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A QUALITATIVE ANALYSIS OF THE INTERNAL EFFICIENCY OF FORMAL DISTANCE EDUCATION SYSTEMS IN MEXICO

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A Thesis

in

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of

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ABSTRACT

A Qualitative Analysis of the Internal Efficiency of Formal Distance Education Systems in Mexico

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Concordia University, 1986

This dissertation analyzes the internal efficiency of formal distance education (DE) systems in Mexico through the exploration and description of factors that are considered to be the internal necessary producers of 1) different graduation rates, and 2) the level of achievement of the goals that stimulated the development of these systems.

Case Study and Process Evaluation methods were used for the purpose of exploring the internal structure of each of the eleven systems under consideration. Factors that appeared to be unique or common to the least and most efficient systems were analyzed in terms of their roles as main internal producers of differences among the various systems' graduation rates.

The study found that despite the effect that some already known environmental variables may have upon the graduation rate, the latter is also the product of some specific elements that are part of the systems' internal structures. Key factors identified were a)learning strategy, b)predominant technology, c)learning site, d)academic staff, e)creation, production, and delivery of learning materials, and f)the evaluation of the system

through different outcome measures. Systems with higher internal efficiency use a multi-media approach combined with regular interpersonal communication; learning takes place both at home and in group settings; materials are designed by teams of both permanent and part-time staff with production and delivery carried out through a mix of in-house and external resources; evaluation is performed on at least two aspects of the system.

Based on these factors, and their relation to the large discrepancy between the number of students who have enrolled and those who have graduated, this research concluded that the internal efficiency of formal DE in Mexico on the whole is far from being optimal nor satisfactory. In a similar manner, the study also concluded that the effectiveness or achievement of original goals of these systems has been only partially accomplished in terms of effectively expanding educational opportunities for the disadvantaged sectors of Mexican society.

The study points to a promising methodology for analyzing distance education systems and provides further insight toward the development of theory in an increasingly important area of educational technology.

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To all of these people, two simple words: muchas gracias.

Finally, this section would not be complete without the name and special recognition to the person who has been my major motivation for completing this thesis, and who waited patiently for me during one year of painful separation, and personal sacrifice, my wife, Nadia. This dissertation is especially dedicated to her.

DEDICATORIA

A mi Nadiezhda, con dos palabras solamente:
Tibia liubliu.

A la tierna y dulce memoria de Doña Meche:
mi querida e inolvidable madre. Para ella,
una vez mas, mi mejor esfuerzo.

A mi padre, muy especialmente, con entrañable
cariño y profunda gratitud.

A la memoria de mi querido hermano Roberto:
mi amigo y maestro de siempre.

A mis hermanos: Arturo, Rene y Nano, con
todo cariño.

A la memoria de mi abuelita Maria.

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CHAPTER I

INTRODUCTION TO THE PROBLEM

1.1 The Problem and its Relevance within the Context of Mexico's Education

This dissertation is concerned with the study and evaluation of the internal efficiency of the eleven distance education (hereafter DE) systems operating at different levels, within the formal education structure of Mexico.

The relevance of the study stems from the fact that these systems, which account for most DE practice within the country, have not been able to perform according to expectations, and consequently they have been unable to attain, both quantitatively and qualitatively, the goals that triggered their creation.

At the core of the Mexican government expectations for DE was the expansion of educational and training opportunities to people, who were unable to attend regular classes in the traditional system, culminating in a diploma or certificate that could increase their chances of obtaining a better paid job, thus helping reduce the socio-economic differences that existed between the various sectors of Mexican society-- especially between the urban, semi-urban, and rural areas. Likewise, it was expected that these systems could help in the development and introduction of a more relevant curriculum content based on

the needs of the society at large, and which would also introduce some new instructional practices that could stimulate the creation of new learning styles based on an independent-study approach. It was also expected that DE could help decentralize the educational system of the country, thus contributing to the development of the different regions and allowing a better match between regional needs and educational content. Finally, it was thought that with the help of these systems a second chance would be given to many thousands of people who dropped out of the traditional system and who therefore never completed their basic school education (Alvarez-Manilla, Arenas, Benavides, de Oliveira, Pardo, and Prieto, 1982; Arena, 1979; Castrejon, 1981; Chaparro, 1979; Espinoza, 1979; Garcia, 1979; Moreno, 1981; Muñoz-Izquierdo, 1983).

Indeed, the development and implementation of DE systems in Mexico were based on the social and educational needs of the country contemplated within the National Plan of Education, the National Law of Education, The Education for All Project, and the National Development Plan. Within this framework, Federal government officials decided that DE systems could contribute to the achievement of the following goals: a) to expand educational opportunities to the most disadvantaged sectors of the population throughout the nation, b) to offer a new approach to adult education through the use of more flexible educational systems, c) to help in the establishment of a more effective in-job

training strategy for the purpose of achieving the development goals of the nation, and d) the development of a more decentralized educational structure that would focus on the needs of the individual, the community, and the country at large (Consejo Coordinador de Sistemas Abiertos de Educacion Superior [CCSAES], 1984; 1983; 1982). Hence, in general terms, DE was seen as a viable alternative and conceived as a new educational approach much more in accordance with the socio-economic, scientific, and technological needs of Mexican society.

Although the use of DE in Mexico can be traced back to 1947, its major impetus took place during the late 60's when the idea of the need for a better educational structure gained political momentum. This, in fact, was not surprising when we consider the socio-economic and political climate of the period, in particular the students' movement which became a real educational, political, and socio-economic challenge to the Mexican system as a whole (Guevara, 1978; 1981). Furthermore, the traditional educational system of the country was suffering the overwhelming effects of an increased demand for its services at all levels to which it could not respond adequately. Likewise, it is also important to mention the impact that the diffusion of the British Open University model had, together with other important and influential DE systems developed in the industrialized nations of the world, upon the development of a large number of programmes

and institutions of this kind within the country.

As of 1984, there were eleven formal distance education systems (or Open Learning systems as they are commonly known in Mexico[1]) operating at various levels within the country. Some of these were put in place for the explicit purpose of bringing education to the rural areas such as the Community Courses-Elementary School, Telesecundaria, and the Intensive Elementary School for Adults systems. Others included the goal of serving some sectors of the population within the countryside, but were mainly addressed to groups of students living in the urban and semi-urban areas of the country by offering high school, vocational, technical-industrial, and university education.

Undoubtedly, the use of distance education systems has helped to expand educational services to people who belong to the most impoverished sectors of Mexican society, at a pace that with the traditional system would have been almost impossible to achieve. Likewise, many of the so called "bottlenecks" produced at the different levels of education, particularly at the elementary, junior high school, and high school levels, have to some extent been loosened up with the help of these systems, and consequently each year more and more students are enrolled in these kinds of institutions with the hope of obtaining a certificate, diploma, or equivalent, that could help them increase their chances of obtaining a better position

within the job-market.

Unfortunately, with the exception of Telesecundaria which has an outstanding graduation rate (i.e., terminal efficiency rate), and two university level operations, most of the formal distance education systems operating in Mexico have had very low terminal efficiency results.

Although it could be argued that the socio-economic, cultural, family-related, nutritional, and other environmental factors are the main producers of the high drop out and low terminal efficiency rates in most of these institutions, we are inclined to argue that there are also some specific factors contained within each of these systems that are producing, perhaps to a larger extent, the poor rates of graduation.

Moreover, unless the terminal efficiency rate of these systems is improved, the effectiveness that these institutions could have in terms of achieving the goals and objectives which triggered their development will be very difficult or almost impossible to be reached.

Hence, it is the purpose of this dissertation to study the phenomenon of formal distance education in Mexico, in terms of its internal efficiency, through the description and exploration of each of the eleven systems that comprise this area of education in their natural occurring states.

In order to achieve this goal, a qualitative research methodology incorporating both Case Study and Process Evaluation research methods will be used for the purpose of

identifying those factors contained within each individual system, and within clusters of them as well, that could be considered to be the internal necessary producers of the high, medium, and low terminal efficiency results. Likewise, we will attempt to draw some plausible inferences and conclusions as to the positive or negative consequences of each of these factors. A secondary goal is to contribute both to the field of distance education in general through means of the methodology used for analyzing distance education systems in a more systematic and reliable way, and to distance education practice in Mexico through means of the results and conclusions of this study.

1.2 Specific Objectives of the Study as Derived from the Problem

In order to properly investigate the aforementioned problem, this study is aimed towards the achievement of the following objectives:

1) To describe the most salient characteristics of the eleven DE systems in terms of their overall organization, specific subsystems, internal operational structure and results.

2) To formulate a general model of DE in Mexico in which common characteristics and patterns of behaviour among the eleven systems will be identified and delineated;

3) To analyze, in comparative form, the characteristics that are both common and unique to all systems in order to

identify those factors that are present in the most and the least efficient systems.

4) To generate propositions concerning the factors that may be contributing to the internal efficiency of these systems.

5) To validate these propositions on the basis of the evidence generated in the analysis.

6) To prescribe, on the basis of the evidence produced, specific guidelines as to what should be done in order to improve the efficiency of the systems and consequently to increase the probability of achieving their goals.

7) To contribute to the theoretical and practical developments in the area of DE on the basis of the methodology used and the results obtained from the study.

These objectives are to be reflected within each of the remaining chapters of this dissertation.

1.3 Structure of the Study

The structure and body of this dissertation are developed in six chapters. The first chapter is an introduction to the problem, the objectives of the study, and overall structure of the dissertation.

The second chapter is intended to provide the reader with a thorough discussion of the methodology of this study. Aspects and concepts such as internal efficiency, descriptive and exploratory research, the research design, design tests, the nature and purpose of qualitative

research, data collection, instrumentation, and the procedures for analyzing the data will be presented.

In the third chapter, a full historical account of the development and present status of distance education in Mexico is presented. This chapter will provide the reader with the necessary background knowledge regarding the context in which formal distance education systems operate, and the nature, objectives, structure, operation, and results of each of the eleven systems under consideration. Hence, this chapter will become the data-base to be used within the next chapters.

The fourth chapter contains an in-depth analysis of each of the eleven systems. At this particular stage, a methodology for analyzing and classifying in a comprehensive, yet detailed way, each of these systems for the purpose of identifying their most salient characteristics from which a general model of Mexican distance education could be drawn, will be introduced. In addition, those factors that are both unique and common to each individual system and to clusters of systems as well, which could be considered to be those that in one way or another are the main internal producers of the terminal efficiency rates of these systems, will be identified.

In the fifth chapter, an analysis and interpretation of the results obtained within the previous chapter for the purpose of developing some propositions, validating them on the basis of the evidence obtained, and making some

plausible inferences as to why these factors appear within a particular individual or cluster of systems, and how these factors might be contributing to their terminal efficiency rates, will be performed. Thus, this chapter will provide the reader with a more solid understanding concerning not only the nature of the factors themselves, but also their consequences in terms of adequate or inadequate structural and operational characteristics and practices of formal distance education systems in Mexico.

Finally, in chapter six, some general conclusions regarding the adequacy and/or inadequacy of certain practices within these systems, and also some practical recommendations to Mexican practitioners for the purpose of helping to improve the structural and operational aspects of their systems, will be drawn and suggested. The researcher will also introduce some ideas for future research in the area of Mexican Distance Education, for the purpose of encouraging the study of these particular factors in other complementary ways. Finally, the implications and limitations of this study will be presented.

As a final comment to this introduction, the researcher wishes to express that, although the results of this study could benefit those people concerned with managing, designing, planning, and studying distance education systems in Mexico and other parts of the world, the main concern of this study will always be the thousands

of Mexican students who see in distance education the hope for a better life. This dissertation is written with their benefit as the primary purpose in mind.

CHAPTER II

METHODOLOGY

2.1 Qualitative Research, Case Study, and Process Evaluation

This study is concerned with the analysis and understanding of a specific social phenomena (i.e. distance education) in its naturally occurring state. Since there will be no attempt to manipulate the research setting nor to state any *a priori* hypotheses for the purpose of validating an already existing theoretical framework, but instead to allow those important dimensions (i.e. propositions and theoretical constructs) to emerge from the study itself following an analytical-inductive research strategy, a qualitative research methodology will be used (Bliss, Monk, and Ogborn, 1983; Bogdan & Knopp, 1982; Campbell, 1974; Kidder, 1981; Patton, 1983; Rosenblatt, 1981; Van Maanen, Dabbs, and Faulkner, 1982; Yin, 1984).

Within the qualitative research methodology, the idea is to proceed from the bottom up, beginning with, and developing theoretical categories, concepts, and propositions, from the data (Glaser & Strauss, 1967). Such data must necessarily be bound to the context in which the phenomena itself appears to exist. Thus, it could also be said that in addition to an analytical-inductive method of inquiry, the qualitative research methodology also uses a holistic-inductive paradigm. This paradigm establishes

that the researcher "works back and forth between parts and wholes, separate variables, and complex, interwoven constellations of variables in a sorting-out then putting-back together process" (Patton, 1983, p. 47).

Qualitative research uses different analytical-inductive methods for the purpose of discovering what is happening in a given phenomenon and verifying whatever has been discovered. Two of these methods are Case Study, and Process Evaluation. In the present work both methods will be used in a combined form in order to investigate the problem under study.

In regard to case study research, its use is for the purpose of answering a "how or why question about a contemporary set of events, over which the investigator has little or no control" (Yin, 1984, p. 20). This set of events, in this case the nature and results of formal DE in Mexico, will be investigated within its real-life context. For that purpose, the Case Study methodology has at least four different applications:

1) To explain the causal links in real-life interventions that are too complex for survey or experimental strategies;
2) To describe the real-life context in which an intervention has occurred;
3) To describe the intervention itself;
4) To explore those situations in which the intervention being evaluated has no clear, single set of outcomes (Yin, 1984, p. 25).

Within this study, and given the fact that no previous research has been done in Mexico in the area of formal DE for studying the internal efficiency of the eleven systems, the application of a case study methodology will be used first, for describing the social, political, and educational context in which formal DE in Mexico has occured and is still being carried out; secondly, for describing each one of the individual DE systems with the purpose of gaining knowledge about their structural, organizational, and operational properties through which common, unique, and salient characteristics could be adequately and systematically identified and described; and thirdly, for exploring the nature of these characteristics (i.e. factors) and their potential link to the outcomes that each individual system has had in terms of their terminal efficiency, or students' graduation rates.

