level.

6.3.4 The Path Analysis for the Causal Models

Path analysis is the multivariate analysis technique for the causal model. Regression analysis is processed to analyze path between two or more variables with the path coefficients. Path analysis represents the relationships between two or more variables in the recursive model, so-called path diagram. Path diagram displays the relationships among variables with the direct and indirect effects.

Path analysis was employed to determine whether the independent variables effect directly or indirectly to the dependent variable. The standardized regression coefficient – beta value represents path coefficient with the direction from sources to destination. Structural equation represents the overall relationships among variables with the path coefficients.

6.3.4.1 RU Graduate of Learning Satisfaction Causal Model

In evaluation, the effectiveness of distance learning administration is measured by two dimensions: the students' learning satisfaction and the students' educational effectiveness. For the students' learning satisfaction, the path analysis determines whether the independent variables such as Cursup, Facsup, Stsup, Servsup, Instech, CMC, HCI, Usetech, Exps, Hrread, Hr_ex, and Hrfar effecting directly or indirectly to the dependent variable (SUMSAT) as well as it determines whether the independent variables such as Itaccss, Itefft, Iteffcy, Needperc, St_barier, Lclmt, Achv, Stexpct, Leval, Instxt, Age, Revn, Dep, Dep_ed, Re_ex, and Gpa effecting directly or indirectly to the dependent variable (EDUC_EFFT) at the educational effectiveness dimension.

There are three major steps to construct the causal model:

1. The estimation of path coefficients
2. The computation of indirect causal effects
3. The calculation of total causal effects.

The structural equation for the RU graduate students' learning satisfaction is described following:

$$SUMSAT = P_{y6}\,CMC + P_{y1}\,CURSUP + P_{y2}\,FACSUP + P_{y4}\,SERVSUP + P_{y7}\,HCI$$

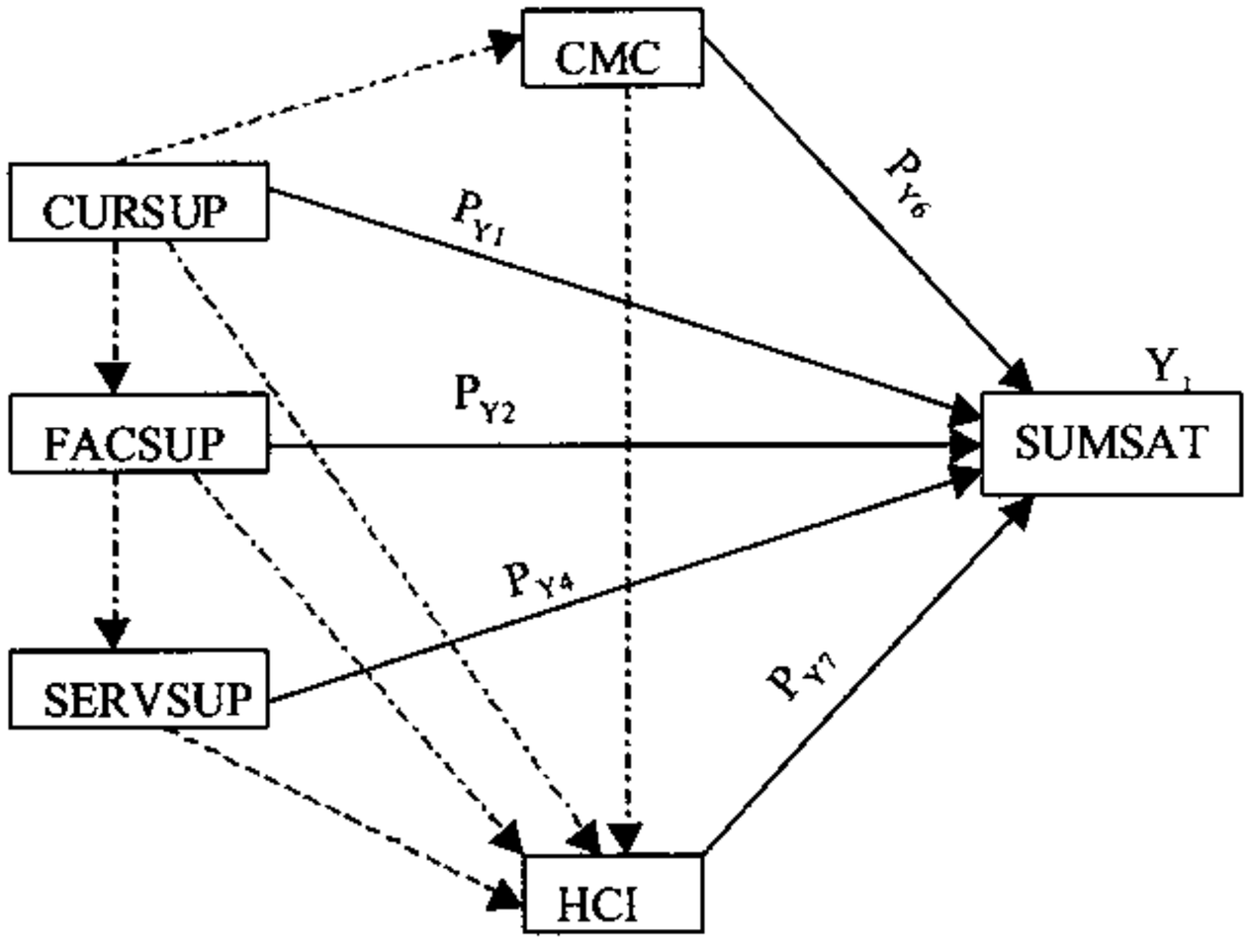

Figure 6.6: The RU graduate of learning satisfaction causal model with path coefficient parameters

Where SUMSAT = The students' learning satisfaction

CURSUP = The curriculum supports

FACSUP = The faculty supports

SERVSUP = The service and staff supports

HCI = Human-Computer Interaction

CMC = Computer-Mediated Communication

P_{y1} = Path coefficient between SUMSAT and curriculum supports

P_{y2} = Path coefficient between SUMSAT and faculty supports

P_{y4} = Path coefficient between SUMSAT and service and staff supports

P_{y6} = Path coefficient between SUMSAT and computer-mediated communication supports (CMC)

P_{y7} = Path coefficient between SUMSAT and human-computer interaction supports (HCI)

From figure 6.6, we can conclude that the direct effect of CURSUP on the learning satisfaction (SUMSAT) is shown by $P_{y1;}$ The direct effect of FACSUP on the learning satisfaction (SUMSAT) is shown by $P_{y2;}$ The direct effect of CMC on the learning satisfaction (SUMSAT) is shown by P_{y6} and so on. While the dot lines represent the indirect effects.

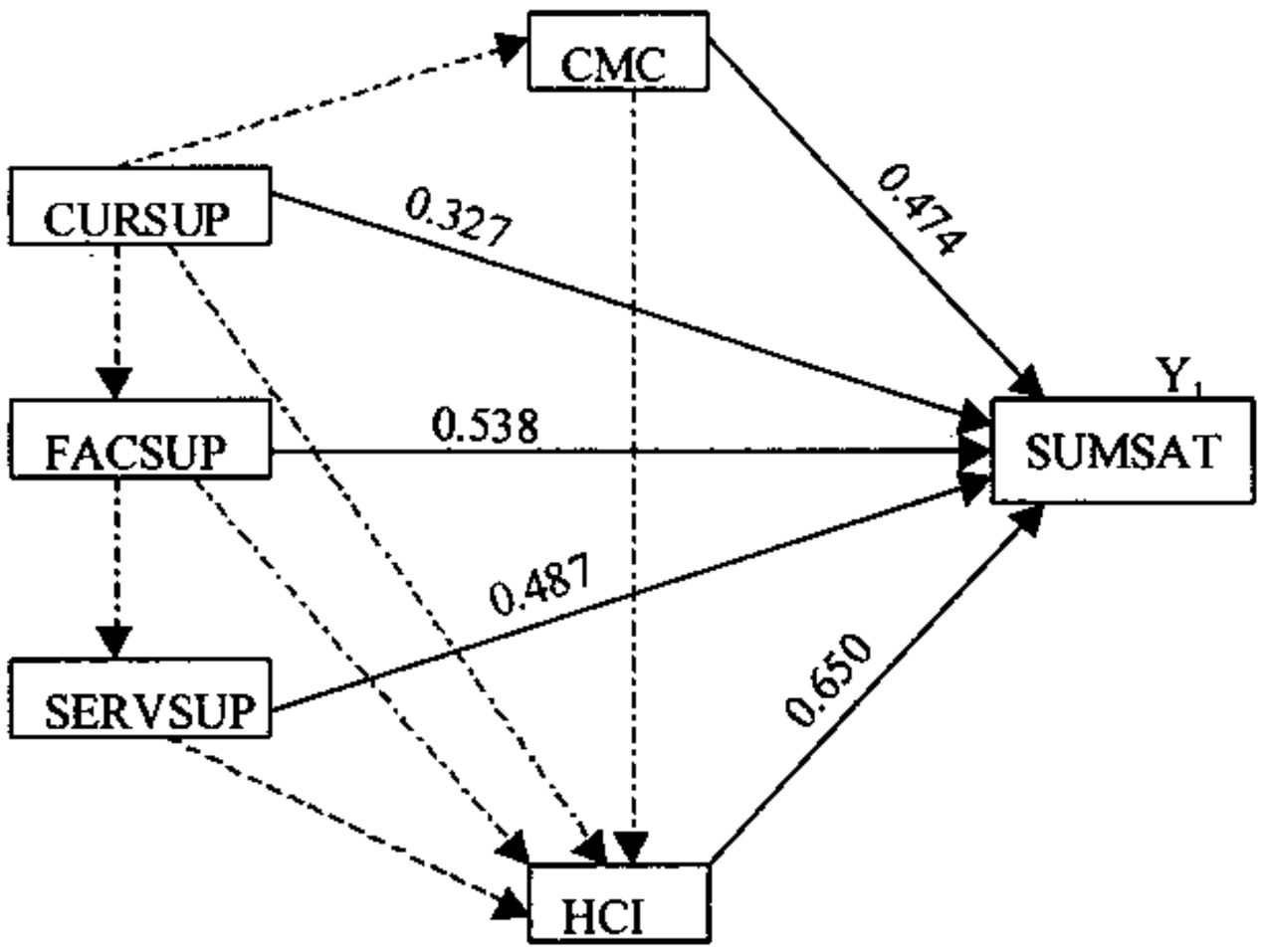

Figure 6.7: The RU graduate learning satisfaction causal model with the path coefficient values

Figure 6.7 illustrates that the curriculum supports did not have any significant direct effect on faculty supports, nor did computer-mediated communication, nor did human-computer interaction but it has direct effect on the learning satisfaction with the coefficient value of 0.327 which implies that each unit change in curriculum supports resulted in the change in learning satisfaction as a whole of 0.327 units. The faculty supports also show that there is significant direct effect on the learning satisfaction with the coefficient value of 0.538 which implies that each unit change in faculty supports resulted in the change in learning satisfaction as a whole of 0.538 units. The human-computer interaction has the strong significant direct effect on the learning satisfaction with the coefficient value of 0.650 which implies that each unit change in human-computer interaction resulted in the change in learning satisfaction as a whole of 0.650 units. The service and staff supports and computer-mediated communication have direct effect on the learning satisfaction with the coefficient values of 0.487 and 0.474 respectively.

6.3.4.2 STOU Graduate of Learning Satisfaction Causal Model

The structural equation for the STOU graduate students' learning satisfaction is described following:

$$SUMSAT = P_{y1}\,CURSUP + P_{y2}\,FACSUP + P_{y7}\,HCI$$

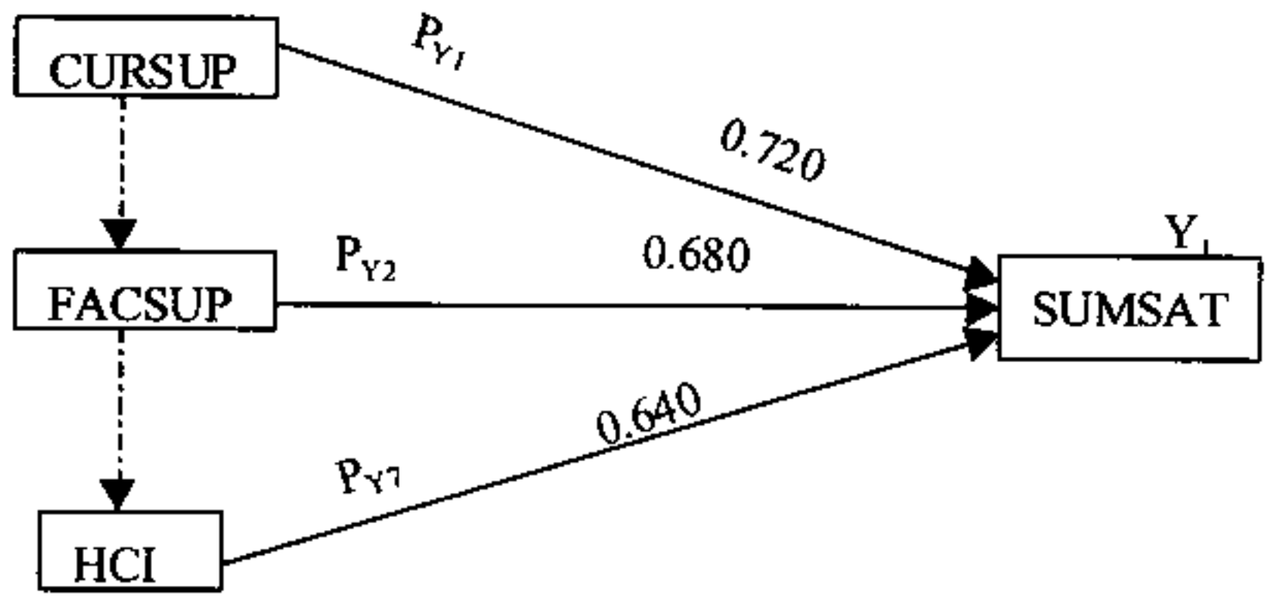

Figure 6.8: The STOU graduate of learning satisfaction causal model with the path coefficient parameters and values

Where SUMSAT = The students' learning satisfaction

CURSUP = The curriculum supports

FACSUP = The faculty supports

HCI = Human-Computer Interaction

P_{y1} = Path coefficient between SUMSAT and curriculum supports

P_{y2} = Path coefficient between SUMSAT and faculty supports

P_{y7} = Path coefficient between SUMSAT and human-computer interaction supports (HCI)

In figure 6.8, the curriculum supports did not have any significant direct effect on faculty supports, nor did human-computer interaction but it has strong significant direct effect on the learning satisfaction with the coefficient value of 0.720 which implies that each unit change in curriculum supports resulted in the change in learning satisfaction as a whole of 0.720 units.

The faculty supports also show that there is a strong direct effect on the learning satisfaction with the coefficient value of 0.680 which implies that each unit change in faculty supports resulted in the change in learning satisfaction as a whole of 0.680 units as well as the human-computer interaction also has the strong significant direct effect on the learning satisfaction with the coefficient value of 0.640 which implies that each unit change in human-computer interaction resulted in the change in learning satisfaction as a whole of 0.640 units.

The overall of path analysis of RU and STOU is summarized in the table 6.26 with the path coefficients. Path analysis displays the path coefficients of independent variables on the graduate students' learning satisfaction.

Table 6.26: Path coefficients of independent variables (Standardized Regression Coefficients-Beta) in the Path Analysis of RU and STOU Graduate studies on the learning satisfaction comparison

	Dependent variable (SUMSAT)	
Independent variables	RU	STOU
CURSUP	.327**	.720**
FACSUP	.538**	.680**
SERVSUP	.487**	-
CMC	.474**	-
HCI	.650**	.640**

	Dependent variable (SUMSAT)	
Independent variables	RU	STOU
R Square	.506	.635
Adjusted R Square	.500	.629
F	82.459***	105.508***

* P – value < 0.05, ** P-value < 0.01, *** P-value < 0.001

From table 6.26 shows that curriculum supports, faculty supports, and human-computer interaction supports are the independent variables direct effecting on the graduate students' learning satisfaction for both RU and STOU. However, service and staff supports and computer-mediated communication are also independent variables direct effecting on the RU graduate students' learning satisfaction.

6.3.4.3 RU Graduate of Educational Effectiveness Causal Model

The structural equations for the RU graduate students' educational effectiveness are described as following:

$$EDUC\_EFFT = P_{y1}\,ITACCSS + P_{y2}\,ITEFFT + P_{y3}\,ITEFFCY + P_{21}\,P_{y2}\,(ITACCSS)\,(ITEFFT) + P_{23}\,P_{y2}\,(ITEFFCY)\,(ITEFFT) + P_{y9}\,LEVAL + P_{y8}\,STEXPCT + P_{y4}\,NEEDPERC + P_{y13}\,DEP$$

and

$$LEVAL = P_{96}\,LCLMT$$

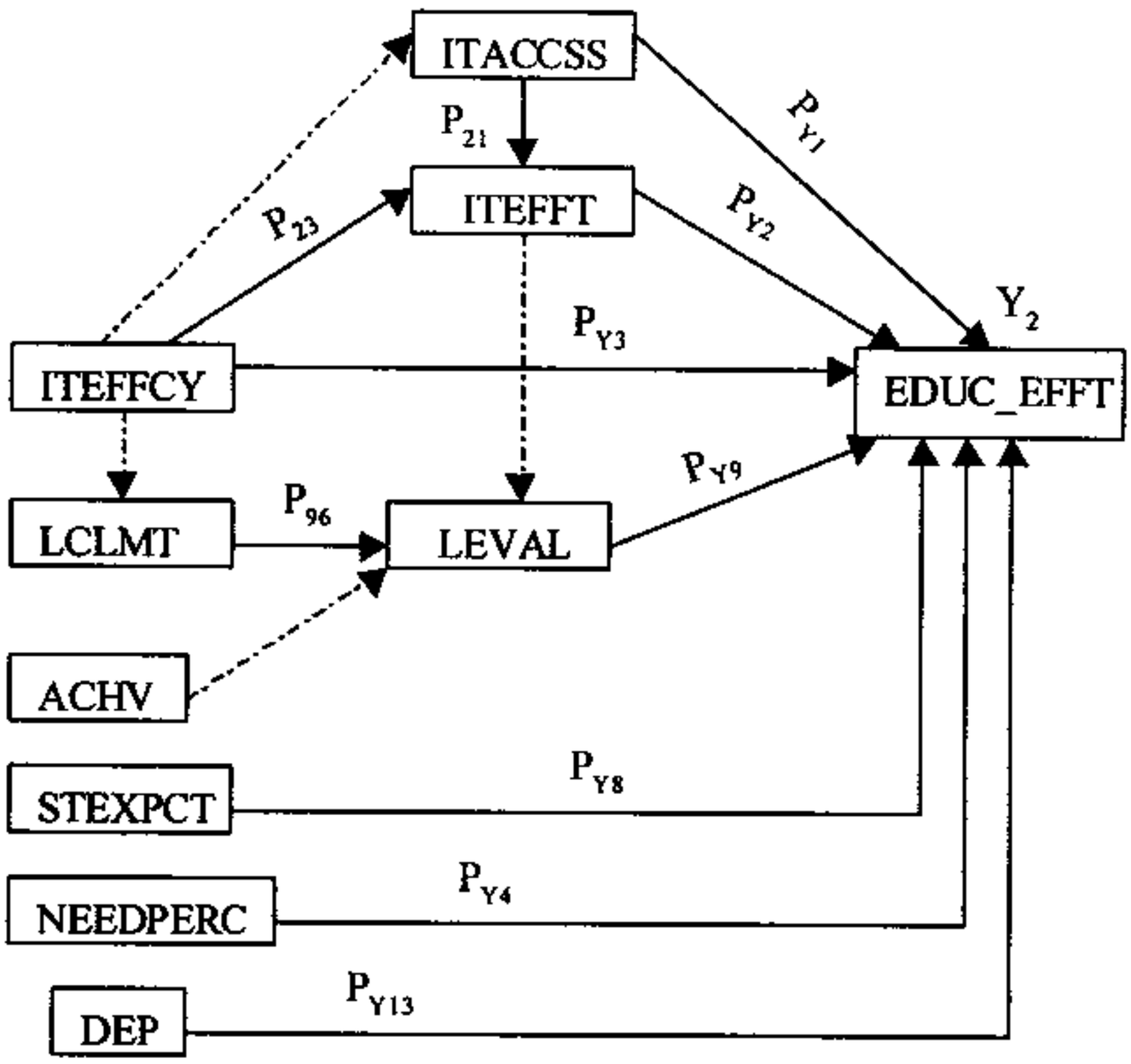

Figure 6.9: The RU graduate of educational effectiveness causal model with path coefficient parameters

Where EDUC_EFFT = The students' educational effectiveness

ITACCSS = IT accessibility

ITEFFT = IT effectiveness

ITEFFCY = IT efficiency

LEVAL = Learning evaluation

LCLMT = Learning climate

STEXPCT = Students' expectations

NEEDPERC = Students' needs

ACHV = Achievement orientation

DEP = Number of dependents

P_{y1} = Path coefficient between EDUC_EFFT and IT accessibility

P_{y2} = Path coefficient between EDUC_EFFT and IT effectiveness

P_{y3} = Path coefficient between EDUC_EFFT and IT efficiency

P_{y9} = Path coefficient between EDUC_EFFT and learning evaluation

P_{y8} = Path coefficient between EDUC_EFFT and students' expectations

P_{y4} = Path coefficient between EDUC_EFFT and students' needs

P_{y13} = Path coefficient between EDUC_EFFT and number of dependents

P_{96} = Path coefficient between learning evaluation and learning climate

P_{21} = Path coefficient between IT effectiveness and IT accessibility

P_{23} = Path coefficient between IT effectiveness and IT efficiency

The path analysis of RU graduate educational effectiveness, indicates the path coefficient value with the standardized regression coefficients – Beta, shown in the figure 6.10

Figure 6.10 illustrates that IT efficiency has direct effect on the educational effectiveness (EDUC_EFFT) with the coefficient value of 0.546 which implies that each unit changed in IT efficiency resulted in the change in the educational effectiveness as a whole of 0.546 units. In addition, IT efficiency has indirect effect on IT accessibility and it has strongly direct effect on the IT effectiveness with the coefficient value of 0.732. Meanwhile IT effectiveness has direct effect on the educational effectiveness (EDUC_EFFT) with the coefficient value of 0.588 which

implies that each unit changed in IT effectiveness resulted in the change in educational effectiveness as a whole of 0.588 units. However, IT accessibility also has direct effect on the educational effectiveness (EDUC_EFFT) with the coefficient value of 0.321 and it has strongly direct effect on IT effectiveness.

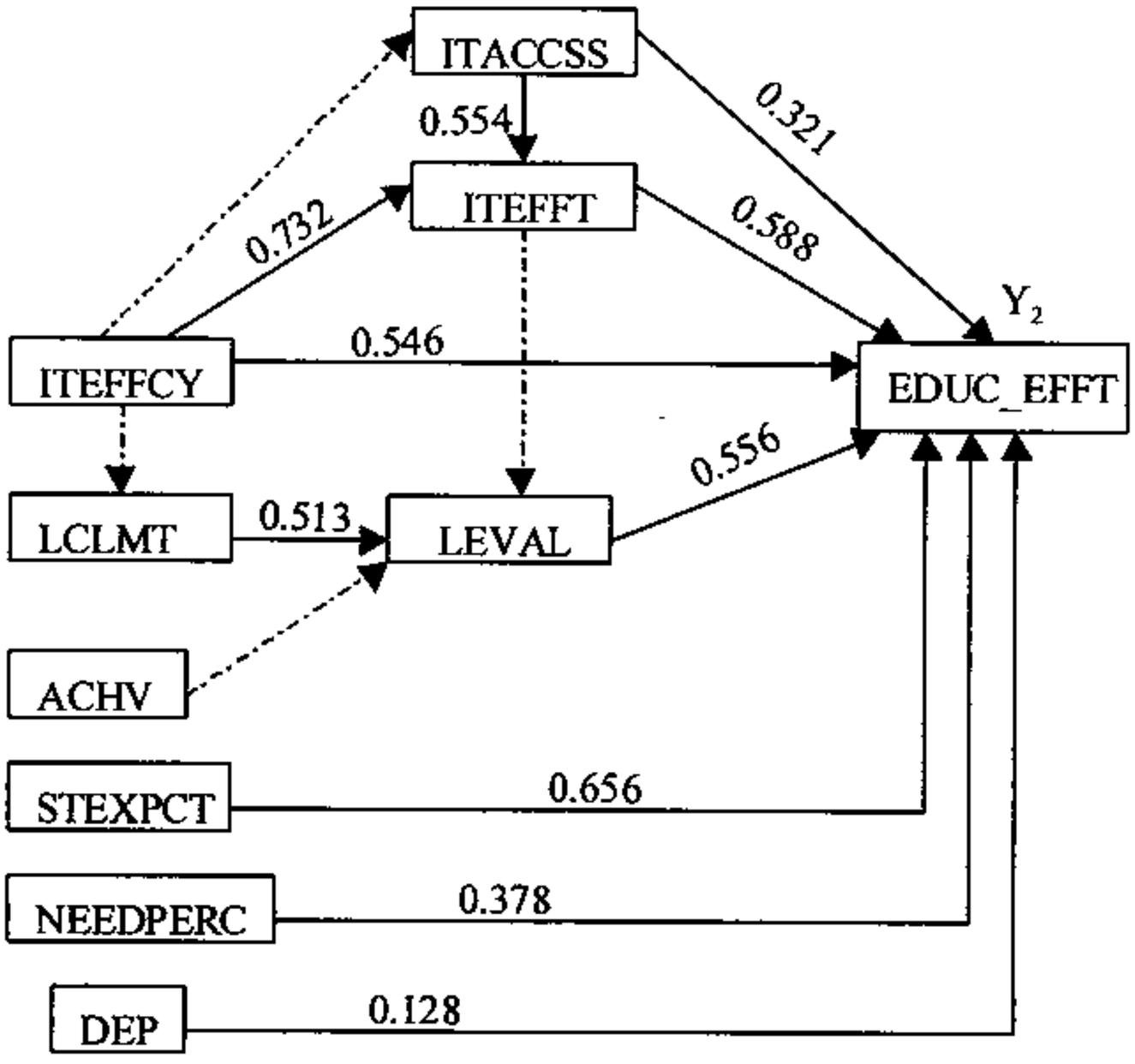

Figure 6.10: The RU graduate educational effectiveness causal model with the path coefficient values

Moreover, The learning climate has direct effect on the learning evaluation and in the other hand, the learning evaluation has direct effect on the educational effectiveness (EDUC_EFFT) with the coefficient value of 0.556 which implies that each unit change in learning evaluation resulted in the change in educational effectiveness as a whole of 0.556 units. There is also indirect effect of achievement orientation on the learning evaluation. The students' expectations yields strong direct effect on the educational effectiveness (EDUC_EFFT) with the coefficient value of 0.656 which implies that each unit change in students' expectations resulted in the change in educational effectiveness as a whole of 0.656 units. The students' needs and number of dependents have also direct effects on the educational effectiveness (EDUC_EFFT) with the coefficient value of 0.378 and 0.128 respectively.

6.3.4.4 STOU Graduate of Educational Effectiveness Causal Model

The structural equation for the STOU graduate students' educational effectiveness is described as following:

$$EDUC\_EFFT = P_{y3}\ ITEFFCY + P_{y9}\ LEVAL + P_{y10}\ INSTXT + P_{y13}\ DEP$$

Where EDUC_EFFT = The students' educational effectiveness
ITEFFCY = IT efficiency
LEVAL = Learning evaluation
INSTXT = Context of instruction
DEP = Number of dependents

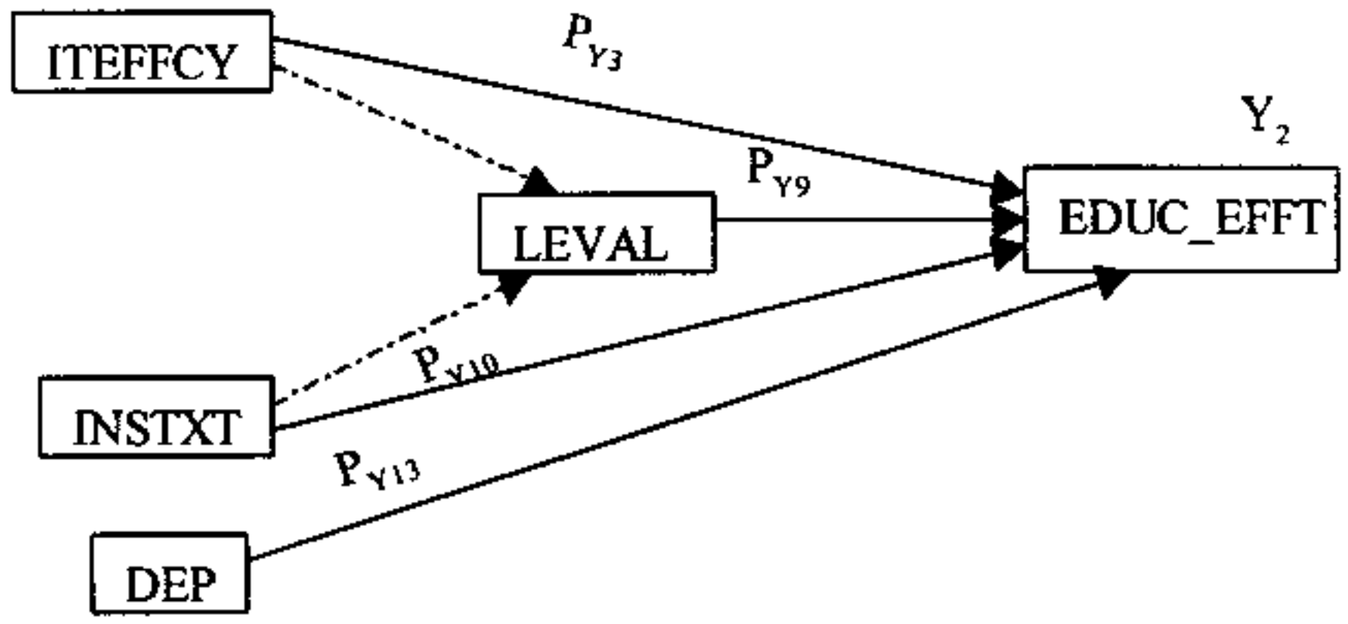

Figure 6.11: The STOU graduate of educational effectiveness causal model with path coefficient parameters

Where P_{y3} = Path coefficient between EDUC_EFFT and IT efficiency
P_{y9} = Path coefficient between EDUC_EFFT and learning evaluation
P_{y10} = Path coefficient between EDUC_EFFT and context of instruction
P_{y13} = Path coefficient between EDUC_EFFT and number of dependents

The path analysis of STOU graduate of educational effectiveness, indicates the path coefficient value with the standardized regression coefficients – Beta, shown in the figure 6.12 as following:

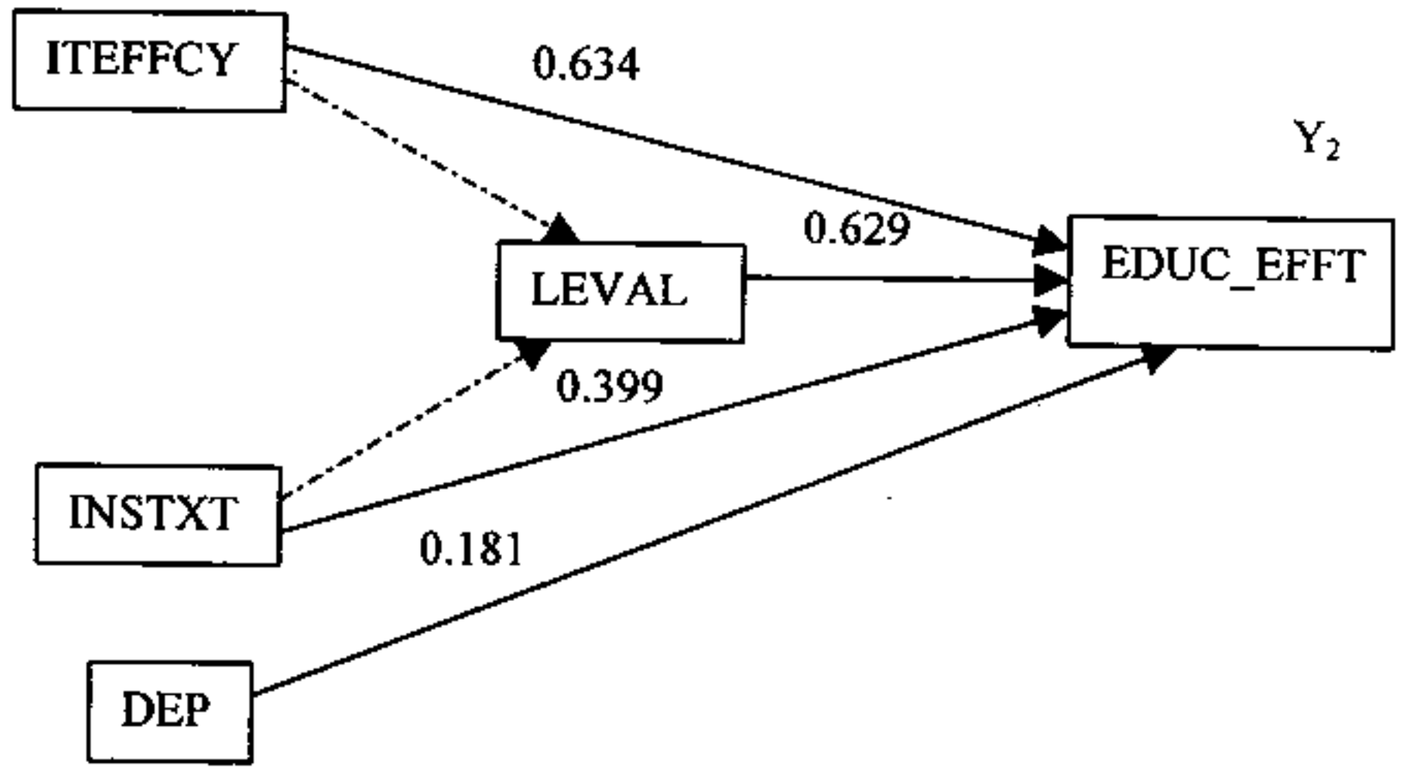

Figure 6.12: The STOU graduate educational effectiveness causal model with the path coefficient values

Figure 6.12 illustrates that the IT efficiency has strong direct effect on the educational effectiveness (EDUC_EFFT) with the coefficient value of 0.634 which implies that each unit change in IT efficiency resulted in the change in educational effectiveness as a whole of 0.634 units. However, IT efficiency has also indirect effect on the learning evaluation while the learning evaluation has strong direct effect on the educational effectiveness (EDUC_EFFT) with the coefficient value of 0.629 which implies that each unit change in learning evaluation resulted in the change in educational effectiveness as a whole of 0.629 units. The context of instruction has indirect effect on the learning evaluation and it also has direct effect on the educational effectiveness (EDUC_EFFT) with the coefficient value of 0.399 which implies that each unit change in context of instruction resulted in the change in educational effectiveness as a whole of 0.399 units. The number of dependents has direct effect on the educational effectiveness with the coefficient value of 0.181 which implies that each unit change in number of dependents resulted in the change in educational effectiveness (EDUC_EFFT) as a whole of 0.181 units.