On the basis of what was mentioned earlier in terms of this study being the first one of its nature for investigating the phenomenon of the internal efficiency of formal DE in Mexico, this study therefore is aimed towards the description and exploration of this phenomenon rather than the explanation of the causal relationships among the structure, organization, operation, characteristics, and the terminal efficiency rates of the eleven systems.

Hence, this study is only concerned with the application of case study methodology at levels 2), 3), and 4).

The use of a descriptive and exploratory approach to the problem of concern is a proper one since "much scientific activity is concerned with the description of natural or manmade phenomena [or] the discovery of new phenomena, [thus] science could not advance without accurate identification and description of structures" (Borg & Gall, 1983, p. 20). Therefore, through description the researcher will be able to provide the basic knowledge that is needed in the area of formal DE in Mexico, so that later studies could address and attempt either prediction, control, or explanation of this particular phenomenon.

As mentioned earlier, although description and exploration per se are not concerned with explanation in a cause-effect sense, they are still adequate for developing some kind of inferences as to the potential link between certain factors and characteristics of the various formal DE systems and their terminal efficiency rates, within the framework of a "producer-product relationship" (Ackoff, 1967, p. 65).

In Process Evaluation, on the other hand, the idea is to analyze the process whereby a program produces the results it does. In order to accomplish this, this method follows a four-step procedure: 1) the evaluator tries to unravel what is actually happening in a program in searching for major patterns and important nuances that give the program its character, 2) the understanding gained is intended to permit decisions to be made about the extent

to which the program is operating in the way it is supposed to be operating, 3) by this understanding of the dynamics of program processes, it is possible to isolate critical elements that have contributed to program successes and failures, and 4) the researcher proposes validated explanations of the successes, failures, and changes in a program (Patton, 1983, pp. 60-62). It is important to mention that Process Evaluation also emphasizes the idea of the researcher not having predetermined hypotheses about what the strengths and weaknesses of a given program are.

In the present study, the aforementioned four-step procedure to Process Evaluation will be applied as follows:
1) To provide a detailed description of the most salient characteristics of the eleven DE systems in terms of their overall organization, specific subsystems, internal operational structure and results (internal efficiency), since all of these give each system its character;
2) On the basis of the information gained in the previous step plus that concerning the total number of students enrolled and the total number of graduates (terminal efficiency) for each system, the extent to which each system (i.e. program) is operating at a high, medium, or low terminal efficiency level, will be revealed;
3) Based on the information gained in the previous steps, and the development of a scheme for the purpose of breaking down and classifying into various levels and sub-levels of analysis all the raw information obtained regarding the

overall organization, specific subsystems, and the internal operational structure of each individual system, it will be possible to identify those critical factors that are considered to be contributing to the different terminal efficiency levels of these systems;

4) Finally, on the basis of the results obtained in the third step, it will be possible to propose various validated explanations of the successes, failures and changes in each of the eleven DE systems for the purpose of providing some guidance to practitioners as to the most critical factors that they should take into account in order to bring formal DE systems in Mexico to a satisfactory level.

Thus, it is clear that a combined approach to investigating this problem has emerged in which a qualitative research methodology is the general framework within which two specific qualitative evaluation research techniques are to be joined, namely, Case Study, and Process Evaluation. Furthermore, by using a "recursion effect" (Beer, 1979) it could be said that Process Evaluation will be used within the context of a Case Study design in order to reduce as much as possible the negative effects of using one-single research instrument, thus attempting a methodological triangulation by multiplying the methods for gaining knowledge about the problem of concern (Patton, 1983; Le Vine, 1981; in Brewer and Collins; Campbell, 1969).

2.2 Research Design

Although it is true that a "qualitative research design is an evolving process, one in which the questions to be asked and the data to be collected emerge in the process of doing research" (Bogdan and Knopp, 1982, p. 71), it is possible and desirable for us to decide upon a more specific design within the framework of the combined methodology previously mentioned: a Single-Case Study Design (Yin, 1984).

The choice of this particular design was made on the basis of its adequacy whenever a revelatory[2] study is carried out.

According to Yin (1984, pp. 43-44), a revelatory case study situation exists "when an investigator has an opportunity to observe and analyze a phenomenon previously inaccessible to scientific investigation [in which] the descriptive information alone will be revelatory". In this particular case, the idea of "inaccessibility" can be translated to "no previous studies and information in the area of concern", prior to the current investigation. Hence, this research becomes revelatory since this researcher is the first to "explore" the phenomenon of formal DE in Mexico, while using a descriptive approach to produce data that could be used in future research.

Furthermore, it is important to note that the use of a single case study research design also allows the researcher to include in this analysis the "outcomes from

individual projects within the program" (Yin, 1984, p. 44) of interest, that is, formal DE in Mexico. In this sense, what this study is attempting to analyse is formal DE in Mexico as the main unit of analysis i.e., the case in itself, while also considering the information and outcomes from each of the eleven systems as subunits in themselves. This differentiation is made on the basis of the educational nature of the eleven systems, which is to say that upon completion of the required coursework by the student, each institution (i.e. system) grants a diploma, certificate, or degree as in any other formal educational institution.

On the basis of this rationale, this particular design is not only a single case study but more precisely, a single-embedded case study design (Yin, 1984, p. 44). With the use of this particular design the researcher will not only be attempting the exploration and description of the main unit of analysis and the various subunits contained within it, but also the different levels and sublevels within each individual system or subunit; that is to say, their components or elements, intrinsic characteristics, and results, will enable the researcher to infer some common patterns of behaviour as well as differences among the systems for the purpose of providing evidence as to the circumstances under which internal efficiency is likely or unlikely to occur.

It is expected that the use of this design will assist

not only in exploring and describing the phenomenon of DE in Mexico, but also in understanding it in a more scientific way.

2.3 Data Collection

Data were collected during a three month period in 1984 on each of the eleven DE systems, using two main sources of information: 1) The Consejo Coordinator de Sistemas Abiertos de Educacion Superior-CCSAES [Coordinating Council of Open Learning Systems in Higher Education], and 2) Each of the eleven systems independently.

Nineteen eighty three was chosen as the standardized year for comparing all systems, since the data were gathered in 1984. Nineteen eighty three would hence represent the most recent information base available and would constitute the minimum amount of time needed to evaluate results from some of the newer systems in operation (e.g. Primaria Intensiva Para Adultos, which started operations in 1977).

Since the CCSAES is the unit within Mexico's Secretariat of Public Education (SEP) that is responsible for supervising, coordinating, and evaluating all Open Learning Systems (i.e. DE systems) at High School, Vocational and University levels within the country, this was considered to be the most reliable source of information during the data collection process.

Although in 1984 the CCSAES was mainly concerned with Open Learning Institutions at higher levels of education, it is of paramount importance to mention that since its creation in 1978 it was also given the mandate to develop a database on systems operating at elementary and junior High School levels as well. Thus, the resources from this Council such as library, and data bank facilities, were made accessible to the researcher for consulting and obtaining copies of official documents published by the Council itself, as well as SEP, on each system.

Within the Council, the researcher had the opportunity to meet and work with the officials responsible for three different departments or subunits: 1) Promotion and diffusion, 2) Publications and documentation, and 3) Projects and Research. Within each of these departments official documents were made available to and consulted by the researcher. Furthermore, these officials also helped in the process of arranging visits to each individual system.

As mentioned earlier, the data that were obtained at the CCSAES were of an official nature in the form of documents that the Council publishes every year. On the basis of this, and taking into consideration that 1978 was the year when the Council was established, the most recent publications were those that were consulted for this study i.e., from the years 1982, 1983, and 1984.

Within each individual system the researcher had the

opportunity to meet with officials at different levels, however, the researcher made sure that all of these people were working at the administrative or coordinating level within the various systems, since they are the ones who can provide the most comprehensive information on the institution. Hence, all the information obtained from each individual system in the form of official documents, reports, booklets, and other descriptive publications, were made available to the researcher by either the Head of the Administrative unit, the Secretary or Assistant to the Head of the Administrative unit, or an official working within it.

It is important to highlight that no information in the form of informal comments or the like were taken into consideration since this form of gathering data was considered unreliable. Hence, only printed official documentation was considered for the purpose of developing the database of this study.

In most cases, however, the information that was obtained within each institution was the same that the CCSAES had already made available to the researcher; in fact, it was found that the Council had provided the investigator with more information than the systems themselves. This practice was expected since the Council is the most powerful structure, in terms of DE, within the country.

The nature of the data collected was in the form of

Summary Reports, General Reports on evaluation results, and internal documents that describe the most salient characteristics of each system. All the information that refers to the "salient characteristics" of each of the eleven systems are based on the nature of the four subsystems contained within Kaye & Rumble's (1981) model of DE. In other words, the researcher gathered data on each system in relation to the four key elements that are considered to be the most relevant in any DE system as included in the aforementioned model: 1) Regulation Subsystem; 2) Student Subsystem; 3) Course Subsystem; 4) Logistics Subsystems (see Section 3.2). In addition to this, the researcher also gathered data on aspects related to the evaluation of the systems since it was considered to be important in terms of nature of the research problem under study, and also in terms of providing a more comprehensive view of the results obtained by these systems (e.g. Student, Organizational and Instructional Materials Evaluation).

Unfortunately, not all the data that were made available on each system in relation to each of the aforementioned subsystems, were of the same quantity. This is to say that some institutions provided more detailed information on certain aspects of the institution than others; however, the researcher made sure that adequate information was obtained on each of the four subsystems plus evaluation, for the purpose of classifying the data

for all of the eleven systems in a standardized form.

It is also important to mention that in the case of one institution, i.e. The Open Community Courses and Rural Elementary School System, the data were collected through CCSAES and the Latinamerican Institute of Educational Communications (ILCE). This procedure was carried out this way because SEP through the Consejo Nacional de Fomento Educativo, CONAFE (National Council for Educational Promotion), is directly responsible for this DE system and therefore it has no institutional body in itself as the other systems do. Thus, recognizing that ILCE was a reliable source of information since it has carried out research and published official reports in conjunction with SEP on the structure, organization, operation and results of this particular system, the researcher visited the institution and met with the Head of the Research Department, and Director of the M.A. Distance Education programme in Educational Technology. In addition to this, valuable information was obtained at CONAFE itself through the Register and Information Department.

Through this procedure of gathering data on each of the eleven systems, this research fulfills the requirements of data triangulation (Denzin, 1978; in Patton) in addition to those of methodological triangulation by means of using two different, yet complimentary methods to study the problem under consideration, namely Case Study and Process Evaluation, for the purpose of studying systems at

different levels of organization.

2.4 Instrumentation

As mentioned in the previous section, all the data that were collected on each of the eleven systems were in relation to the four-key elements (i.e. subsystems) contained in Kaye & Rumble's (1981) general model of DE. This model was chosen as the main pattern for gathering data because of its external validity in terms of being applicable to any DE institution regardless of its internal structure, or level of education at which it operates. In that sense, this model provided the researcher with a reliable "blue-print" upon which a more elaborate instrument for analyzing and classifying DE systems in terms of their four major components plus evaluation, was developed.

Even though Kaye & Rumble's model is very useful for identifying the most salient subsystems contained in any DE system, it is still limited in scope for describing the various elements contained within each of the various subsystems themselves at a level of analysis that is needed in this study. The main purpose here is to identify and describe those factors that because of their appearance within an individual or cluster of systems, as either unique or common characteristics and behaviours, contribute to the different levels of the dependent variable under study (i.e. graduation, or terminal efficiency levels).

Hence, in order to be able to identify and describe those internal factors contained within each of Kaye & Rumble's subsystems in each of the eleven Mexican DE systems under study, a scheme or classification model was developed on the basis of other models developed by various scholars in the area of DE (Escotet, 1980; Kaye & Rumble, 1981; Keegan, 1982; McAnany, Oliveira, Orivel & Stone, 1983; Neil, 1981; Perraton, 1981).

The decision to develop a "new instrument" for analyzing and classifying DE systems in terms of their major components or subsystems, instead of using any particular classification-model already available from the work of the above mentioned authors, came as a result of the intrinsic limitations found in each of these models. This is to say that, in one way or another, most of these models address only one or two of the major subsystems namely the Course, and Regulation Subsystems, thus leaving behind the Student, Logistics, and Evaluation Subsystems.

The only exception is the model presented by Neil (1981) which properly addresses all of the major subsystems. However, its weakness stems from the fact that when the researcher tried to apply it to the analysis of the eleven Mexican systems, it did not provide adequate results in terms of comprehensiveness and detail in the information needed within each major subsystem; moreover, at different levels of analysis this model does not include categories that have been incorporated in the models that

were developed by the other authors, and which are considered to be of paramount importance for exploring and describing a DE system in a thorough manner.

Hence, the decision was made to use Neil's (1981) classification model as a basic pattern upon which a more comprehensive and detailed scheme or classification-model for exploring and describing DE systems was developed. However, this "new" classification model also incorporated much of the information contained in the other models since these were considered to be very useful and adequate for analyzing aspects such as the Course, Regulation, and Evaluation Subsystems within each of the eleven Mexican DE systems. Similarly, whenever it was found that important aspects of a DE system were not considered or incorporated within any of these models, they were included and a full justification for their inclusion within the scheme was provided (see section 4.1.2).

The combined approach to developing the classification-model, or scheme used in this study was as follows:

Factor one, Status, which includes two subfactors: a) governance, and b) origination, with their corresponding categories, was taken from the work of Neil (1981) as a basic structure, and also from Kaye & Rumble's (1981) model for defining subfactor a).

Factor two, Qualifications, was also taken from Neil's model in its entirety.