The overall of path analysis of RU and STOU is summarized in the table 6.27 with the path coefficients. Path analysis displays the path coefficients of independent variables on the graduate students' educational effectiveness.

Table 6.27: Path coefficients of independent variables (Standardized Regression Coefficients-Beta) in the Path Analysis of RU and STOU at Graduate studies on the educational effectiveness comparison

Independent variables	Dependent var.		Dependent variable (EDUC_EFFT)	
	(ITEFFT)	(LEVAL)	RU	STOU
ITACCSS	.554**		.321**	-
ITEFFCY	.732**		.546**	.634**
ITEFFT			.588**	-
NEEDPERC			.378**	-
LCLMT		.513	-	-
STEXPCT			.656**	-
LEVAL			.556**	.629**
INSTXT			-	.399**
DEP			.128	.181

Independent variables	Dependent variable (SUMSAT) RU	STOU
R Square	.547	.554
Adjusted R Square	.537	.544
F	53.505***	55.864***

* P – value < 0.05, ** P-value < 0.01, *** P-value < 0.001

The integrated causal models are summarized in order to view and compare the effectiveness of distance learning administration on both universities. The dependent variable (DL_ADMEFFT) is effected by two dimensions of independent variables namely, the students' learning satisfaction (SUMSAT) and the students' educational effectiveness (EDUC_EFFT).

The structural equation for the RU and STOU on the effectiveness of distance learning administration is described as following:

$$DL\_ADMEFFT = P_{y1}\ SUMSAT + P_{y2}\ EDUC\_EFFT + P_{21}\ P_{y2}\ (SUMSAT)(EDUC\_EFFT)$$

Where DL_ADMEFFT = The effectiveness of DL administration

SUMSAT = The students' learning satisfaction

EDUC_EFFT = The students' educational effectiveness

P_{y1} = Path coefficient between SUMSAT and DL_ADMEFFT

P_{y2} = Path coefficient between EDUC_EFFT and DL_ADMEFFT

P_{21} = Path coefficient between SUMSAT and EDUC_EFFT

The integration of RU graduate students' learning satisfaction dimension and the students' educational effectiveness dimension is displayed in figure 6.13

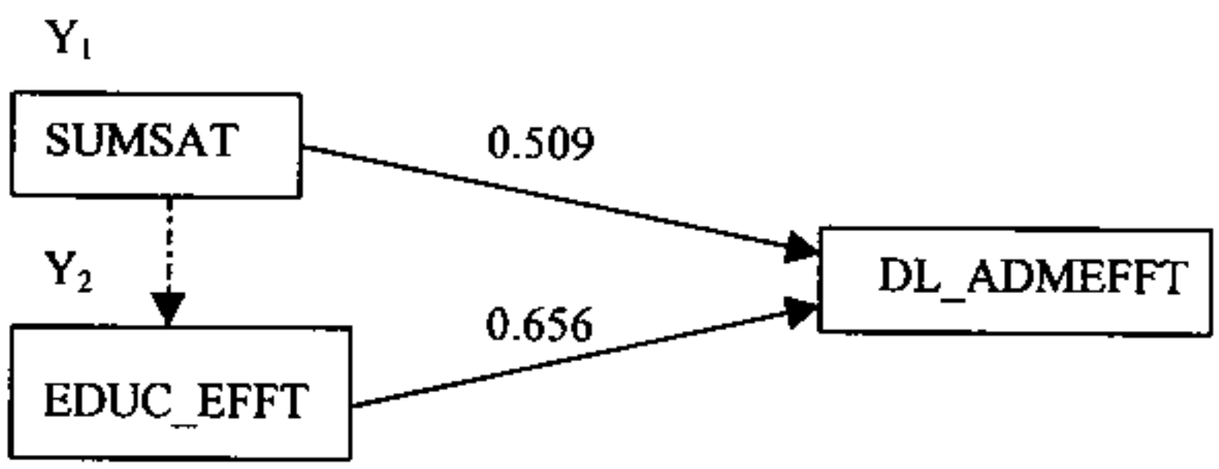

Figure 6.13: The integrated causal model of RU graduate studies level with the path coefficient values

Figure 6.13 illustrates that SUMSAT and EDUC_EFFT have strong direct effects on the effectiveness of distance learning administration (DL_ADMEFFT) with the coefficient value of 0.509 and 0.656 respectively which implies that each unit change in SUMSAT resulted in the change in DL_ADMEFFT as a whole of 0.509 units and each unit change in EDUC_EFFT resulted in the change in the DL_ADMEFFT as a whole of 0.656 units.

The integration of STOU graduate students' learning satisfaction dimension and the students' educational effectiveness dimension is displayed in figure 6.14

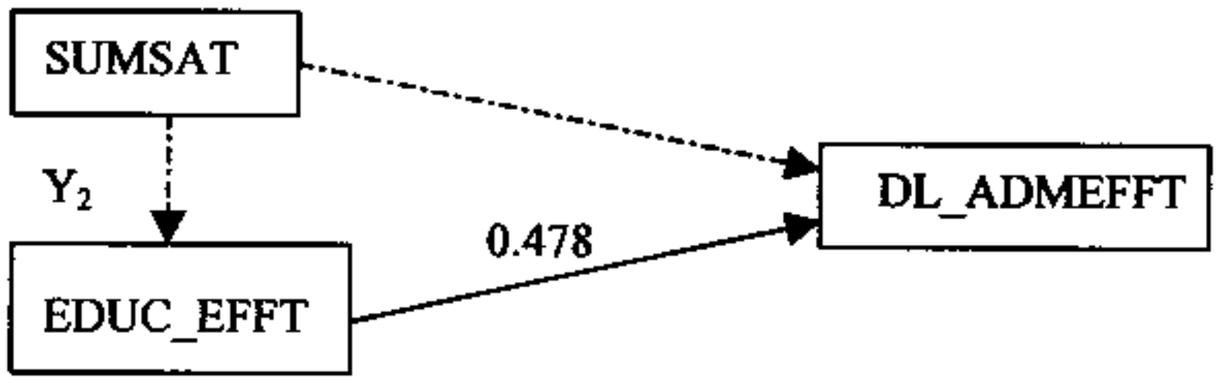

Figure 6.14: The integrated causal model of STOU graduate studies level with the path coefficient values

Figure 6.14 illustrates that EDUC_EFFT has direct effects on the effectiveness of distance learning administration (DL_ADMEFFT) with the coefficient value of 0.478 which implies that each unit change in EDUC_EFFT resulted in the change in DL_ADMEFFT as a whole of 0.478 units. However, SUMSAT has indirect effect on the effectiveness of distance learning administration (DL_ADMEFFT).

The integration of RU causal models and the integration of STOU causal model can be summarized into table 6.28 with the path coefficients indicated. Table 6.28 shows that there is no direct effect of SUMSAT on the STOU effectiveness of distance learning administration,

Table 6.28 Path coefficients of independent variables (Standardized Regression Coefficients-Beta) in the Path Analysis of RU and STOU at graduate studies on comparison

Independent variables	Dependent variable (DL_ADMEFFT)	
	RU	STOU
SUMSAT	.509***	-
EDUC_EFFT	.656***	.478***

Independent variables	Dependent variable (SUMSAT)	
	RU	STOU
R Square	.493	.229
Adjusted R Square	.490	.225
F	197.194***	54.023***

* P – value < 0.05, ** P-value < 0.01, *** P-value < 0.001

From these two casual models above, we notice that - at the graduate studies level - there are strong direct effects of the students' learning satisfaction and the students' educational effectiveness on the effectiveness of distance learning administration with the standardized coefficient (beta) 0.509 and 0.656 for RU graduate students, which implies that each unit change in SUMSAT resulted in the change in DL_ADMEFFT as a whole of 0.509 units and implies that each unit change in EDUC_EFFT resulted in the change in DL_ADMEFFT as a whole of 0.656 units. However, there is also direct effect of the students' educational effectiveness toward the effectiveness of distance learning administration, but no any direct effect of students' learning satisfaction for STOU graduate students.

6.3.4.5 RU Undergraduate of Learning Satisfaction Causal Model

The structural equation for the RU undergraduate students' learning satisfaction is described following:

$$SUMSAT = P_{y1}\,CURSUP + P_{y3}\,STSUP + P_{y5}\,INSTECH + P_{y6}\,CMC + P_{65}\,P_{y6}\,(INSTECH)(CMC) + P_{35}\,P_{y3}\,(INSTECH)(STSUP)$$

Where SUMSAT = The students' learning satisfaction
CURSUP = The curriculum supports
STSUP = The student supports
INSTECH = The instructional delivery modes
CMC = Computer-Mediated Communication

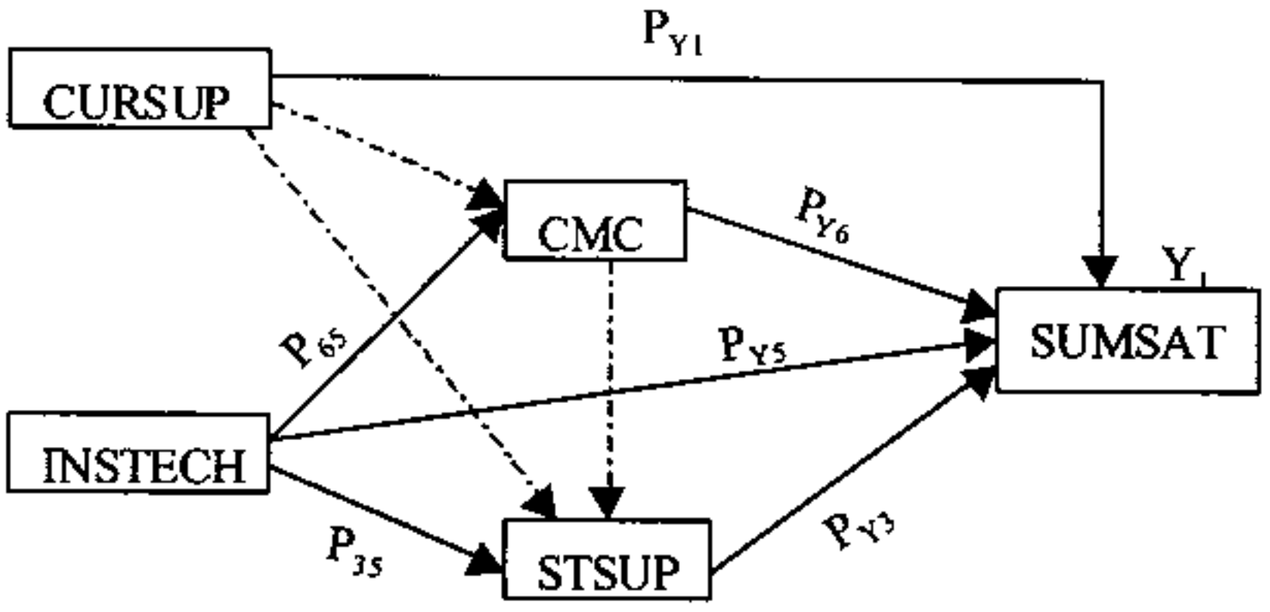

Figure 6.15: The RU undergraduate of learning satisfaction causal model with path coefficient parameters

Where P_{y1} = Path coefficient between SUMSAT and curriculum supports
P_{y3} = Path coefficient between SUMSAT and student supports
P_{y5} = Path coefficient between SUMSAT and instructional delivery modes
P_{y6} = Path coefficient between SUMSAT and computer-mediated communication supports (CMC)
P_{65} = Path coefficient between CMC and instructional delivery modes
P_{35} = Path coefficient between student supports and instructional delivery modes

The path analysis of RU undergraduate of learning satisfaction, indicates the path coefficient value with the standardized regression coefficients – Beta, shown in the figure 6.16 as following:

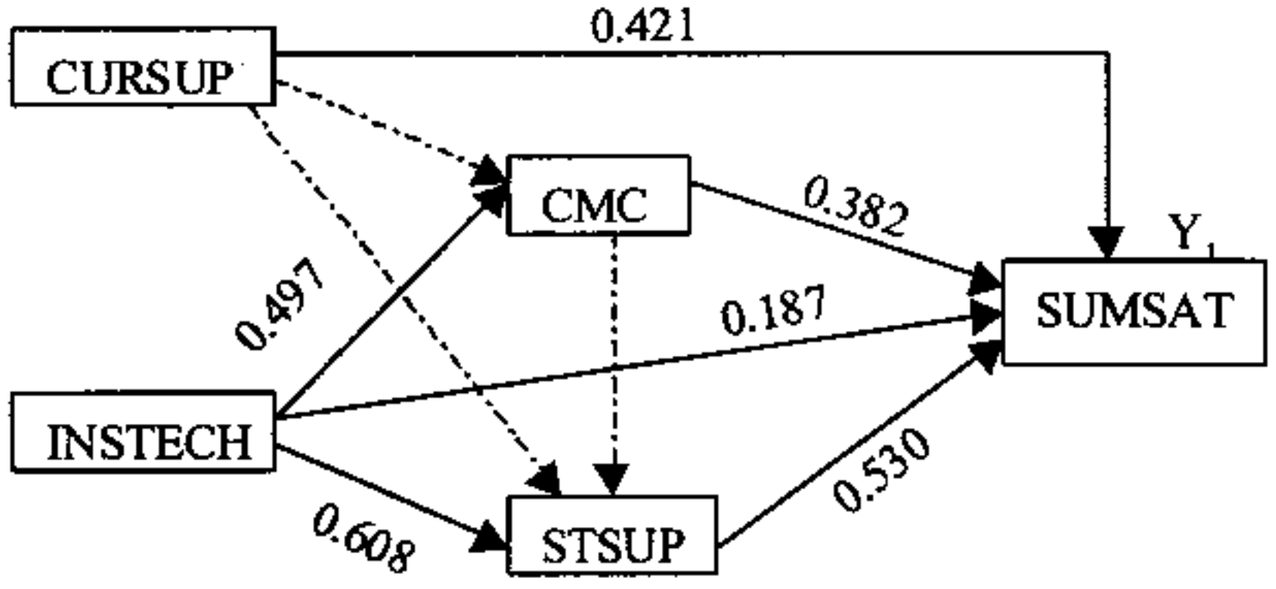

Figure 6.16: The RU undergraduate learning satisfaction causal model with the path coefficient values

Figure 6.16 illustrates that the curriculum supports has indirect effects on the student supports and the computer-mediated communication (CMC) but it has direct effect on the learning satisfaction with the coefficient value of 0.421 which implies that each unit change in curriculum supports resulted in the change in learning satisfaction as a whole of 0.421 units. The student supports has a significant direct effect on the learning satisfaction with the coefficient value of 0.530 which implies that each unit change in student supports resulted in the change in learning satisfaction as a whole of 0.530 units. The computer- mediated communication (CMC) has indirect effect on the student supports while it has direct effect on the learning satisfaction with the coefficient value of 0.382 which implies that each unit change in CMC resulted in the change in learning satisfaction as a whole of 0.382 units. However, the instructional delivery modes has direct effects on CMC, the student supports, and on the learning satisfaction with the coefficient value of 0.497, 0.608, and 0.187 respectively where CMC and student supports are considered as the moderator variables.

6.3.4.6 STOU Undergraduate of Learning Satisfaction Causal Model

The structural equation for the STOU undergraduate students' learning satisfaction is described following:

$$SUMSAT = P_{y2}\,FACSUP + P_{y3}\,STSUP + P_{y6}\,CMC + P_{y7}\,(HCI)$$

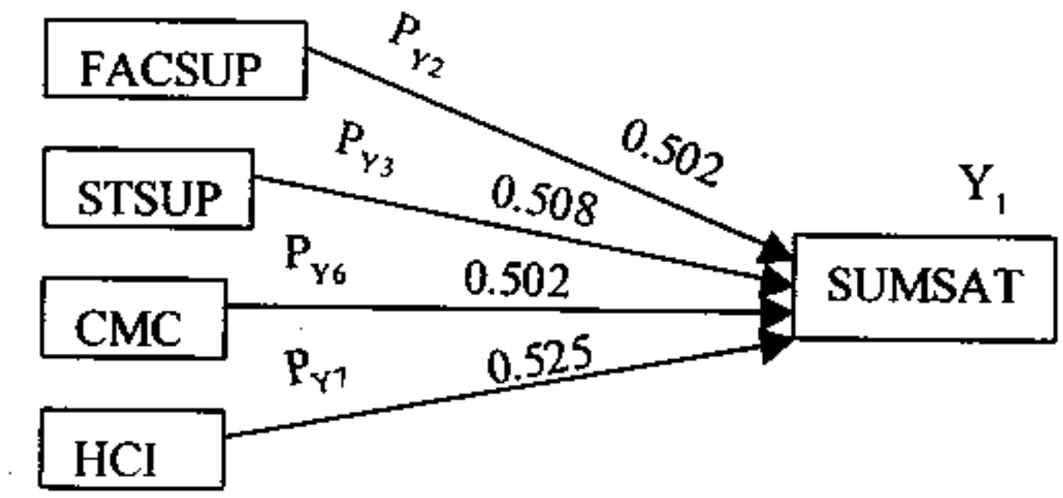

Figure 6.17: The STOU undergraduate of learning satisfaction causal model with the path coefficient parameters and values

Where SUMSAT = The students' learning satisfaction

FACSUP = The faculty supports

STSUP = The student supports

CMC = Computer-Mediated Communication

HCI = Human-Computer Interaction

P_{y2} = Path coefficient between SUMSAT and faculty supports

P_{y3} = Path coefficient between SUMSAT and student supports

P_{y6} = Path coefficient between SUMSAT and computer-mediated communication supports (CMC)

P_{y7} = Path coefficient between SUMSAT and human-computer interaction (HCI)

Figure 6.17 illustrates that the faculty supports and student supports have direct effects on the learning satisfaction with the coefficient value of 0.502 and 0.508 respectively. While the computer-mediated communication (CMC) and human-computer interaction have direct effects on the learning satisfaction with the coefficient value of 0.502 and 0.525 respectively.

Table 6.29: Path coefficients of independent variables (Standardized Regression Coefficients-Beta) in the Path Analysis of RU and STOU Undergraduate studies on the learning satisfaction comparison

Independent variables	Dependent var. (STSUP)	(CMC)	Dependent variable (SUMSAT) RU	STOU
CURSUP			.421**	-
FACSUP			-	.502**
STSUP			.530**	.508**
INSTECH	.608**	.497**	.187**	-
CMC			.382**	.502**
HCI			-	.525**

Independent variables	Dependent variable (SUMSAT) RU	STOU
R Square	.398	.515
Adjusted R Square	.376	.498
F	18.046***	30.261***

* P – value < 0.05, ** P-value < 0.01, *** P-value < 0.001

6.3.4.7 RU Undergraduate of Educational Effectiveness Causal Model

The structural equation for the RU undergraduate students' educational effectiveness is described as following:

$$EDUC\_EFFT = P_{y1}\ ITACCSS + P_{y2}\ ITEFFT + P_{y4}\ NEEDPERC$$

Where EDUC_EFFT = The students' educational effectiveness

ITACCSS = IT accessibility

ITEFFT = IT effectiveness

NEEDPERC = Students' needs

P_{y1} = Path coefficient between EDUC_EFFT and IT accessibility

P_{y2} = Path coefficient between EDUC_EFFT and IT effectiveness

P_{y4} = Path coefficient between EDUC_EFFT and students' needs

The path analysis represents the path coefficient value with the standardized regression coefficients – Beta, shown in the figure 6.18 as following:

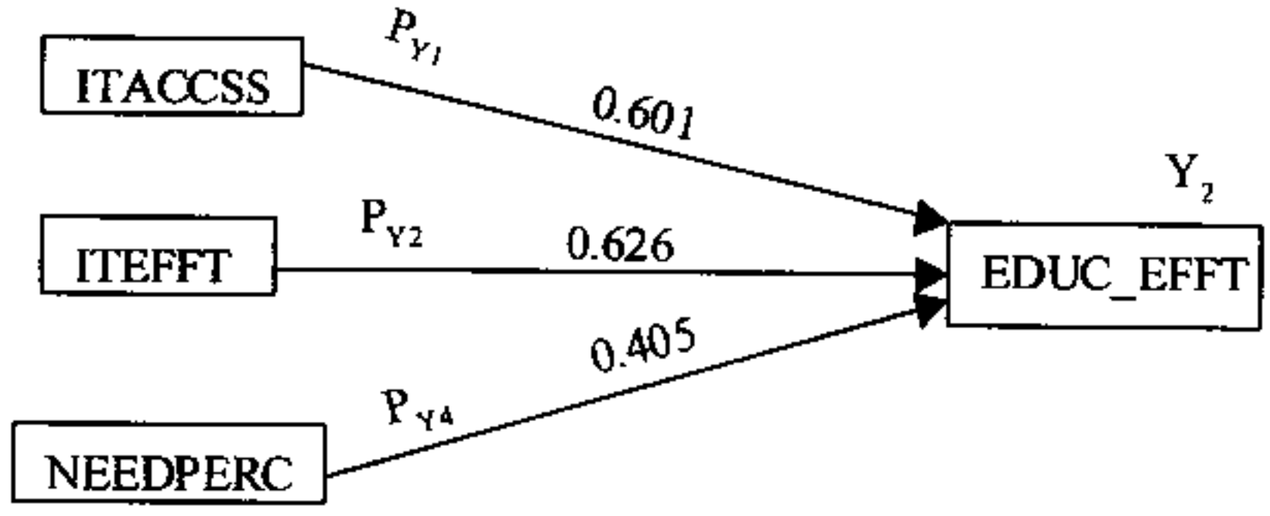

Figure 6.18: The causal model of RU undergraduate of educational effectiveness with the path coefficient parameters and values

Figure 6.18 illustrates that the IT accessibility and IT effectiveness have strong direct effects on the educational effectiveness with the coefficient value of 0.601 and 0.626 respectively which implies that each unit change in IT accessibility resulted in the change in educational effectiveness as a whole of 0.601 units and each unit change IT effectiveness resulted in the change in educational effectiveness as a whole of 0.626 units. Each unit change in students' needs resulted in the change in the education effectiveness as a whole of 0.405 units.

6.3.4.8 STOU Undergraduate of Educational Effectiveness Causal Model

The structural equation for the STOU undergraduate students' educational effectiveness is described as following:

$$EDUC\_EFFT = P_{y2}\ ITEFFT + P_{y8}\ STEXPCT$$

Where EDUC_EFFT = The students' educational effectiveness

ITEFFT = IT effectiveness

STEXPCT = Students' expectations

P_{y2} = Path coefficient between EDUC_EFFT and IT effectiveness

P_{y8} = Path coefficient between EDUC_EFFT and students' Expectations

The path analysis represents the path coefficient value with the standardized regression coefficients – Beta, shown in the figure 6.19 as following:

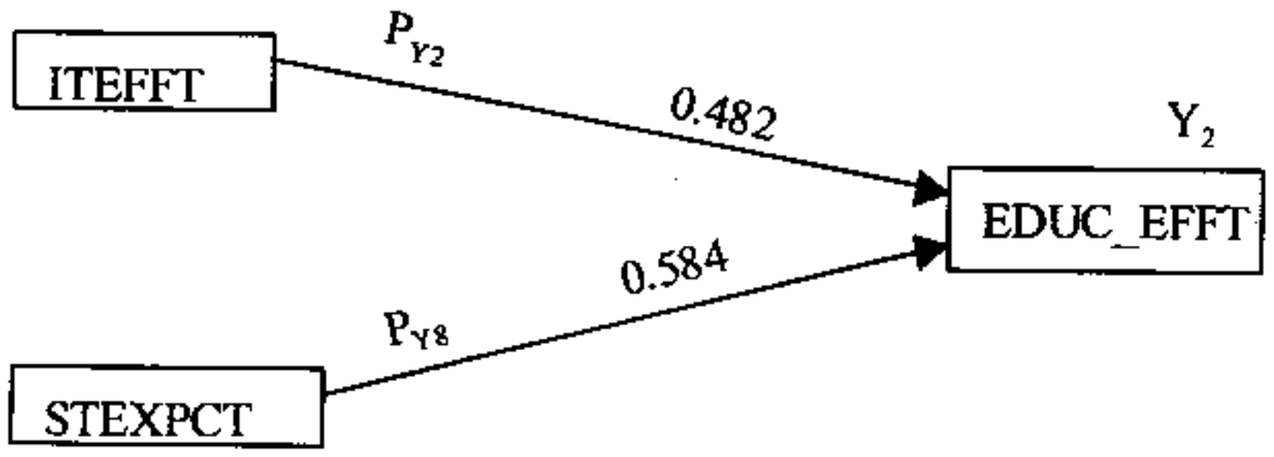

Figure 6.19: The causal model of STOU undergraduate of educational effectiveness with the path coefficient parameters and values

Figure 6.19 illustrates that the IT effectiveness and the students' expectations have direct effects on the educational effectiveness with the coefficient value of 0.482 and 0.584 respectively which implies that each unit change in IT effectiveness resulted in the change in educational effectiveness as a whole of 0.482 units and each unit change in students' expectations resulted in the change in the education effectiveness as a whole of 0.584 units.

The overall of RU and STOU path analysis is summarized in the table 6.30:

Table 6.30 Path coefficients of independent variables (Standardized Regression Coefficients-Beta) in the Path Analysis of RU and STOU at undergraduate studies on the educational effectiveness comparison

Independent variables	Dependent variable (EDUC_EFFT)	
	RU	STOU
ITACCSS	.601**	-
ITEFFT	.626**	.482*
NEEDPERC	.405*	-
STEXPCT	-	.584**

Independent variables	Dependent variable (SUMSAT)	
	RU	STOU
R Square	.487	.392
Adjusted R Square	.468	.382
F	25.818***	38.099***

* P – value < 0.05, ** P-value < 0.01, *** P-value < 0.001

The integrated causal models are summarized in order to view and compare the effectiveness of distance learning administration on both universities. The dependent variable (DL_ADMEFFT) is effected by two dimensions of independent variables namely, the students' learning satisfaction (SUMSAT) and the students' educational effectiveness (EDUC_EFFT).

The structural equation for the RU and STOU on the effectiveness of distance learning administration is described as following:

$$DL\_ADMEFFT = P_{y1}\ SUMSAT + P_{y2}\ EDUC\_EFFT + P_{21}\ P_{y2}\ (SUMSAT)(EDUC\_EFFT)$$

Where DL_ADMEFFT = The effectiveness of DL administration

SUMSAT = The students' learning satisfaction

EDUC_EFFT = The students' educational effectiveness

P_{y1} = Path coefficient between SUMSAT and DL_ADMEFFT

P_{y2} = Path coefficient between EDUC_EFFT and DL_ADMEFFT

P_{21} = Path coefficient between SUMSAT and EDUC_EFFT

The integration of RU undergraduate students' learning satisfaction dimension and the students' educational effectiveness dimension is displayed in figure 6.20

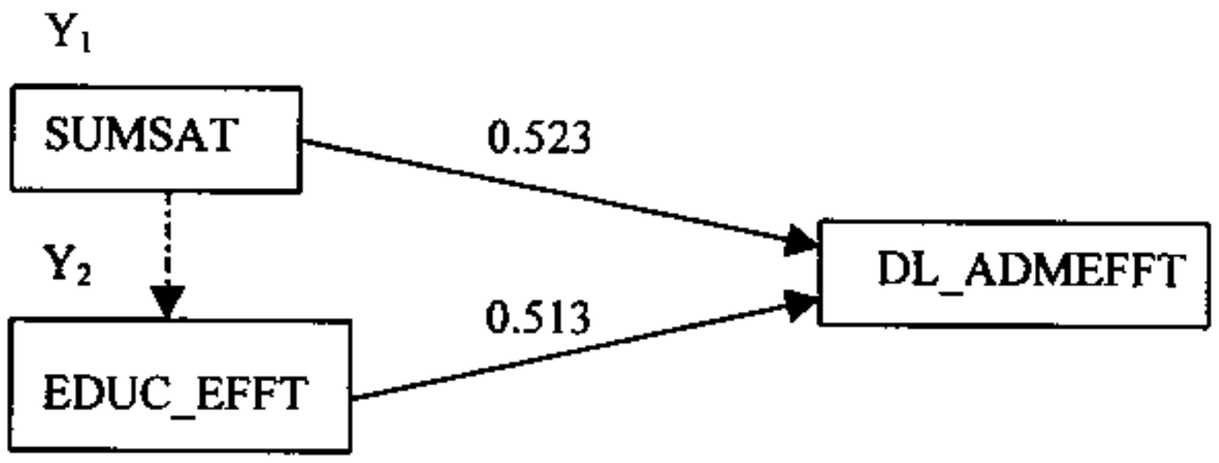

Figure 6.20: The RU undergraduate studies level causal model with the path coefficient values

From figure 6.20, SUMSAT and EDUC_EFFT have significant direct effects on the effectiveness of distance learning administration (DL_ADMEFFT) with the coefficient value of 0.523 and 0.513 respectively which implies that each unit change in SUMSAT resulted in the change in DL_ADMEFFT as a whole of 0.523 units and each unit change in EDUC_EFFT resulted in the change in the DL_ADMEFFT as a whole of 0.513 units.