Factor three, Learning-Course, which includes the four subfactors a) Learning Strategy, b) Predominant Technology, c) Learning Site, and d) Student's evaluation, was taken from Neil's model as a basic general structure, and also from Escotet's (1980) model for defining subfactor a). Furthermore, within subfactor b), a more detailed classification was added on the basis of the most commonly used technologies in DE systems around the world, as suggested by the literature in this area of education (e.g., Bates, 1984), and also on the basis of those technologies most widely used by Mexican DE systems. Within sublevel c), McAnany et al's (1983) model together with that developed by Perraton (1981), which make a clear distinction between Formal and Non-Formal DE systems, were introduced. Finally, a detailed description of the different evaluation formats commonly used by Mexican DE institutions was introduced as subfactor d), which did not exist in Neil's original classification. The justification for the introduction of this particular subfactor is based on the importance that the students' evaluation process has in any kind of educational practice, and which could also provide valuable information to the researcher during the process of describing and exploring the inner structure of these systems.

Factor four, Subjects-Courses Offered, which include two subfactors: a) Origin, and b) Nature of the courses and curriculum, was based in its entirety on Neil's original

model.

Factor five, Level of Studies, which includes four subfactors: a) Adult Higher, b) Adult Non-Higher, c) Junior High School, and d) Elementary School, was taken in part from Neil's original model i.e., factors a), and b), whereas the remaining two were developed on the basis of the nature of some Mexican DE systems which offer an elementary and Junior High School curriculum. If these subfactors would not have been included, the original model could not have been used with DE systems operating at Basic education levels.

Factor six, Scale of Operation, which includes two subfactors: a) Urban and Semi-Urban, and b) Rural, was taken partially from Neil's original model for defining the size of each system, however, the distinction between Urban, Semi-Urban, and Rural, was introduced by the researcher on the basis of the importance that the environment in which a DE system operates has in terms of providing information about the nature of the clientele being served, and their most salient characteristics. Without this distinction, the understanding of the role that DE has within a particular context, together with the scale of operation, would not be the same in the sense that the investigator would not be able to identify the impact that a particular system has upon a particular context.

Factor seven, Learning Materials, which includes three subfactors: a) Creation, b) Production, and c) Delivery

System, was taken from Neil's original model, with one exception: within subfactor c) a distinction was made between government or private delivery system, since Mexican DE institutions could use either one. This is important in terms of quality of the materials being delivered to the students, and the economic and political implications that DE practice has in countries like Mexico.

Factor eight, Students, which includes subfactors a) Registration, b) Entry requirements, and c) Sources of Support, was taken entirely from Neil's original model.

Factor nine, Academic Staff, which includes subfactors a) Own full-time, b) Own part-time, c) Part-time external Consultants, d) Mixed, and e) Other, was taken entirely from Neil's original model.

Factor ten, Finance, which includes subfactors a) self-financing, and b) non-self-financing, were taken from Neil's original model. However, within subfactor b), a distinction is made made between different sources of support that a DE system may have. This distinction is important because of the implications that a source of economic support may have in terms of the control exercised from the outside upon a DE system, and consequently the nature of the organization, its mode of operation, and its results.

Factor eleven, Goals-Objectives-Purposes, which includes subfactors a) Expand educational opportunities within the traditional system, b) Decentralize the

educational system, c) Provide on-the-job training, d) Provide second-opportunity to dropout people, e) Provide specialized education according to the needs of the country, and f) Provide Continuing-education services, was developed and added to Neil's model in order to make it more comprehensive and analytical, since the goals, objectives, or purposes that any DE system has defines the entire structure and operation of the system; moreover, the knowledge of the goals can also provide a measure against which the success or failure of the system could be evaluated in an objective way. This factor was one of the major additions to Neil's original model.

Factor twelve, System's Evaluation Through Outcome Measures, which includes subfactors a) Cost Measures per Unit, b) Learning, c) Correlates of Learning, d) Exam pass rates, e) Graduation rates, f) Dropout rates, g) Comparison with other alternatives, h) Survival of the institution through the years, i) Quality of Instructional Materials, and j) Amount of Study Demanded, was entirely taken from McAnany et al's (1983) work on the variables that are considered to be an adequate and reliable measure of the efficiency and effectiveness of DE systems as a whole. However, within subfactor b), since this model considers exams as the only method for evaluating the students' level of learning, which is not always the case in the population of systems under concern, this subfactor was expanded in order to include other common practices being used by

Mexican DE systems. Subfactor f) was eliminated because of inconsistencies in the database from the DE systems under study. In addition to this, subfactor g) was expanded to include a comparison with other educational alternatives in terms of 1) benefits, and 2) effectiveness. This distinction was considered to be important on the basis of the major arguments commonly used in favor of DE systems which are related to its cost-effectiveness when compared to traditional systems, and on the other hand, the potential that DE systems have for benefiting many thousands of people- especially in Third World Countries- that are commonly forgotten or unattended by conventional or traditional education (see Appendix A for complete descriptions of all models mentioned above).

2.5 Data Analysis

As mentioned earlier, the nature of the data that were collected on each of the eleven DE systems was based on the four-key subsystems contained in Kaye & Rumble's (1981) general model of DE, and a fifth element was incorporated into the original model by the researcher, i.e. the evaluation subsystem. Consequently, all the data that are presented in Chapter III of this study regarding each of the eleven DE systems were classified according to each of these five elements: 1) Regulation, 2) Students, 3) Course, 4) Logistics, and 5) Evaluation Subsystems. In that sense, a first level of analysis was performed.

Likewise, and on the basis of the previous step, the data were analyzed even further by using the scheme or classification model that was developed for that purpose (see section 2.4), which allows the researcher to explore and describe in more comprehensive detail the factors and subfactors contained within each of the aforementioned subsystems.

Hence, data related to the Regulatory Subsystem of each of the eleven systems were classified and analyzed through factors 1) Status, 6) Scale of Operation, 10) Finance, and 11) Goals, Objectives, Purposes, contained within the scheme. Data related to the Student subsystem were classified and analyzed through factors 5) Level of Studies, and 8) Students.

Data related to the Course subsystem were classified and analyzed through factors 2) Qualifications, 3) Learning-Course, 4) Subjects-Courses Offered, and 7) Learning Materials.

Data related to the Logistics subsystem were classified and analyzed through factors a) Academic Staff, and 10) Finance.

Data related to the Evaluation Subsystem were classified and analyzed through factor 12) System's Evaluation Through Outcome Measures.

Thus two basic instruments were used for the purpose of classifying and analyzing the data that were collected on each system: 1) Kaye & Rumble's (1981) general model of

DE, plus the additional Evaluation subsystem, and 2) the scheme or classification-model that was developed on the basis of other important classification-models developed by various scholars in the area of DE. In that sense, a second level of analysis was performed.

On the basis of the results obtained in the previous step, the researcher was able to verify the existence or non-existence of each factor, subfactor, and different categories within each subfactor, in each of the DE systems under consideration. However, it is important to mention that because of a lack of data in two of the eleven systems (i.e. The Intensive Elementary School System for Adults, and the National College for Professional-Technical Education System) in terms of the total number of students enrolled and the total number of students graduated, during the year 1983, which is the year that was taken as a standard for comparing the terminal efficiency rate of all systems, these two were excluded from the actual analysis stage of this study. However, they were taken into consideration for the development of the general Mexican model of DE because qualitative data were available in both cases.

Indeed, although both CCSAES and ILCE provided the researcher with descriptive information regarding the nature of the most important characteristics and elements (i.e., subsystems) contained within each of these two DE programs, the researcher was unable to obtain quantitative

data (i.e., total number of students enrolled and graduated in the year 1983), simply because it was not available during the year the researcher visited the setting.

Reasons for the lack of information were because 1) the National College for Professional-Technical Education system was still operating at the pilot-testing level, and 2) the Intensive Elementary School System for Adults does not have an official public document with the latest figures on the system, as the rest of the other systems have.

A third level of analysis on the data was performed when the results from the application of the "new" scheme or classification model to nine of the eleven systems were obtained. The procedure was as follows:

The first-step at this level of analysis was carried out for the purpose of identifying the presence or absence of the various factors and subfactors within each system, to allow a better understanding of the nature of the most important elements and characteristics contained within the inner structure of these systems.

The second-step included the ranking of the nine systems from the highest to the lowest terminal efficiency rates for the purpose of providing a measure upon which factors and subfactors could later be further analyzed and classified.

The third-step involved the identification of factors and subfactors within each system, in relation to their

terminal efficiency rates. This procedure allowed the researcher to identify those factors and subfactors contained within those systems having the higher and the lower terminal efficiency rates, and those contained within the extreme cases as well, in other words, the systems with the highest and the lowest terminal efficiency of all the nine DE programs under study. Through this procedure the researcher was able to obtain a valuable piece of evidence that might indicate the potential connection between some specific factors and subfactors, and the different terminal efficiency rates of the DE systems.

The fourth-step involved the development of various propositions[3] on the basis of the results obtained in the previous step of the analysis, for the purpose of directing the researcher's attention to the evidence obtained in terms of the factors and subfactors that are contained within the systems with highest, higher, lower, and lowest terminal efficiency, in order to be able to develop a chain of evidence as to the weaknesses or strengths of the factors and subfactors contained in each system, in terms of their relation to the different levels of the dependent variable. This practice, it is argued, allowed the researcher to make some valuable inferences concerning the connection between the internal organization and structure of each system, and their results.

In addition to the above mentioned, the development of the various propositions was also based on the nature of

the structure that was used for analyzing the factors contained within each of the nine systems either individually, or in groups. This is to say that, in order for the researcher to be able to comply with the requirements of theory triangulation (i.e. analytical triangulation), through which one single set of data is interpreted by using multiple perspectives (Denzin, 1978; in Patton), six distinctive yet complimentary ways of analysis and interpretation of the previous results were incorporated:

1) The analysis of the factors that are unique to the most efficient system of all, in other words, those characteristics and elements that are contained exclusively in the system with the highest terminal efficiency rate (i.e., 82% terminal efficiency rate).

2) The analysis of the factors that are common to the most efficient systems, or those characteristics and elements contained within systems having higher terminal efficiency rates (10% and above terminal efficiency rates).

3) The analysis of the factors that are common to the least efficient systems, or those characteristics and elements contained within those system having lower terminal efficiency rates (i.e., ranging from 1% to 5% terminal efficiency rates).

4) The analysis of the factors that are unique to the least efficient system of all, or those characteristics and elements contained exclusively in the system having the

lowest terminal efficiency rate (i.e., 0.5% terminal efficiency rate).

5) The analysis of the factors that are more frequently found within those systems having higher terminal efficiency rates than in those with lower terminal efficiency rates; i.e., those characteristics that are more common to the systems having 10% and above terminal efficiency rates, as opposed to those systems with lower terminal efficiency rates ranging from 0.5% to 5%.

6) The analysis of the factors that are more frequently found within those system having lower terminal efficiency rates than in those with higher efficiency rates, or those characteristics that are more common to systems having terminal efficiency rates that range from 0.5% to 5%, than in those systems having higher terminal efficiency rates ranging from 10% to 82%.

Through this triangulation process the researcher was able to explore the potential connection between some particular internal characteristics of these systems and their terminal efficiency rates. Furthermore, on the basis of these results, the researcher was able to provide some suggestions and recommendations for the introduction or the elimination of particular organizational, structural, and operational practices within the nine systems under study, with a view to improving the overall level of performance of formal DE in Mexico.

2.6 Problems of Construct, Internal, and External Validity, and Reliability within The Research Design

According to Yin (1984, pp. 29-35), there are five components of a case study research design which are especially important:

a) a study's questions;

b) its propositions, if any;

c) its unit(s) of analysis;

d) the logic linking the data to the propositions; and

e) the criteria for interpreting the findings.

a) The Study Questions: As mentioned earlier, case studies are particularly appropriate whenever "how" and "why" questions are asked about a particular phenomena. In this study, the questions deal with How efficient are Mexican DE systems ?, and, Why these systems have different terminal efficiency results?

b) The Study Propositions: Based upon the above mentioned questions, the propositions within this study will be directed to those specific factors that are considered to be related, in some way, to the different terminal efficiency levels of the nine systems under study so that the attention will be focused on the verification of such propositions.

c) The Study's Unit(s) of Analysis: Given the specific nature of the research problem and its objectives, the

primary unit of analysis becomes Formal DE in Mexico with eleven subunits (i.e., DE systems) through which maximum variation is to be achieved in terms of their organization, structure, goals, level of studies, settings, and results as related to their terminal efficiency levels. These systems are, however, homogeneous in their dimensions of concern i.e., DE systems operating within the formal education structure.

d) Linking Data to Propositions: This refers to Campbell's (1975) idea of "pattern-matching", whereby several pieces of information from all systems may be related to some theoretical proposition. Within this study, this translates to the critical step in which, based on the results of the analysis of each system, the researcher will be able to identify those critical factors that may be directly or indirectly related to the efficiency of each system, for the purpose of relating them to the general proposition which states that so far, these systems have not been able to perform according to the original expectations.

e) Criteria for Interpreting the Findings: This stage is particularly troublesome since there is no precise way of setting the criteria for interpreting the findings (Yin, 1984). However, in this particular case, the researcher will try to find at least two sufficiently contrasting patterns as to why some systems are more efficient than

others, so that these findings can be interpreted in terms of two rival propositions: either the absence or presence of some factors.

The main criteria through which these five design components can be possibly evaluated, are through the use of four tests: 1) Construct Validity; 2) Internal Validity; 3) External Validity; and 4) Reliability.

According to Yin (1984, p. 36), there are some specific tactics that can be used in this study in order to deal with these tests:

1) Construct Validity:
   a) Use multiple sources of evidence;
   b) Establish a chain of evidence; and
   c) Have key informants review draft case study reports.
2) Internal Validity:
   a) Pattern-Matching;
   b) Explanation-building;
   c) Time-series analysis;
3) External Validity:
   a) Use replication logic in multiple-case studies;
4) Reliability:
   a) Use case study protocol;
   b) Develop case study data base.

2.6.1 Construct Validity

Construct validity attempts to determine whether a test measures the construct it says it measures (Moore, 1983).