The integration of STOU undergraduate students' learning satisfaction dimension and the students' educational effectiveness dimension shows in figure 6.21

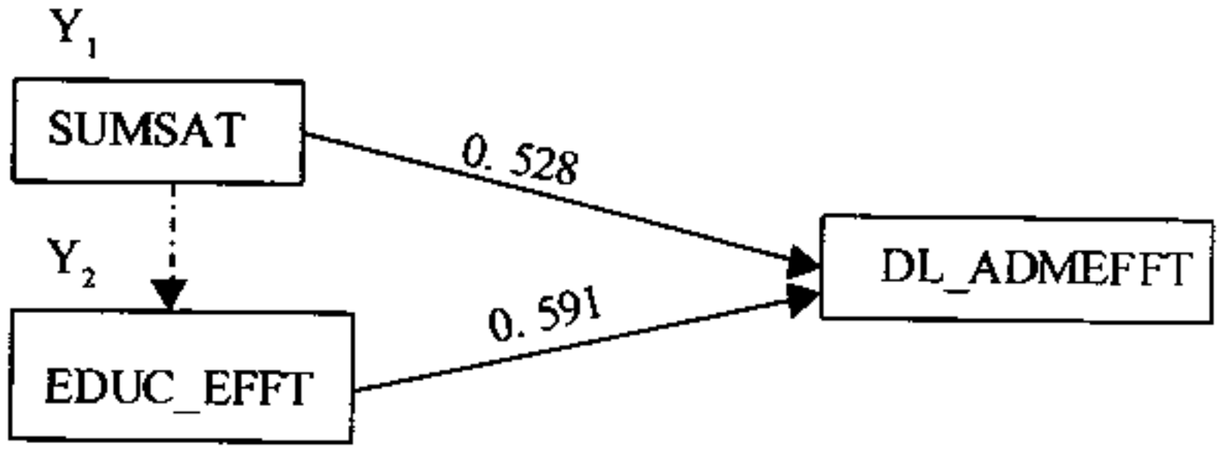

Figure 6.21: The STOU undergraduate studies level causal model with the path coefficient values

Figure 6.21 illustrates that SUMSAT and EDUC_EFFT have direct effects on the effectiveness of distance learning administration (DL_ADMEFFT) with the coefficient value of 0.528 and 0.591 respectively, which implies that each unit change in SUMSAT resulted in the change in DL_ADMEFFT as a whole of 0.528 units while each unit change in EDUC_EFFT resulted in the change in DL_ADMEFFT as a whole of 0.591 units.

The integrated causal models of RU and STOU undergraduate studies levels with the path analysis is summarized in the table 6.31 as following:

Table 6.31 Path coefficients of independent variables (Standardized Regression Coefficients-Beta) in the Path Analysis of RU and STOU at undergraduate studies on comparison

Independent variables	Dependent variable (DL_ADMEFFT)	
	RU	STOU
SUMSAT	.523***	.528***
EDUC_EFFT	.513***	.591***
	Dependent variable (SUMSAT)	
Independent variables	RU	STOU
R Square	.489	.461
Adjusted R Square	.480	.455
F	53.177***	76.180***

* P – value < 0.05, ** P-value < 0.01, *** P-value < 0.001

6.4 HYPOTHESES TESTING

Table 6.32 summarizes the research findings of RU and STOU at the graduate studies level. The students' learning satisfaction dimension and the students' educational effectiveness dimension are testing and comparing in this table.

The first hypothesis predicted that the educational supports (curriculum, faculty, student, and service and staff supports) would have the positive relationships and lead to increase the students' learning satisfaction. Table 6.32 reports that for RU graduate students, faculty supports make a significant incremental students' learning satisfaction (beta = 0.538, $p < .01$). Curriculum supports and service and staff supports are also leading to increase the students' learning satisfaction (beta = 0.327, $p < .01$ and beta = 0.487, $p < .01$ respectively). For STOU graduate students, curriculum and faculty supports have the positive relationships and strongly lead to increase the students' learning satisfaction. Therefore the educational supports (except student supports) confirm the first hypothesis for RU graduate students. While the curriculum and faculty supports confirm the first hypothesis for the STOU graduate students.

The second hypothesis predicted that the technological supports (instructional delivery modes, CMC, HCI, and technological utilization) would have the positive relationships and lead to increase the students' learning satisfaction. Table 6.32 reports that Human-Computer Interaction (HCI) makes the significant incremental learning satisfaction and leads to increase both RU and STOU students' learning satisfaction with the positive beta weight of 0.650 and 0.640 ($p < .01$) respectively. However, Computer-Mediated Communication (CMC) support also has the positive relationship and lead to increase the students' learning satisfaction with the positive beta weight of 0.474 ($p < .01$) for RU graduate students. Therefore, we can conclude that CMC supports the RU graduate learning satisfaction while HCI supports both of RU and STOU graduate students' learning satisfaction.

The third hypothesis predicted that students' educational costs and time spent (expense on study, time spent for examination preparation, and time for traveling to study) have the negative relationships and lead to decrease the students' learning satisfaction. Table 6.32 reports that there is no any variable supports this hypothesis since there is no any variable significant to the assumption.

Table 6.32: Hypotheses testing results at the graduate studies levels

Hypotheses	RU	STOU
H1: Students' educational supports lead to increase the students' learning satisfaction.		
• Curriculum support (CURSUP)	Confirmed	Confirmed
• Faculty support (FACSUP)	Confirmed	Confirmed
• Student support (STSUP)	-	-
• Service and staff support (SERVSUP)	Confirmed	-
H2: Students' technological supports lead to increase the students' learning satisfaction.		
• Instructional delivery modes (INSTECH)	-	-
• CMC	Confirmed	-
• HCI	Confirmed	Confirmed
• Technological utilization (USETECH)	-	-
H3: Students' educational costs and time spent lead to decrease the students' learning satisfaction.		
• Expense on study (EXPS + IND_EXPS)	-	-
• Time for exam. Preparation (HR_EX)	-	-
• Time travel spent (HRFAR)	-	-
H4: IT application to distance learning administration leads to increase the students' educational effectiveness.(IT)		
• IT Accessibility (ITACCSS)	Not Confirmed	-
• IT Effectiveness (ITEFFT)	Confirmed	-
• IT Efficiency (ITEFFCY)	Confirmed	Confirmed
H5: Students' motivation leads to increase the students' educational effectiveness (NEEDPERC)	Confirmed	-
H6: Students' barriers lead to decrease the students' educational effectiveness		
• Number of dependents / educating dep.(DEP)	Not Confirmed	Not Confirmed
• Students' Barriers (STBARIER)	-	-
H7: Students' educational environment relation to increase the students' educational effectiveness		
• Learning climate (LCLMT)	-	-
• Achievement orientation (ACHV)	-	-
• Students' expectation (STEXPCT)	Confirmed	-
• Learning evaluation (LEVAL)	Confirmed	Confirmed
• Context of instruction (INSTXT)	-	Confirmed

The fourth hypothesis predicted that the information technology (IT) application (IT accessibility, IT effectiveness, and IT efficiency) would have the positive relationships and lead to increase the students' educational effectiveness. Table 6.32 reports that IT applications in terms of effectiveness, and efficiency are positive relationships and lead to strongly increase the RU graduate students' educational effectiveness with the positive beta weight value of 0.588, and 0.546 ($p < .01$) respectively. IT accessibility has the negative relationship and leads to decrease the students' educational effectiveness. For STOU, there is only IT efficiency with the positive relationship and it leads to increase strongly to STOU graduate students' educational effectiveness. Therefore, IT accessibility does not confirm the hypothesis.

The fifth hypothesis predicted that the students' motivation or needs have the positive relationships and lead to increase the students' educational effectiveness. Table 6.32 reported that there is only RU students' needs have the positive relationship and leads to increase the students' educational effectiveness (beta = 0.378, $p < .01$). Thus, the RU graduate students' needs confirm this hypothesis.

The sixth hypothesis predicted that the students' barriers and number of dependents or number of educating dependents have the negative relationships and lead to decrease the students' educational effectiveness. Table 6.32 reported that number of dependents of both RU and STOU graduate students have the positive relationships and lead to increase the students' educational effectiveness (RU beta = 0.128, $p < .01$ and STOU beta = 0.181, $p < .01$). Therefore, number of dependents of RU and STOU graduate students do not confirm the hypothesis.

The hypothesis seven predicted that the students' educational environment have the positive relationships and lead to increase the students' educational effectiveness. Table 6.32 reported that the students' expectation and the learning evaluation of RU graduate students have the positive relationships and lead to increase the students' educational effectiveness. While the learning evaluation and the context of instruction of STOU graduate students have the positive relationships and lead to increase the students' educational effectiveness. Therefore, the learning evaluation confirms the hypothesis for both RU and STOU graduate students. The students' expectation confirms the hypothesis for RU while the context of instruction confirms for STOU graduate students.

The hypotheses testing for the research results of RU and STOU at the undergraduate studies level can be summarized in the following tables:

Table 6.33: Hypotheses testing results at the undergraduate studies levels

Hypotheses	RU	STOU
H1: Students' educational supports lead to increase the students' learning satisfaction.		
• Curriculum support (CURSUP)	Confirmed	-
• Faculty support (FACSUP)	-	Confirmed
• Student support (STSUP)	Confirmed	Confirmed
• Service and staff support (SERVSUP)	-	-
H2: Students' technological supports lead to increase the students' learning satisfaction.		
• Instructional delivery modes (INSTECH)	Not Confirmed	-
• CMC	Confirmed	Confirmed
• HCI	-	Confirmed
• Technological utilization (USETECH)	-	-
H3: Students' educational costs and time spent lead to decrease the students' learning satisfaction.		
• Expense on study (EXPS + IND_EXPS)	-	-
• Time for exam. Preparation (HR_EXM)	-	-
• Time travel spent (HRFAR)	-	-
H4: IT application to distance learning administration leads to increase the students' educational effectiveness.(IT)		
• IT Accessibility (ITACCSS)	Confirmed	-
• IT Effectiveness (ITEFFT)	Confirmed	Confirmed
• IT Efficiency (ITEFFCY)	-	-
H5: Students' motivation leads to increase the students' educational effectiveness (NEEDPERC)	Confirmed	-
H6: Students' barriers lead to decrease the students' educational effectiveness		
• Students' Barriers (STBARIER)	-	-
• Number of dependents / educating dep.	-	-
H7: Students' educational environment relation to increase the students' educational effectiveness		
• Learning climate (LCLMT)	-	-
• Achievement orientation (ACHV)	-	-
• Students' expectation (STEXPCT)	-	Confirmed
• Learning evaluation (LEVAL)	-	-
• Context of instruction (INSTXT)	-	-

Table 6.33 summarizes the research findings of RU and STOU at the undergraduate studies level. The results of two dimensions: the students' learning satisfaction and the students' educational effectiveness are testing and comparing in this table.

The first hypothesis predicted that the educational supports (curriculum, faculty, student, and service and staff supports) would have the positive relationships and lead to increase the students' learning satisfaction. Table 6.33 eports that for RU undergraduate students, the student supports make a significant incremental students' learning satisfaction (beta = 0.530, $p < .01$). Curriculum supports is also leading to increase the students' learning satisfaction (beta = 0.421, $p < .01$). For STOU undergraduate students, the student and faculty supports have the positive relationships and strongly lead to increase the students' learning satisfaction. Therefore the educational supports (except service supports) confirm the first hypothesis for RU undergraduate students. While the student and faculty supports confirm the first hypothesis for the STOU undergraduate students.

The second hypothesis predicted that the technological supports (instructional delivery modes, CMC, HCI, and technological utilization) would have the positive relationships and lead to increase the students' learning satisfaction. Table 6.33 reports that Computer-Mediated Communication (CMC) has the positive relationship and leads to increase both RU and STOU undergraduate students' learning satisfaction with the positive beta weight of 0.382 and 0.502 ($p < .01$) respectively. In addition, the instructional delivery mode (INSTECH) has the negative relationship and leads to decrease the students' learning satisfaction for RU undergraduate students. However, the HCI has the positive relationship and leads to increase the students' learning satisfaction for STOU undergraduate students with the positive beta weight value of 0.525 ($p < .01$). Therefore, we can conclude that CMC supports both the RU and STOU undergraduate students' learning satisfaction. The HCI supports STOU undergraduate students' learning satisfaction. While the instructional delivery mode (INSTECH) does not support the hypothesis for RU undergraduate students.

The third hypothesis predicted that students' educational costs and time spent (expense on study, time spent for examination preparation, and time for traveling to study) have the negative relationships and lead to decrease the students' learning satisfaction. Table 6.33 reports that there is no any variable supports this hypothesis since there is no any variable significant to the assumption.

The fourth hypothesis predicted that the information technology (IT) application (IT accessibility, IT effectiveness, and IT efficiency) would have the positive relationships and lead to increase the students' educational effectiveness. Table 6.33 reports that IT applications in terms of access and effectiveness are positive relationships and lead to strongly increase the RU undergraduate students' educational effectiveness with the positive beta weight value of 0.601, and 0.626 ($p < .01$) respectively. These two variables confirm the fourth hypothesis for RU undergraduate studies level. For STOU, there is only IT efficiency with the positive relationship and it leads to increase STOU undergraduate students' educational effectiveness.

The fifth hypothesis predicted that the students' motivation or needs have the positive relationships and lead to increase the students' educational effectiveness. Table 6.33 reported that there is only RU students' needs have the positive relationship and leads to increase the students' educational effectiveness (beta = 0.405, $p < .01$). Thus, the RU graduate students' needs confirm this hypothesis.

The sixth hypothesis predicted that the students' barriers and number of dependents or number of educating dependents have the negative relationships and lead to decrease the students' educational effectiveness. Table 6.33 reported that there is no any variable supports this hypothesis since there is no any variable significant to the assumption

The hypothesis seven predicted that the students' educational environment have the positive relationships and lead to increase the students' educational effectiveness. Table 6.33 reported that the students' expectation of STOU undergraduate students has the positive relationships and lead to increase the students' educational effectiveness. Therefore, the students' expectation confirms the hypothesis for STOU undergraduate students.

6.5 CONCLUSION

Any given data typically have multiple causal origins, thus the use of linear statistical models by regression analysis is recognized. For a university system, the educational administration embedded in the causal structure are the system parameters where they are numerical quantities that include initial values of variables (student's satisfaction or perception) parameters that characterize operating properties (educational supports and service supports, technological supports) and parameter that characterizes personal problem (such as educational cost, learning barriers, and time spent). If parameter values are changed the impacts of the changes on system will be changed accordingly.

This chapter presents the findings of the output and the impact of distance learning administration of both Ramkhamhaeng University (RU) and Sukhothai Thammathirat Open University (STOU) in terms of the students' learning satisfaction and the students' educational effectiveness.

The research methodology is employed to analyze the data accurately and precisely. The eight causal models constructed by Path analysis, representing the relationships among the variables (direct and indirect) effecting on the students' learning satisfaction (SUMSAT) and the students' educational effectiveness (EDUC_EFFT).

In conclusion, SUMSAT and EDUC_EFFT have direct effects on the effectiveness of distance learning administration (DL_ADMEFFT) at RU graduate studies level with the standardized coefficients of 0.509 and 0.656 respectively (see table 6.28). While there is no the students' learning satisfaction of STOU graduate students exists. In addition, SUMSAT and EDUC_EFFT have strongly direct effects on the effectiveness of distance learning administration (DL_ADMEFFT) at both RU and STOU undergraduate studies level with the path coefficient values of 0.523 and 0.513 for RU undergraduate students and 0.528 and 0.591 for STOU undergraduate students.

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

According to the meaning of distance education, distance education is the educational process between two people - teacher and student, separated by physical distance. The core of distance education is an interactive. Interactivity is crucial to effective distance learning as it gives instructors valuable real-time feedback to material they are presenting. Interactivity also allows students to ask questions and share ideas with their instructor, which helps to boost student attention level and interest (One Touch, 1996).

In the traditional distance education perspectives, the student is an individual. The student's focus is on the object of study, and on his/her individual process of study. The teacher is also an individual but to the teacher, the relationship with the student is far from unique. The student is one among a number, and the teacher may tend to apprehend the student more as a case than as an individual. The teacher's focus will be more on the product and outcome of the student's efforts than on the student as a person but also on the feed back that is adequate from the teacher to the student in order to support the student's learning process.

The premise of this research purposes to build an understanding of distance education through a critical analysis of the educational transaction at the open universities in Thailand. This research is an attempt to provide a framework with the educational transaction and environments, communications technology utilization, service and staff supports, in order to analyze the influential factors on the effectiveness of distance learning systems. A framework based not only upon access to information but also provision of supports for developing knowledge and understanding at a distance. A framework also examines the distant learners' needs and barriers on the education.

Measuring effectiveness and efficiency in educational institutions is difficult as mentioned in this research. Some values such as satisfaction, educational supports and accessibility, needs, community participation, technology development, and social equity frequently are in race for educational effectiveness and efficiency. Nevertheless, an increasing need to create distance education systems and integrate them with conventional institutions is exponential growth. Through the resulting diversity and choice, an open learning systems was emerged.

Strategies for open and distance learning remain being developed and deeply problematic. Renwick[1] (2000) suggests four problems and solutions on education:

- Traditional paradigms for teaching and learning no longer work in the post-industrial age. This requires to fashion new paradigms of teaching and learning.
- Open and distance learning are not synonymous. This requires governments to devise policies which create environments for distance and other forms of guided self instruction.
- Relationships between educationalists and technologists are a weak factor of policy making and planning. This issue requires more emphasis on the educational ends to be served by new technologies and a corresponding commitment to relevant research and development.
- Educational institutions, particularly face-to-face institutions, must change their internal cultures. This issue encourages success of educational institutions by applying the radical cultural changes within traditional learning institutions.

Education increases knowledge and knowledge improves human being behaviors and enhances dignity. Knowledge is an organized and meaningful information, its acquisition is the focus of educational activities. Learning organization emphasizes education for life long learning. However, education is inevitably about change and in order to disseminate knowledge to all, education should be diversified and prepared for next generation. This diversity orients to knowledge creation, access and use, with the massive implicit curriculum for delivery and for management.

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[1] Renwick, William. (2000), "Organizational Strategies for Open and Distance Learning", *Honorary Research Fellow report*, Victoria University of Wellington, New Zealand, available at URL http://tecfa. unige.ch/~tognotti/abs1.html

7.1 CONCLUSIONS OF THE STUDY

The concepts and context properties discussed in this research, are based upon the output and outcome from the conceptual framework of RU and STOU at the graduate and undergraduate studies levels. A system model reflects the structures of learning achievement on satisfaction and effectiveness of students' learning into the integrated models.

From my perspectives, the effectiveness of distance learning administration is not only based on any side of the student-teacher relationship but also comes from the system of instructional delivery mode and learning supports with and without technological utilization. Thus, this study focuses on the framework laid by the educational supports, the technological support, the learning environment, as well as the students' needs, perspectives, satisfaction, and learning barriers.

The evidence in the research points to the conclusion that teaching and studying at a distance, especially when using telecommunications media, is effective when effectiveness is measured by the students' learning satisfaction, and by the students' educational effectiveness. The computer-mediated communication (CMC) and human-computer interaction (HCI) are the influential factors to increase the learning satisfaction while the information technology (IT) utilization effects on the increment of the educational effectiveness of RU and STOU at both studies levels.

However, the educational supports such as curriculum supports, faculty supports and student supports are still the necessary and major factors of education. The educational supports are also the influential factors that direct effect on the students' learning satisfaction.

The research studies proposed the three elements of distance education. Three elements of distance education are instructional design, technology, and supports. These three elements are provided by RU and STOU to their students differently in the relation to the university's policies, strategies, and resources availability.

Table 7.1 and table 7.2 summarized the three elements for successful distance education, in the comparison between Ramkhamhaeng University (RU) and Sukhothai Thammathirat Open University (STOU).

Table 7.1: Comparative Distance Education Elements between RU and STOU at the graduate studies level

Universities / Elements	Distance Education of RU (1 course = 3 credits)	Distance Education of STOU (1 course = 5 credits)
Instructional Design - Texts - Learning materials e.g. VDO, tape cassette - Supplementary Texts	1. Classroom-based Instruction • Face-to-Face • Tutorial instruction 2. Two-way communication • Teleconferencing • Videoconference 3. Correspondence • Mail, Facsimile • Telephone 4. Computer-based Learning • Computer conference, e-mail • Internet 5. Virtual Classroom	1. Self-directed study 2. Classroom seminar • Face-to-Face (twice per semester) 3. Correspondence • Mail, Facsimile • Telephone 4. Computer-based Learning • Computer conference, e-mail • Internet
Technology - Computer - Tele communication - IT - ET	1. Synchronous Delivery • Real-time learning and discussion • Teleconferencing • Videoconference • Computer conferencing 2. Asynchronous Delivery • Computer-based learning (CAI) • Internet • Virtual education	1. Synchronous Delivery • Face-to-Face (seminar / workshop) • Research workshop (15 credits) 2. Asynchronous Delivery • Computer-based learning (CAI) • Internet
Supports - Curricula - Faculty - Student - Service - Technology	1. 3 schools curricula 2. Faculty supports • Real time teaching • Texts / Documents 3. Student support • Seminars • Facilitators 4. Service support • Learning facilities • Tape recording 5. Technology • Computers	1. 6 schools curricula (Admission opens every after another year) 2. Faculty supports • Texts/Documents 3. Student support • Seminars • Counselors 4. Service support • Research counselor 5. Technology • No support *

Table 7.2: Comparative Distance Education Elements between RU and STOU at the undergraduate studies level

Universities / Elements	Distance Education of RU (1 course = 3 credits)	Distance Education of STOU (1 course = 6 credits)
Instructional Design - Texts - Learning materials e.g. VDO, tape cassette - Supplementary Texts	1. Classroom-based Instruction • Face-to-Face 2. One-way communication • Video, Tape cassette • Radio, TV 3. Correspondence • Mail, Facsimile • Telephone 4. Computer-based Learning • Internet 5. Virtual Education	1. Self-directed study 2. One-way communication • Tape cassette • Radio, TV 3. Correspondence • Mail, Facsimile • Telephone
Technology - Computer - Tele communication - IT - ET	1. Synchronous Delivery • Real-time learning • Broadcasting (Radio, TV) 2. Asynchronous Delivery • Computer-based learning (CAI) • Internet • Virtual education	1. Synchronous Delivery • Broadcasting (Radio, TV) 2. Asynchronous Delivery • Computer-based learning (CAI) • Internet
Supports - Curricula - Faculty - Student - Service - Technology	1. 4 faculties curricula 2. Faculty supports • Real time teaching • Texts / Documents 3. Student support • Tutorial • Facilitators • Counselors 4. Service support • Learning facilities • Tape recording 5. Technology • Computers	1. 10 schools curricula 2. Faculty supports • Texts/Documents 3. Student support • Seminars • Counselors • Facilitators 4. Service support • Learning materials • Tape recording 5. Technology • No support *

Table 7.1 summarizes the graduate level comparing the three elements of distance education between RU and STOU while table 7.2 compares at the undergraduate level with the same three elements.

Ramkhamhaeng University (RU) and Sukhothai Thammathirat Open University (STOU) are two open universities in Thailand, facilitating the distance education system which exploited the educational technology, media and methods of instructional delivery in order to disseminate knowledge to the aspired and adult students at remote areas on the provision of educational equality and access.

Ramkhamhaeng University (RU) provides the parallel form of education, in which there are face-to-face classroom and self-study education while Sukhothai thammathirat Open University (STOU) provides distinctive form of education which emphasizes on individualized or self-study education, thus there are different supports for students and yield different students' expectations and learning barriers.

Consideration of the RU and STOU graduate students, RU graduate students at the remote areas, are compulsory to attend classroom. The instructional delivery mode is teleconferencing in which the teacher and students can discuss with each other at the real time. The synchronous education provides the virtual classroom where teacher and students are simultaneously interacting. This telecommunication utilizes the capability and facilities of the THAICOM satellites to transmit the texts, voice and image to another three regional campuses, this means that there are four regional campuses on active. RU distance education employed teleconferencing capacity, encouraging the cost-effectiveness on both university and students as well as providing the educational opportunity in equality. Therefore, there are many variables influence the RU graduate students' learning satisfaction and the educational effectiveness when compare with STOU graduate students (see figure 6.7, figure 6.8, figure 6.10 and figure 6.12).

For STOU graduate students, they are selected from the working and high position on the job so they are all working persons. STOU graduate students are self-directed learners but they are required to meet teachers or academic coordinators at least two times in a semester in order to comprehend the subject matter and discussions. Thus, the curriculum supports, faculty supports, human-computer interaction (via e-mail), IT efficiency, context of instruction, and learning evaluation are influential variables towards the students' learning satisfaction and educational effectiveness. However, some courses required students to meet together for the workshop - research methodology course, for example.

The research findings, both RU and STOU graduate students, indicated that number of dependents is the independent variable leading to increase the students' educational effectiveness instead of decreasing. This can be explained that for family survival and for career development on the economic crisis, education is the way to survive. Since education influences people to get more knowledge, which leads to job advancement and opportunity so that the number of dependents leads to increase the students' educational effectiveness instead of decrease. From table 6.3 shown that most graduate RU and STOU students have at least one child where the maximum number is six children and the average number is equivalent to one.

For the distant RU undergraduate students, they can choose to study at home or study via real time one-way communication at the regional campus centers. They can also borrow the learning materials such as tape cassette, supplementary documents, etc. in library at the regional campus. There will be a face-to-face teaching once a semester in order to comprehend the subject matter for 6 hours totally at the regional campuses. Moreover, there are site university staff facilitate the students who need help or ask the questions.

For distant STOU undergraduate students, There are six regional centers at the provinces to provide the facilities students needed. STOU students can buy texts and learning materials from regional center. Libraries are provided by the local libraries where STOU students can read or borrow the texts and receive the university news. Local library provides the facilities as if the regional campuses. However, students can buy the books with or without tape cassette with price difference.

The research findings, both RU and STOU undergraduate students, indicated that information technology (IT) effectiveness, students' needs and expectation are the independent variables affect the educational effectiveness. Since all of them are self-study students so that they depend mostly on the instructional delivery modes via radio and television. Thus, IT effectiveness, their needs and expectations to success on the education are the influential factors for their study.

However, the curriculum supports, faculty supports, and student supports (except the service and staff supports) are the crucial factors to their learning satisfaction. These variables have the strong direct effects to the students' learning satisfaction and the educational effectiveness.

7.2 FUTURE TRENDS IN DISTANCE EDUCATION

Distance learning has the capacity to reach many more people in a more cost-effective manner than traditional classroom instruction. Monohan and Wimber (1988) suggest that the educational institutions are able to shift the focus from teacher as the deliverer of knowledge to teacher as a facilitator or guide to information. This paradigm shift from student-filled, single teacher-directed classroom to "teacherless", boundaryless, timeless learning or schooling is causing a degree of stress to the administrators in the educational community.

The National Academy of Sciences and the National Academy of Engineers discuss this shift as following:

> This model of education calls for changing the roles of students, teachers, and institutions. In the new model, students assume many of functions previously reserved for teachers. In small groups, individual students act as peer-tutors for others. Because they are often the ones most familiar with new technologies, students lead by example, helping their classmates work through problems. In this way students begin learning from an early age how to communicate and how to assume greater responsibility for their own education. Teachers in contrast, change from being the repository of all knowledge to being guides or mentors who help students navigate through the information made available by technology and interactive communications.....Schools may emerge more conventional institutions may have branch campuses integrated into businesses, hospitals, or homes (National Academy of Sciences, 1996).

The educational transaction is seen as a communication process, where two-way communication between teacher and student represents the most basic element of the educational transaction. However, distance educators today need to design new educational systems which capture the capabilities of all existing communications technology. Communication is the interface between teaching and learning and technology represents the interface between structure (e.g. organization) and process. Thus, educational technology is the science of integrating structure and process. The importance of educational technology in distance education is not only to recognize the necessity of technological structure for mediated communication but also maintain an appropriate balance between it and the process of the educational phenomena.

As distance learning continue to expand, the acceptance of the use of distance learning technologies is growing, educators must be ready to examine the issues generated by the paradigm shift. For effective implementation, the educators might view this shift to all educational changes of values which require new skills, behaviors, and beliefs or understandings. The emerging technologies of distance learning can have a positive effect on the educational system where the development of new skills, behaviors, and beliefs is a complex process that must embrace the problems inherent in change (Fullan, 1993).

As mentioned, technological development is a complex process, it is much more than the overt acceptance of material and technical improvements but it is a cultural, social, and psychological process as well. Associated with every technical and material change there is a corresponding change in the attitudes, the thoughts, the values, the beliefs, and the behavior of people who are affected by the material change, which is clarified as the term "sociotechnological development".

What is the future of distance learning technologies in education? What are the prospects and implications? The report "*Reinventing Schools: The Technology is Now!*" states that education will look different than it does in most institutions today. Institutions might be open all day and all year, with groups of students rotating in and out of session. Classroom might include students of different ages. Traditional 50-minute classes will stretch or disappear to accommodate activities made possible by technology. A multi-disciplinary approach toward teaching and learning will result in longer-term projects that cut across disciplines, combining the subject matter of previously separate classes. Multiple choice tests will be replaced by new kinds of assessments that measure the acquisition of higher-order skills. The ultimate goal of this new model of education is to foster communities of lifelong learners, where intellect and cooperation are highly valued. The elements of this new model of education are starting to appear in scattered communities across the nation. Institutions are experimenting with new organizational structures, new forms of governance, and new uses of technology that are designed to reflect the constant flux of modern society. This trend is about to accelerate dramatically. As distance learning technologies become more powerful and plentiful, and as the needs of society more urgently call for a new model of education.

7.3 RECOMMENDATIONS

A report by the School of Continuing Studies at Indiana University and AT&T indicates that educators planning to implement distance learning programs will need to address the special needs of remote learners. The needs include advising and counseling, access to learning resources, communication needs, and administrative support systems. In addition to needs that can be met through institutional support structures, the report maintains that distance learners must: assume responsibility for their own learning, actively question and obtain help, be flexible, and brace for technical difficulties in the two-way flow of information. Another dimension of the needs of distance learners is an investigation of student attitudes towards distance learning. The four categories investigated include attitudes toward technology, toward distance education teaching methods, toward student and teacher interaction, and toward being a remote student (AT&T, 1995). These attitudes contribute to the overall assessment of student needs and to the implementation of a distance education course.

In another perspectives, distance education can be interpreted as "access to learning". The interpretation of "access to learning[2]" means that it makes education more attainable by more people. That is, it provides the educational opportunities in the workplace, community, or the home, for those unable to attend school or college because of cultural, economic, or social barriers. Dedicated distant learning institutions and traditional colleges and universities have provided opportunities to students unable to attend campus for some time. They relied mainly on correspondence, traditional print instructional materials, and perhaps, audio and video cassettes, or television. The Web based technology is starting to change now as educators devise new ways to capitalize on education.

The successful distance education should shift from the old traditional education on correspondence to the new paradigm of electronic world. There are three proposed recommendations for future distance education. These are quality in education, educational technology utilization, and visionary administrators.

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[2] Ronald D. Owston, 1997. "The WWW: A Technology to Enhance Teaching and Learning?" In Educational Researcher, Vol. 26, No. 2, March 1997, York University, U.S.A., pp. 27-33.

7.3.1 Quality in Education

In the new environment of higher education, management has assumed an enhanced significance where many innovation and successful initiatives are taking place with respect to commercial marketing of services and off-shore course provision. However, there is almost universal agreement that the effectiveness of distance learning system is linked more closely to the quality of instructional design and learner support than it is to the technology used. Thus educators can increase effectiveness by ensuring that course design, student support, and instructional strategies reflect an understanding of the student satisfaction, achievement, and persistence as the key factors.

Quality in education is urged to focus in the modern information era for the endless development. The core business of institutions remains the provision of quality teaching, the conduct of quality research, and the undertaking of quality community service to benefit the national constituency. It is the focus of interest and long-term management for the purpose of universities.

The other related concern of learning effectiveness is the quality of the educational experience such as the quality of learning materials, the process of learning, the degree of freedom in educational programs, content, etc, as well as the level of the independence of the students.