In this sense, the idea here is to determine how the researcher will measure the variable called internal efficiency. For this purpose, graduation rate or terminal efficiency, was selected as the test to be used to measure this particular concept, on the basis of the following operational definition of internal efficiency:

Internal efficiency is the system's ability to convert input students into output students in adequate numbers as measured by the difference between the total number of graduates (i.e., those students who have received a certificate, diploma or equivalent) as compared to the total number of students enrolled in the system.

Certainly, this definition of internal efficiency is entirely based on the system's productivity in which quantity is the main yardstick with which internal efficiency is to be measured.

Yet at a different level of Construct Validity, the use of multiple sources of information for collecting the data in each individual subunit of analysis or program (i.e., the eleven DE systems), plus the use of Kaye & Rumble's (1981) model of DE as the main criteria for collecting specific and standardized information on each system also provide this study with adequate prerequisites

to fulfill the demands of this particular test.

Although it could be argued that the use of terminal efficiency for "measuring" internal efficiency is not the most adequate one, this measure was chosen on the basis of its flexibility for comparing these systems regardless of their level of education, context, structural characteristics, and other properties. Furthermore, it is important to recognize that operational definitions of organizational efficiency may be unique to individual investigators who view the organization from either the inside or the outside, and under different circumstances. Thus, as an outsider to the programs under consideration, internal efficiency in this study is to be measured by one single unambiguous test in terms of quantity.

Finally, the establishment of a chain of evidence for the purpose of increasing the Construct Validity of this study was achieved by the use of the information provided by multiple sources, and then subjected to the various cluster analyses until the researcher was able to identify the most critical factors that could be considered the main internal producers of the differences among the various DE systems, in terms of their terminal efficiency rates.

2.6.2 Internal Validity

Internal Validity concerns the internal fitness or rigor of the research design. This is usually achieved by controlling for the possible effects of confounding

variables (Moore, 1983).

Given the nature of this research (i.e., qualitative, case study), this study attempts to achieve internal validity through the development of a database based on a reliable source and an instrument for classifying and analyzing it based on the work of well known scholars in the field of DE. In this sense, this study attempts to minimize the operation of error by the identification of those particular subsystems, factors and subfactors that can be considered to be an adequate operationalization of the construct called internal efficiency. Thus, with this in mind, it is possible to reduce the effect that other confounding categories (i.e., subsystems, factors and subfactors), which might be the product of unreliable sources of information, could have upon the independent variable under study.

Needless to say, an optimal way for increasing the internal validity of this study would have been the use of time-series analysis. Unfortunately, the time and economic constraints within which this study was carried out did not allow the researcher to do so.

2.6.3 External Validity

Although "the question of external validity [...] is never completely answerable" (Campbell and Stanley, 1966, p. 5), this study will attempt to comply with this test by the use of the entire population of systems where maximum

variety is being achieved. These systems represent all the settings found in formal DE in Mexico, thus, the results could be generalized to the entire population itself.

A word of caution should be expressed here. The results from this study may or may not be generalizable to what is happening to other DE systems in other countries, without any explicit recognition from the researcher. This is so simply because of the fact that "social phenomena are too variable and too context-bound to lend themselves to generalizations" (Cronbach, 1975; in Patton, 1983, p. 280). Needless to say, the way in which DE institutions operate in one particular country or another, and the extent to which the issue of efficiency and effectiveness are addressed on the basis of the rationale behind their design and implementation for the achievement of very particular goals, are generally different. Thus, the chances of making vague or even wrong generalizations to other cases are too high. Instead, an attempt will be made to contribute to theory development rather than generalize to other foreign DE systems. Such generalizations of results to theory (i.e. analytical generalizations), and not to other cases around the world, is an acceptable procedure within the case study research methodology (Yin, 1984, p. 39). In addition, it is expected that the research methodology being used in this study could be applicable in other settings regardless of the nature of the DE system(s) under study (i.e., formal, nonformal, informal systems).

2.6.4 Reliability

Reliability refers to minimizing the errors and biases in a study. Hence, "the objective is to be sure that, if a later investigator followed exactly the same procedures as described by an earlier investigator and conducted the same case study all over again, the later investigator should arrive at the same findings and conclusions. (Note that the emphasis is on doing the same case over again, not on "replicating" the results of one case by doing another case study)" (Yin, 1984, p. 40).

Therefore, each step within this study will be made as operational and well documented as possible, so that in the future someone else could replicate it.

Reliability, in a study of this nature, could also be increased by having another person or persons double-checking the most critical steps within this study i.e., the application of the new scheme or classification model to each system. At selected intervals, an interrelater reliability could be established (i.e., the extent to which two or more researchers assign the same interpretation to a given independant variable). With this procedure, descriptive research like the present one increase even further its reliability. Unfortunately, this was not possible to do because of the financial constraints of this study which was not carried out under the auspices of a research grant or the like, but instead entirely financed by the researcher himself.

Reliability was attempted instead through the use of a systematic procedure during the development of the scheme or classification model, and in the way the database was classified according to very specific criteria as defined by Kaye & Rumble's model. Reliability was also strengthened through the use of multiple sources of information in relation to the most salient characteristics of each system (i.e., different sources of information for each system).

CHAPTER III

THE DEVELOPMENT, AND PRESENT STATUS OF DISTANCE EDUCATION IN MEXICO

3.1 Historical Developments (1921-1985)

In 1921, with the establishment of the Secretariat of Public Education (SEP), rural schools in Mexico were created together with non-formal educational programmes such as cultural missions, and educational radio for a general audience. All these developments encouraged the Mexican government to create in 1947, the General Direction for Literacy and External Education.

During the same year, the Federal Institute for Teacher's Training was founded with the goal of providing and updating teachers' knowledge and skills in different areas, without having them interrupt their teaching practice. This Institute offered courses at a distance through correspondence as well as intensive courses during the summer and winter holiday periods. Hence, the creation of this Institute constituted the first Mexican incursion into the field of Distance Education as it is known today (Secretaria Ejecutiva del Consejo Coordinador de Sistemas Abiertos de Educacion Superior or CCSAES, 1982).

During the decade of the 50's, new projects of a DE nature were put in place. Such was the case of the Technical Training Centers for Rural Populations, Centers for Industrial Training, Occupational Teaching Centers, and

the National Center for Technical Industrial Education. Nevertheless, it is important to highlight the fact that although these projects could be classified as being DE systems, their teaching strategy combined regular face-to-face teaching together with independent study. Thus, they could be defined as being Consultation DE Models (Keegan, 1982; in Daniel, Stroud, and Thompson) in which the use of a combined instructional strategy takes place (Escotet, 1980). Starting in 1964, with the creation of a nationwide massive literacy campaign, the use of distance education by SEP became a more common practice with strong government recognition. Indeed, this literacy campaign was not only the first attempt made by the Federal government to use DE on a large scale, but it also inaugurated an educational policy that was 100% open in terms of bringing education to anyone who wanted to learn. This experience was, unquestionably, the first real experience that Mexico had with open learning in using a distance education modality as a means for achieving its educational objectives.

Later on, during the same decade, a further step in the development of more sophisticated DE systems was made by the introduction of a multi-media strategy for teaching and learning at a distance. This approach combined the use of correspondence together with radio and/or television, as in the case of the Radioprimaria and Telesecundaria systems. Both systems addressed the needs of rural students at elementary and junior-high school levels. In

the case of the former one, unfortunately, severe administrative and planning problems disrupted the operation of the system, thus leaving a gap that so far has not been filled by any other system of its kind (Spain, 1973). Telesecundaria, on the contrary, has been for the last 14 years the most notable DE system in Mexico due to its ability to stay in operation despite the large number of problems faced by the system throughout the years (Mayo, McAnany, and Klees, 1973; Palavicini, 1981).

It is interesting to note that although up to 1973 DE systems had had all the official support and recognition that favoured their development, it was not until this year that the government promulgated a law which established the right and need to educate the entire population through means of more flexible educational systems (SEP, Ley Federal de Educacion, 1973); two years later, a second law was forwarded to the Congress for approval which provided educational opportunities to all people over the age of 15 who, for whatever reason, had not been able to complete their education.

Based on this, adult education in Mexico became defined as an integral part of the educational system of the country. In most cases, it was operationalized as an out-of-school modality intended to take advantage of each individual's latent abilities for studying in an independent way (SEP-CCSAES, 1982).

But it was not until the early 70's that DE in Mexico

became rather fashionable in higher education, since early incursions were directed exclusively to elementary, secondary, and other forms of basic education.

The use of DE at higher levels of education was a clear effect of the impact that the British Open University system together with other models developed in the industrialized world (i.e. Spain, Sweden, Germany, USA, Canada, Italy), had -and still have- upon the development of this kind of system in Latinamerica and other developing nations of the world (i.e. Iran, West Indies, South Pacific, Venezuela, Costa Rica, Korea).

During the period 1973-74, two prestigious Mexican universities decided to establish "Open" modalities within their formal structure. The first was the National Autonomous University of Mexico (UNAM) which in 1973 inaugurated its Open University services by offering 19 undergraduate programmes or "licenciaturas", in nine different faculties, schools and departments (Coordinacion del Sistema de Universidad Abierta de la UNAM, 1982). The second Open University system was established at the National Politechnical Institute (IPN) which in 1974 started its operation by offering two "licenciaturas" and two vocational certificates or diplomas (SEP-CCSAES, 1983).

As mentioned earlier, the impact that the British Open University had upon both UNAM and IPN was appreciable in terms of their respective decisions to establish open modalities within their traditional structures. However,

it is also of paramount importance to emphasize the fact that the establishment of these systems had a great deal to do with the political and educational turmoil that arose in Mexico in 1968. This experience together with the progressive UNAM's educational structure reforms proposed by former Rector Dr. Gonzalez Casanova, which included the plans for the establishment of an Open University system within UNAM's traditional structure (Guevara 1981 p. 16), triggered the development of a new university operation in which both students and professors were seeking a more nationalistic, democratic, and humanistic approach to university education, one based upon the analysis of a questionable role that up to that date Mexican universities had been playing within the society at large.

After the 1968 students' movement (Guevara, 1978; 1981), the so called "democratization" of education became a main issue in later political campaigns and as a consequence open learning was thought to be an adequate means for these purposes.

In 1974, the General Direction of Technical Institutes and Industrial Technological Education located within SEP decided to establish two Open learning systems: the Open Technological system, and the Technological Industrial Educational system. Two years later, the Open Vocational system was also inaugurated, as an extension of the traditional in-school Vocational system of the country.

It is thus clear that at that point in time the

Mexican government through SEP directed its attention not only to DE per se, but also to the establishment of new educational system for the purpose of providing technical-industrial training at large, especially to workers and personnel within this sector of the economy. Needless to say, this decision was in tune with the ideas that former president of Mexico Luis Echeverria had concerning the industrial development of the country and the democratization of educational opportunities to the impoverished masses living in the urban and semi-urban areas as well (e.g. Mexico City, Guadalajara, Monterrey, Leon, Queretaro, etc).

In 1978, two important decisions were made during the six-year presidential period of Lopez Portillo (1976-82): one, was the creation of the National University of Pedagogy as a means of providing university level education to thousands of rural and urban pre-school, elementary, and secondary school teachers in different areas such as Elementary and Early Childhood B.A. programmes, Basic and Physical Education B.A. programmes, and an M.A. programme in Distance Education (SEP-CCSAES, 1983); the second major decision made was the creation of the National Coordinating Council for Open Education Systems for Higher Education (CCSAES). This Council was given the responsibility of promoting and coordinating the various Open education systems already in operation, and also charged with the mandate to assess the plans for future projects, both at

middle high and higher levels of education. Unfortunately, due to severe budgetary constraints within the government,especially during the last three years, this Council no longer exists.

Presently, there are eleven formal DE systems -or Open education systems as they are called in Mexico- operating at various levels using different instructional strategies and formats:

1) Sistema Primaria Intensiva para Adultos (Intensive Elementary School System for Adults)
2) Sistema de Cursos Comunitarios- Primaria Rural (Community Courses and Rural Elementary School System);
3) Telesecundaria;
4) Sistema de Ensenanza Abierta -Colegio de Bachilleres (Open Teaching System -Bachillerato College);
5) Sistema Preparatoria Abierta (Open High School System);
6) Colegio Nacional de Educacion Profesional Tecnica (National College for Technical-Professional Education);
7) Sistema Abierto de Educacion Tecnologica Industrial (Open Industrial-Technological Educational System);
8) Sistema de Tecnologico Abierto (Open Technological System);
9) Sistema Universidad Abierta-UNAM (Open University System-UNAM);
10) Sistema Abierto de Ensenanza-IPN (Open Teaching System-IPN);

11) Sistema de Educacion a Distancia de la Universidad Pedagogica Nacional (Distance Education System at the National University of Pedagogy).

As noted earlier, during Echeverria's presidential period--who took office just after the student-political turmoil during the late 60's--the idea of expanding the benefits of education to millions of Mexicans throughout the country became of paramount importance to the government, mainly because of two factors. The most immediate was the political pressure exercised upon the government by university students (i.e. UNAM and IPN) and other political groups within the Cabinet. On the part of the students , the pressure was in terms of a new educational structure being sought as a means toward the creation of a more meaningful relationship between students and professors. Also, they were taken with the idea of making university education much more in accordance with the social, economic, and political reality of the country, instead of being isolated centers divorced from the everyday problems (Guevara, 1978; 1981).

During the period 1968-74, the students' unrest spread throughout the country reaching most public universities and other educational centers. As a result of this -and the involvement of Echeverria, as Secretary of State in 1968, in the quelling of a student rally in August of that

year- the President gave a more populistic approach to his educational policy. At that time the idea of expanding the educational benefits, especially to those who had little or no chance of attending regular/traditional educational centers, became a powerful incentive for the development of DE.

The second factor that triggered the expansion of the Mexican educational system was the discovery of huge oil deposits. With the large sums of capital investments and export revenues, the country suddenly found itself in a kind of economic boom that produced an unprecedented industrial development in many areas. Quite naturally, in order to be able to carry out this industrial development, thousands of workers needed more adequate training and education; thus the creation of dozens of vocational and a variety of technical, technological, and industrial schools became one of the hallmarks of this period. However, one problem remained: the incapability of the traditional educational system to provide this kind of training because of its lack of human, material, and economic resources. On the other hand, the country could not afford to grant one or two years of absence from the workplace to thousands of people who needed this type of training. Hence, the idea of providing home-based education and in-job training became attractive and economically acceptable.