Since the concept of instructional technology became more accepted in the 1960s. In the meantime, revolutionary ideas about learning seemed to have more and more influence on society. Thus these revolutionary ideas were eventually developed into the concept of "lifelong education" which is one of the most important philosophies in distance education.

Instructional technology was perceived as a means of changing the one-way authoritarian relationship between instructor and student. The idea of shifting emphasis from teachers to learners was accelerated in the 1960s. Some of the ways this shift was achieved are directly relevant to distance education whilst other methods could be adopted for use within the fairly inflexible structure of distance education systems (Baath, 1979).

Dave Lewis (1993), Hewlett-Packard Media Technologies, reports that more and more people are realizing the importance and power of interactive distance learning. Under conditions where a need exists and resources are available, distance learning gains an advantage over the competition. The investment in distance learning technology can turn into long term cost reductions by reducing travel, delivery and training expenses, while increasing effectiveness and providing the ability to track results. The challenge for education is to emulate the success of distance learning in which educational institution must determine the importance of distance learning and ascertain the needs and resources available in order to gain the advantages of distance learning.

Ensuring high quality in distance education programs, four elements should be considered as the critical components in developing and assessing. Keep-on improvement, ability of faculty and quality assurance, texts and teaching, and electronic advantage are encouraged.

- Keep-on improvement is a criterion of total quality management (TQM) approach which emphasizes on the continuous improvement and customer satisfaction. Thus, the educational improvement and service delivery are the core functions of quality in the distance learning system.
- Ability of faculty's clear explanation and quality assurance are the necessary criteria for educational quality today. Since teachers are assumed to be facilitators to guide the information on study, therefore teachers should possess variety of knowledge and be able to answer questions.
- Texts and learning materials should be provided. Since distant students depend mostly on the printed texts and learning materials, so that the quality in the instructional design can enhance knowledge improvement.
- Electronic advantage facilities such as computers, telecommunication, educational technology, and so on should be provided for future generation of distance education. Teachers' skills on electronic equipment are also required. The more familiar teachers are with the instructional design and delivery process, the more effective their presentations will be. The educational institution should be the source of knowledge and the technological skills.

In addition, not only the quality in education is encouraged but the quality of staff should also be promoted. Quality staff is considered on attitude, knowledge, skill, and personality components with the dominant characteristics, is shown in figure 7.1

Figure 7.1: The components of quality staff requirement

7.3.2 Educational Technology Utilization

Communication is oriented to the future. It involves exchange, implies participation and adaptation, and includes sharing. For this reason, teaching involves the very essence of the communication process, and the communication process involves teaching. So sharing and influence, teaching and learning, are about communication involved.

Ross Clayton (1972) defines technology as the use of scientific knowledge for social purpose. He reminds that technologies can be thought of as objects to which we attach values. Hence, the technological change can bring about changes in values. Technology refers to physical objects whether it is the space shuttle or a hand-held calculator.

Technology relates to education in at least three major ways:

- ❖ The development of technicians;
- ❖ The general education in technology; and
- ❖ The application of technology to the instructional process.

The National Council for Educational Technology (NCET, 1967) defined educational technology as "the development, application and evaluation of systems, techniques and aids to improve the process of human learning".

The National Center for Programmed Learning (NCPL) defined that educational technology is the application of scientific knowledge about learning, and the conditions of learning, to improve the effectiveness and efficiency of teaching and training.

Therefore, the term "educational technology" refers to

1. The teaching machine which uses the equipment and techniques. Those are associated with equipment such as audio-visual aids, computers and Internet capabilities.
2. The systems of instruction such as programmed instruction, and program construction
3. The methods of instruction where systems of higher education vary from one country to another in the way of candidate selection and teaching procedure. (R. L. REID, 1969: 2-3)

Many constraints and policy issues exist in providing distance education to remote rural areas. They include the high costs of technology and adequate equipment provision; the design and the cost in producing appropriate educational material and software such as videotapes and computer programs; the choice and assessment of the most appropriate courseware media; the expertise of the technicians and system analysts; the difficulties in administration and evaluation of progress; and the acceptance of the concept and technique by the education administrators and the public. However, one of the most significant social benefits is to provide distance or tele-education to all citizen with the equity and access on the education.

Within the educational process, there are three general areas in which technology is being applied. These are

- ❖ General administration;
- ❖ Testing; and
- ❖ Instruction. (J. D. Finn, 1960: 383-4)

The uses of technical management systems, modern equipment, information access and retrieve technique, and other advanced media represent the applications to the field of general administration. However, administration is interrelated with the other two areas of testing and instruction because the problems arise from these two areas would guide the technical solution in administration.

Testing exists in many respects of existing education on the most developed technology at present. This is true both from a machine and from a system standpoint. The close relationships between psychological, achievement, and other types of testing are examples.

Because of the tendency for technology has no limits and constantly to extend into new areas, it is inevitable that, in an advanced technical society, technology should begin to extend into the instructional process itself. However, technology of the instructional process can, for purposes of analysis, be isolated from testing.

According to the technological utilization perspectives, I would like to propose three elements as the crucial components of educational technology utilization. They are know-how technology, accessibility, and on-line instructional delivery. These elements provide the successful distance education and virtual university as well.

- Know-how technology: The educational technology is regarded as a two-stage pattern in the phrase "adapt-adopt" used by Lange (1967). With the development of speech, of writing, of printing, of photography, of sound recording and reproduction, motion film and television, the teaching-learning process has *adapted* new skills or materials designed. Student could learn via the book, with or without the teacher. The pattern of teaching and learning changed both in space and time where the libraries, schools and universities emerged. Film, radio, television, language laboratories, and teaching machines have appeared, to be adapted and installed to suit the existing classroom and teaching-learning situation. Later their influence becomes so pervasive that the process or system has to *adopt* the philosophy of the new in preference to the old. The development of writing and later of printing, the development of microphone to the wireless receiver or loud speaker, and the television cameras to the digital cameras as the examples of the adoption.
- Accessibility: Interactive multimedia learning materials, simplified access and searching of databases, exponential growth of new resources and technology around the world, and open technical standards that allow any brand of modern computer to access the Web. The Web has advantages to provide increased access on education and make learning more comfortable to reach. Accessibility is one of the crucial factors for the effectiveness of distance learning systems at the remote learners.
- On-line instructional delivery: The advanced telecommunication and the modern computer capability facilitate the learners to access on-line education easily and rapidly either via synchronous or asynchronous modes. On-line instructional delivery can be also seen as the cost-effectiveness on education. Moreover, Internet and Web provide on-line instructional delivery more accessible and comfortable today.

Nevertheless, Schumacher (1973) also foresees that a change in technology will necessitate a change in values. He believes that work and leisure are as essentially the same, if we measure human satisfaction in terms of the quality of life and not in terms of economic success.

7.3.3 Visionary Administrators

The future of distance learning technologies in education will be most influenced by the manner in which educational administrators handle the change process. Michael Fullan[3] (1993) states that visions can blind as well as enlighten. He advocates the following action guidelines for building learning institutions:

1. Understand the culture of the institution. Administrators must take into consideration the needs and attitudes of the institution because each institution has a unique set of problems, concerns, and assets which are reflected in the staff and community and which contribute to the culture and climate of the institution.
2. Value teachers and promote their professional growth. Teachers are at the core of the success of distance learning technologies. Any reform effort should value the experience and professionalism of educators. The growth of distance learning technologies will be dependent upon training and professional development being offered to educators.
3. Extend what you value.
4. Express what you value. Education, in all forms, values excellence, equity, access, and choice. These values should be reflected in the development of distance learning technologies.
5. Promote collaboration, not cooptation.
6. Make menus, not mandates.
7. Use bureaucratic means to facilitate, not to constrain. Collaboration and a sense of followership are essential to the success of any reform movement in education. All must work with shared purpose toward a shared vision. Furthermore, the capacity to promote partnerships and alliances will create a need to use bureaucratic means to facilitate change, not to constrain the efforts of advocates of distance learning.

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[3] John Bingham, Teresa Davis, and Cathy Moore 1996. Emerging Technologies in Distance Learning. Available at URL: http://horizon.unc.edu/courses/287/1996/groups/Distance_Learning.asp.

8. Connect with the wider environment. As the emerging technologies of distance learning begin to break down the walls of the traditional classroom and begin to build bridges around the worlds, the future work of educators must be characterized by a spirit of inquiry and continuous learning that involves educators, students, and all other stake holders.

According to Trow (1994), the soft and hard managerialism are introduced. Soft managerialism seeks to provide higher education of quality at its lowest cost and is concentrated upon improving the efficiency of an institutional performance as it currently exists; where hard managerialism argues for the reshaping of higher education through the introduction of new management systems that then become a continuing force within higher education.

The soft approach operates at the institutional level where university administrators tend to promote the competition between organizational sub-units within universities. This argument runs that departments or schools in competition will maximize their efforts, so enhancing the performance of their faculty or group. Maximizing faculty performance in turn is seen as maximizing institutional performance.

According to my opinion, I would like to recommend six elements for administrators on education. They are vision, innovative initiation, proactive leader, opportunity advantage, redesign and rethink, and network and navigation.

- Vision: Administrators of the educational institutions need to understand the nature and power of education in order to predict or foresee the future of education and its environments. Administrators need to understand the strategic import of daily life, the connection between the smallest individual activity and the grandest external mandate, and the importance of moving decisions between one domain and another. The actions can be used to manage the change process and to effectively address the issues of excellence, quality, equity, and access that will inherently complicate the implementation of distance learning as the educational reform movements.

- ❖ Innovative initiation: As educational administrators begin to grapple with the issues of equity and access, technological expertise, quality of learning, financial constraints, and needs of remote learners in their efforts to implement distance learning technologies that need to be addressed is the facilitation of the change process. Administrators should initiate the innovation on both education and technology.
- ❖ Proactive leader: Education for strategic decision-making is recognizing as the strategic import of establishing and operating "big" strategic-decision operations. Administrators should have the resources to manage and to embrace the changes brought about by distance learning systems. The quick response and active administration of the proactive leader will bring to the success of distance learning system over the competitors.
- ❖ Opportunity advantage: Well-educated administrators need to understand the connections between institutions and their environments, need to know how to scan beyond the institutions walls and how, to take advantage of the prevailing winds or chaos. Crisis is opportunity advantage when administrators know how to mange and conquer.
- ❖ Redesign and rethink: Problem-finding is as important as problem-solving (Peterson, 1986). Finding the strategic potential in ordinary actions provides the opportunity to redesign the educational supports and the enactment of a vision or direction. The skills and tools of systems thinking and system dynamics can help us to do much better than ever. Therefore, redesign and rethink are the necessary factors to educational reform to distance learning system.
- ❖ Network and navigation: Educational strategy is about making connections. Interdependence also implies bridges between organizations and environments, between individuals and organizations. Administrators control access to bridges, gateways, networks, and other organizational structures. Ultimately, cyber-university is recommended for the future distance education. Cyber-university provides the education via electronic communication and multimedia of education. Cyber-university encourages the boundless knowledge and promotes mass learners.

APPENDIX D

RU Organization Chart and Records

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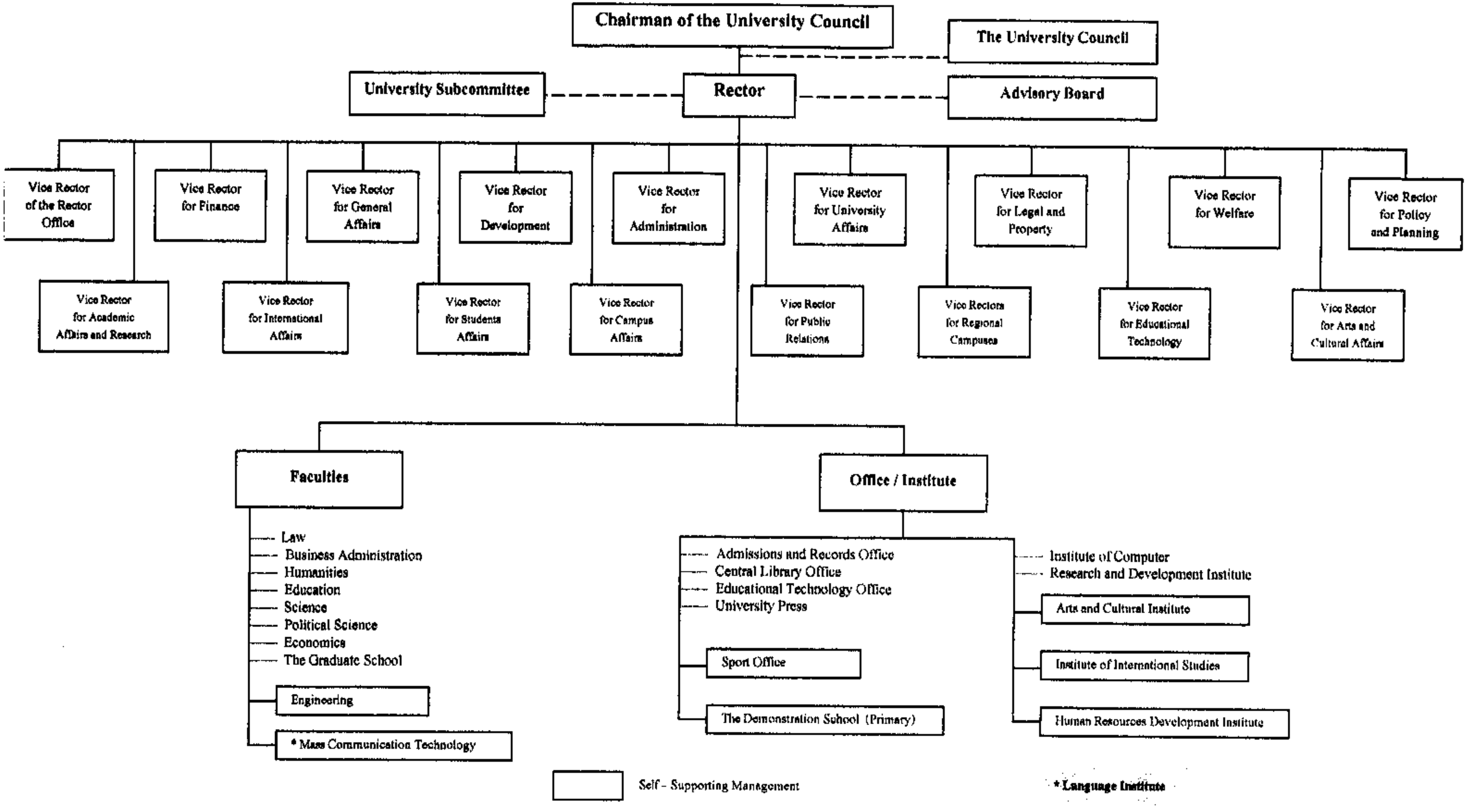
Organization Chart

RAMKHAMHAENG UNIVERSITY ADMINISTRATION CHART



stitutional Research Sub-division March 2001

RU

Main Campus

Main Campus : Numbers of Enrollment on Undergraduate studies 1987 - 1999

Year	Law	%	Business Admin.	%	Hu manities	%	Educa tion	%	Science	%	Political Science	%	Econom ics	%	Engin eering	Total
1987	24,849	27.52	29,637	32.82	5,498	6.09	4,644	5.14	8,984	9.95	12,989	14.38	3,697	4.09	-	90,298
1988	19,649	23.92	29,873	36.36	5,078	6.18	4,221	5.14	8,767	10.67	11,082	13.49	3,489	4.25	-	82,159
1989	14,909	20.58	27,846	38.43	4,589	6.33	3,364	4.64	7,203	9.94	11,216	15.48	3,334	4.60	-	72,461
1990	15,859	19.73	30,089	37.44	5,110	6.36	4,248	5.29	7,767	9.67	13,816	17.19	3,471	4.32	-	80,360
1991	13,929	17.47	29,912	37.51	5,121	6.42	4,242	5.32	6,658	8.35	16,208	20.32	3,682	4.62	-	79,752
1992	11,841	15.95	26,674	35.93	7,839	10.56	3,257	4.39	5,943	8.01	15,416	20.77	3,267	4.40	-	74,237
1993	12,131	15.74	26,627	34.55	8,535	11.07	3,648	4.73	5,725	7.43	17,582	22.81	2,821	3.66	-	77,069
1994	12,996	17.50	24,406	32.86	8,680	11.69	3,621	4.88	5,159	6.95	16,693	22.48	2,716	3.66	-	74,271
1995	13,788	17.96	24,028	31.30	9,543	12.43	3,761	4.90	5,060	6.59	17,663	23.01	2,923	3.81	-	76,766
1996	14,486	16.73	27,341	31.57	11,864	13.70	3,796	4.38	5,668	6.55	20,324	23.47	3,118	3.60	-	86,597
1997	15,186	16.51	27,278	29.65	12,770	13.88	3,562	3.87	6,267	6.81	23,539	25.59	3,139	3.41	255	91,996
1998	20,786	18.43	28,789	25.52	16,959	15.03	5,215	4.62	7,474	6.63	29,906	26.51	3,415	3.03	268	112,812
1999	22,851	20.00	25,613	22.41	17,682	15.47	5,286	4.63	6,290	5.50	33,582	29.39	2,715	2.38	253	114,272
Total	190,409		332,500		101,586		47,579		80,675		206,434		39,072		523	908,778

Table D-1 Main Campus : Numbers of Enrollment on Undergraduate studies 1987 - 1999

Main Campus : Numbers of Enrollment on Undergraduate studies 1987 - 1999

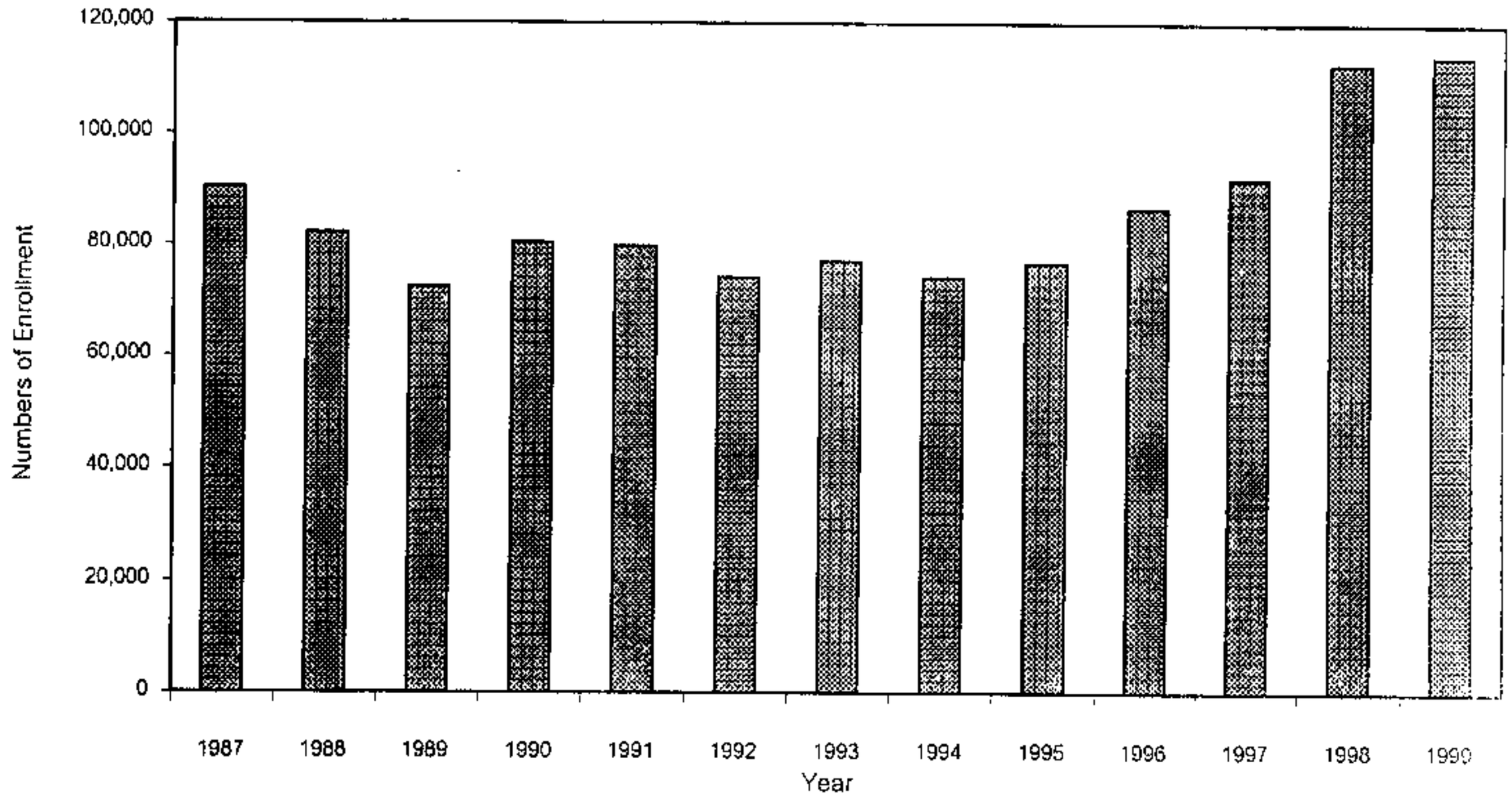


Figure D-1 Main Campus : Numbers of Enrollment on Undergraduate studies 1987 - 1999

Main Campus : Numbers of Graduates on Undergraduate studies 1987 - 1998

Year	Law	Business Admin.	Humanities	Education	Science	Political Science	Economics	Engineering	Total
1987	4,197	5,074	2,130	1,614	433	5,216	1,427	-	20,091
1988	3,651	5,034	1,731	1,644	360	4,845	1,214	-	18,479
1989	3,428	6,316	1,704	1,478	417	4,280	1,114	-	18,737
1990	2,559	5,808	1,377	1,044	598	3,175	891	-	15,452
1991	2,720	7,250	1,512	1,047	632	3,359	1,017	-	17,537
1992	2,754	6,565	1,255	888	645	3,560	943	-	16,610
1993	2,415	6,357	1,428	855	681	3,931	963	-	16,630
1994	2,483	6,268	1,694	799	870	5,063	912	-	18,089
1995	2,200	6,088	2,275	755	855	5,127	993	-	18,293
1996	1,946	5,662	2,618	571	718	4,815	874	-	17,204
1997	3,058	5,024	2,726	580	779	5,222	731	-	18,120
1998	1,835	5,201	3,230	558	553	6,244	926	-	18,547
Total	33,246	70,647	23,680	11,833	7,541	54,837	12,005	-	213,789

Table D-2 Main Campus : Numbers of Graduates on Undergraduate studies 1987 - 1998

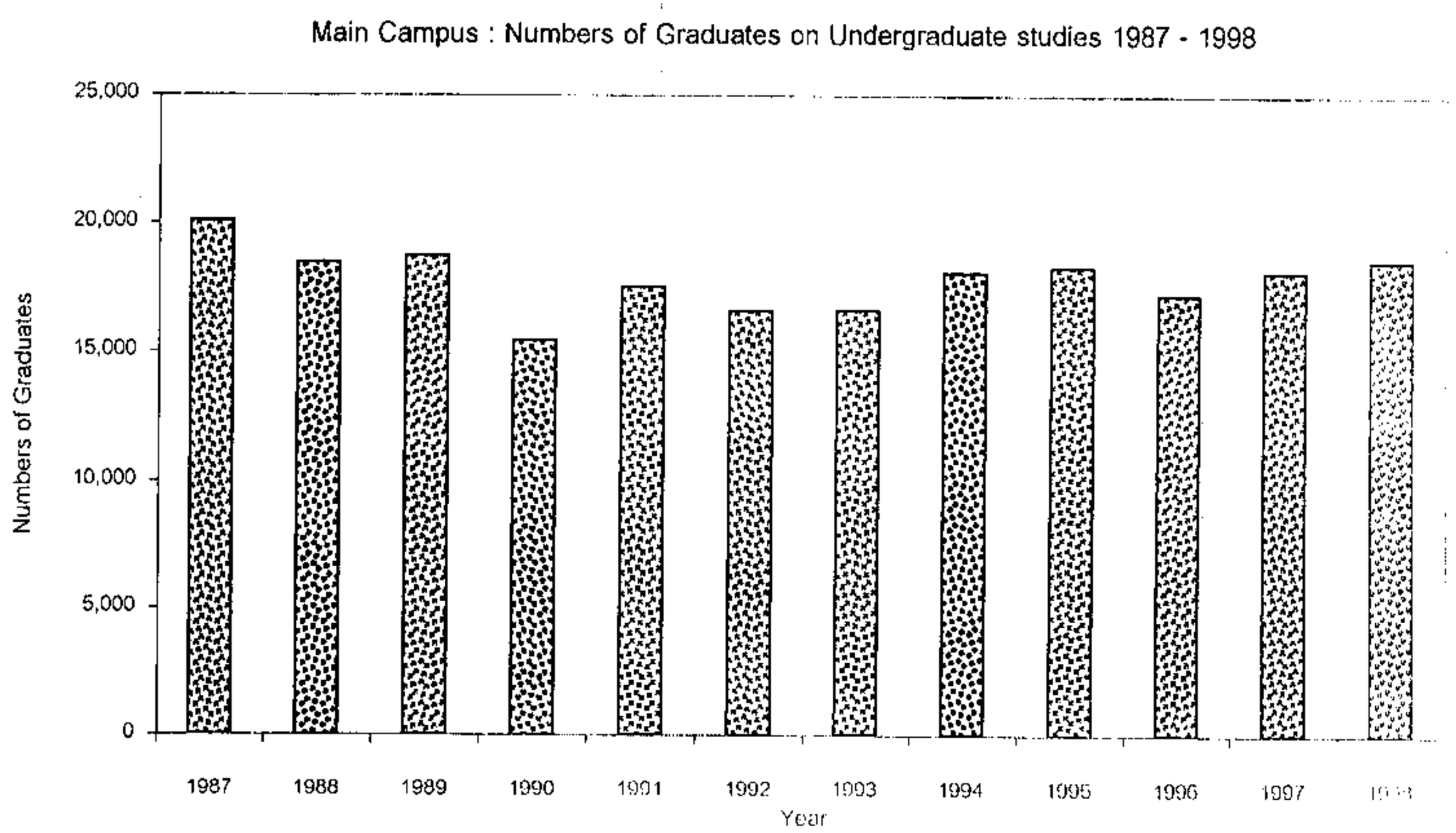
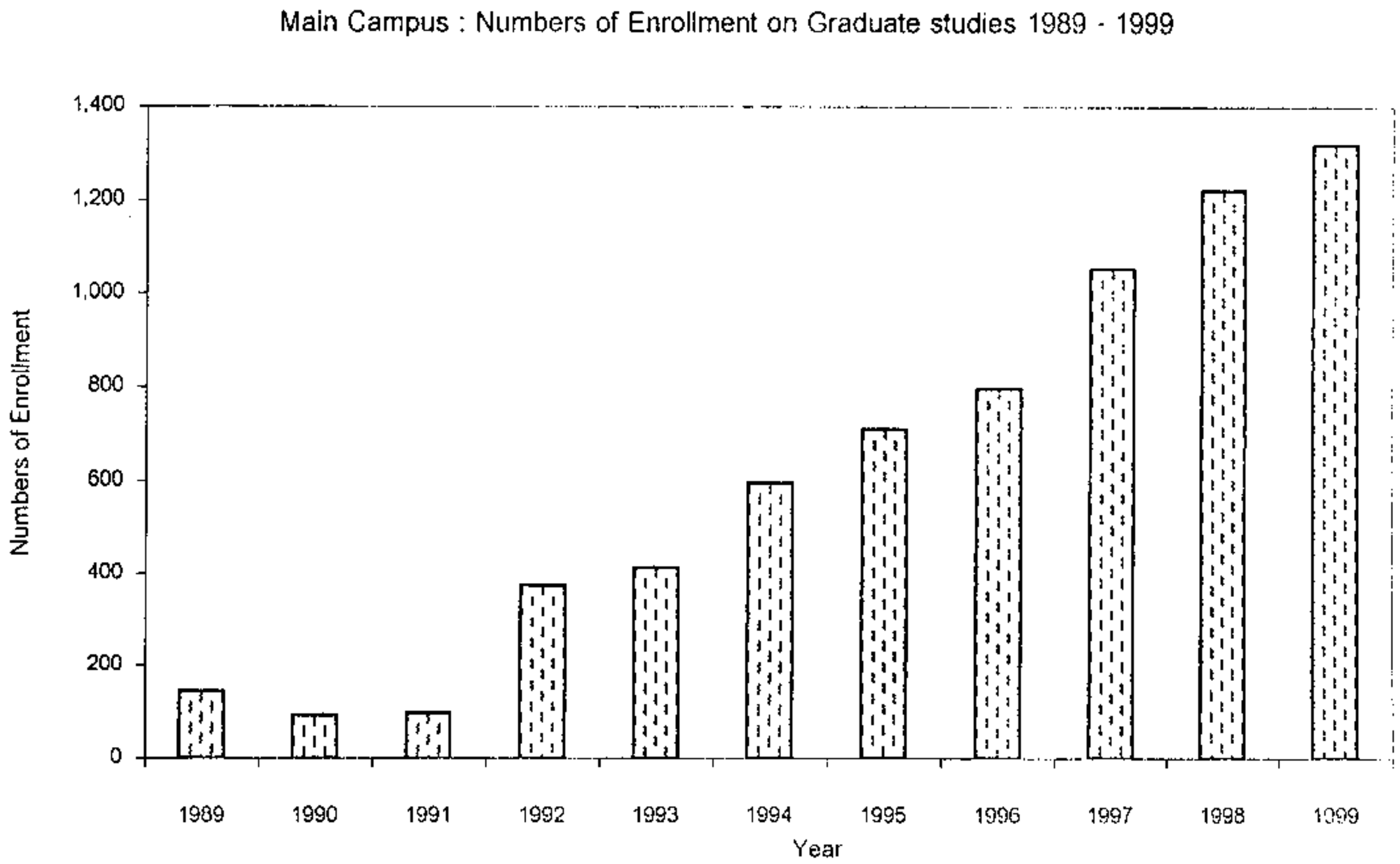


Figure D-2 Main Campus : Numbers of Graduates on Undergraduate studies 1987 - 1998

Main Campus : Numbers of Enrollment on Graduate studies 1989 - 1999

Year	Law	Business Admin.	Humanities	Education	Science	Political Science	Economics	Total
1989	-	-	-	10	10	80	44	144
1990	-	-	-	8	4	41	40	93
1991	-	-	-	9	9	40	39	97
1992	118	80	24	64	8	40	40	374
1993	122	95	23	83	8	44	37	412
1994	120	106	60	164	7	91	47	595
1995	125	121	127	180	9	102	46	710
1996	112	150	107	232	17	125	53	796
1997	154	200	109	288	14	205	83	1,053
1998	143	261	111	355	12	247	93	1,222
1999	171	243	126	411	22	285	61	1,319
Total	894	1,013	561	1,393	98	1,015	522	5,496

Table D-3 Main Campus : Numbers of Enrollment on Graduate studies 1989 - 1999



Fugure D-3 Main Campus : Numbers of Enrollment on Graduate studies 1989 - 1999

Main Campus : Numbers of Graduates on Graduate studies 1990 - 1998

Year	Law	Business Admin.	Humanities	Education	Science	Political Science	Economics	Total
1990	-	-	-	-	-	1	-	1
1991	-	-	-	3	-	2	1	6
1992	-	-	-	6	4	14	5	29
1993	4	1	-	5	6	29	8	53
1994	24	73	-	20	4	42	21	184
1995	13	87	3	67	1	44	30	245
1996	66	67	20	107	1	51	35	347
1997	24	125	41	151	4	66	27	438
1998	76	197	47	193	4	136	31	684
Total	207	550	111	543	20	368	152	1,951