During the year 1977, while President Lopez Portillo was still in office, the Federal government through SEP,

developed a new educational plan called "Education for All". This plan was conceived within the framework of an even greater educational strategy: the National Educational Plan (Muñoz-Izquierdo, 1983).

The central premise of this educational plan was to offer educational content that would be functional to the employment needs of the individual, and adequate to the development needs of the country, through the use of traditional and non-traditional educational modalities among which independent study was meant to be used extensively.

By the same token, this National Educational Plan also incorporated within its content an idea that has been a common denominator in most educational plans and laws since the end of the Revolution in 1921: to provide adequate educational opportunities and better quality education to the rural population. In order to achieve this goal,the National Plan introduced the idea of decentralizing SEP with the purpose of allowing a more regional-community based type of education which was to be linked to the most important economic, social, and cultural needs of each region. Based on this matching between regional-community needs and educational content, it was thought that the passive acceptance that had characterized traditional education in Mexico and its logical consequences upon the student could be avoided, so as to be able to produce students who would be capable of modifying the reality in

which they lived (Muñoz-Izquierdo, 1983).

Thus, throughout the presidential period of both Echeverria and Lopez Portillo, emphasis was given to the use of DE systems as one of the most feasible approaches for the expansion of the national educational system. This action taken by the Federal government was meant to improve the employment opportunities of the individual, to increase the productivity in the workplace, and to enhance the political, and cultural participation of those who had access to education.

Today it is well known that in order for education to become effective in terms of improving the life-style of students, increasing their productivity within the workplace, enhancing their social, political and cultural participation, and above all, helping reduce the socio-economic differences among the various sectors of the population, especially between urban and rural inhabitants, diverse structural changes must take place within the educational, economic, and political systems of Mexico. As well, an understanding is needed on the part of those who are responsible for introducing new laws and plans that education taken alone as a single independent variable does not promote, especially in the most impoverished sectors of the population (i.e. the rural areas), the kind of improvement and changes desired (Coombs & Ahmed, 1978; Foster & Sheffeld, 1973; La Belle, 1984; Leon & Gamez, 1984; Muñoz-Izquierdo, 1983; Schmelkes, 1983; Torres,

1984).

Presently, the educational policies of President Miguel de la Madrid's government do not differ much from those of his predecessors. And it is likely that the most important factor that affects the lack of new projects, especially in the area of Distance Education, is the tight economic situation in which the Federal government has been operating since its inauguration in 1982.

3.2 Present Practice and Status of Distance Education in Mexico

The present status of DE in Mexico is a direct consequence of what was done in this field during the 1967-82 period, when all eleven formal "Open learning" systems that are in operation today were established. However, it is also important to highlight the importance that earlier developments in this area since 1947 have had upon the conception, nature, structure and use of today's systems.

Out of the eleven "Open learning" systems that are part of the traditional educational structure of Mexico (see section 3.1), only three are addressed to providing basic education to the rural population (i.e. Sistema Primaria Intensiva para Adultos, Sistema de Cursos Comunitarios, and Telesecundaria), while the remaining ones serve mostly an urban and semi-urban clientele that make up the majority of the work-force within the industrial and

professional sectors of the economy.

Although many education officials within SEP have repeatedly assumed that the educational system of the country is improving, Alvarez Manilla et al (1983) suggest it has not been able to overcome its most apparent and widely criticized weaknesses in terms of the failure to achieve a more equal educational opportunity for all sectors of the population, the lack of an educational content that could be functional according to the employment needs of the individual and the development needs of the country, and the introduction of a more effective teaching practice directed towards the development of a new type of learning that would be problem-solving and activity oriented.

Petty (1981) supports these conclusions and notes that Latinamerican educational systems undoubtedly reflect the nature of the severe socio-economic and political conflicts that exist within the country, which cannot be resolved unless there is a structural change of ideas and interests on the part of those who enforce the political decisions and power.

Not surprisingly then, given the nature and semantic connotation that "Open learning" has--especially after the British model became well known--Mexican education officials thought that this promising strategy might achieve the goal of equalizing educational opportunity that was desperately needed since the end of the Revolution in

1921. Furthermore, this "new" modality could also provide a wide-spread rural population with an opportunity that so far had been neglected or, at least, was poorly addressed by the formal traditional school system.

Certainly, with the development and implementation of the Intensive Elementary School System for Adults, the Community Course System, and Telesecundaria, the benefits of basic education were expanded. However, it has been suggested that this action will not be entirely effective if it stops at this level without the complementary action of other economic and social changes (Schmelkes, 1983).

So far within the rural areas of Mexico, with the exception of projects such as the Valle del Mezquital Basic Education system (Garcia, 1979), Plan Puebla, Plan Zacapoaxtla (Luciardi, 1977), and other short-term agricultural development projects sponsored by UNESCO and other international agencies, little has been done to provide the rural adult population with a more comprehensive and adequate education that could provide them with a solid technical-agricultural oriented type of training similar to that offered by the various Vocational and Technical-Industrial schools operating within the urban and semi-urban areas of the country. This would also serve better the goals contemplated within the Law of Education, National Plan of Education, and Education for All plans, which form the basis and rationale for any action taken by SEP in terms of educational practices throughout the

country.

In the next section, we present a brief but concise description of the most relevant elements and characteristics (i.e. subsystems and their attributes [Beishon & Peters, 1976]) contained within each of the eleven Distance Education systems operating in Mexico today. This description will concentrate on four-key elements that are considered to be the most relevant in any DE system (Kaye & Rumble, 1981, P. 21):

1) Regulatory Subsystem (i.e. planning, organization, decision making, and control);
2) Student Subsystem (i.e. the users and their most important characteristics);
3) Course Subsystem (i.e. curriculum structure and its didactic model);
4) Logistics Subsystem (i.e. human and material resources that support the entire operation of the system).

In addition to these four elements, the researcher has also included a fifth that is considered to be of utmost relevance since it addresses the overall efficiency of each system: the Evaluation subsystem. This fifth element refers to the evaluation of students' learning and organization, in terms of the number of students who have graduated.

All descriptions of instructional delivery methods are based upon Escotet's (1980, p. 110) classification of

instructional strategies (See Appendix A).

3.2.1 Sistema Abierto Primaria Intensiva para Adultos (SAPIPA; Open Intensive Elementary School System for Adults)

a) Regulatory and Student Subsystems:

This system came into existence as part of the Education for All programe, included within the 1977 National Plan for Education.

Its main goal is to provide Elementary School education to adults living in small rural communities throughout the nation who, for whatever reason, have not been able to conclude or even start their primary education.

b) Course and Logistics Subsystems:

This system uses on one hand, a multi-media strategy because of its use of programmed textbooks together with audiovisual support materials in the form of radio and television programmes, and on the other, a learner centered approach that is supported by a study-group practice. These study-groups are chaired by a general supervisor who has been trained to do the job, and who acts also as an advisor whenever a student has problems with the instructional content.

It is important to highlight that the programmed textbooks being used in this system, because of their structure and contents, favor and promote a study-group

strategy, thus taking into consideration, either consciously or unconsciously, the point made by Holtzman, Diaz-Guerrero, and Swartz (1975) concerning the learning styles of Mexican students in terms of their being more inclined towards cooperative learning practices as opposed to individualistic approaches favoured by North American students.

The textbooks are given to students at any CONASUPO store (CONASUPO is a government owned food-store chain) on a free basis. The student has no deadline whatsoever regarding the completion of the contents within each textbook and may study whenever inclined, without having any imposition from the system.

c) Evaluation Subsystem:

Government statistics on the system have shown that the completion rate among students is very low, thus reducing the potential benefit of the system upon the rural population (Alvarez-Manilla et al., 1982). These same authors point to the origins of the high drop out rate within this system when they look at two important factors: first, the validity of the assumptions made by the system's planners and administrators regarding the high intrinsic motivation that the rural adult student would have in his studies, and second the already existent skills and abilities of the students for studying within a self-pacing independent style. Unfortunately, neither assumption was correct.

Indeed, in order to become an effective and efficient distance student it is not only necessary to possess a high level of motivation and interest in the programme, but also to have the proper skills to be able to plan and organize the coursework in an optimal way. Furthermore, such a task, as Escotet (1983) pointed out, will be the product of a person with a high capacity for analysis and synthesis, and this is something that a rural student who, when for the first time in his/her life is faced with intellectual work, is unlikely to perform well unless the system provides him/her with an adequate preparatory skills before the DE course begins.

In addition to that noted earlier, Alvarez-Manilla et al (1982) also mention the importance of negative effects that some specific external or environmental factors may have upon the student's performance such as poor nutrition, extenuating a long day's work in the field, lack of space and other facilities for studying at home, and other socio-economic and political factors. These factors have also been documented by other researchers in the area of rural education (Leon & Gamez, 1984; Torres, 1984; Schmelkes, 1983). Likewise, it is also important to note that for the rural student -especially the adult learner- the idea of having a primary school certificate does not necessarily mean a better quality of life in terms of economic benefits or that his/her job in the field will improve as a consequence of his knowledge, as might be thought by SEP

officials.

3.2.2 Sistema de Cursos Comunitarios y Educacion Primaria Rural (SCCEPR; Open Community Courses and Rural Elementary School System)

a) Regulatory and Student Subsystems:

This system was created in 1973 as a direct result of the analysis that SEP, the National Council for Educational Development (CONAFE), and other government agencies carried out on the problem of rural education throughout Mexico.

The main objective of this system is to offer Elementary School education to children between the ages of 6-14 who live in small rural communities of less than 500 people. Presently, the system has expanded its services to 15,000 of these communities scattered in 31 states.

This system also has as a major goal the reduction in the number of children who migrate to the cities and larger villages in search of Elementary School education.

b) Logistics Subsystems:

The system has been organized in such way as to comply with the government's decentralization of educational services policy through the effective involvement of each community within both management and instructional levels. Through the use of local "patronatos" or patronages, as they are called, the overall operation of the system is guaranteed and locally regulated as well since 25% of the total costs of operation are absorbed by the different

communities (Solis & Pointelin, 1982, p. 12).

c) Course Subsystem:

One of the most interesting features of this system is that dealing with the instructional content being taught. The educational content is not based entirely on the traditional Elementary School curriculum but also includes the needs and the reality of the community. This project is thus one of the very few -other similar projects are the Valle del Mezquital Basic Education (Garcia, 1979), and the Agro-Industrial Educational Project at El Coecillo, Guanajuato (PREDEPAC, 1983)- that have taken local factors and characteristics into account at the time of defining and elaborating the instructional objectives and contents for the system.

This system use a single-media strategy based on the use of a textbook or "Manual", as it is called, in each subject. In addition to the Manual, the strategy relies upon an instructor 15 % of the time, who is normally a young person between the ages of 15-20 with a Secondary School certificate, and who typically has taken an intensive pedagogical training for the sole purpose of becoming a Community Instructor.

It is important to highlight the fact that this system, in its educational structure, markedly differs from those of traditional origin: that is, instead of having a six-grade structure, the system has been divided into three levels. With this structure, the people responsible for

the project attempt to solve the age problem that is so common in the rural areas, where there are more older students who are a few years behind their urban counterparts of the same grade. Likewise, this three level structure avoids the problem of having multiple grade repetition that is also a common fact in rural education, and therefore it helps reduce the psychologically detrimental effects on the student whenever he/she must repeat a number of courses.

Although the system has taken into account the needs, values, and overall characteristics of the rural communities in its definition and elaboration of educational contents, this system does not belong to a different category of Elementary School system but, rather, it is aimed at the improvement of the quality of education within the rural environment.

Due to the intrinsic characteristics of the Manuals, these reinforce an individualized approach to learning and cover 85% of the instruction within each subject. Likewise, the Manuals emphasize and motivate the student to work as much as possible in groups, or at least with another fellow student whenever this is possible (Solis & Pointelin, 1982).

It is important to note that all the activities and exercises included within each Manual make use of local resources and therefore do not require further expenses on the part of the local "patronatos", nor do they need

the constant supervision of the Instructor, thus allowing the students to work in a more independent/autonomous way.

All the Community Instructors are required to spend two years in each community while studying at a distance. Later on, during their third year, they can continue their Vocational or Senior High School education in the traditional way in any of the following areas: Commerce & Economics; Physics & Mathematics; Chemistry & Biology, and Social Studies.

d) Evaluation Subsystem:

According to the evaluation parameters defined by SEP and CONAFE for the system, the project has been successful in terms of a) expanding elementary school education to 343,960 students (1979-80 figures) living in 15,000 small rural communities, b) the high motivation with which the local "patronatos" have participated in both the development and management process of the system, and c) the contribution of the system to the Education for All programme established by the Federal government (Solis & Pointelin, 1982).

Indeed, SCCEPR has been very successful in terms of expanding education to thousands of children living in the most remote areas of the country. However, the system's output in terms of the number of students who have been able to graduate is not as encouraging as it should be. Indeed, according to CONAFE's most recent figures (CONAFE,

1987), out of 127,000 students who enrolled in the system back in 1973, only 3,016 were able to graduate by 1979 or, in other words, 2.3% of those who initially started their elementary school education six years earlier - which is the normal number of years at this level of education. Further, according to government statistics, in 1970 the graduation rate or terminal efficiency for the total rural areas was 10.1% (Solis & Pointelin, 1982, p. 1). SCCEPR has claimed that its retention rate is much better than the normal 70% drop out rate within the traditional system operating in the rural areas. However the data obtained on the general terminal efficiency or graduation rate for this system (2.3%) clearly indicates that the completion rate amongst the students is quite low, and therefore the drop out rate for the entire system should be higher than 70%.

3.2.3 Telesecundaria

a) Regulatory Subsystem:

Telesecundaria began its operation in 1967 as a response to the acute problems that the traditional Secondary or Junior High School system had in its efforts of expanding its services to small rural communities where the likelihood of getting secondary education was rather small.