Table D-4 Main Campus : Numbers of Graduates on Graduate studies 1990 - 1998

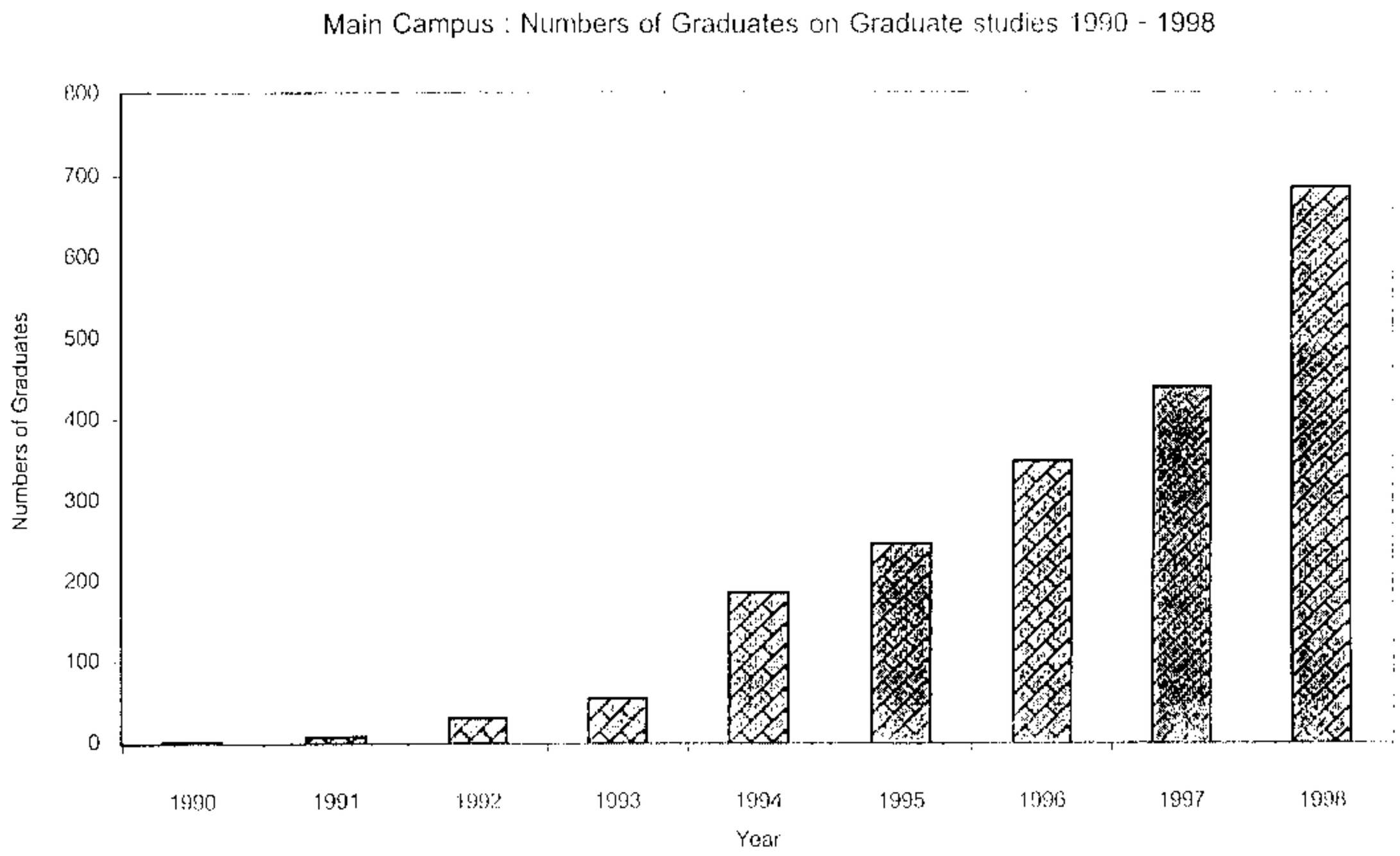


Figure D-4 Main Campus : Numbers of Graduates on Graduate studies 1990 - 1998

RU

Regional Campus

Regional Campus : Numbers of Enrollment on Undergraduate studies 1995 - 1999

Regional Center	Year					Total
	1995	1996	1997	1998	1999	
Nakhon Si Thamarat	1,049	865	951	1,817	1,219	5,901
Uthai Tani	274	210	171	315	378	1,348
Prachin Buri	395	185	211	237	334	1,362
Phrae	-	201	145	500	437	1,283
Amnad Chareon	-	241	94	359	431	1,125
Nakhon Phanom	-	240	245	234	294	1,013
Khon Kaen	-	-	-	-	746	746
Srisaket	-	-	-	-	375	375
Sukhothai	-	-	-	-	413	413
Trang	-	-	-	-	568	568
Total	1,718	1,942	1,817	3,462	5,195	14,134

Table D-5 Regional Campus : Numbers of Enrollment on Undergraduate studies 1995 - 1999

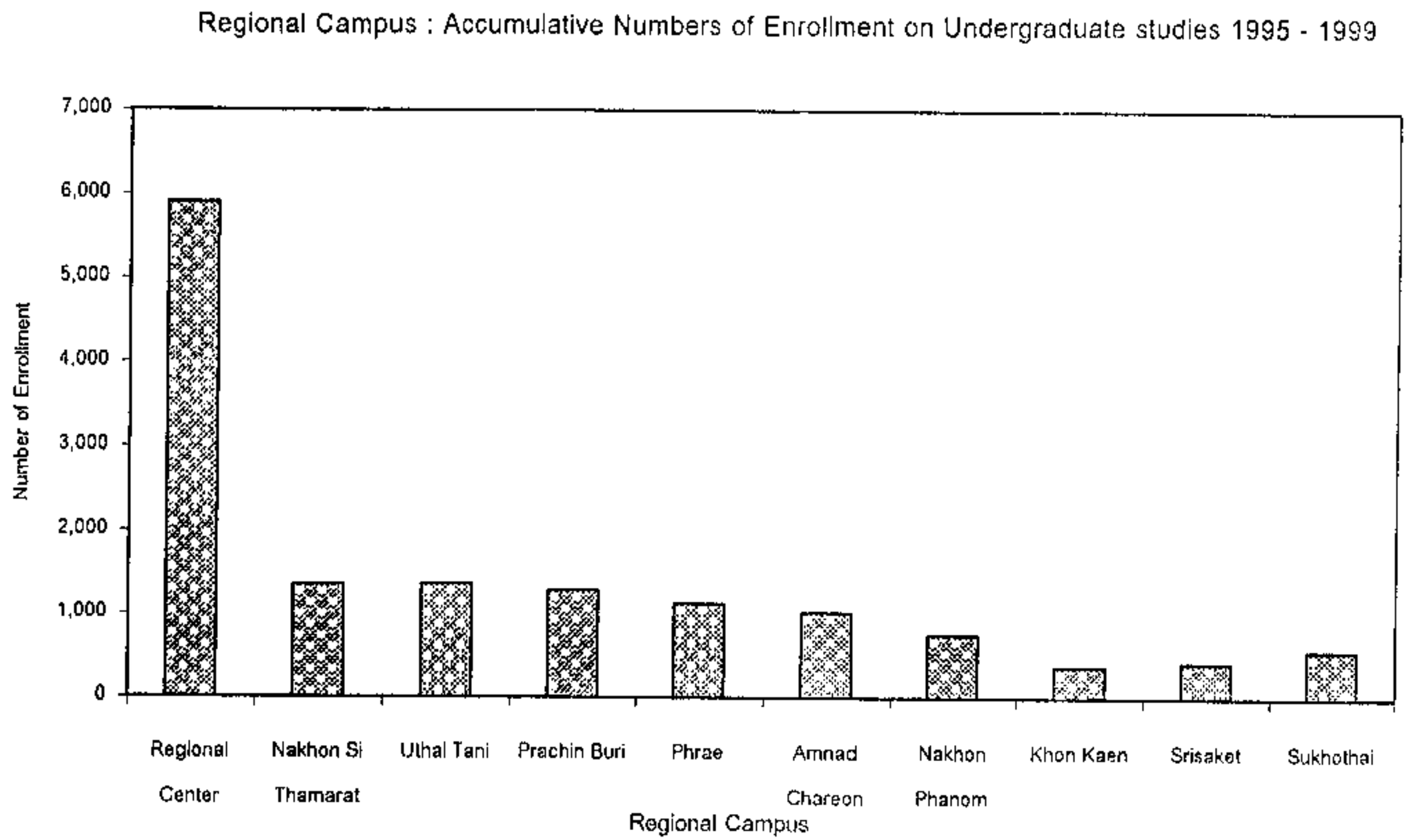


Figure D-5 Regional Campus : Accumulative Numbers of Enrollment on Undergraduate studies 1995 - 1999

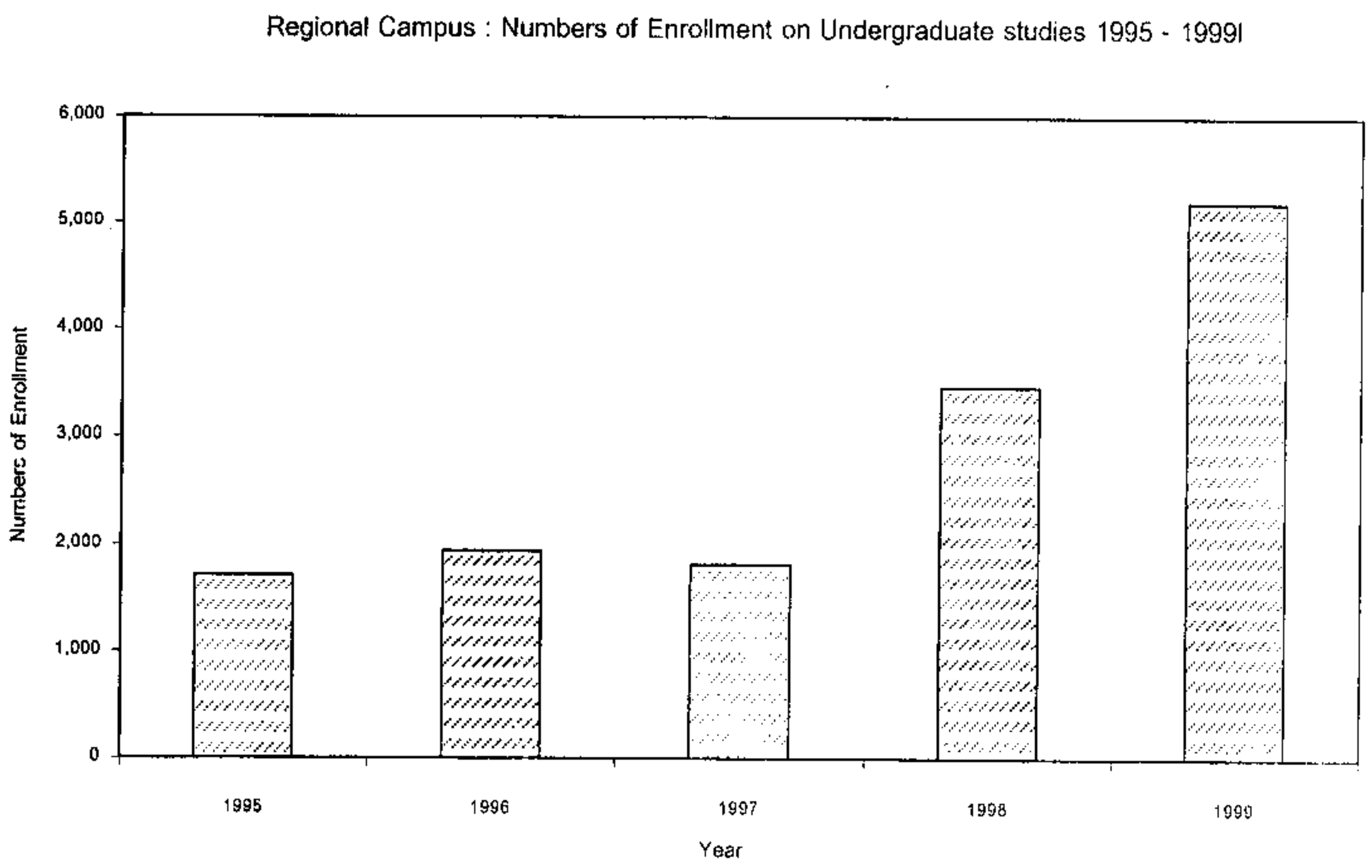


Figure D-5.1 Regional Campus : Numbers of Enrollment on Undergraduate studies 1995 - 1999

Regional Campus : Numbers of Enrollment on Graduate studies 1996 - 1999

Regional Center	Year				Total
	1996	1997	1998	1999	
Nakhon Si Thamarat	297	291	337	371	1,296
Uthai Tani	264	269	300	316	1,149
Prachinburi	298	-	328	329	955
Amnad Chareon	216	257	203	-	676
RAM2	-	295	316	333	944
Phrae	-	-	203	-	203
Nakhon Phanom	-	-	165	-	165
Nakhon Ratchasima	-	-	292	330	622
Khon Kaen	-	-	-	233	233
Srisaket	-	-	-	343	343
Sukhothai	-	-	-	270	270
Total	1,075	1,112	2,144	2,525	6,856

Table D-6 Regional Campus : Numbers of Enrollment on Graduate studies 1996 - 1999

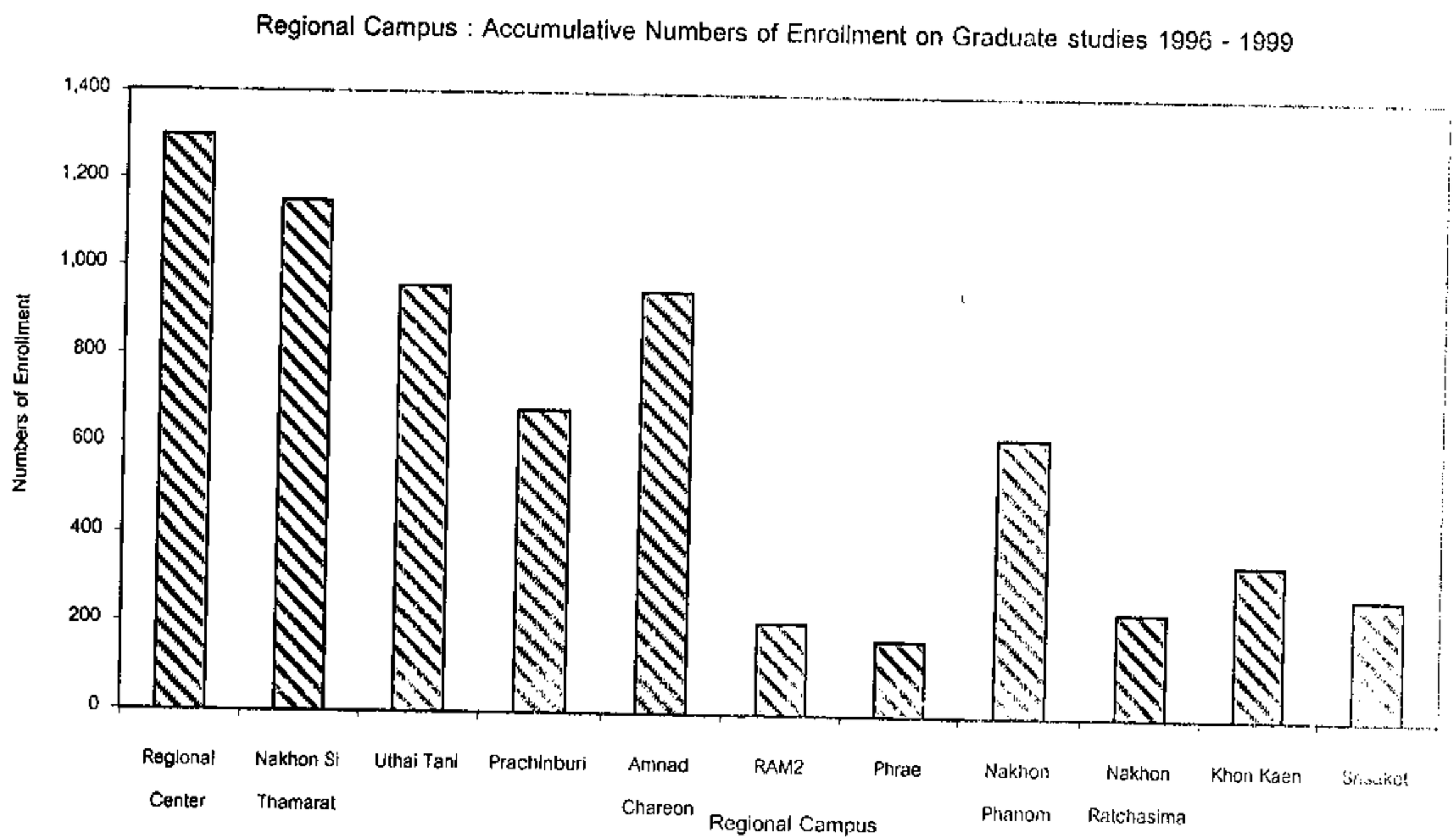


Figure D-6 Regional Campus : Accumulative Numbers of Enrollment on Graduate studies 1996 - 1999

Regional Campus : Numbers of Enrollment on Graduate studies 1996 - 1999

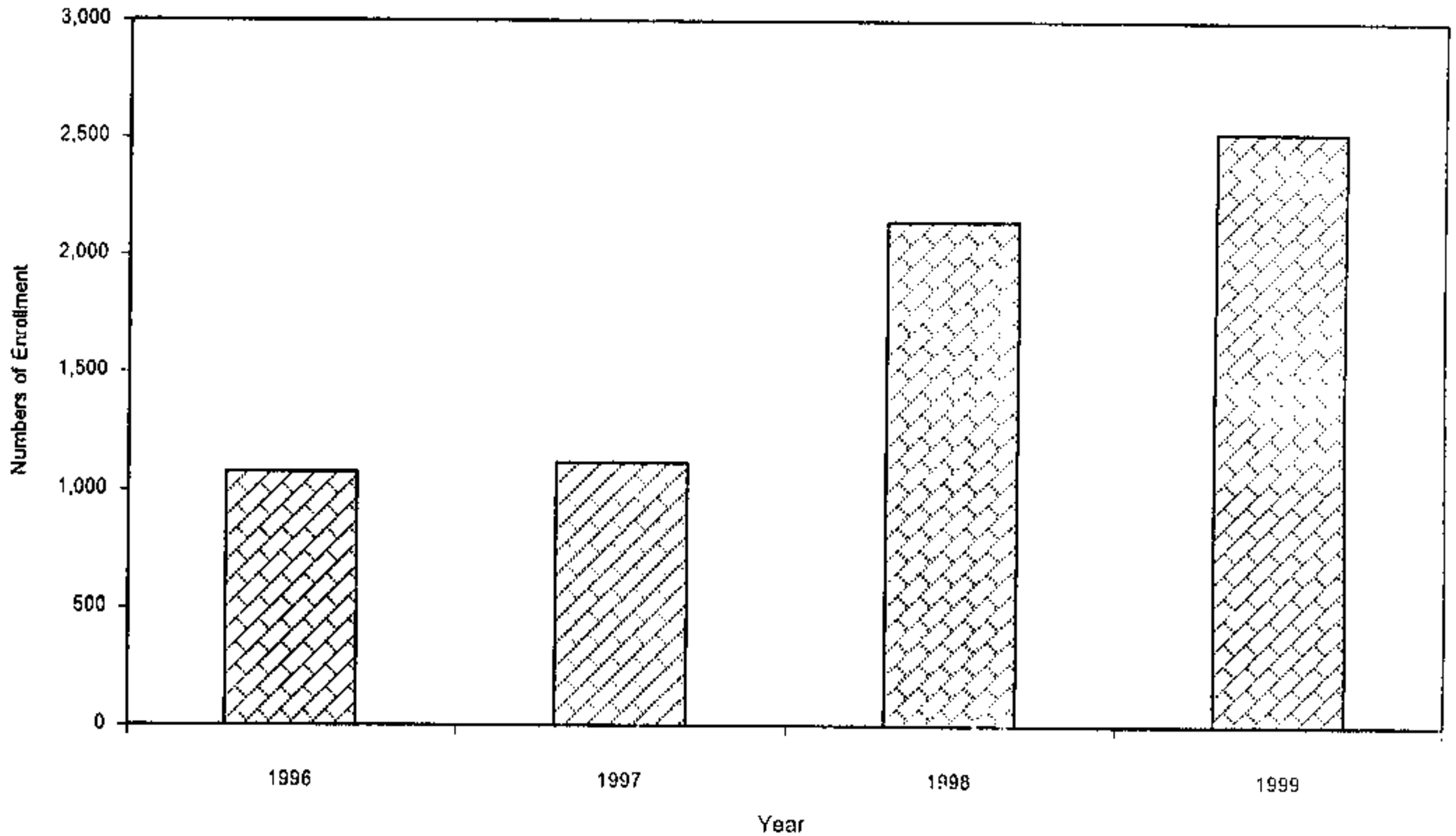


Figure D-6.1 Regional Campus : Numbers of Enrollment on Graduate studies 1996 - 1999

RU

Personnel Records

Ramkhamhaeng University Personnel

Faculty/Office	Lecturers			Academic Assistants			Clerical Staff			Full-time Employees			Grand Total		
	Govt. Budget	RU Budget	Total	Govt. Budget	RU Budget	Total	Govt. Budget	RU Budget	Total	Govt. Budget	RU Budget	Total	Govt. Budget	RU Budget	Total
Law	79	-	79	15	28	43	32	33	65	39	11	50	165	72	237
Business Admin.	79	-	79	13	11	24	31	17	48	17	9	26	140	37	177
Humanities	152	-	152	10	9	19	23	13	36	21	5	26	206	27	233
Education	249	6	255	6	9	15	35	8	43	55	10	65	345	33	378
Science	174	-	174	18	5	23	50	40	90	48	6	54	290	51	341
Political Science	50	-	50	13	8	21	17	19	36	22	3	25	102	30	132
Economics	59	-	59	10	8	18	22	23	45	21	1	22	112	32	144
Rector's Office	-	-	-	109	35	144	238	202	440	362	208	570	709	445	1,154
Admission and Records	-	-	-	66	52	118	69	33	102	23	5	28	158	90	248
Central Library	-	-	-	106	18	124	47	44	91	35	6	41	188	68	256

Table D-7 Ramkhamhaeng University Personnel

Ramkhamhaeng University Personnel

Faculty/Office	Lecturers			Academic Assistants			Clerical Staff			Full-time Employees			Grand Total		
	Govt. Budget	RU Budget	Total	Govt. Budget	RU Budget	Total	Govt. Budget	RU Budget	Total	Govt. Budget	RU Budget	Total	Govt. Budget	RU Budget	Total
Educational Technology	-	-	-	64	-	64	70	21	91	5	2	7	139	23	162
RU Press	-	-	-	10	6	16	28	93	121	7	42	49	45	141	186
RU Computer Center	-	-	-	27	1	28	19	4	23	1	1	2	47	6	53
Graduate School	-	-	-	9	2	11	6	2	8	-	2	2	15	6	21
Research ana Development	-	-	-	4	2	6	3	1	4	-	-	-	7	3	10
Grand Total	842	6	848	480	194	674	690	553	1,243	656	311	967	2,668	1,064	3,732

Table D-7 (Continued) Ramkhamhaeng University Personnel

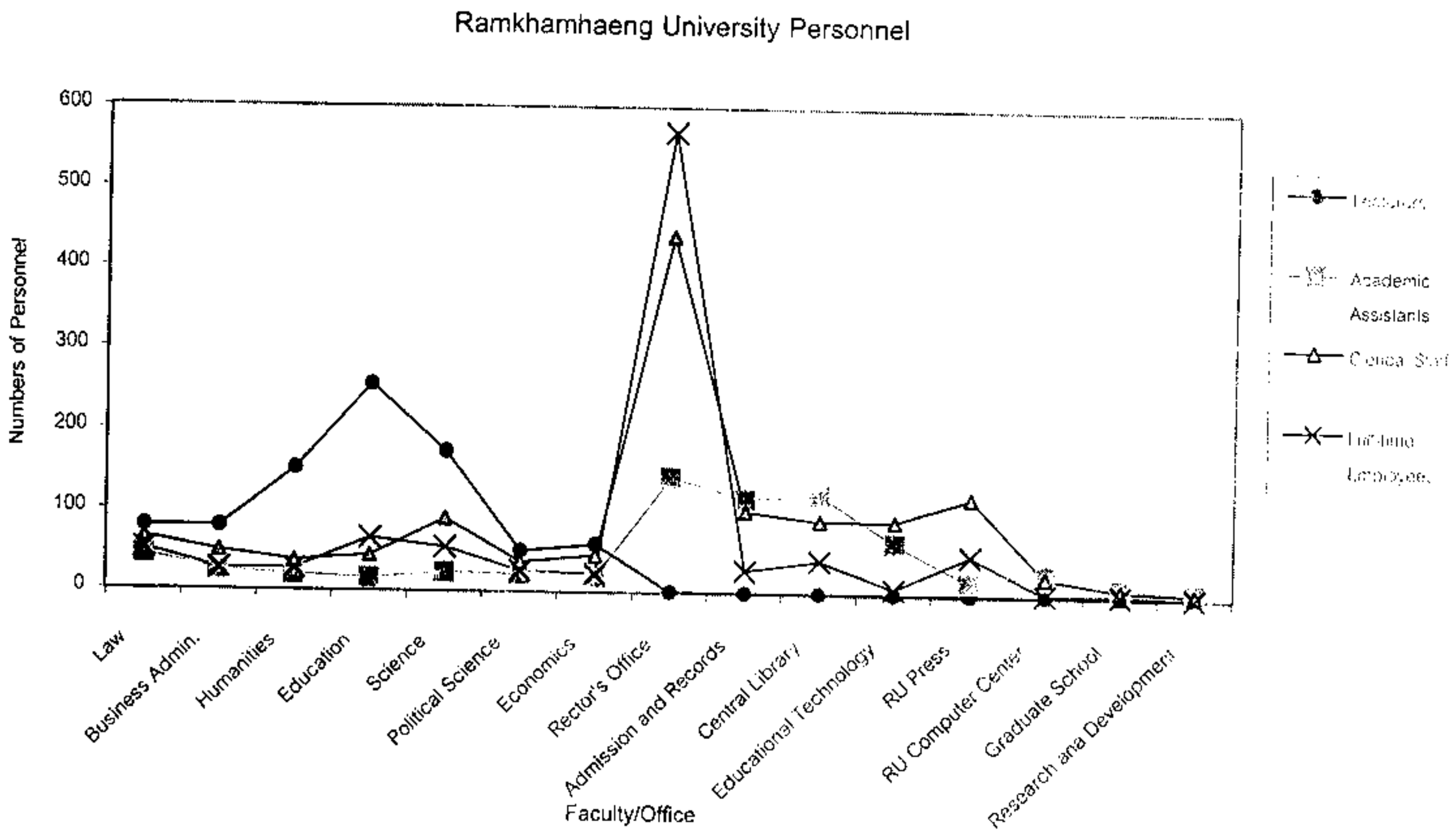


Figure D-7 Ramkhamhaeng University Personnel

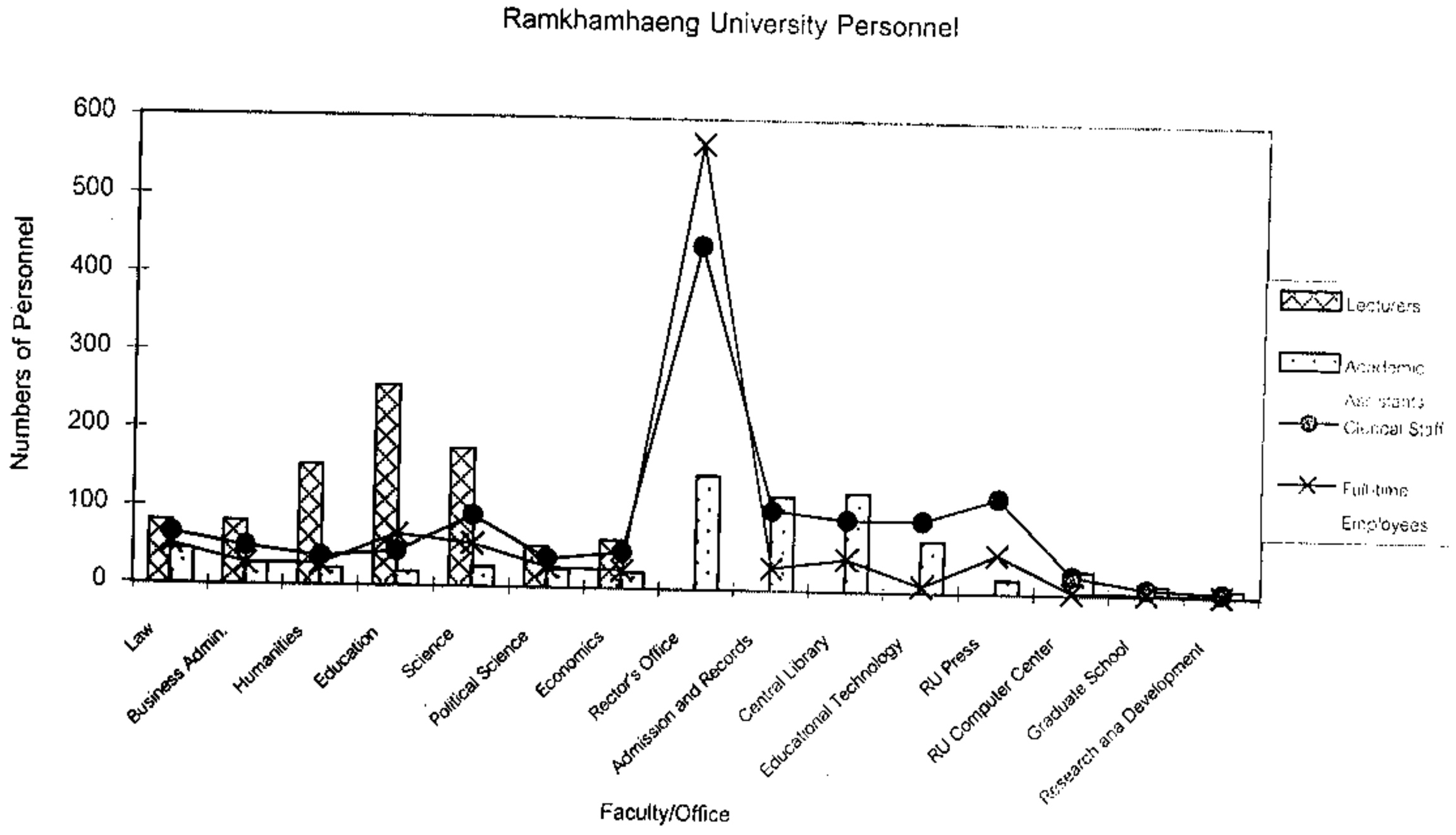


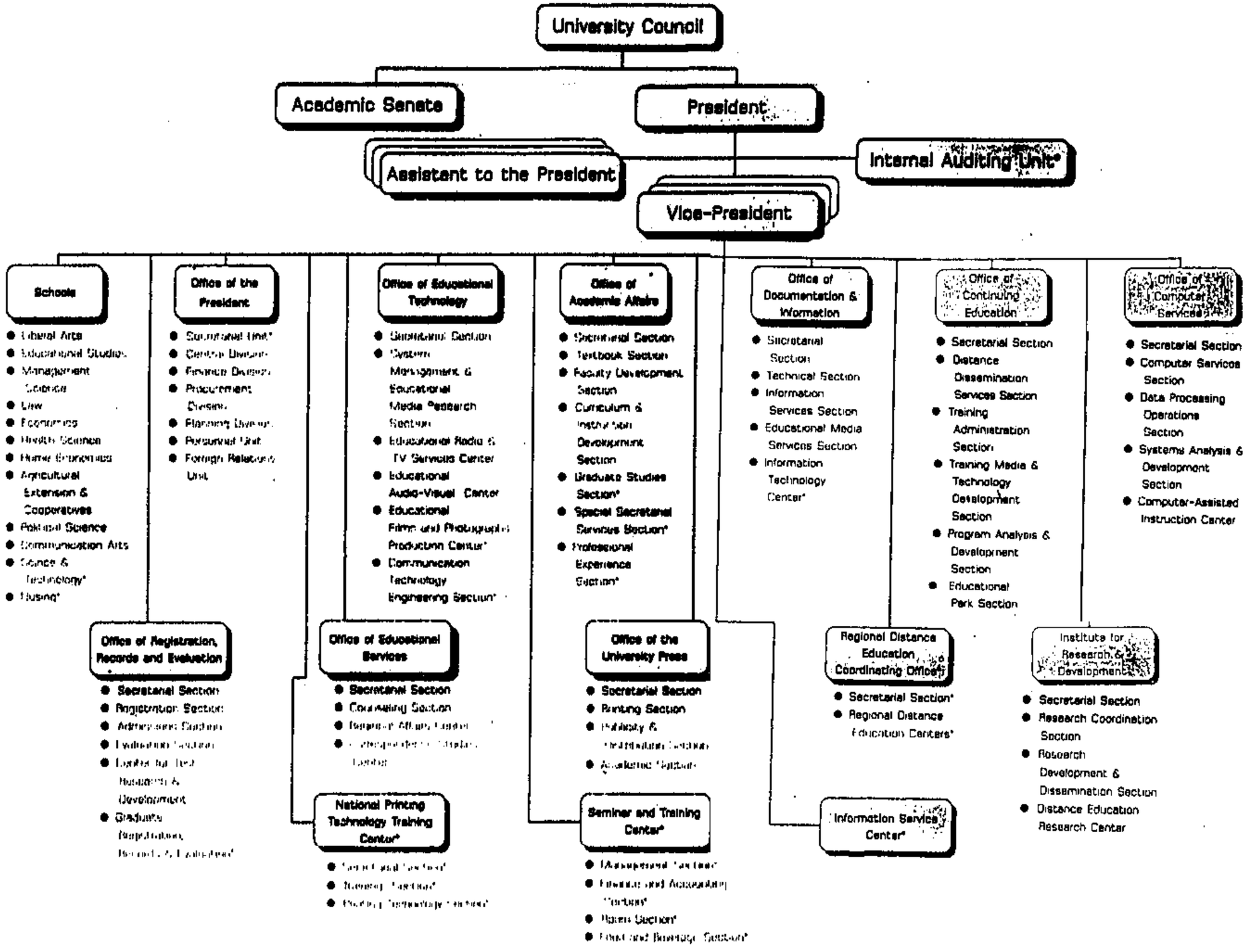
Figure D-7 Ramkhamhaeng University Personnel

APPENDIX E

STOU Organization Chart and Records

STOU

Organization Chart



Note: * Established as an internal administrative unit

STOU

Main Campus

Year	Liberal Arts	%	Education	%	Management Science	%	Laws	%	Health Science	%	Economics	%
1981			73,605	91.54	6,805	8.463						
1982			9,813	14.21	16,225	23.499	29,827	43.20	3,985	5.77	1,553	2.25
1983			11,514	24.55	10,864	23.164	12,549	26.76	2,061	4.39	1,932	4.12
1984			19,720	23.57	23,351	27.915	18,589	22.22	4,401	5.26	2,786	3.33
1985			15,346	19.18	25,024	31.284	16,053	20.07	4,359	5.45	1,962	2.45
1986			8,856	14.36	21,499	34.852	12,021	19.49	4,444	7.20	1,425	2.31
1987			6,489	13.38	16,056	33.102	9,669	19.93	4,444	9.16	1,124	2.32
1988			5,604	11.34	16,863	34.122	9,982	20.20	5,629	11.39	1,066	2.16
1989	570	1.10	4,733	9.10	19,711	37.878	10,420	20.02	5,571	10.71	1,107	2.13
1990	793	1.23	4,829	7.49	25,808	40.027	13,438	20.84	4,825	7.48	1,686	2.61
1991	963	1.32	4,513	6.17	29,480	40.325	14,176	19.39	5,295	7.24	1,873	2.56
1992	1,110	1.29	5,290	6.16	34,885	40.645	17,076	19.90	7,212	8.40	2,351	2.74
1993	1,976	2.41	4,771	5.81	32,688	39.798	17,686	21.53	6,679	8.13	2,245	2.73
1994	2,226	2.34	7,359	7.74	38,767	40.791	19,990	21.03	6,033	6.35	2,583	2.72
1995	2,581	2.50	6,334	6.14	41,000	39.756	23,653	22.94	6,620	6.42	2,966	2.88
1996	3,041	3.14	5,068	5.24	40,546	41.894	20,282	20.96	6,799	7.02	2,535	2.62
1997	2,854	3.14	3,836	4.22	38,339	42.153	18,508	20.35	5,896	6.48	2,521	2.77
1998	2,628	2.98	4,211	4.78	33,144	37.606	19,673	22.32	5,759	6.53	2,741	3.11
1999	2,816	3.19	5,667	6.41	33,085	37.449	19,113	21.63	5,012	5.67	2,123	2.40
2000	2,906	3.03	9,938	10.35	32,385	33.730	19,363	20.17	4,693	4.89	1,970	2.05
	24,464		217,496		536,525		322,068		99,717		38,549	

STOU: Numbers of Enrollment on Undergraduate Studies 1981 - 2000

Year	Home Economics	%	Political Science	%	Agricultural Ext & Coop	%	Communication Arts	%	Science and Techonolgy	%	Total
1981											80,410
1982	2,287	3.31			5,356	7.76					69,046
1983	2,353	5.02	3,731	7.96	1,896	4.04					46,900
1984	3,006	3.59	4,688	5.60	3,006	3.59	4,102	4.90			83,649
1985	4,045	5.06	4,383	5.48	3,097	3.87	5,721	7.15			79,990
1986	2,830	4.59	3,695	5.99	2,248	3.64	4,669	7.57			61,687
1987	2,137	4.41	2,832	5.84	1,855	3.82	3,899	8.04			48,505
1988	1,704	3.45	2,608	5.28	2,248	4.55	3,716	7.52			49,420
1989	1,477	2.84	2,821	5.42	1,859	3.57	3,769	7.24			52,038
1990	1,756	2.72	3,999	6.20	2,557	3.97	4,785	7.42			64,476
1991	1,835	2.51	5,223	7.14	4,424	6.05	5,324	7.28			73,106
1992	1,771	2.06	6,579	7.67	3,421	3.99	6,133	7.15			85,828
1993	1,667	2.03	6,435	7.83	3,059	3.72	4,929	6.00			82,135
1994	1,901	2.00	7,643	8.04	3,415	3.59	5,122	5.39			95,039
1995	2,481	2.41	8,386	8.13	3,676	3.56	4,956	4.81	477	0.46	103,130
1996	1,992	2.06	7,835	8.10	3,315	3.43	4,822	4.98	548	0.57	96,783
1997	1,692	1.86	9,491	10.44	2,828	3.11	4,457	4.90	531	0.58	90,953
1998	1,758	1.99	10,278	11.66	3,042	3.45	3,320	3.77	481	1.79	88,135
1999	1,836	2.08	10,392	11.76	3,525	3.99	3,049	3.45	1,581	1.96	88,347
2000	2,009	2.09	10,104	10.52	4,329	4.51	2,969	3.09	1,729	5.57	96,013
	40,537		111,123		59,156		75,742		5,347		1,535,590

STOU : Numbers of Enrollment on Undergraduate Studies 1981 - 2000

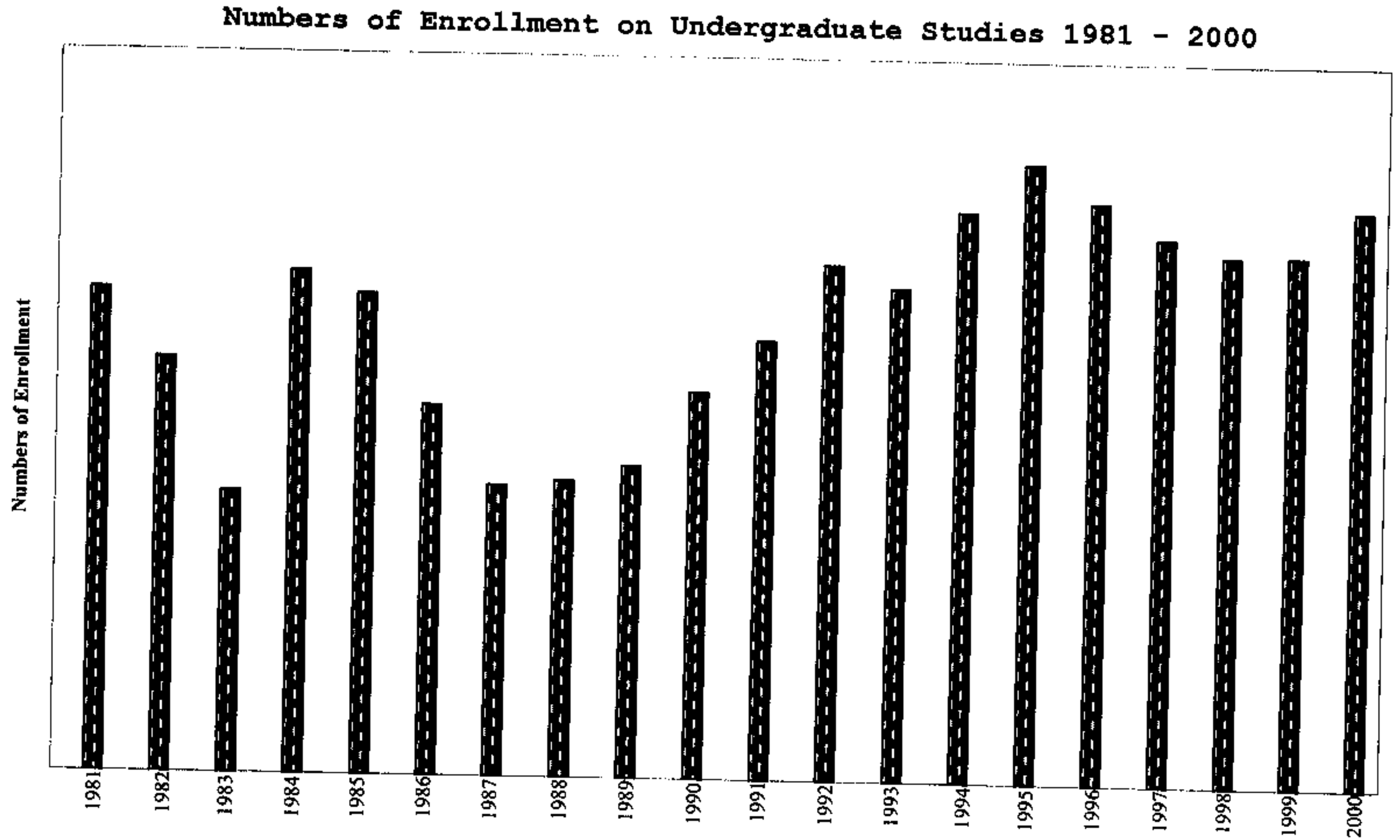


Figure E-1 STOU : Numbers of Enrollment on Undergraduate Studies 1981 - 2000

Year	Liberal Arts	%	Educational Studies	%	Management Science	%	Laws	%	Health Science	%	Economics	%
1982			8,217	85.65	1,377	14.35						
1983			14,528	84.28	1,956	11.35						
1984			7,743	67.41	1,906	16.59	572	4.98	83	0.72		
1985			6,954	59.08	1,831	15.56	1,033	8.78	695	5.90	51	0.43
1986			6,526	49.50	2,328	17.66	1,672	12.68	887	6.73	88	0.67
1987			6,697	44.58	3,281	21.84	1,671	11.12	1,174	7.82	130	0.87
1988			5,438	36.71	3,505	23.66	1,807	12.20	1,531	10.34	129	0.87
1989			4,815	34.65	3,369	24.25	1,584	11.40	1,535	11.05	111	0.80
1990	70	0.63	2,982	26.90	2,654	23.94	1,468	13.24	1,744	15.73	119	1.07
1991	126	1.10	2,647	23.05	2,731	23.79	1,693	14.74	2,021	17.60	134	1.17
1992	147	1.19	2,394	19.35	3,216	25.99	1,682	13.59	2,387	19.29	163	1.32
1993	197	1.59	2,213	17.85	3,199	25.81	1,824	14.71	2,432	19.62	177	1.43
1994	198	1.57	2,130	16.84	3,486	27.56	1,944	15.37	2,348	18.56	162	1.28
1995	219	1.78	2,217	18.00	3,386	27.49	1,798	14.60	1,929	15.66	189	1.53
1996	235	1.82	1,844	14.30	3,816	29.60	2,204	17.10	2,021	15.68	230	1.78
1997	323	2.54	1,514	11.88	3,832	30.08	2,372	18.62	1,903	14.94	198	1.55
1998	321	2.66	1,242	10.29	3,918	32.47	2,065	17.11	1,852	15.35	217	1.80
1999	273	2.44	1,056	9.45	3,818	34.17	1,943	17.39	1,566	14.02	204	1.83
	2,109		81,157		53,609		27,332		26,108		2,302	

STOU : Numbers of Graduates on Undergraduate studies 1982 - 1999

Year	Home Economics	%	Political Science	%	Agricultural Ext & Coop	%	Communication Arts	%	Science and Techonolgy	%	Total
1982											9,594
1983	250	1.45			503	2.92					17,237
1984	539	4.69			644	5.61					11,487
1985	536	4.55			671	5.70					11,771
1986	490	3.72	222	1.68	972	7.37					13,185
1987	602	4.01	354	2.36	900	5.99	212	1.41			15,021
1988	667	4.50	345	2.33	929	6.27	461	3.11			14,812
1989	645	4.64	464	3.34	859	6.18	513	3.69			13,895
1990	383	3.46	477	4.30	581	5.24	607	5.48			11,085
1991	343	2.99	502	4.37	586	5.10	699	6.09			11,482
1992	299	2.42	587	4.74	925	7.48	573	4.63			12,373
1993	241	1.94	592	4.78	940	7.58	581	4.69			12,396
1994	272	2.15	730	5.77	783	6.19	598	4.73			12,651
1995	299	2.43	917	7.44	749	6.08	614	4.98			12,317
1996	254	1.97	996	7.73	741	5.75	550	4.27			12,891
1997	278	2.18	1,102	8.65	709	5.57	502	3.94	6	0.05	12,739
1998	238	1.97	1,188	9.84	551	4.57	465	3.85	11	0.09	12,068
1999	193	1.73	1,161	10.39	511	4.57	423	3.79	25	0.22	11,173
	6,529		9,637		12,554		6,798		42		228,177

STOU : Numbers of Graduates on Undergraduate studies 1982 - 1999

STOU : Numbers of Graduates on Undergraduate studies 1982 - 1999

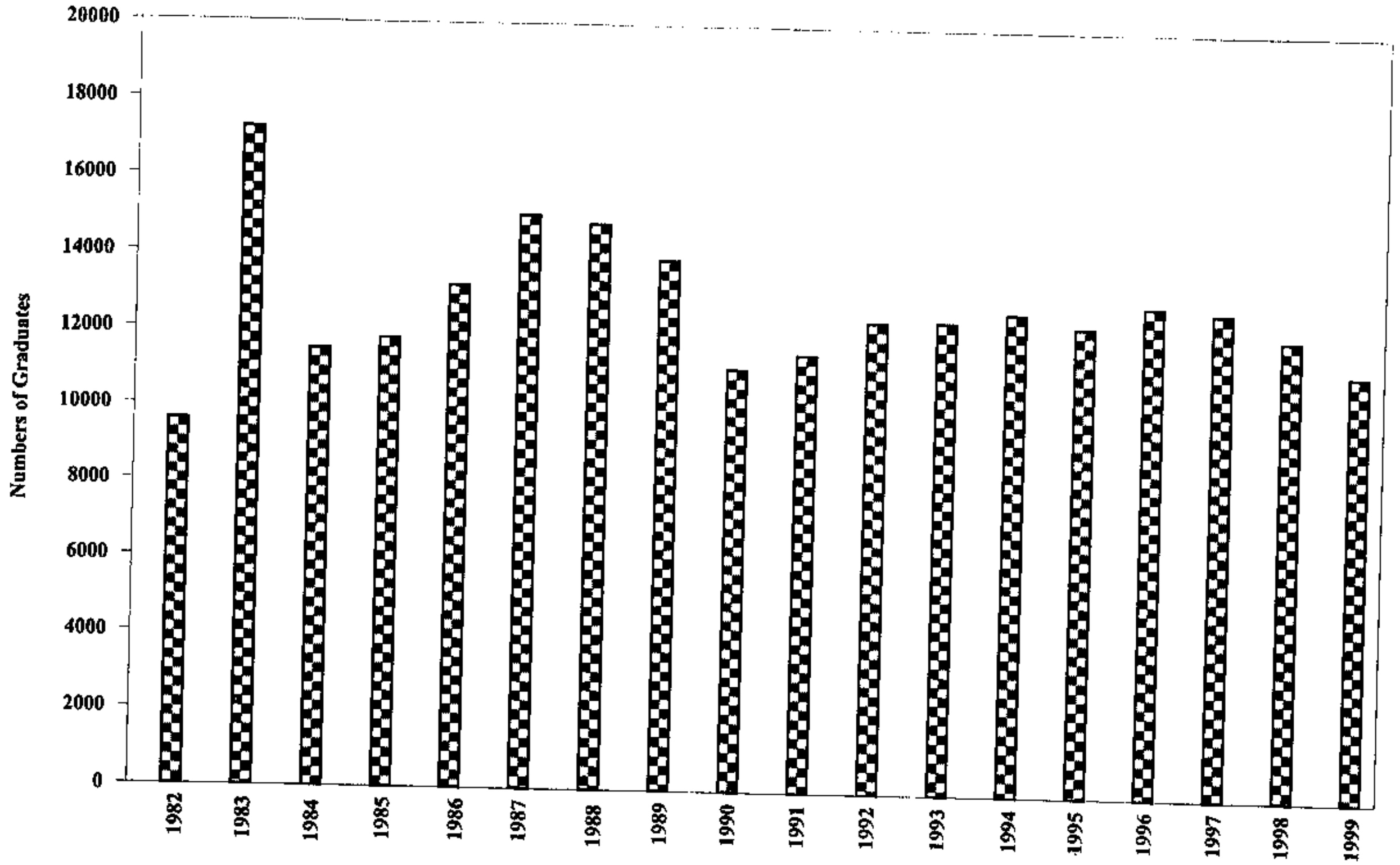
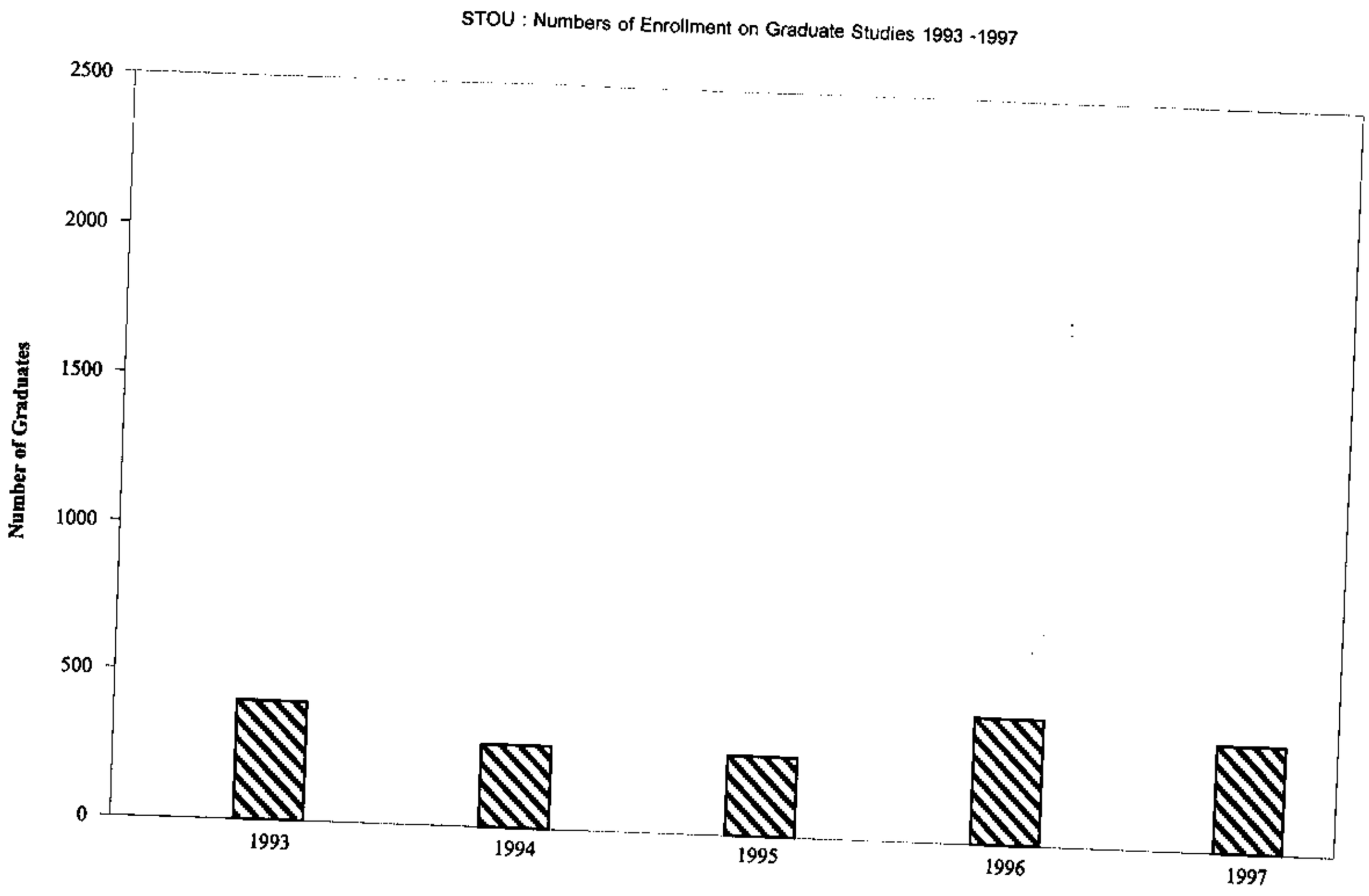


Figure E-2 STOU : Numbers of Graduate on Undergraduate Studies 1982 - 1999

Year	Education	%	Management Science	%	Health Science	%	Economics	%	Agricultural Ext & Coop	%	Total
1993	399	100.00									399
1994	277	100.00									277
1995	268	100.00									268
1996	320	75.29					105	24.71			425
1997			166	46.11	114	31.67			80	22.22	360
	1,264		166		114		105		80		1,729

STOU : Numbers of Enrollment on Graduate Studies 1993 -1997



Fugure E-3 STOU : Numbers of Enrollment on Graduate studies 1983 - 1997

Year	Teaching & Curriculum	%	Educational Administration	%	Educational Technology & Media	%	Total
1994	2	28.57	4	57.14	1	14.29	7
1995	53	48.18	36	32.73	21	19.09	110
1996	18	56.25	8	25.00	6	18.75	32
1997	44	52.38	26	30.95	14	16.67	84
1998	25	45.45	16	29.09	14	25.45	55
1999	16	41.03	17	43.59	6	15.38	39
	158		107		62		327

STOU : Numbers of Graduates on Graduate studies 1994 - 1999

STOU

Personnel Records

Sukhothai Thammathirat Open University Personnel

Civil Officers		1,274
	Lecturer	375
	Academic Assistants	331
	Clerical Staff	565
Full-time Employees		565
	Govt. Budget	176
	STOU. Budget	292
	Specail Budget	97

APPENDIX A

Questionnaires

Pre-test

Pre-Test Questionnaire

at

"International Consortium on Inter-University Exchange and Cooperation in the 21st Century"

University of Yunnan

Kunming, China

(May 25-29, 1999)

Questionnaire

This questionnaire is a part of dissertation to survey the opinion of University Administration in various aspects. I would be really appreciate your kind filling out this questionnaire

Part 1 : General information

Please, fill the mark ✓ into ( ) indicated in front of the question and fill out in the proper space.

1. Sex of the respondents : 1. ( ) Male 2. ( ) Female

2. The Academic Position or rank of the respondents

   1. ( ) Lecturer 2. ( ) Assistant Professor

   3. ( ) Associate Professor 4. ( ) Professor 5. ( ) others .....

3. The present administrative position or rank of the respondents

   1. ( ) Vice President for .....

   2. ( ) Dean 3. ( ) Associate Dean for .....

   4. ( ) Head of Major .....

   5. ( ) Faculty Committees .....

   6. ( ) University Committees .....

   7. ( ) Others (specify) .....

4. Faculty of (name) .....

5. Level of the respondents' education

   1. ( ) Bachelor degree 2. ( ) Master degree 3. ( ) Doctoral degree

   4. ( ) Others (specify) .....

6. Number of Majors in your faculty ..... majors

   1. ( ) Major ..... 2. ( ) Major .....

   3. ( ) Major ..... 4. ( ) Major .....

   5. ( ) Major ..... 6. ( ) Major .....

   7. ( ) Major ..... 8. ( ) Major .....

   9. ( ) Major ..... 10. ( ) Major .....

7. Number of years, working at the university

   1. ( ) less than 5 years 2. ( ) 6 - 10 years 3. ( ) 11 - 15 years

   4. ( ) 16 - 20 years 5. ( ) 21 - 25 years 6. ( ) 26 - 30 years

   7. ( ) more than 30 years

Part 2 : The Academic service and curriculum

Please, fill the mark ✓ in the bracket ( ) in front of the question which is the best answer and fill out the proper space

8. Your faculty serves the level of study as

1. ( ) Undergraduate ( ) main campus ( ) local campus
2. ( ) Graduate ( ) main campus ( ) local campus
3. ( ) Doctor ( ) main campus ( ) local campus

9. Please, identify the problems and difficulties by setting the most important one as the first priority (1 is the most important problems and so on)

1. ( ) Curriculum / Texts (specify) .....
2. ( ) Lecturers (specify) .....
3. ( ) Students (specify) .....
4. ( ) Media (specify) .....
5. ( ) Financial (specify) .....
6. ( ) Others (specify) .....

10. The solutions to solve those problems and difficulties should be

1. ( ) Curriculum / Texts (specify) .....
2. ( ) Lecturers (specify) .....
3. ( ) Students (specify) .....
4. ( ) Media (specify) .....
5. ( ) Financial (specify) .....
6. ( ) Others (specify) .....

Part 3 : The Opinion on Administration

11. Please, identify and prioritize the responsibility or the duty to serve the university administration including the technologies and techniques used (1 = the most important one and so on)

1. .....
2. .....
3. .....
4. .....
5. .....

12. According to the above answer. Please, identify the solutions to solve

1. .....
2. .....
3. .....
4. .....
5. .....

13. To consider for the best university administration, There should be

1. .....
2. .....
3. .....
4. .....
5. .....

..... ☺ Thank You ☺.....

Pre-Test Questionnaire

at

Regional Campus :
Nakhon Si Thammarat

Ramkhamhaeng University

Thailand

Questionnaire

"Information Technology Application on Public University Administration"

This questionnaire is a part of dissertation research to survey the opinion, requirements and difficulties on your distance learning. Please, check the box and fill out the appropriate blank. Thank you very much for your cooperation.

[1 - 2] [3 - 6]

Part I : General Information

Please, fill with the mark ✓ in the appropriate bracket ( ) corresponding to your background and fill out the appropriate blank.

[7]

1. Regional Campus Province .....
2. Sex 1. ( ) Male 2. ( ) Female
3. Faculty of ..... Level of Education 1. ( ) Undergrad. 2. ( ) Grad.
4. Marital Status 1. ( ) Single 2. ( ) Married 3. ( ) Divorce 4. ( ) Separate

5. Age 1. ( ) less than 20 year 2. ( ) 21 - 25 year 3. ( ) 26 - 30 year
   4. ( ) 31 - 35 year 5. ( ) 36 - 40 year 6. ( ) 41 - 45 year
   7. ( ) 46 - 50 year 8. ( ) 51 - 60 year 9. ( ) more than 60 year

6. Faculty graduated on Bachelor degree ..... (only graduate students).
7. University graduated on Bachelor degree ..... (only graduate students).
8. Type of Academic
   1. ( ) Pure Science 2. ( ) Applied Science
   3. ( ) Social Science 4. ( ) Applied Social Science
   5. ( ) others .....

9. Career of respondents
   1. ( ) Civil Officer 2. ( ) State Enterprise 3. ( ) Private Employee
   4. ( ) Business Owner 5. ( ) Politician 6. ( ) Others .....
10. Cause of study
   1. ( ) Degree 2. ( ) Career Promotion 3. ( ) Social acceptance
   4. ( ) Political vote 5. ( ) Knowledge enhancement
   6. ( ) Opportunity Advantage 7. ( ) others .....
11. Methods of Teaching and Learning Delivery
   1. ( ) Face-to-Face 2. ( ) One-way Communication
   3. ( ) Two-way Communication 4. ( ) F-F and Two-way Com.
12. Assistant Coordinated Instructor requirement
   1. ( ) Yes 2. ( ) No

Part II : Barriers and Problems of Distance Learning

Please, prioritize the problems and difficulties by putting 1 = most critical issue and also identify the problems and difficulties

13. Problems and difficulties on your study
    1. ( ) Curriculum (identify) .....
    2. ( ) Lecturer (identify) .....
    3. ( ) Student himself (identify) .....
    4. ( ) Teaching Media (identify) .....
    5. ( ) Budget (identify) .....
    6. ( ) Regulatory (identify) .....

14. Problems and difficulties of yourself
    1. ( ) Distance from home to campus (identify) .....
    2. ( ) Time available for study (identify) .....
    3. ( ) Limited Budget (identify) .....
    4. ( ) Lack of Educational Background (identify) .....
    5. ( ) Lack of English Proficiency (identify) .....
    6. ( ) Lack of IT skill (identify) .....

15. Problems and difficulties of your campus
    1. ( ) Uncomfortable classroom (identify) .....
    2. ( ) Satellite Communication Loss (identify) .....
    3. ( ) Assistant Coordinated Instructor inefficiency (identify) .....
    4. ( ) Staff at regional campus inefficiency (identify) .....
    5. ( ) Technicians at regional campus inefficiency (identify) .....
    6. ( ) Location is dirty / hot air condition (identify) .....
    7. ( ) Lack of concentration because of noisy (identify) .....
    8. ( ) No any problem

16. How often you attend class
    1. ( ) Attend every time
    2. ( ) absence once a week
    3. ( ) Seldom absence
    4. ( ) Never attend class

17. Prioritize the importance of study focus on your idea : 1 = most importance
    1. ( ) Theories / Concepts
    2. ( ) Case Study
    3. ( ) Applied Theories
    4. ( ) Laboratory
    5. ( ) Guest Lecturers
    6. ( ) It Utilization
    7. ( ) Computer Facilities
    8. ( ) R & D
    9. ( ) Others .....

Part III : Academic and Service Perspectives for Distance Learning

Check with ✓ in the box upon your agreement on the following :

Level of agreement / Academic aspects	Level of agreement			
	Strongly Agree	Agree	Disagree	Strongly Disagree
18. Faculty news is update				
19. Distance Learning (DL)is suitable for province				
20. You willing to pay more for Face-Face Learning				
21. DL via satellite and F-F oriented is preferable				
22. Asst. Coordinated Instructor is required				
23. You can contact with lecturers easily				
24. Teaching team is qualified				
25. Curriculum is suitable				
26. Texts are satisfied				
27. Most lecturer is satisfied				
28. Discussing with lecturers via Satellite is satisfied during study				
29. Expand branches of DL is preferable				
30. DL enhances Equity				
31. Graduate Master degree supports career success				
32. Education makes better society				
33. Teaching Media Advance				
34. Staff service is satisfied				
35. Teaching assessment can improve teaching				
36. Teaching assessment means nothing				
37. Study is Self-learning				

Check with ✓ in the box upon your agreement on the following :

Level of agreement / Academic aspects	Level of agreement			
	Strongly Agree	Agree	Disagree	Strongly Disagree
38. Education increases social respect and acceptance				
39. Education enhances confidence				
40. Education enhances self-reliance				
41. Texts in library are sufficient				
42. DL is cost-efficiency				
43. DL is repeat learning				
44. IT makes globalization				
45. IT enhances self-development				

Check with ✓ in the box upon level of importance on the following :

Level of Importance / DL concentration	Most ← Importance → Least				
	5	4	3	2	1
46. DL should focus on - Case study					
- Theories & Concepts					
- Apply to job & life					
- Cultural & Art Promotion					
- R & D					
47. Academic Excellence should focus on - Curriculum					
- Academic Quality					
- Faculty Proficiency					
- Teaching & Learning Quality					
- R & D					
- IT Utilization					
- Quality of student. Admission					
- Quality of Graduates					
- Guest Lecturers					

Check with ✓ in the box upon your agreement on the following :

Level of agreement / Service aspects	Level of agreement			
	Strongly Agree	Agree	Disagree	Strongly Disagree
48. Good service in registration process				
49. Study schedule is fit				
50. Grade reports rapidly				
51. Grade results are fair				
52. Good in equipment ex. Computers				
53. Contact with lecturer during class conveniently				
54. Teaching delivery is clear & efficient in class				
55. Sign in class is fine				
56. Library searching is influent				
57. Internet searching is convenient				
58. Internet often be interrupted				
59. Number of computer is adequate				
60. IT enhances quality assurance				

61. What benefits you get from IT service
    1. ( ) E-mail 2. ( ) Internet searching
    3. ( ) Word processing 4. ( ) Games 5. ( ) never use
62. What level of your computer proficiency
    1. ( ) Much more 2. ( ) Moderate 3. ( ) Least
63. How often you use computer
    1. ( ) Often 2. ( ) Seldom 3. ( ) Never
64. IT benefits educational administration in level
    1. ( ) Most benefit 2. ( ) Moderate 3. ( ) Least
65. IT can afford educational administration in dimension of
    1. ( ) Education (identify) .....
    2. ( ) Administration (identify) .....
    3. ( ) Service (identify) .....
    4. ( ) Teaching & Learning (identify) .....
    5. ( ) Others (identify) .....