This system was implemented by the government through SEP and the General Direction of Audiovisual Education as a more feasible and cost-effective solution to the so called

"bottleneck" problem at this level of education.

"In 1966, Telesecundaria was tested in a pilot-study; the experiment was deemed a success by Federal authorities. The following year, the system began broadcasting its televised lessons to seventh grade students dispersed throughout eight states. Ten months later, Telesecundaria expanded and then broadcasting to eight and ninth grades, respectively, began" (Palavicini, 1981, p. 10).

b) Student Subsystem:

The system grew at an accelerated rate from 6,569 students enrolled in 1968, to 149,000 students in 1983, hence absorbing a little more than 3.6% of the entire Secondary School population of the country which was 4,088,918 students during the same year (Direccion de Television Educativa, SEP, 1981, pp. 118-119).

Telesecundaria's objective has always been "to complement, rather than reform or replace, the conventional system, and thus it retains the curriculum and educational goals of the main system. Its mission is to bring secondary education to students who would not otherwise have access to the regular schools" (McAnany, Oliveira, Orivel, and Stone, 1983, p. 307).

c) Course and Logistics Subsystems:

Telesecundaria uses a multi-media experiential strategy based on the use of televised lessons, together with a workbook and a Teleclassroom Coordinator's intervention. Every day, the student receives six to seven 17 minute

televised lessons in different subjects, followed by a workbook exercise and a brief intervention from the coordinator; the Teleclassroom coordinator has the duty of providing the students with an introductory explanation to the topic to be televised next.

One interesting characteristic of this system, in addition to the fact that it uses a formal in -school traditional model heavily mediated through television, is that the different rural communities in which it operates must organize local "patronatos", similar to those used in the Community Courses System, as a means of absorbing some of the expenses for the daily operation of the system, e.g., classroom furniture, local rent, T.V. sets, and classroom materials. This also serves as a vehicle for decentralizing the system. However, there is a difference in the way the local "patronatos" in both Telesecundaria and the Community Courses System operate: while the Community Courses' "patronatos" have the support of the governor and the private business sector within each state, Telesecundaria's "patronatos" are made up entirely from local poor people that with great efforts are able to put together enough money to pay their share of the system's operation (Palavicini, 1981).

d) Evaluation Subsystem:

Based on the evaluation results that Montoya & Rebeil (1983) and the Telesecundaria Unit (1983) reported in their

respective studies, the system has not only been successful in expanding Secondary School education to thousands of rural communities of less than 2,000 inhabitants, but also in terms of the learning achievements of its students when compared to other equivalent groups within the traditional Secondary system. This conclusion tends to support the research results that Mayo et al (1973), and J. Mayo (1973) reported in their cost-effectiveness and teacher observation studies respectively. Likewise, Mayo et al (1973) also reported on some of the most severe weaknesses of the system at that time. These included the poor performance and effectiveness of the Teleclassroom Coordinator mainly due to a lack of adequate training, the poor quality of the televised lessons, and reception problems in the vast majority of the communities involved with the project. Nowdays, according to Montoya & Rebeil (1983), these problems no longer exist and Telesecundaria not only provides more extensive and adequate training to Teleclassroom Coordinators and improved quality in its televised lessons, but it has also made improvements within the curriculum structure, the workbook contents, the production techniques of its T.V. programmes, and the role of television within the system since it no longer consumes the largest portion of time in the teaching-learning process.

One of the most important criticisms that Palavicini (1981) made on the system in his study, was the fact that

the management action, and therefore the overall control and regulation of the system, was not a part of its structure but rather an external condition being taken care of by the General Direction of Audiovisual Education within SEP. It was argued then that if this action would have continued, the system's operation and output would have been detrimental to its overall efficiency and effectiveness, thus reducing the chances of achieving the goals the system was pursuing.

In a 1983 report, the Telesecundaria Unit explained how during 1981, paradoxically, the system became an independent body within SEP and the National High School Education Department. Thus it no longer belonged to the General Direction of Audiovisual Education and it was able to exercise an independent and autonomous management action, which needless to say had a more beneficial effect upon the entire structure and operation of the system.

Despite a number of labor, administrative, pedagogical, and local operational problems faced by the system during the last 14 years, today's Telesecundaria is a satisfying system (Simon, 1982, p. 36) which has been making progress especially during the last six years. Hence, it is not surprising to see how the number of graduates has increased together with the overall retention efficiency of the system, as shown in Figure 1.

The official figures indicate that by the year 1982-83 an amazing 82% of 270,000 students enrolled in the system

(secondary school education in Mexico extends over three years) successfully graduated (Direccion de T.V. Educativa, SEP, 1983, pp. 118-120). On the basis of these figures, it appears that the Telesecundaria system is one of the most successful DE systems in the world, including the British Open University, which has a 50% terminal efficiency rate (McIntosh, Woodley, and Morrison, 1983, p. 185).

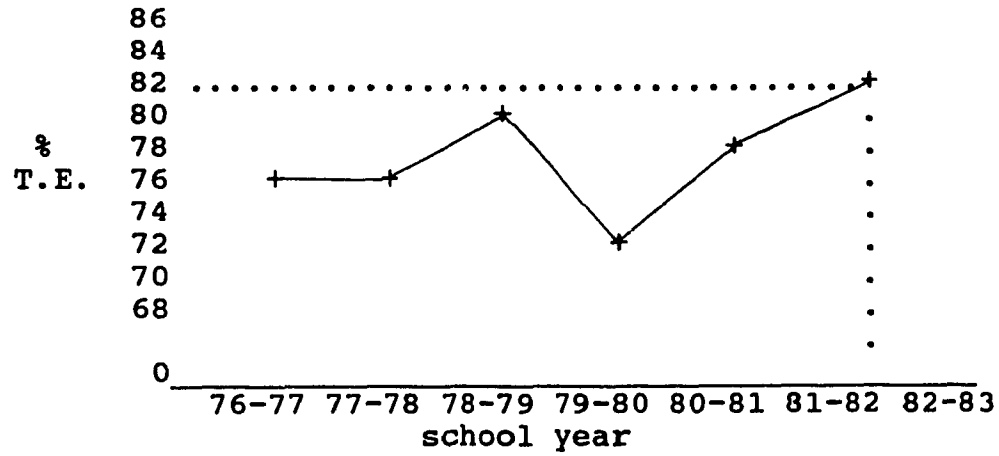

Figure 1. Telesecundaria's terminal efficiency (T.E.) rate

Note. From SEP, First National Reunion of Telesecundaria, April 1982.

3.2.4 Sistema de Ensenanza Abierta del Colegio de Bachilleres (SEACB; Open Teaching Bachilleres High School System)

a) Regulatory and Student Subsystems:

This system was inaugurated in April, 1976 for the purpose of providing a mixture of traditional high school education and technical-vocational courses to people between the ages of 15-35 who for whatever reason have not been able to start, continue, or complete their high school or "bachillerato" studies. The system operates on a nationwide basis covering both urban and rural sectors of the population (SEP, Consejo Coordinador de Sistemas Abiertos de Educacion Superior [CCSAES], 1983).

The major justification for the existence of this system was that, through the expansion of post-secondary school education by means of an open learning system as a wing to the traditional Bachillerato system , Mexican adults would be able to obtain a certificate to allow them to improve their socio-economic status and life-style.

The system is under the direct supervision of the General Direction of Bachilleres School located in Mexico City, and its operation is maintained through six different campuses or centers located in Mexico City and the states of Mexico and Chihuahua.

b) Course Subsystem:

The curriculum structure and contents offered by SEACB are exactly the same as those offered by the traditional

school system which is composed of 36 propedeutic courses, as they are called, and 10 technical-training courses. All 46 courses are distributed in six semesters; furthermore, the system allows the student during his/her last two semesters to choose among three elective or optional series of courses.

A multi-media individualized instructional strategy is used which combines both programmed textbooks and supplementary audiovisual materials (i.e. audio and video tapes). As opposed to Telesecundaria, the programmed textbook is the most important element within the instructional strategy. It is designed and organized in such a way as to facilitate an autodidactic learning on the part of the student. The textbook includes diagrams and other graphic representations to facilitate the understanding and retention of the various contents; as well, both audio and video tapes provide the student with a reinforcer to the contents covered in the textbook.

c) Logistics Subsystem:

In addition to both textbooks and A/V materials, the system heavily relies on the work of Consultants and Monitors; the former provide the learner with a tutorial action that is directly related to the contents being studied in each course, whereas the monitors provide a kind of psychological support service that is directed towards the improvement of autodidactic behaviour. Both Consultants and Monitors are well qualified people who must

hold a "licenciatura" in areas such as Educational Psychology, Education, Social Work, Mathematics, Physics, English, etc. The way these two types of supervision are provided could be either on an individual or a group basis; if individual, then the student has a choice between telephone, postal, or face-to-face tutorials (SEP-CCSAES, 1983).

d) Evaluation Subsystem:

In evaluating a student's progress, the system uses three different methods: 1) auto-evaluation at the end of each lesson contained within each textbook, 2) module-evaluation which is administrated by the Consultants each time a student completes a specific number of lessons in each subject, and 3) final evaluation that is given by the Monitors at the end of each course. The first two types of evaluation are carried out on a continuing basis whilst the final evaluation is given during six different periods per year.

According to the General Direction of Bachilleres School, the curriculum structure and contents, the overall organization and administration, the graduation rate (i.e. terminal efficiency), and diffusion of the entire DE system, are evaluated annually. However, the only available data are in the area of terminal efficiency, and diffusion.

By 1983, this system was serving 22,071 students through its six campuses; during the same year there were

1,150 graduates, or 5.2% of the total enrollment (SEP-CCSAES, 1983, p. 132).

Despite the low completion rate among students, this system is very well structured and organized, especially at the instructional strategy level. Likewise, the objective of expanding Bachillerato education to the working adult population, mostly within the urban areas of the country, has been partially accomplished. However,some important issues still remain unsolved: How adequate is the curriculum content of this system for the rural population? Does the system contribute to the educational development of the country side? Why is it that the system does not provide an option directed towards the preparation of human resources within the rural areas with an emphasis on agriculture and animal husbandry techniques?

Based on the fact that all six campuses or centers are located in the metropolitan areas of Mexico, Toluca, and Chihuahua City, and that the general orientation of the curriculum is directed towards the teaching of a traditional and technical-industrial content, it might be argued that although the system considered the expansion of its services into the rural areas (Escandon, 1982), its curriculum content may not be suitable to the educational needs of the young rural students in general.

3.2.5 Sistema de Ensenanza Preparatoria Abierta (SEPA; Open High School Teaching System)

a) Regulatory Subsystem:

In 1973 both Monterrey's Technological Institute for Advanced Studies (ITESM) and Centre for the Study of Advanced Educational Media and Procedures (CEMPAE), signed an agreement through which a new autodidactic package for high school education was to be developed and tested on a pilot basis in Monterrey City.

By 1979, based on the positive results of this experience, the CCSAES together with other government agencies decided to implement a system called Open High School on a larger scale in the northern and central regions of Mexico. The system as it was designed was a replica of the traditional High School system already in place.

In addition to the expansion of educational services to more students, the purpose of this system was to introduce a new approach to learning: autodidactic behaviour. This new approach, it was thought, would teach the student the proper skills so that learning might become a permanent and vital behaviour in the new generation of Mexicans (SEP-CCSAES, 1983, p. 54). Likewise, the creation of this system also responded to the policy through which the decentralization of educational services was to be accomplished according to the 1977 National Plan for Education.

Although the system is an integral part of the traditional High School system, its overall administration is exercised by SEP's General Direction of Evaluation (DGE). The DGE decided that the best way of administrating the system, while at the same time decentralizing its operation, would be through the use of the services provided by each of the offices that SEP has already in place within each state. In Mexico City alone, there are eleven DGE offices that provide student's services.

b) Course Subsystem:

SEPA uses a one-medium strategy that is based on the extensive use of print materials. Besides the use of a semi-programmed textbook in each subject, the student also relies on the use of anthologies, exercise books, and study guides during the learning process. The latter ones are designed for the purpose of reinforcing and supporting the contents presented within each textbook.

Since SEPA uses the same curriculum structure and content as the traditional system, the entire programme is made up of 33 courses and three specialties: Humanities, Management Science, and Physical-Mathematical Sciences. The whole curriculum is meant to be completed within six terms or three years of full-time study. During the first three terms all students are required to take the same courses regardless of their area of interest, and it is not until the end of the second year that they are allowed

to take specialized courses in their area.

c) Logistics Subsystem:

Unlike other Mexican DE systems, the Open High School does not use the services of either Coordinators, Supervisors, or Tutors. Hence, the course of study has been designed to make use of a 100% independent-study strategy on the part of the student. Despite this, it is important to mention that a group of 180 "Evaluation-Coordinators", as they are called, are in charge of providing the student with some guidance before, during, and after final examinations in each subject.

Based on the statistics obtained by the DGE and the Assistant Secretariat of Educational Planning within SEP (1984, pp. 3-11), and the results reported by SEP and the CCSAES (1983, p. 61), the number of students who enrolled in the system between 1979 and 1984, together with the number of students who have graduated, is presented in Table 1.

Based on the results shown in Table 1, the terminal efficiency rate of this sytem is quite low. Hence, if this system is to become an efficient educational organization, it should evaluate and assess the factors that are contributing to the inability of the system to graduate more students.

Given the fact that no data were available on the systems' students and evaluation, the researcher could not include them in this description of the system.

Table 1

Enrollment, and Graduation rates at the Open High School System, 1979-84

YEAR	TOTAL NUMBER OF ENROLLMENTS	NUMBER OF GRADUATES	% GRADUATION
1979-1984	65,819	890	1.3%

3.2.6 Sistema de Modalidad Abierta del Colegio Nacional de Educacion Profesional Tecnica (CONALEP; Open Education System at the National College for Technical-Professional Education)

a) Regulatory and Student Subsystems:

In 1982, due to an increasing number of students who wanted to enter the traditional CONALEP system but were unable to do so because of time and work constraints, the institution decided to start experimenting on a pilot-basis with an open learning modality.