Part IV : Level of expectation and perception for Distance Learning

Please, check ✓ in the box according to the level of expectation (EXP)and perception (PRCPT)

level of perception : 1 = Less than expectation 2 = Equal to expectation
3 = More than expectation

Level of EXP and PRCPT / Context	EXP			PRCPT		
	3	2	1	1	2	3
66. Body of knowledge improvement						
67. Career Advancement						
68. Knowledge supports Job skill						
69. Family support						
70. Boss support						
71. Time available for study						
72. Study goes along with job						
73. Diversity of knowledge via IT						
74. Discussion diverts from interest						
75. Texts are update and qualified						
76. Contact lecturers conveniently						
77. Context in education is interest						
78. Grading results are satisfied						
79. Develop in IT utilization						
80. IT in the teaching course						
81. You expects the acceptance of social						

82. Your suggestions are welcome

1. .....
2. .....
3. .....
4. .....
5. .....

THANKS

APPENDIX B

Questionnaire

Thai Version

ที่ ทม 1802/138

คณะรัฐประศาสนศาสตร์
สถาบันบัณฑิตพัฒนบริหารศาสตร์
คลองจั่น บางกะปิ กทม 10240.

15 ธันวาคม 2543

เรื่อง ขอความร่วมมือในการสัมภาษณ์เพื่อประกอบการเขียนวิทยานิพนธ์

เรียน

ด้วย นางวิพร เกตุแก้ว นักศึกษาหลักสูตรปรัชญาดุษฎีบัณฑิต (การบริหารการพัฒนา) คณะรัฐประศาสนศาสตร์ สถาบันบัณฑิตพัฒนบริหารศาสตร์ ได้รับอนุมัติให้ทำวิทยานิพนธ์ เรื่อง "Effectiveness of Distance Learning Administration: A Comparative Study of Ramkhamhaeng University (RU) and Sukhothai Thammathirat Open University (STOU)" ซึ่งจำเป็นจะต้องได้ข้อมูลที่เกี่ยวข้องอย่างเพียงพอ

คณะรัฐประศาสนศาสตร์พิจารณาแล้วเห็นว่า หน่วยงานของท่านมีประสบการณ์ที่เกี่ยวข้องกับหัวข้อวิทยานิพนธ์ที่ศึกษา อันจะเป็นประโยชน์อย่างยิ่งต่อการดำเนินงานการศึกษาครั้งนี้ จึงเรียนมาเพื่อขอความอนุเคราะห์ข้อมูลที่เกี่ยวข้องและรายละเอียดต่างๆ ที่พอจะเปิดเผยให้นักศึกษาทราบได้ ทั้งนี้ นักศึกษาจะเป็นผู้ประสานงานติดต่อกับท่านด้วยตนเอง หรือขอความกรุณาติดต่อกับนักศึกษาได้โดยตรงที่หมายเลข 310-8483-9 ต่อ 42

คณะรัฐประศาสนศาสตร์ หวังเป็นอย่างยิ่งว่าคงได้รับความอนุเคราะห์จากท่านเป็นอย่างดี จึงขอขอบพระคุณเป็นอย่างสูงมา ณ โอกาสนี้

ขอแสดงความนับถือ

ศาสตราจารย์

(ไพบูลย์ ช่างเรียน)
ประธานกรรมการวิทยานิพนธ์

คณะรัฐประศาสนศาสตร์
โทรศัพท์/โทรสาร 374-4977

ที่ ทม 1802/ ๒๙

คณะรัฐประศาสนศาสตร์
สถาบันบัณฑิตพัฒนบริหารศาสตร์
คลองจั่น บางกะปิ กทม. 10240

๒๕ มกราคม 2544

เรื่อง ขอความอนุเคราะห์กรอกแบบสอบถาม เพื่อประกอบการ เขียนวิทยานิพนธ์

เรียน

ด้วย นางวิพร เกตุแก้ว นักศึกษาหลักสูตรปรัชญาดุษฎีบัณฑิต (การบริหารการพัฒนา) หลักสูตรนานาชาติ คณะรัฐประศาสนศาสตร์ สถาบันบัณฑิตพัฒนบริหารศาสตร์ ได้รับอนุมัติให้ทำวิทยานิพนธ์ เรื่อง "Effectiveness of Distance Learning Administration: A Comparative Study of Ramkhamhaeng University (RU) and Sukhothai Thammathirat Open University (STOU)" ซึ่งจำเป็นจะต้องได้ข้อมูลที่เกี่ยวข้องอย่างเพียงพอ

คณะรัฐประศาสนศาสตร์ พิจารณาแล้วเห็นว่า หน่วยงานของท่านมีประสบการณ์ที่เกี่ยวข้องกับหัวข้อวิทยานิพนธ์ที่ศึกษา อันจะเป็นประโยชน์อย่างยิ่งต่อการดำเนินการศึกษาครั้งนี้ จึงเรียนมาเพื่อขอความอนุเคราะห์ข้อมูลที่เกี่ยวข้อง และรายละเอียดต่างๆ ทั้งนี้นักศึกษาจะเป็นผู้ประสานงานติดต่อกับท่านด้วยตนเอง หรือขอความกรุณาติดต่อกับนักศึกษาได้โดยตรงที่หมายเลข 310-8483-9 ต่อ 42

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ขอแสดงความนับถือ

ศาสตราจารย์

(ไพบูลย์ ช่างเรียน)
ประธานกรรมการวิทยานิพนธ์

คณะรัฐประศาสนศาสตร์
โทรศัพท์/ โทรสาร 374-4977

บันทึกข้อความ

ส่วนราชการ

ที่ ทม 0905/ พิเศษ **วันที่** มกราคม 2544

เรื่อง ขอความร่วมมือแจกและรวบรวมแบบสอบถาม

เรียน

ด้วยดิฉัน นางวิพร เกตุแก้ว นักศึกษาระดับปริญญาเอก คณะรัฐประศาสนศาสตร์ สถาบันบัณฑิตพัฒนบริหารศาสตร์ กำลังทำวิทยานิพนธ์ปริญญาเอกหัวข้อ "ประสิทธิผลการบริหารการเรียนทางไกล: กรณีศึกษาระหว่างมหาวิทยาลัยรามคำแหง และ มหาวิทยาลัยสุโขทัย ธรรมาธิราช" (Effectiveness of Distance Learning Administration: Comparative study of Ramkhamhaeng University and Sukhothai Thammathirat Open University) เป็นการสอบถามความคิดเห็นความพึงพอใจ และอุปสรรคในการเรียนทางไกลของนักศึกษาทั้งสองมหาวิทยาลัย จึงใคร่ขอความร่วมมือในการแจก และเก็บรวบรวมแบบสอบถามสำหรับนักศึกษา มสธ. (ได้แนบแบบสอบถามมาด้วยแล้ว)

จึงเรียนมาเพื่อโปรดพิจารณาและขอความอนุเคราะห์ จักขอบคุณยิ่ง

(นางวิพร เกตุแก้ว)

นักศึกษา ปริญญาเอก

<u>แบบสอบถาม</u>

"ประสิทธิผลการบริหารการเรียนทางไกลของมหาวิทยาลัยรัฐ"

แบบสอบถามนี้เป็นส่วนหนึ่งในการทำวิทยานิพนธ์ปริญญาเอกเพื่อทราบความคิดเห็น ความพึงพอใจ ความต้องการและปัญหาอุปสรรคในการเรียนทางไกลของท่าน จึงขอความกรุณาท่านกรอกข้อมูลตามความเป็นจริง และขอขอบคุณที่สละเวลาอันมีค่าตอบแบบสอบถามนี้

<u>ส่วนที่ 1 : ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม</u>

โปรดใส่เครื่องหมาย ✓ ลงในช่อง ( ) หน้าคำตอบที่สอดคล้องกับลักษณะเฉพาะของท่าน และ เติมข้อความในช่องว่างที่กำหนดไว้

1. ท่านกำลังศึกษาอยู่ที่มหาวิทยาลัย .....
2. สาขาวิทยบริการเฉลิมพระเกียรติ์ หรือ ศูนย์วิทยพัฒนาบริการจังหวัด .....
3. เพศของผู้ตอบแบบสอบถาม 1. ( ) ชาย 2. ( ) หญิง
4. ปัจจุบัน ท่านศึกษาคณะ .....
5. ปัจจุบันท่านศึกษาระดับการศึกษา 1. ( ) ป.ตรี ชั้นปีที่ .....
   2. ( ) ป.โท ชั้นปีที่ .....
6. สถานะภาพสมรส 1. ( ) โสด 2. ( ) สมรส 3. ( ) หย่า 4. ( ) ม่าย
   (หากสมรส) จำนวนบุตร ..... คน จำนวนบุตรที่กำลังศึกษา ..... คน
7. อายุของผู้ตอบแบบสอบถาม ..... ปี
8. อาชีพในปัจจุบันของท่าน
   1. ( ) ข้าราชการ 2. ( ) พนักงานรัฐวิสาหกิจ 3. ( ) บริษัทเอกชน
   4. ( ) ธุรกิจส่วนตัว 5. ( ) นักการเมือง 6. ( ) ว่างงาน 7. ( ) อื่นๆ .....

   หากท่าน<u>ตอบข้อย่อย 6 หรือ ข้อย่อย 7</u> โปรด<u>ข้ามไปตอบข้อ 11</u>

   โปรดระบุตำแหน่ง .....

   ระยะเวลาที่ท่านดำรงตำแหน่ง ..... ปี ประสบการณ์ในการทำงาน ..... ปี
9. รายได้เฉลี่ยของครอบครัว (สามีและภรรยารวมกัน) ..... บาทต่อเดือน
10. รายจ่ายเฉลี่ยของครอบครัว ..... บาทต่อเดือน
11. ค่าลงทะเบียนรวมทั้งสิ้น ..... บาทต่อภาคการศึกษา
12. <u>ค่าใช้จ่ายในการศึกษา</u>ที่นอกเหนือจากข้อ 10 และ 11 เป็นเงิน ..... บาทต่อเดือน
13. ท่านอาศัยอยู่ในจังหวัดที่ตั้งสาขาวิทยบริการฯ หรือ ศูนย์วิทยพัฒนาบริการหรือไม่
   1. ( ) ใช่ ระยะทางในการเดินทาง ..... กม.
   2. ( ) ไม่ใช่ ระยะทางในการเดินทาง ..... กม.
14. ท่านใช้เวลาในการเดินทางมาเรียนเป็นเวลาประมาณ ..... ชั่วโมงต่อครั้ง
15. ท่านได้เรียนมาแล้วจนถึงปัจจุบัน รวมเป็น ..... หน่วยกิต
16. ท่านมีคะแนนเฉลี่ยสะสม เท่ากับ ..... ต่อจำนวนกระบวนวิชา ..... หน่วยกิต
17. ท่านได้มี<u>การสอบซ่อม</u>มาแล้วรวม ..... วิชา
18. ท่านต้องใช้<u>เวลาในการศึกษาจนสำเร็จหลักสูตร</u>รวมทั้งสิ้น ..... ปี ..... เดือน
19. ท่านใช้เวลาในการอ่านหนังสือเรียนเป็นเวลา ..... ชั่วโมง/สัปดาห์
20. ท่านใช้เวลาอ่านหนังสือเรียนในการ<u>เตรียมตัวสอบ</u>เป็นเวลา ..... ชั่วโมง/แต่ละครั้งการสอบ
21. ขณะที่ท่านศึกษาอยู่นี้ ท่านได้สมัครเข้าเรียนมหาวิทยาลัยอื่นด้วยหรือไม่
   1. ( ) สมัคร เหตุผล .....
   2. ( ) ไม่ได้สมัคร เหตุผล .....

<u>ส่วนที่ 2 : ข้อมูลความคิดเห็นและความต้องการของผู้ตอบแบบสอบถามในด้านการเรียนการสอน</u>

คำถามต่อไปนี้ ขอให้ท่าน<u>เรียงลำดับความสำคัญ</u> (อย่างน้อย 3 ลำดับ) จากความสำคัญมากที่สุด ไปจนถึงความสำคัญน้อยสุด โดยกำหนดให้ 1= ความสำคัญมากที่สุด ลงใน ( ) หน้าข้อความนั้นๆ และใส่เครื่องหมาย ✓ ในช่อง<u>ใช่</u> หรือ <u>ไม่ใช่</u> (ใส่ ✓ ได้มากกว่าหนึ่งเครื่องหมาย) ตามต้องการ

22. ท่านสมัครเรียน เพราะท่านต้องการ (โปรดเรียงลำดับความสำคัญ)	<u>ใช่</u>	<u>ไม่ใช่</u>
1. ( ) ปริญญาบัตร		
2. ( ) เพิ่มความก้าวหน้าในตำแหน่งงาน		
3. ( ) เป็นที่ยอมรับของสังคม		
4. ( ) หาคะแนนเสียงในการเล่นการเมือง		
5. ( ) เพิ่มเติมความรู้มากขึ้น		
6. ( ) เพิ่มโอกาสให้ตนเอง ระบุ		
7. ( ) เป็นงานอดิเรก		
8. ( ) เป็นเกียรติแก่วงศ์ตระกูล		
9. ( ) ปรับเปลี่ยนสายงาน		

23. ท่านได้รับอะไรบ้างจากการเรียน? (โปรดเรียงลำดับความสำคัญ)	<u>ใช่</u>	<u>ไม่ใช่</u>
1. ( ) แนวคิดในเชิงวิพากษ์		
2. ( ) ความรู้		
3. ( ) การประยุกต์ใช้ความรู้		
4. ( ) ความเชี่ยวชาญทางด้านเทคนิค		
5. ( ) แนวคิดและทฤษฎี		
6. ( ) การยอมรับของสังคม		
7. ( ) ความเคารพในตนเองและการพึ่งพาตนเอง		
8. ( ) การให้ความเชื่อถือ		
9. ( ) การได้รับความไว้วางใจ		

24. ท่านสามารถนำสิ่งที่เรียนไปใช้กับงานที่ทำอยู่ ในด้านใดบ้าง?	<u>ใช่</u>	<u>ไม่ใช่</u>
1. ( ) เพิ่มความชำนาญงาน		
2. ( ) เพิ่มประสบการณ์		
3. ( ) เพิ่มความเข้าใจงาน		
4. ( ) แก้ปัญหา		
5. ( ) ควบคุมคุณภาพ		
6. ( ) การใช้เทคโนโลยี..		
7. ( ) ความคิดสร้างสรร		
8. ( ) ควบคุมภาวะวิกฤติต่างๆ		
9. ( ) ออกแบบผลิตภัณฑ์ หรือ บริการรูปแบบใหม่		

25. การศึกษาระบบการสอนทางไกล ก่อให้เกิด (โปรดเรียงลำดับความสำคัญ)	<u>ใช่</u>	<u>ไม่ใช่</u>
1. ( ) การกระจายรายได้สู่ชนบท		
2. ( ) การมีส่วนร่วมในสังคมชุมชน		
3. ( ) การกระจายความรู้สู่ชนบท		
4. ( ) ความเสมอภาคทางการศึกษา		
5. ( ) โอกาสในการเรียน		
6. ( ) โอกาสในการทำงาน		

	ใช่	ไม่ใช่
7. ( ) สังคมพึ่งตนเองได้		
8. ( ) ความสามารถในการรู้หนังสือและอ่านออกเขียนได้		
9. ( ) การพัฒนาคุณธรรม		

26. ท่านต้องการให้มหาวิทยาลัยที่ท่านศึกษาอยู่ในปัจจุบันปรับปรุงทางด้านใดบ้าง (โปรดเรียงลำดับความสำคัญ)

	ใช่	ไม่ใช่
1. ( ) พัฒนาหลักสูตร		
2. ( ) พัฒนาเนื้อหากระบวนวิชา		
3. ( ) จิตสำนึกของความเป็นอาจารย์		
4. ( ) ความสามารถของคณาจารย์ในการอธิบายเนื้อหาวิชา		
5. ( ) บริการทางวิชาการ		
6. ( ) บริการด้านอุปกรณ์การเรียน		
7. ( ) บริการด้านห้องสมุด		
8. ( ) บริการการใช้คอมพิวเตอร์		
9. ( ) ประเภทของสื่อการสอนต่างๆ		

27. ท่านต้องการให้อาจารย์ผู้สอนใช้ระบบการสอนแบบใด ?
(โปรดเรียงลำดับความต้องการ)

	ใช่	ไม่ใช่
1. ( ) สอนตัวต่อตัวในห้องเรียน		
2. ( ) สื่อสารทางเดียว โดยผ่านทางวิทยุ หรือโทรทัศน์		
3. ( ) สื่อสารสองทาง โดยการใช้อุปกรณ์สื่อสารคมนาคม ทำให้สามารถโต้ตอบกับนักศึกษาในขณะสอน		
4. ( ) โดยติดต่อทางจดหมาย		
5. ( ) โดยติดต่อทางโทรศัพท์ หรือ โทรสาร		
6. ( ) นักศึกษาอ่านหนังสือด้วยตนเอง ไม่ต้องมีการสอน		
7. ( ) นักศึกษาอ่านหนังสือและเรียนจากอุปกรณ์การเรียน เช่น เทปเสียง หรือ เทปวิดีโอ		

28. วิชาที่ท่านเรียนมีการสอนแบบใดบ้าง?

1. การสอนแบบปรนัย คิดเป็น ..... % ของจำนวนวิชาที่เรียนทั้งหลักสูตร
2. การสอนแบบอัตนัย คิดเป็น ..... % ของจำนวนวิชาที่เรียนทั้งหลักสูตร
3. การสอนโดยการทำรายงาน คิดเป็น ..... % ของจำนวนวิชาที่เรียนทั้งหลักสูตร
4. การสอนโดยการทำวิจัย คิดเป็น ..... % ของจำนวนวิชาที่เรียนทั้งหลักสูตร
5. การสอนโดยการออกปฏิบัติภาคสนามคิดเป็น ..... % ของจำนวนวิชาที่เรียนทั้งหลักสูตร
6. การสอนในห้องปฏิบัติการ คิดเป็น ..... % ของจำนวนวิชาที่เรียนทั้งหลักสูตร

❖❖❖❖❖❖❖❖❖❖❖❖❖❖❖

<u>หมายเหตุ</u> <u>ประสิทธิภาพ</u> หมายถึง จำนวนผลลัทธ์ที่ได้รับซึ่งให้กำไรหรือผลประโยชน์มากกว่าทุนหรือจำนวนสิ่งที่ใส่เข้าในการกระทำใดๆ (Output : Input > 0)

<u>ประสิทธิผล</u> หมายถึง ผลที่ได้รับบรรลุเป้าหมายที่กำหนดไว้มากน้อยเพียงใด

<u>เทคโนโลยีสารสนเทศ</u> (IT) คือ เทคโนโลยีที่รวมความสามารถของคอมพิวเตอร์ในการแสดงตัวอักษร ภาพ สีและเสียง เข้ากับความสามารถของอุปกรณ์โทรคมนาคม เพื่อส่งตัวอักษร ภาพ สีและเสียง ไปยังสถานที่ที่อยู่ห่างไกลได้ ทำให้สามารถสื่อสารกันข้ามทวีปได้

<u>ส่วนที่ 3 : ข้อมูลด้านปัญหาและอุปสรรคของผู้ตอบแบบสอบถามในการเรียนการสอน</u>

โปรดระบุปัญหาและอุปสรรค โดยใส่ตัวเลข<u>เรียงตามลำดับความสำคัญ</u> (อย่างน้อย 3 ลำดับ) กล่าวคือ 1 หมายถึง ปัญหาที่มีความ<u>สำคัญมากที่สุด</u> ลงใน ( ) หน้าข้อความนั้นๆ พร้อมทั้งระบุปัญหานั้นๆ และใส่เครื่องหมาย ✓ ในช่อง<u>มีปัญหา</u> หรือ <u>ไม่มีปัญหา</u> ตามประเภทของปัญหาที่ท่านประสบ

29. ปัญหาและอุปสรรคใน<u>การเรียนของท่าน</u> คืออะไร?

	<u>มีปัญหา</u>	<u>ไม่มีปัญหา</u>
1. ( ) หลักสูตร / เอกสารตำรา (ระบุ)		
2. ( ) อาจารย์ผู้สอน (ระบุ)		
3. ( ) คะแนนเฉลี่ยสะสม (ระบุ)		
4. ( ) สื่อการสอน (ระบุ)		
5. ( ) การติดต่อสื่อสารกับคณาจารย์ (ระบุ)		
6. ( ) เนื้อหาวิชาที่เรียนไม่ตรงกับสายงาน (ระบุ)		
7. ( ) ระเบียบราชการ/ข้อกฎหมาย (ระบุ)		

30. ปัญหาและอุปสรรคของ<u>ตัวท่านเอง</u> คืออะไร?

	<u>มีปัญหา</u>	<u>ไม่มีปัญหา</u>
1. ( ) ระยะทางในการเดินทางมาเรียน (ระบุ)		
2. ( ) เวลาที่ต้องอุทิศให้การเรียน (ระบุ)		
3. ( ) ค่าใช้จ่ายในการเรียน (ระบุ)		
4. ( ) การสนับสนุนของครอบครัว (ระบุ)		
5. ( ) การสนับสนุนของผู้บังคับบัญชา (ระบุ)		
6. ( ) การขาดแรงจูงใจ (ระบุ)		
7. ( ) ไม่มีพื้นฐานความรู้ที่เรียนอยู่ (ระบุ)		

31. ปัญหาและอุปสรรคของ<u>สถานที่ที่เรียน</u> คืออะไร ?

	<u>มีปัญหา</u>	<u>ไม่มีปัญหา</u>
1. ( ) ห้องเรียนคับแคบ ที่นั่งเรียนไม่เพียงพอ.....		
2. ( ) ห้องเรียนสกปรก และ/หรือ แอร์ไม่เย็น.....		
3. ( ) ไม่มีที่พักผ่อน หรือ ห้องปรึกษาการเรียน.....		
4. ( ) การทำงานของ<u>เจ้าหน้าที่ที่ศูนย์ประสานงาน</u>บกพร่อง.....		
5. ( ) การทำงานของ<u>เจ้าหน้าที่ห้องควบคุมเครื่อง</u>บกพร่อง.....		
6. ( ) หนวกหู เพื่อนร่วมเรียนส่งเสียงดัง และ/หรือ..... คุยโทรศัพท์มือถือขณะเรียน		
7. ( ) สถานที่จอดรถไม่เพียงพอ หรือ ไม่สะดวก และ/หรือ..... สถานที่ไม่ร่มรื่น		

32. ปัญหา และอุปสรรคของ<u>การใช้เทคโนโลยีสารสนเทศของท่าน</u> คือ

	<u>มีปัญหา</u>	<u>ไม่มีปัญหา</u>
1. ( ) ไม่มีความรู้พื้นฐานทางคอมพิวเตอร์.....		
2. ( ) ไม่มีห้องสำหรับการเรียนเสริม เช่น ห้องดูวิดีโอ.....		
3. ( ) ไม่มีอุปกรณ์สำหรับการเรียนบริการ..... เช่น เครื่องถ่ายเอกสาร เครื่องอัดสำเนา		
4. ( ) มหาวิทยาลัยไม่ได้จัดเครื่องคอมพิวเตอร์ให้ใช้.....		
5. ( ) การสื่อสารการเรียนการสอนทางไกล ไม่สัมฤทธิ์ผล..... การสื่อสารขาดตอนบ่อยครั้ง		
6. ( ) ไม่มีการบริการห้องสมุด อิเล็กทรอนิกส์สืบค้นข้อมูล.....		
7. ( ) ไม่มีอุปกรณ์สื่อสารบริการเพื่อติดต่ออาจารย์ผู้สอน.....		

<u>ส่วนที่ 4 : ข้อมูลความพอใจของผู้ตอบแบบสอบถามในเนื้อหาด้านการศึกษา</u>

โปรดให้คะแนนเป็นตัวเลขแสดงระดับความพอใจของท่าน ลงในช่องคะแนนที่กำหนด ตามเนื้อหาด้านบริการการศึกษา ทั้งนี้ตัวเลข 1 = พอใจน้อยที่สุด ⟶ 10 = พอใจมากที่สุด และใส่เครื่องหมาย ✓ในช่องไม่มีรายการ ในกรณีที่มหาวิทยาลัยของท่านไม่มีประเด็นหรือรายการนั้น

ท่านพอใจในสิ่งต่อไปนี้มากน้อยเพียงใด โปรดให้คะแนน (คะแนนเต็ม 10)

รายการ	คะแนน	ไม่มีรายการ
33. หลักสูตรที่ทางมหาวิทยาลัยจัดสอน.....	.....	.....
34. เนื้อหาวิชาที่เรียน	.....	.....
35. <u>ความชัดเจน</u>ในการอธิบายของคณาจารย์	.....	.....
36. คำแนะนำเนื้อหาวิชาของอาจารย์ประสานงาน	.....	.....
37. เอกสารและอุปกรณ์การเรียนที่มหาวิทยาลัยจัดให้ ได้แก่		
1. ตำรา	.....	.....
2. เอกสารประกอบการเรียน	.....	.....
3. ตำราอ้างอิง	.....	.....
4. เอกสารถ่ายสำเนาประกอบการบรรยาย	.....	.....
5. อุปกรณ์การเรียน เช่น เทปเสียง เทปวิดีโอ แผ่นจานแม่เหล็กชนิดอ่อน(diskette) แผ่นซีดี.....	.....	.....
38. รูปแบบวิธีการสอนที่มหาวิทยาลัยบริการ ได้แก่		
1. ผ่านทางวิทยุกระจายเสียงเพื่อการศึกษา	.....	.....
2. ผ่านทางโทรทัศน์เพื่อการศึกษา	.....	.....
3. สอนในรูปแบบภาพยนต์	.....	.....
4. สอนในรูปแบบการใช้สไลด์ (slide)	.....	.....
5. การสอนโดยใช้แผ่นใส	.....	.....
6. การสอนโดยการอัดเทปวิดีโอ (video)	.....	.....
7. การสอนโดยการอัดเทปเสียง (cassettes)	.....	.....
8. โดยการใช้โปรแกรมทางคอมพิวเตอร์	.....	.....
9. การสอนแบบสื่อสารทางไกลสองทาง	.....	.....
10. การสอนสดตัวต่อตัวในห้องเรียน	.....	.....
11. เรียนด้วยตนเอง ไม่มีการจัดการสอนใดๆ	.....	.....
39. การสอนของวิทยากรพิเศษ หรือ ผู้ชำนาญการ.....	.....	.....
40. เอกสารตำราที่มีบริการเพื่อการค้นคว้าในห้องสมุด	.....	.....
41. การจัดเครื่องคอมพิวเตอร์ให้นักศึกษาใช้งาน	.....	.....
42. การบริการด้านการลงทะเบียนของเจ้าหน้าที่	.....	.....
43. นโยบายการบริหารของผู้บริหารมหาวิทยาลัยระดับสูง.....	.....	.....
44. การให้บริการของเจ้าหน้าที่ประจำศูนย์	.....	.....
45. การจัดตารางเรียนในห้องเรียน	.....	.....
46. การจัดตารางเรียนทางวิทยุกระจายเสียงเพื่อการศึกษา ...	.....	.....
47. การจัดตารางเรียนทางโทรทัศน์การศึกษาสำหรับดูที่บ้าน	.....	.....

รายการ	คะแนน	ไม่มีรายการ
48. การจัดตารางเรียนทางโทรทัศน์สำหรับดูที่ศูนย์	.....	.....
49. อุปกรณ์การเรียนที่จัดให้ใช้ที่ศูนย์	.....	.....
50. ผลคะแนนในการสอบ	.....	.....
51. ความสะดวกในการเข้าพบคณาจารย์	.....	.....
52. การให้บริการข่าวสารที่มหาวิทยาลัยจัดให้ทางวารสารข่าว	.....	.....
53. การติดต่อสื่อสารกับอาจารย์ผู้สอน ในรูปแบบ		
1. ติดต่อทางจดหมาย	.....	.....
2. ติดต่อทางโทรศัพท์ โทรสาร	.....	.....
3. ติดต่อทางการสื่อสารสองทาง (teleconferencing)..	.....	.....
4. ติดต่อทางจดหมายอิเล็กทรอนิกส์ (e-mail)	.....	.....
5. ติดต่อโดยตรงในห้องเรียน (face-face)	.....	.....
54. การใช้โปรแกรมคอมพิวเตอร์ ที่จัดเตรียมให้	.....	.....
55. การสืบค้นข้อมูลทางห้องสมุดอิเล็กทรอนิกส์	.....	.....
56. การซักถาม-ตอบกับคณาจารย์ผู้สอนในห้องเรียน.....	.....	.....
57. การซักถาม-ตอบกับคณาจารย์ทางการสื่อสารสองทาง.....	.....	.....
58. ข้อมูลข่าวสารที่มหาวิทยาลัยนำเสนอทาง Intranet	.....	.....
59. ความชัดเจนในการถ่ายทอดด้วยระบบสื่อสารคมนาคม ทางไกลสองทาง	.....	.....
60. ความรวดเร็วในการแจ้งผลสอบ	.....	.....
61. การขยายสาขาวิทยบริการฯหรือศูนย์วิทยพัฒนาบริการ.	.....	.....
62. ความสะดวกในการติดต่อสื่อสารทาง Internet	.....	.....
63. ระบบการเรียนการสอนทางไกลของมหาวิทยาลัยรัฐ	.....	.....
64. เนื้อหาทางวิชาการโดยรวมที่จัดสอนของมหาวิทยาลัย	.....	.....
65. สื่อการสอนทางไกลที่ทันสมัยที่ใช้ในปัจจุบันของ มหาวิทยาลัย	.....	.....
66. การให้บริการโดยรวมของมหาวิทยาลัย	.....	.....
67. การบริหารงานการศึกษาของผู้บริหารมหาวิทยาลัย	.....	.....
68. การใช้เทคโนโลยีและการบริการของมหาวิทยาลัย	.....	.....
69. รูปแบบวิธีการสอนที่จัดบริการโดยมหาวิทยาลัย	.....	.....
70. สิ่งแวดล้อมในการเรียนโดยรวมของมหาวิทยาลัย	.....	.....
71. การเข้าถึงการให้บริการของมหาวิทยาลัย	.....	.....
72. คุณภาพการสอนของคณาจารย์มหาวิทยาลัย	.....	.....

73. ท่านได้ใช้ประโยชน์ของบริการเทคโนโลยีสารสนเทศ (IT) ทางด้านใดบ้าง?

1. ( ) เล่นเกมส์ จำนวน ..... ชม/ครั้ง จำนวนการใช้เครื่อง ..... ครั้ง/สัปดาห์
2. ( ) พิมพ์รายงาน จำนวน ..... ชม/ครั้ง จำนวนการใช้เครื่อง ..... ครั้ง/สัปดาห์
3. ( ) E-mail จำนวน ..... ชม/ครั้ง จำนวนการใช้เครื่อง ..... ครั้ง/สัปดาห์
4. ( ) เขียนโปรแกรมใช้งาน จำนวน .....ชม/ครั้ง จำนวนการใช้เครื่อง ..... ครั้ง/สัปดาห์
5. ( ) สืบค้นหาข้อมูลทางInternetจำนวน .....ชม/ครั้งจำนวนการใช้เครื่อง.....ครั้ง/สัปดาห์
0. ( ) ไม่เคยใช้เลย

74. ท่านคิดว่า เทคโนโลยีสารสนเทศ (IT) มีประโยชน์ต่อการเรียนการสอนในระดับ .....(1-10)

<u>ส่วนที่ 5 : ข้อมูลแสดงความคิดเห็นของผู้ตอบแบบสอบถามในกระบวนการศึกษา</u>

โปรดให้คะแนนเป็นตัวเลขที่แสดงระดับความคิดเห็นของท่าน ลงในช่องคะแนนที่กำหนด ตามเนื้อหาของกระบวนการศึกษา ทั้งนี้ ตัวเลข 1 = เห็นด้วยน้อยที่สุด ——▶ 10 = เห็นด้วยมากที่สุด และใส่เครื่องหมาย ✓ ในช่องไม่มีรายการ ในกรณีที่มหาวิทยาลัยของท่านไม่มีบริการในรายการนั้น

ท่านเห็นด้วยกับสิ่งต่อไปนี้มากน้อยเพียงใด โปรดให้คะแนน (คะแนนเต็ม 10)

รายการ	คะแนน	ไม่มีรายการ
75. ขนาดจำนวนนักศึกษาที่รับเข้าร่วมเรียนเหมาะสม	.....	.....
76. ห้องเรียนสะอาด และอากาศดี	.....	.....
77. ห้องน้ำสะอาด และมีเพียงพอ	.....	.....
78. เก้าอี้ และอุปกรณ์การเรียนในห้องเรียนเป็นระเบียบ	.....	.....
79. การจัดกลุ่มวิชาการเพื่อทบทวนและติวบทเรียน	.....	.....
80. การมีส่วนร่วมในกิจกรรมกลุ่มและการจัดพบปะสังสรรค์..	.....	.....
81. การจัดพิธีไหว้ครู	.....	.....
82. การอบรมเชิงวิชาการและปัจฉิมนิเทศน์	.....	.....
83. การแนะแนวการสอบความรอบรู้ และการทำวิทยานิพนธ์.	.....	.....
84. การสอนที่มีการลงมือปฏิบัติจริง (workshop)	.....	.....
85. การสอนโดยการติดต่อกับอาจารย์ทางจดหมาย	.....	.....
86. การสอนสดในห้องเรียน	.....	.....
87. การสอนโดยวิธีการติดต่อสื่อสารทางไกล	.....	.....
88. คณาจารย์สอนตามเนื้อหาที่กำหนดไว้และครบถ้วน	.....	.....
89. คณาจารย์ผู้สอนสามารถอธิบายได้เข้าใจและชัดเจน	.....	.....
90. คณาจารย์ผู้สอนมีคุณวุฒิเหมาะสม	.....	.....
91. คณาจารย์ผู้สอนมีความสามารถในการกระตุ้นให้แสดงความคิดเห็น	.....	.....
92. เนื้อหาวิชาที่สอนทันสมัย	.....	.....
93. ความรู้ที่เรียนสามารถประยุกต์ใช้กับงานที่ทำอยู่ปัจจุบัน	.....	.....
94. ความศึกษาทำให้เกิดคุณภาพชีวิตที่ดีขึ้น	.....	.....
95. ระบบการสอนทางไกลช่วยลดค่าใช้จ่ายในการศึกษา	.....	.....
96. นักศึกษาระบบการสอนทางไกลเป็นการศึกษาด้วยตนเอง	.....	.....
97. การศึกษาควรเน้นการใช้เครื่องคอมพิวเตอร์	.....	.....
98. การศึกษาควรเน้นการแก้ปัญหา	.....	.....
99. การศึกษาควรควบคู่กับการเรียนคุณธรรม	.....	.....
100.การศึกษาช่วยให้ผู้เรียนมีคุณธรรมมากขึ้น	.....	.....
101.การศึกษาช่วยให้การงานของท่านประสบความสำเร็จ.....	.....	.....
102.การศึกษาช่วยให้ชีวิตในสังคมของท่านมีอำนาจมากขึ้น.....	.....	.....
103.การศึกษาทำให้ท่านเกิดความภูมิใจ&ความเคารพนับถือ	.....	.....
104.การศึกษาช่วยให้ท่านเพิ่มรายได้จากการงาน	.....	.....
105.การศึกษาทำให้เสียเวลาที่สนุกรื่นรมย์ของท่าน	.....	.....

รายการ	คะแนน	ไม่มีรายการ
106.การศึกษาทำให้สถาบันครอบครัวล่มสลาย	.....	.....
107.การศึกษาทำให้เกิดการแก่งแย่งและความเห็นแก่ตัว.....	.....	.....
108.มหาวิทยาลัยควรจัด		
1. การอบรมการใช้เครื่องคอมพิวเตอร์	.....	.....
2. ให้มีการประเมินการสอนของคณาจารย์	.....	.....
3. ให้มีการหมุนเวียนคณาจารย์ในการสอน	.....	.....
4. ให้มีการหมุนเวียนสถานที่ในการเรียน.....	.....	.....
5. ให้มีการปรับปรุงอุปกรณ์การเรียน	.....	.....
6. ให้มีการปรับปรุงเอกสารตำราเรียน	.....	.....
7. ให้มีการปรับปรุงหลักสูตร	.....	.....
8. ให้มีการปรับปรุงรูปแบบวิธีการสอน	.....	.....
109.การสอนทางไกลควรใช้เทคโนโลยีสารสนเทศ (IT)เป็นเครื่องมือการสอน	.....	.....
110.เทคโนโลยีสารสนเทศ (IT) ช่วยให้		
1. สามารถสอนผู้เรียนได้จำนวนมาก.....	.....	.....
2. การสอนทางไกลครอบคุมได้หลายพื้นที่.....	.....	.....
3. ลดค่าใช้จ่ายทางการศึกษา	.....	.....
4. ประหยัดระยะทางในการศึกษา	.....	.....
5. ประหยัดระยะทางในการติดต่อสื่อสาร	.....	.....
6. ประหยัดระยะเวลาในการติดต่อสื่อสาร	.....	.....
7. เกิดทางเลือกใหม่ทางการศึกษา	.....	.....
8. เกิดความเสมอภาคทางการศึกษา	.....	.....
9. รู้ข่าวสารรอบโลกได้อย่างรวดเร็ว	.....	.....
10. เกิดการแลกเปลี่ยนข้อมูลข่าวสาร	.....	.....
11. เกิดการบริการแบบใหม่ ๆที่ทันสมัย	.....	.....
12. เกิดธุรกิจทางอิเล็กทรอนิกส์	.....	.....
13. เกิดความรู้จากการสืบค้นข้อมูล	.....	.....
14. เกิดพัฒนาทางการศึกษาทุกสาขาวิชา	.....	.....
15. ระบบการสอนทางไกลมีประสิทธิภาพ.....	.....	.....
16. เกิดคุณภาพในการสอน	.....	.....
17. เกิดคุณภาพของข่าวสาร	.....	.....
111.ระบบการสอนทางไกลควรพัฒนาด้าน		
1. คุณภาพของตำราและเอกสาร.....	.....	.....
2. คุณภาพของการสอน.....	.....	.....
3. คุณภาพของคณาจารย์ผู้สอน.....	.....	.....
4. คุณภาพผู้บริหารมหาวิทยาลัย	.....	.....
5. คุณภาพของอุปกรณ์การสอน.....	.....	.....
6. คุณภาพของการศึกษาและฝึกอบรม.....	.....	.....
7. คุณภาพของเครื่องมือเทคโนโลยี.....	.....	.....
8. คุณภาพของข้อมูลข่าวสาร.....	.....	.....

รายการ	คะแนน	ไม่มีรายการ
111. ระบบการสอนทางไกลควรพัฒนาด้าน (ต่อ)		
9. คุณภาพของเครื่องคอมพิวเตอร์	.....	.....
10. คุณภาพของโครงสร้างพื้นฐานโทรคมนาคม.....	.....	.....
112.การศึกษาช่วยให้สังคมพึ่งตนเองได้	.....	.....
113.การศึกษาทำให้เกิดภูมิปัญญา	.....	.....
114.การศึกษาเป็นการเรียนรู้ตลอดชีวิต	.....	.....
115.การศึกษาทำให้ท่าน		
1. เกิดความรู้เพิ่มขึ้นจากเดิม	.....	.....
2. เกิดทักษะและความชำนาญเพิ่มขึ้นจากเดิม	.....	.....
3. เกิดความเข้าใจในประเด็นเนื้อหาเพิ่มขึ้นจากเดิม	.....	.....
4. สามารถขบวดแนวคิดและเกิดความคิดเห็นใหม่ ๆ.....	.....	.....
5. สามารถอธิบายบทเรียนให้เพื่อนในชั้นเข้าใจได้ดี.....	.....	.....
6. สามารถนำความรู้ไปใช้ในงานที่ทำอยู่ ได้เป็นผลสำเร็จดีมาก	.....	.....
7. สามารถนำความรู้ไปประดิษฐ์ผลิตภัณฑ์ หรือ สร้างบริการแบบใหม่.....	.....	.....
8. เข้าใจบทเรียนได้ด้วยตนเองโดยไม่ต้องฟังคำอธิบาย	.....	.....
9. สามารถแก้ปัญหาโดยใช้ความรู้ที่เรียนมาได้อย่างดี	.....	.....
10. มีความรู้ควรควบคู่คุณธรรม	.....	.....

<u>ส่วนที่ 6 : ข้อมูลการประเมินของผู้ตอบแบบสอบถามในด้านการบริหารการเรียนของมหาวิทยาลัย</u>

โปรดใส่คะแนนแสดงระดับการประเมินของท่านต่อประสิทธิผลการบริหารการเรียนทางไกลของมหาวิทยาลัย ลงในช่องคะแนนที่กำหนด โดยที่ 1 = คะแนนประเมินต่ำสุด และ 10 = คะแนนประเมินสูงสุด และใส่เครื่องหมาย ✓ ในช่องไม่มีรายการในกรณีที่มหาวิทยาลัยของท่านไม่มีบริการนั้น

ท่านประเมินการบริหารการเรียนของมหาวิทยาลัยที่ท่านศึกษาอยู่ปัจจุบันกับสิ่งต่อไปนี้มากน้อยเพียงใด โปรดให้คะแนน (คะแนนเต็ม 10)

รายการ	คะแนน	ไม่มีรายการ
116.การเข้าถึงการให้บริการของมหาวิทยาลัย		
1. จำนวนชั่วโมงในการให้บริการของมหาวิทยาลัย.....	.....	.....
2. จำนวนชั่วโมงในการให้บริการของศูนย์สาขา.....	.....	.....
3. จำนวนการขยายพื้นที่ในการสอนทางไกล	.....	.....
4. ความสะดวกและรวดเร็วในการติดต่อมหาวิทยาลัย...	.....	.....
5. จำนวนสื่อการสอนที่ให้บริการของมหาวิทยาลัย.....	.....	.....
6. ความทันสมัยของสื่อการสอนที่ให้บริการ.....	.....	.....
7. นักศึกษาสามารถเข้าถึงสื่อการสอนได้สะดวกที่บ้าน..	.....	.....
8. นักศึกษามีความรู้ความสามารถในการเข้าถึงสื่อการสอนได้เป็นอย่างดี	.....	.....

ท่านประเมินการบริหารการเรียนของมหาวิทยาลัยที่ท่านศึกษาอยู่ปัจจุบันกับสิ่งต่อไปนี้มากน้อยเพียงใด โปรดให้คะแนน (คะแนนเต็ม 10)

รายการ	คะแนน	ไม่มีรายการ
117.การสนองตอบความต้องการที่มหาวิทยาลัยบริการ		
1. ตรงตามความต้องการของนักศึกษา	.....	.....
2. ตรงตามความต้องการของสังคมชุมชน	.....	.....
3. ตรงตามความต้องการของตลาดแรงงาน	.....	.....
4. ตรงตามการพัฒนาการศึกษา	.....	.....
118.คุณภาพของการบริหารการเรียนของมหาวิทยาลัย		
1. คุณภาพทางการบริหารของมหาวิทยาลัย	.....	.....
2. คุณภาพผู้บริหารของมหาวิทยาลัย	.....	.....
3. คุณภาพของการศึกษา	.....	.....
4. คุณภาพของการฝึกอบรม	.....	.....
119.ผลลัพธ์ที่นักศึกษาได้รับหลังจากเข้าศึกษาแล้ว		
1. ความรู้ความสามารถของนักศึกษา	.....	.....
2. คุณธรรมของนักศึกษาที่ได้รับจากการศึกษา	.....	.....
3. วิสัยทัศน์ของนักศึกษา	.....	.....
4. ความชำนาญและทักษะของนักศึกษา	.....	.....
120.ประสิทธิภาพและประสิทธิผล		
1. มหาวิทยาลัยให้บริการต่อสังคมอย่างมีประสิทธิภาพ	.....	.....
2. มหาวิทยาลัยให้บริการต่อนักศึกษาทำให้เกิดความรู้และทักษะได้อย่างมีประสิทธิผล	.....	.....
3. มหาวิทยาลัยใช้ประสิทธิภาพของเทคโนโลยีสารสนเทศ (IT) ในการสอนทางไกล.....	.....	.....
4. ประสิทธิผลของการสอนทางไกล คือประหยัดค่าใช้จ่าย / คุ้มค่า	.....	.....
5. การสอนทางไกลทำให้เกิดความเสมอภาคด้านศึกษา	.....	.....
6. มหาวิทยาลัยมีความเป็นเลิศทางวิชาการ	.....	.....
121.ผลกระทบของระบบการสอนทางไกล		
1. ระบบการสอนทางไกลทำให้มีโอกาสในการหางานทำ	.....	.....
2. ระบบการสอนทางไกลมีผลดีต่อสังคมชุมชน	.....	.....
3. ระบบการสอนทางไกลทำให้เกิดการลงทุนสิ้นเปลือง	.....	.....
122.การสร้างความรู้ในการปฏิบัติแนวใหม่	.....	.....
1. ในความคิดใหม่	.....	.....
2. ในทิศทางใหม่	.....	.....
123.การยอมรับ		
1. โอนหน่วยกิตของมหาวิทยาลัยแห่งใหม่เพื่อศึกษาต่อ	.....	.....
2. บัณฑิตในตลาดแรงงาน	.....	.....

APPENDIX C

Questionnaire

English Version

Questionnaire

"Effectiveness of Distance Learning at State University"

This questionnaire is a part of research dissertation for examining the students' opinion, satisfaction, requirement, and learning barriers of distance learning. Please, check the box and fill out the appropriate blank. Thank you very much for your kind cooperation.

Part 1 : General Information

Please, fill out the box ( ) with the mark ✓ in front of the correspondent answer related to your background and qualification, and fill out the appropriate blank

1. You are studying at university of .....
2. Regional campus or service development academic center province .....
3. Sex of respondent 1. ( ) Male 2. ( ) Female
4. You are studying at Faculty of .....
5. You are studying at 1. ( ) Undergraduate level Class .....
   2. ( ) Graduate level Class .....
6. Marital status 1. ( ) Single 2. ( ) Married
   3. ( ) Divorce 4. ( ) Widow(er)

(if married) Number of dependents ..... No. of educating dependents .....

7. Age of respondent ..... year
8. Your current career
   1. ( ) Civil officer 2. ( ) State Enterprise
   3. ( ) Private employee 4. ( ) Business owner
   5. ( ) Politician 6. ( ) Freelance 7. ( ) Others

   If you choose the answer of 6 or 7, skip to answer question no. 11

   Position of Job (specify) .....

   Duration of the position posses..... Year, experience in work ..... year
9. Average income of family (husband and wife) ..... bahts per month
10. Average of family expense ..... bahts per month
11. Total tuition fee ..... bahts per semester
12. Expense in study excluding expense in question 10 and 11 ..... bahts per month
13. Are you living in the province located regional campus or service development center province
    1. ( ) Yes, Distance of travelling ..... Km.
    2. ( ) No, Distance of travelling ..... Km.
14. Time spent on travel to study..... Hours per each time
15. Accumulated credits you earned up to now is ..... credits
16. Your GPA is ..... with the total courses of ..... credits
17. Total numbers of re-examination taken ..... courses
18. Total duration of time until graduate ..... year ..... month
19. Total time spent for reading on study ..... hours / week
20. Total time spent for reading on examination preparation ..... hours / each exam.
21. Have you applied for another university?
    1. ( ) Yes Why .....
    2. ( ) No Why .....

Part 2 : Respondents' opinions and requirements on teaching and learning

Please, prioritize the following answers based on the significance (at least 3 order) ascending from most to least importance. Using 1 = most importance, please fill out the number in ( ) of the answer, and also mark ✓ in the appropriate choice of Yes or No (Mark ✓ can be filled out as many as require)

22. Your needs on study (please, prioritize the significance)

	Yes	No
1. ( ) Diploma or Certificate (specify)		
2. ( ) Career advancement (specify)		
3. ( ) Social acceptance (specify).....		
4. ( ) Political vote support (specify)		
5. ( ) Enhanced knowledge (specify).....		
6. ( ) Increased opportunity (specify)		
7. ( ) Hobby (specify)		
8. ( ) Family honor (specify)		
9. ( ) Career Transition (specify)		

23. What did you get from study? (prioritize the significance)

	Yes	No
1. ( ) Critical concepts (specify)		
2. ( ) Knowledge (specify)		
3. ( ) Applied knowledge (specify)		
4. ( ) Technical skills (specify)		
5. ( ) Concepts and theories (specify)		
6. ( ) Social acceptance (specify)		
7. ( ) Self-respect and self-dependence (specify)		
8. ( ) Reliability (specify)		
9. ( ) Accountability (specify)		

24. Do you gain your study on applying to job, which direction?

	Yes	No
1. ( ) Increase skill (specify)		
2. ( ) Increase experience (specify)		
3. ( ) Increase understanding (specify)		
4. ( ) Problem solving (specify)		
5. ( ) Quality control (specify)		
6. ( ) Technology utilization (specify)		
7. ( ) Creativity / Initiation (specify)		
8. ( ) Critical control (specify)		
9. ( ) New products / new services (specify)		

25. Distance education system influences (prioritize)

	Yes	No
1. ( ) Income distribution (specify)		
2. ( ) Community participation (specify)		
3. ( ) Knowledge dissemination (specify)		
4. ( ) Equity on education (specify)		
5. ( ) Learning opportunity (specify)		
6. ( ) Career opportunity (specify)		
7. ( ) Community dependency ability (specify)		
8. ( ) Literacy ability (specify)		
9. ( ) Moral development (specify)		

26. Requirement for university improvement (prioritize)

	Yes	No
1. ( ) Curriculum development (specify)		
2. ( ) Academic context development (specify)		
3. ( ) Teacher's conscious (specify)		
4. ( ) Teaching ability on explanation (specify)		
5. ( ) Academic service (specify)		
6. ( ) Learning materials service (specify)		
7. ( ) Library service (specify)		
8. ( ) Computer usage service (specify)		
9. ( ) Teaching media service (specify)		

27. Which instructional delivery modes preference (prioritize)

	Yes	No
1. ( ) Face-to-face		
2. ( ) One-way communication (via radio or TV)		
3. ( ) Two-way communication (via telecommunication) For interactive learning as teleconference		
4. ( ) Mail		
5. ( ) Telephone or facsimile		
6. ( ) Self study (no need teaching)		
7. ( ) Study from media (such as VDO or cassette)		

28. What types of your examination on study? (specify in percentage)
    1. Multiple choices ..... % of total courses in curriculum
    2. Written examination ..... % of total courses in curriculum
    3. Report examination ..... % of total courses in curriculum
    4. Research ..... % of total courses in curriculum
    5. Field study examination ..... % of total courses in curriculum
    6. Laboratory examination ..... % of total courses in curriculum

❖❖❖❖❖❖❖❖❖❖❖❖❖❖❖❖

Remark

Efficiency means amount of output are greater than input (Output : Input > 0) or the output rate is higher than input rate.

Effectiveness means how much effect of the achieved output is closed to objective setting.

Information Technology (IT) is the combination of the capacity of computer and telecommunication equipment in order to transfer texts, image, and voice to remote areas all over the world.

Part 3 : Problems and barriers on teaching and learning

Please, prioritize the following problems or barriers based on the significance (at least 3 order) ascending from most to least importance. Using 1= most importance fill out in ( ) and also specify that problem. Mark ✓ in the appropriate choice of Yes and No at the problems you face

29. Problems and barriers on your study | Yes | No(problem)
    1. ( ) Curriculum / Learning materials (specify) .....
    2. ( ) Lecturers (specify).....
    3. ( ) Grade Point Average (specify).....
    4. ( ) Media (specify).....
    5. ( ) Communication with lecturers (specify).....
    6. ( ) Context of subject is not related to job (specify).....
    7. ( ) Laws / Regulation (specify).....

30. Problems and barriers of your own | Yes | No(problem)
    1. ( ) Distance of traveling to study .....
    2. ( ) Time devoted to study .....
    3. ( ) Expense on study .....
    4. ( ) Family support .....
    5. ( ) Superior support .....
    6. ( ) Lack of Motives .....
    7. ( ) Lack of Educational background .....

31. Problems and barriers of study location | Yes | No(problem)
    1. ( ) Too small class room / Not enough seats .....
    2. ( ) Dirty class room / Air condition problem .....
    3. ( ) No place for rest or study room .....
    4. ( ) Lack of regional staff's responsibility .....
    5. ( ) Lack of technical operator's responsibility .....
    6. ( ) Too noisy because of chats or mobile phones .....
    7. ( ) Not enough place for parking car / pleasant atmosphere .....

32. Problems and barriers of your IT utilization | Yes | No(problem)
    1. ( ) Lack of computer background .....
    2. ( ) No study room for watching video .....
    3. ( ) No learning equipment support .....
       e.g. copier machine, facsimile
    4. ( ) No computer service or support .....
    5. ( ) Distance learning Telecommunication is ineffective .....
       e.g. the signal is often distorted or disconnected
    6. ( ) No electronic library for data searching .....
    7. ( ) No communication facilities for contacting teacher .....

Part 4 : The respondents' satisfaction to the educational context

Please give the score of your satisfaction, put in the score box according to the content of educational context where score 1 = least satisfaction ⟶ 10 = most satisfaction and fill out with the mark (✓) in no item list box in case of no item for the specific content

How much you satisfy the following items, please give the score for satisfaction (10 full score)

Description	Score	No item list
33. Curriculum availability offered by university	.....	.....
34. Context of subject matter	.....	.....
35. The teachers' clear explanation	.....	.....
36. The advisory of facilitators	.....	.....
37. Documents and learning materials provided		
1. Texts	.....	.....
2. Supplementary documents	.....	.....
3. Reference Texts	.....	.....
4. Copied supplementary document	.....	.....
5. Learning materials e.g. tape cassettes, video tapes, diskette) and CD	.....	.....
38. The Instructional delivery modes provided		
1. Radio broadcasting delivery	.....	.....
2. ITV broadcasting delivery	.....	.....
3. Motion movie presentation	.....	.....
4. Teaching by slide projection	.....	.....
5. Teaching by transparences	.....	.....
6. Teaching by video recorder	.....	.....
7. Learning by Tape cassette	.....	.....
8. Computer program presentation	.....	.....
9. Two-way tele-teaching	.....	.....
10. Teaching Face-to-Face in classroom	.....	.....
11. Self-study	.....	.....
39. Guest speakers	.....	.....
40. Texts available in library	.....	.....
41. Computers provided for students	.....	.....
42. Registration service	.....	.....
43. Administrators' policy	.....	.....
44. Regional staff service	.....	.....
45. Classroom schedule	.....	.....
46. Radio broadcasting schedule	.....	.....
47. TV broadcasting at home	.....	.....
48. TV learning available at regional campus / center	.....	.....
49. Learning materials available at regional campus / center	.....	.....
50. Examination grade result	.....	.....

Description	(10 full score) Score	No item list
51. Ease to contact faculty	.....	.....
52. Newsletter service	.....	.....
53. Methods to communicate with faculty		
1. Correspondence by postal mail	.....	.....
2. Communication by telephone, fax	.....	.....
3. Two-way interactive teleconferencing	.....	.....
4. Interaction with teacher by e-mail	.....	.....
5. Face-to-Face interaction in classroom	.....	.....
54. Application programs availability	.....	.....
55. Electronics Library Searching	.....	.....
56. Classroom discussion	.....	.....
57. Two-way discussions	.....	.....
58. University electronic newsletter	.....	.....
59. Clear two-way telecommunication	.....	.....
60. Grade report quick feedback	.....	.....
61. Expanded coverage of campuses	.....	.....
62. Ease to access Internet communication	.....	.....
63. Distance learning system of State University	.....	.....
64. Overall context of the subject matter provided by universities	.....	.....
65. The modern DL media currently used in university	.....	.....
66. The overall of university services	.....	.....
67. The educational administration of administrators .	.....	.....
68. The technological utilization & services of university	.....	.....
69. The instructional delivery modes provided	.....	.....
70. The overall learning environment of university	.....	.....
71. The accessibility to the university's services	.....	.....
72. The quality of faculty's teaching	.....	.....

73. What types of IT utilization you employ?
    1. ( ) Games playing – spend time ..... hours /time,
       Number of time .....times/week
    2. ( ) Word processing – spend time ..... hours /time,
       Number of time ..... times/week
    3. ( ) E-mail – spend time ..... hours /time,
       Number of time ..... times/week
    4. ( ) Programming – spend time ..... hours /time,
       Number of time ..... times/week
    5. ( ) Internet searching – spend time ..... hours /time,
       Number of time ..... times/week
    0. ( ) Never use
74. Do you think that IT is useful to education in which scale ..... (1-10)

Part 5 : The respondents' perception on the educational process

Please give the score of your perception or agreement, by putting the score in box according to your perception on the educational process
where score 1 = least agreement ⟶ 10 = most agreement and fill out with the mark (✓) in no item list box, in case of no item for the specific content

How much you agreement the following items, please give the score of perception

Description	(10 full score) Score	No item list
75. Appropriate Class size	.....	.....
76. Clean and fresh air classroom	.....	.....
77. Clean and enough toilets	.....	.....
78. Learning facilities available in class	.....	.....
79. Academic group establishment	.....	.....
80. Group participation and meetings	.....	.....
81. Respect teacher custom ceremony	.....	.....
82. Academic and final seminar	.....	.....
83. Examination & theses orientation	.....	.....
84. Workshop requirement	.....	.....
85. Correspondence by postal mail	.....	.....
86. Face-to-Face teaching in classroom	.....	.....
87. Teaching by telecommunication	.....	.....
88. Faculty teach in the covered learning contents	.....	.....
89. Clear & Understanding on the teaching explanation ...	.....	.....
90. Qualified faculty	.....	.....
91. Opinion encouragement	.....	.....
92. Modern context of study	.....	.....
93. Applied knowledge to job	.....	.....
94. Better quality of life	.....	.....
95. Distance education reduces the study expense	.....	.....
96. Distance education system is self-study	.....	.....
97. Education should emphasize to use computer	.....	.....
98. Education should focus on problem solving	.....	.....
99. Education should come with moral	.....	.....
100. Education improves students' moral	.....	.....
101. Education helps your job success	.....	.....
102. Education enhances your power	.....	.....
103. Education increases your proud & more respect from others	.....	.....
104. Education increases your income	.....	.....
105. Education wastes your funny time	.....	.....
106. Education causes family separated	.....	.....
107. Education makes people selfish	.....	.....

Description	(10 full score) Score	No item list
108. The university should provide the following:		
1. Computer training courses	.....	.....
2. Faculty evaluation required	.....	.....
3. Faculty rotation	.....	.....
4. Locations rotation	.....	.....
5. Learning materials improvement	.....	.....
6. Texts improvement	.....	.....
7. Curricula improvement	.....	.....
8. Teaching methods improvement	.....	.....
109. Distance education should utilize IT as a tool	.....	.....
110. IT utilization enhances the following:		
1. Mass learners	.....	.....
2. Coverage of various areas	.....	.....
3. Cost-effectiveness	.....	.....
4. Distance education reduction	.....	.....
5. Distance communication reduction	.....	.....
6. Timeliness reduction	.....	.....
7. Diversity of education	.....	.....
8. Equity in education	.....	.....
9. Rapid global information	.....	.....
10. Information interchange	.....	.....
11. New modern service styles	.....	.....
12. Electronics Commerce	.....	.....
13. Data searching knowledge	.....	.....
14. Diverse educational development	.....	.....
15. Improve DE system to efficiency	.....	.....
16. Quality of teaching	.....	.....
17. Quality of information	.....	.....
111. Distance education system should improve in		
1. Quality of texts and documents	.....	.....
2. Quality of teaching	.....	.....
3. Quality of faculty	.....	.....
4. Quality of university administrators	.....	.....
5. Quality of learning materials	.....	.....
6. Quality of education and training	.....	.....
7. Quality of IT equipment	.....	.....
8. Quality of Information	.....	.....
9. Quality of computers	.....	.....
10. Quality of telecommunication infrastructure	.....	.....
112. Education create social self-reliance	.....	.....
113. Education creates wisdom	.....	.....
114. Education is life long learning	.....	.....

Description	Score	No item list
115. Education encourages you in terms of		
1. Increase knowledge	.....	.....
2. Increase skill	.....	.....
3. Increase understanding	.....	.....
4. Conceptualize and initiate	.....	.....
5. Explain to classmate clearly	.....	.....
6. Knowledge applied successfully	.....	.....
7. Knowledge initiates new products and new services .	.....	.....
8. Understanding clearly without attend class	.....	.....
9. Problem-solving from knowledge learned	.....	.....
10. Knowledge with moral	.....	.....

Part 6 : The respondents' perception on the educational process

Please give the score of your evaluation to the effectiveness of distance learning at State university, by putting the score in box according to your evaluation
where score 1 = lowest score of evaluation ⟶ 10 = highest score of evaluation and fill out with the mark (✓) in no item list box, in case of no item for the specific content

How much you evaluate the administration of your university at the following items, please give the score of evaluation

(10 full score)

Description	Score	No item list
116. Accessibility to the university services		
1. Number of service hours university offered	.....	.....
2. Number of service hours at regional centers	.....	.....
3. Coverage of distance learning areas	.....	.....
4. Ease to contact university	.....	.....
5. Number of media service from university	.....	.....
6. Modernity of learning media offered	.....	.....
7. Students can access learning media at home	.....	.....
8. Students can access learning media with knowledge and skill	.....	.....
117. Need relevance of students that university offered		
1. Relevance to students' needs	.....	.....
2. Relevance to communities' needs	.....	.....
3. Relevance to labor markets' needs	.....	.....
4. Relevance to the educational development	.....	.....

Description	(10 full score) Score	No item list
118. Quality of educational program that university offered		
1. Quality of the university's administration	.....	.....
2. Quality of the administrators	.....	.....
3. Quality of education	.....	.....
4. Quality of training	.....	.....
119. Learner outcomes		
1. Students' knowledge and ability	.....	.....
2. Students' moral from education	.....	.....
3. Students' visions	.....	.....
4. Students' experience and skills	.....	.....
120. Effectiveness and efficiency		
1. University serves society efficiently	.....	.....
2. University serves services to students for knowledge and skill enhancement effectively	.....	.....
3. University utilizes IT for distance learning efficiently	.....	.....
4. Distance learning effectiveness is cost-effectiveness	.....	.....
5. Distance learning encourages equality in education	.....	.....
6. University offers the academic excellence	.....	.....
121. Impacts of distance learning		
1. Distance learning system offers job opportunity	.....	.....
2. Distance learning system offers benefits to communities	.....	.....
3. Distance learning system offers high investment	.....	.....
122. Generation of knowledge		
1. Knowledge encourages new practice	.....	.....
2. Knowledge encourages new ideas	.....	.....
3. Knowledge encourages new directions	.....	.....
123. Acceptability		
1. Credits transfer to other universities	.....	.....
2. Graduated students in the labor market	.....	.....

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