The main goals and specific objectives of CONALEP's Open Learning Unit are exactly the same as those of the traditional system, namely, addressing the problems of expanding specialized industrial training opportunities to unqualified workers within the industrial sector of the ecoromy. This is in full agreement with the National Economic and Social Development Plans promulgated by the Federal government (SEP, 1981, p. 101). This system also complies with the requirements of the 1977 National Education Plan in terms of providing adults with more adequate and flexible educational opportunities.

b) Course and Logistics Subsystems:

Indeed, through the establishment of short-term technical-industrial careers in 63 different areas, on a nationwide basis, this system has the potential to become a satisfying organization operating at a distance. In the meanwhile, the system is still testing its structure,

organization, contents,and objectives on the basis of a single two-term career in the field of Technical Soldering, with a sample of 100 students living in Mexico City and Mexico state; it has also started the development of two other programmes for further testing in the areas of Electricity and Library Science.

Based on the pilot-testing experience reported by CONALEP (1982), and CCSAES (1983), this system uses a combined instructional strategy in which a programmed textbook, together with audiovisual support materials, library services, workshops, and tutorials, are coordinated with one another so as to optimize the teaching-learning process.

Although the combination of all these elements are essential to the adequate presentation, study, retention, and practice of the various contents, the textbook is the one element that plays the most important role within the strategy.

In the particular case of the programme in Technical Soldering, the student must complete 14 courses in two terms and each of these has a programmed textbook containing five different modules. Each textbook is designed according to very specific guidelines in order to guarantee a high standard of quality. These guidelines must be followed by each subject-matter expert in charge of writing the contents who are normally a part of the teaching staff within the traditional CONALEP system.

Also, in addition to the textbook, a student manual has been developed in order to inform incoming students about the nature, structure, objectives, and operation of the open learning system.

The other instructional components (i.e. A/V materials, library services, workshops, and tutorials) are offered at each of the different CONALEP Centers located throughout the nation. Each Center is locally administrated. Students are required to complete a certain number of workshop exercises at their local centres in order to obtain a specific number of credits in each course. In addition, the Center provides the student with two kinds of tutorials: one is academic assistance given by a supervisor regarding the modules and evaluation activities, whereas the second type of tutorial is given inside the workshops by a "workshop instructor" on matters exclusively related to the practical aspects of instruction. Both tutorial activities are given on a flexible schedule in order to facilitate and reinforce attendance on a regular basis; however, in the case of the workshop practices, the supervision is given during the weekends only.

Another interesting characteristic of this system is the way in which the student must complete the required coursework in each subject. It has been argued by the system's administrators and planners that one major cause of drop out is the extreme looseness with which distance

education systems in Mexico operate. Thus, in order to minimize the risk of having a high drop out among its students, the system has decided to establish specific deadlines for the completion of each course. So far, mainly due to the newness of the system, we have no data from any evaluation that can show the effects that this practice has upon the retention and completion rate among the students.

c) Evaluation Subsystem:

Firmly based on the idea of using deadlines for the completion of each course, the system uses three different evaluation procedures: 1) a self-administrated evaluation at the end of each lesson, 2) a unit-evaluation given by the Academic Supervisor at the end of each unit of instruction, and 3) an overall evaluation, which is also administrated by the Academic Supervisor at the end of each course, or five modules.

In addition to this three-step student evaluation process, CONALEP's Open Learning Unit has designed a more comprehensive evaluation model for the purpose of evaluating the aspects and processes that are considered to be the most relevant within the system, such as curriculum structure, course-content, learning materials, management, and structural organization (CONALEP, 1982).

Given that the system is very recent in its operation, and is still being tested on a pilot-study basis with one particular career and a small sample of students living in

one particular region, it is difficult to say whether the system is effective or not based on the information obtained regarding its structure and organization. Potentially, however, the system could have a very positive and significant impact upon its target audience (i.e. working class), and the industrial sector of the economy at large, especially if it becomes as attractive as the traditional CONALEP system has been, with nearly 60,000 students enrolled during the academic year 1982-83 (SEP, 1981).

3.2.7 Sistema Abierto de Educación Tecnologica Industrial (SAETI; Open Industrial-Technological Education System)

a) Regulatory Subsystem:

This system began its operation in 1976 with the goal of servicing Junior High School graduates who are unable to continue their High School education in the traditional system in an autodidactic or self-instructional way. The system was also designed for the purpose of researching and trying new learning techniques, teaching methods, and curriculum contents at this level of education (SEP-CCSAES, 1983, p. 68).

During the first four years of operation, this system offered its services through one-single center located in Poza Rica City, in the State of Veracruz. Later on, during 1979, the system abruptly expanded to 14 other states through 18 new centers. This expansion, it was argued, was

based on the analysis of needs that were carried out within each region (SAETI, 1982, p. 3). However, and despite all that was said before, during the 1980-81 academic year the system began to have serious structural and operational problems that prompted the creation of an evaluation committee for the purpose of redefining its objectives, curriculum structure and, most important of all, its structural model.

Indeed, due to the rapid expansion of SAETI, little time and few resources -if any- were devoted to the adequate planning and administrative changes that this abrupt expansion required. As a consequence, the system suddenly departed from its original distance education structure and became a copy of the traditional in-school Industrial/Technological school system, while also maintaining an independent-study philosophy (i.e. little or no supervision and tutorials) that made the drop-out rate increasingly high (SAETI, 1982, pp. 3-4). Furthermore, because of the large number of people that were needed in order to run the system through 14 states, the attention paid to the qualifications of those being hired to work within each regional center, either at the administrative level or at the tutor-counselor level, was not as adequate as might have been expected (SAETI, 1982).

Because of this, in order to improve both the efficiency and the effectiveness of the system, corrective action was taken in areas such as Human Resources, Needs

Analysis and Evaluation, Curriculum content and structure, Instructional Design, and Learning Materials. In addition, the system also decided to develop a manual in which its entire operational structure and functioning were thoroughly explained to both students and personnel.

b) Students Subsystem:

Under this new structure, all students entering the system are required to sign a registration form in which, as in a letter of intent, there is an implicit agreement on the part of the student to follow the internal rules and norms of the institution and the way in which the learning process must be carried out. In other words, the looseness with which the system had been operating in the past, especially in terms of the freedom given to the student without any guidance whatsoever in terms of how to proceed in his/her studies,and with poor evaluation methods being applied, came to an end (SAETI, 1982).

c) Course Subsystem:

Before beginning a programme of studies, all students must attend a propaedeutic course given by a supervisor on either an individual or a group basis for one month, in any of the 18 centers throughout the country. This course is aimed at teaching the students the necessary and adequate skills for studying on an individual basis.

After the propaedeutic course is completed, the student is assigned to the first "didactic package" which contains between 4 and 5 courses. Due to the fact that

each semester is divided into two didactic packages, A and B, the student must take and complete between 48-60 courses during six semesters. Furthermore, the system has imposed a deadline for the completion of each semester, as follows:

a) semesters I and II, must be completed within a period of 16-20 months;
b) semesters III and IV, must be completed within a period of 12-16 months;
c) semesters V and VI, must be completed within a period of 8-12 months.

The criteria that were used for setting the deadlines in each of the three levels are based on the assumption that as the student progresses along the system, he/she gains more skills that will allow him/her to complete each didactic package in less time.

The curriculum structure of the system is divided in three main areas of study: Social Sciences, Physical-Mathematical Sciences, and Chemical-Biological Sciences. Within each area, there are different specializations; so far, the system offers 10 different careers in all three divisions.

In addition to the didactic package, the system relies on the use of various learning aids such as audio and video cassettes, filmstrips, overhead transparencies or acetates, and anthologies. Unfortunately, and mainly because of the tight budget with which the system operates, not all of these multi-media resources are available within each

center.

d) Logistics Subsystem:

During the course of his/her studies, the student is supervised by two different types of tutor-counselors: the first is the Academic Tutor who offers individualized and group tutorials on the basis of a fixed schedule; the main purpose for having this type of tutorial is to help the student with any kind of problem that he/she may have in relation to the theoretical content contained within each didactic package. The second type of tutorial, the so called Workshop-Tutorial, is given by a tutor who specializes in the practical aspect of each course; these workshops are compulsory and are usually offered during the weekends (SAETI, 1982, pp. 13-14).

e) Evaluation Subsystem:

The evaluation of the student's progress at each semester is based on three different types of evaluation:

1) Unit-evaluation, that is given by the academic-tutor whenever he/she considers that the student is ready for it,
2) Course-evaluation, given also by the tutor whenever the student has completed all the course-work within each subject, and
3) the overall evaluation, that is under the direct supervision of each center and given to the student at the end of each didactic package (SEP-CCSAES, 1983, p. 72).

So far, there has been no evaluation carried out by the system which could indicate whether the new structure and organization established during the years 1980-81 have been successful or not. Nevertheless, based on the data reported by SEP and the CCSAES (1983, p. 131) and SAETI's own report (1982, p. 17), the student enrollment and graduation rate within the system since 1979 are shown in Table 2.

Although SAETI has partially fulfilled the goals of the 1977 National Evaluation Plan in terms of expanding educational opportunities to sectors of the population that were almost forgotten in previous decades, it appears that the potential of the system has not been exploited to an acceptable level, yet. This system, perhaps, will be a costly adventure unless the system's administrators take rapid action to increase the actual number of students while decreasing the unitary costs of each of the different didactic packages in terms of their development, revision, maintenance, replacement, and delivery (Daniel & Snowden, 1983).

It may also be advisable to reduce the number of courses that the student must take in such a short period of time. If not, the drop-out rate may increase, especially among those who are expecting a more flexible educational structure than that provided within the traditional system.

Table 2

Student Enrollment and Graduation Rate at SAETI

Year	Total number of Students Enrolled	Graduates
1979-83	4,000	23= 0.5%

3.2.8 Sistema Tecnologico Abierto (STA; Open Technological System)

a) Regulatory Subsystem:

STA was inaugurated in 1978 for the purpose of providing short-term technology oriented careers and Bachelor's degrees in different areas to all those young people who were, for various reasons, unable to study within the traditional Institute of Technology.

Until 1983, this system had expanded to 18 states through the implementation of 22 centers. Each Center offers the same programmes with the same curriculum structure as the traditional system, that is to say a total of nine short-term careers, and four Bachelor's degree programmes in the following areas: Business Administration, Accountancy, Industrial Production, and Industrial Engineering.

b) Student Subsystem:

Unlike other Mexican open learning systems, STA's student population is about the same age as those in the traditional school system i.e., between 19-25 years. Most of them are single (70%) and work on a full-time basis (73%) within either the Public, Industrial, or Commercial sectors of the economy which leads us to conclude that, on the average, they are better off than most distance students in Mexico (SEP-CCSAES, 1983, p. 80).

c) Course and Logistics Subsystems:

The instructional aspect of this system relies heavily

on the use of printed media in the form of semi-programmed textbooks and a study guide for each subject. So far, no provision has been made for the use of any audiovisual media. Hence, this system uses a single-medium individualized strategy.

Students' counseling is carried out by means of two different kinds of tutorials: the first, is an introductory-tutorial that is given to entire groups of students on matters related to the units, lessons, and other topics covered within each course, before the student starts working on it, and the second, is a content-tutorial conducted on an individual basis after a given student has completed all the material contained within each unit of instruction. Both tutorials are offered on a weekly basis for two hours each and tied to a fixed schedule which is given to the student at the beginning of each semester.

In addition to these tasks, the tutor has the responsibility for evaluating the student's progress through means of different tests in each of the content areas in which he/she (i.e. the tutor) specializes. For this purpose, the tutor makes use of either written or oral examinations each time that the student feels he/she is ready for it.

Although each programme has a different number of courses and requirements, based on the total number of credits to be taken by the student each semester, most

courses being taught in the system have an average of eight units each. It is common for all programmes to teach the same courses to all new students during the first year or so, regardless of the career or programme in which the student has already been registered Later on, during the second year, all students within each particular programme take the same courses; and it is not until the third year of studies that the student is allowed to register in those courses which belong to his/her area of specialization, especially in the case of all undergraduate programmes.

d) Evaluation Subsystem:

Since STA does not evaluate its structure, operation, and outputs on a regular basis -although its administrators have claimed that different types of evaluations are made throughout the year (SEP-CCSAES, 1983)- the only information currently available is that regarding the total number of students in the system. For instance, during the 1983 school year there were 6,032 students registered with 176 students graduating or 2.9% of those enrolled (SEP-CCSAES, 1983, p. 133).

Although the system in itself seems to be a satisfying solution (Simon, 1982) to the problem of expanding career opportunities within the working-class population of the country, and professional sectors as well, STA could allocate more efforts to attracting more students, since it seems to be underused. Indeed the failure to reach more students throughout the country might have, in the near

future,an unanticipated impact in terms of increasing the unit costs of producing instructional materials, given the large number of courses offered in each programme (Laaser, 1983; Snowden & Daniel, 1983; Jamison, Klees, & Wells, 1976).

3.2.9 Sistema Universidad Abierta (SUA-UNAM; Open System of the National Autonomous University of Mexico)

a) Regulatory and Student Subsystems:

SUA-UNAM was created in 1972 as an integral part of a democratic modernization project within the National Autonomous University, as a result of a new progressive movement to ameliorate the severe educational crisis experienced in the country during the late 60's (Guevara, 1978; 1981).

This open university system was established with two main objectives in mind: first, to give the working-class population and other sectors of low socio-economic status access to university education and second, to link the University and its students with the industrial systems and social levels of the country. These objectives, it was argued, were to be achieved through means of a high quality university education that was to be brought in to the work place (SUA-UNAM, 1982, pp. 2-3).

All these ideas were translated into action by the establishment of an open modality in 17 undergraduate programmes or "licenciaturas", one technical programme, and

one Master's degree programme, within nine different Faculties, Schools, and Departments (see Figure 2). With this action SUA's planners thought that the university would also provide the traditional school system with an adequate and feasible solution to the increasingly dangerous "bottleneck" problem in programmes of great demand. As well, it could also help those students who abandoned the traditional system with a second chance to complete their degrees within a more flexible structure.

b) Logistics Subsystem:

Although SUA-UNAM has its own Coordinating Unit with which it supervises and regulates the overall structure and operation of the system, it is also linked and depends on UNAM's Rectorship and a General Secretariat. The latter group is composed of an Academic Commission of all the Directors from the nine SUA Faculties, plus the Rector and his General Secretary. Their function is to formulate general policy and basic directions for SUA operation.

SUA's internal Coordinating Unit is made of six distinctive elements:

1.- a General Coordinator;

2.- an Academic Secretary;

3.- the Programmes and Projects Department;

4.- the Technical Support Department;

5.- the Planning and Organization Department;

6.- the Administration Unit.

FACULTY	PROGRAMME
1)Odontology	Dental Surgeon
2)Commerce & Administration	Accountancy & Business Administration
3)Political and Social Sciences	Political Science Sociology Public Administration International Affairs Communication Studies
4)Law	Law
5)National School of Nursing and Obstetrics	Technical Career in Nursing & Obstetrics
6)Philosophy & Literature	Philosophy History Spanish Literature English Literature Pedagogy Geography
7)Animal Husbandry & Zootecnics	M.A. in Animal Husbandry
8)Psychology	Psychology
9)Economics	Economics

Figure 2. Programmes Offered at SUA-UNAM System

Note. Adapted and translated from SUA-UNAM (1982, Appendix, Figure 3).

Through the General Coordinator, the Academic Secretariat, and the Technical Support Department, the system regulates its operation in each of the nine Divisions. It is also important to mention that such coordinating action does not necessarily mean uniformity in the operation of the system, since the establishment of Open learning studies within each Division was done at different points in time. Furthermore, divisional operational standards are also different because of the unique characteristics of each programme being offered, and the needs that each addresses. In essence the curriculum structure, the use of learning materials, and the student's supervision, are unique to each of the nine Divisions.

However, in order to avoid too many differences in the way each Division runs its open learning unit, SUA has established a common administrative and academic organizational structure using the following elements:

a) Head of the Division;

b) Academic Secretariat;

c) Pedagogical Supervision Unit;

d) Production of Didactic Materials Unit;

e) Administrative Unit

All together, these units decide on matters concerning the contents, structure, learning materials, student's supervision, and evaluation procedures, within each Division.

With the exception of the Faculty of Philosophy and

Literature that in 1979 decided to design and develop a whole new curriculum structure that would be exclusive and more adequate to its Open learning Unit, the remainder follow the same curriculum structure and contents as that used in their respective traditional systems.

As mentioned earlier, although each Division has its own distinctive way of operating its Open learning Unit, in most Faculties the use of printed materials as the main instructional material together with the use of Audiovisual materials as support devices, is the rule and the one common denominator. Therefore, SUA use a multi-media instructional strategy in general. The printed materials come in the form of study guides, didactic packages, research packages and textbooks.

c) Course Subsystem:

Although the development of the contents for each instructional package is left to the discretion of each Division, SUA's Coordinating Unit established some parameters and guidelines in terms of formulating and printing. Hence, as soon as the group of subject-matter experts within each Division finish writing and organizing each didactic package, this is sent to SUA's Printing-Shop for correction, proof reading and printing. The materials are then sent back to each Faculty for their distribution.

Students' supervision within the system also follows a different approach within each Division. However, it is

common to find highly qualified people (e.g. 34% of all Supervisors have Graduate degrees , and 18% have "Licenciaturas" or B.A.s) who work either on a part-time or a full-time basis for the system (SUA-UNAM, 1983; 1982).

Until May 1983, there were 497 Supervisors in the system. Given the fact that SUA has a very low enrollment rate of only 4,313 students (SUA-UNAM, 1983, p. 21), the student-supervisor ratio is quite low at only 8.6 students per supervisor, which is seen as an advantage for improving the quality of learning within the system (Gonzalez, 1982, p. 10). Furthermore, in order to optimize the role of the supervisor, each Division is responsible for their training based on the particular needs of each programme. It is hence difficult to identify a common pattern in the way these human resources are trained.

d) Evaluation Subsystem:

The students' evaluation process throughout the system is based, in general terms, on self-evaluations included within the various textbooks, and the use of formal tests (i.e., partial and final examinations) that are given by the supervisors whenever the student feels he/she is ready for it, or whenever the Faculty considers it appropriate. Hence, each Division makes use of the evaluation procedures in different ways according to their needs.

According to Cortes & Elizalde (1982), during the first eight years after its creation SUA had a precarious administration that affected the overall operation of the

system and its ability to attract a higher number of students in all nine Divisions. Gonzalez (1982) suggests that the failure to meet original goals is also partially due to political interests that are implicitly reflected in the allocation of inadequate budgets for the operation of the entire system.

Until September 1983, the data on SUA indicates that the total number of students who were registered in the system was 4,313, and 520 had obtained a university degree, or 12% of the total number of students (SUA -UNAM, 1983, pp. 21-23).

In order to further improve the overall efficiency of the system, in 1982 SUA's Coordinating Unit began plans to introduce a new structural organization. To date, no data is available for the purpose of evaluating the overall impact of this new management structure.

3.2.10 Sistema Abierto de Ensenanza (SAE-IPN; Open Learning System at the National Politechnical Institute)

a) Regulatory and Student Subsystems:

The implementation of SAE-IPN followed a three-stage process: first, in October of 1974 the open learning system began its operation with the collaboration of both the Faculty of Commerce and Administration (ESCA), and the Faculty of Economics (ESE); a month later, the system was established within the Center for Scientific and Technological Studies (CECYT), and finally in August 1979,

the system started its operation at the Educational and Training Center of the Workers' Congress (CEDUCT).

Although all these Faculties and Centers belong to the National Politechnical Institute (IPN), only the Faculties are part of its actual structure whereas the Centers are just affiliated with it.

Both Faculties offer undergraduate degrees or "licenciaturas" at a distance in two areas: Economics, and International Trade. In the case of the other two Centers, the programmes offered are of a Vocational-Technical nature.

Hence, SAE-IPN has two similar but somewhat different objectives dependent upon whom they serve. In the case of the Licenciaturas within IPN, the objective of SAE is to expand educational opportunities in areas with higher demand to those people - mostly young adults - who are unable to attend courses within IPN's traditional school system. In the case of the Centers, the idea was to offer short-term technical-oriented careers to the working class sector for the purpose of helping to improve the development of the industrial sector of the economy, together with the socio-economic level of its students.

Thus, with these two simultaneous actions, the SAE-IPN system was fulfilling the most important premises contained within the National Plan for Education and the most recent National Development Plan, both developed while former President Lopez Portillo was in office (1976-82).

Due to the fact that the system belongs to the IPN, the SEA is administrated by a hierarchical structure where IPN's General Direction or Rectorship is at the top (see Figure 3).

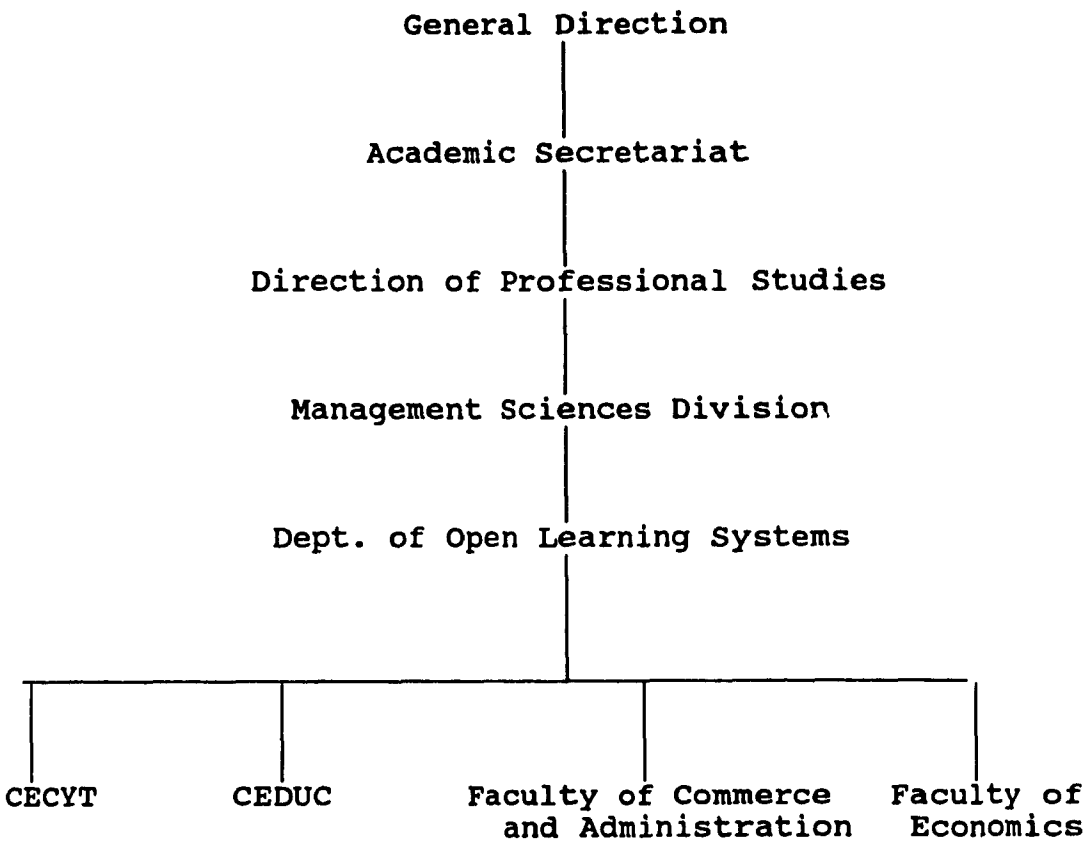

Figure 3. IPN's Open Learning Administrative Structure.

Note. Adapted and translated from the original (SEP-CCSAES, 1983 p. 88).

b) Course Subsystem:

To enter the system, students must first pass what is called a "Diagnostic Examination" which is intended to evaluate an applicant's present level of knowledge in certain areas that are related to the programme he/she is applying to. In addition, all applicants must complete an introductory course in which SAE-IPN's most relevant characteristics, together with the nature of learning at a distance, are thoroughly explained. Other requirements such as Secondary or High School education depend on the characteristics and needs of each programme.

One of the most important characteristics of this system is that related to its instructional delivery system. Given the fact that the IPN has already in place and operates to full capacity a high quality T.V. broadcasting facility, together with a no less efficient A/V Department, the system use to an optimal level all these services. Not surprisingly, its instructional strategy heavily depends on these, together with the use of self-instructional materials such as textbooks, study guides, documents, and anthologies (Escandon, 1982). Hence, this system uses a multi-media instructional strategy with a combination of individualized and group-oriented learning.

c) Logistics Subsystem:

Within the Department of Open learning systems, the Technical Pedagogical Department is in charge of the

development of all self-instructional materials. This Department is also concerned with the organization and supervision of all advisory work (i.e., tutorial) to the students.

Two kinds of student supervisions are conducted. The first is the called Career-Supervision, which is given by a professor specialized in one particular career who is responsible for guiding and explaining to students the nature, objectives, and learning contents of his/her profession. This Supervisor is, more succintly, the liaison between the student and the institution. The Career-Supervisor also has the responsibility for helping the student in the selection of the appropriate number of credits in each semester, and most important of all, for assigning the student to a group of course-tutors. In addition, the Career-Advisor is the one responsible for monitoring the student's progress throughout the system until he/she graduates. The second kind of Advisor is the Course-Supervisor, and this is given by a Professor who specializes in one particular course. The Course-Supervisor is responsible for authorizing all partial and final examinations, and for organizing other learning support activities such as conferences, round tables, seminars, etc. (SEP-CCSAES, 1983, pp. 89-90). Both supervisions are scheduled in relation to the pace at which the study-groups and the individual student advance throughout the courses.

d) Evaluation Subsystem:

The SAE-IPN system use three different methods for evaluating the student's progress: a) Formative Evaluation, which is intended to evaluate the student at the end of each lesson or unit of instruction, and b) Summative Evaluation, which is intended to evaluate the student's level of knowledge at the end of each course. Both types of evaluation are given to the student whenever he/she feels ready for it. In addition to this, the system has made provisions for evaluating the learning material's contents, presentation, scope and evaluation, and the advisors' work as well.

According to the data obtained on the system (SEP-CCSAES, 1983, p. 91), in 1983 there were 2,877 students and during the same year, a total of 276 students had completed their studies and thesis requirements in all the programmes being offered, which represents a 9.5% graduation rate.

3.2.11 Sistema de Educacion a Distancia de la Universidad Pedagogica Nacional (SEAD; Distance Education System at the National Pedagogical University)

a) Regulatory and Student Subsystems:

The SEAD system at the National Pedagogical University was established in November 1979 for the main purpose of providing thousands of pre-school, elementary school, and physical education teachers scattered throughout the nation

-who only had Normal School education- with the opportunity to upgrade their skills and knowledge in their own field of expertise, by offering them undergraduate level university degrees.

This action, it was argued, would have a significant effect upon the teacher's socio-economic situation since most of SEAD students live and work in the rural areas of Mexico (Noguez, 1982). This action would also help improve the educational system, especially where there had not been any significant change over the last 30 years or more, and hence where the educational system of the country faced its biggest and most difficult challenge, The Rural Areas (Muñoz, 1983).

Not surprisingly, SEAD's General Coordinating Unit was given the same kind of objectives as the traditional system, with the only difference being that it was addressed to serve all those teachers who could not attend regular courses within the in-school system at this University, mainly because of work and time limitations.

Indeed, SEAD's most important raison d'etre was to be able to offer university education to rural teachers without having them leave their work place and consequently jeopardizing their already precarious economic situation. Hence, the central idea of helping the teacher-student complete their university education using a home-based study strategy was very attractive from the outset (e.g., during the first year of operation the system enrolled

50,000 students; SEP-CCSAES, 1983, pp. 115-117).

b) Logistics Subsystem:

Although the system has its own administrative body, the General Coordination of Distance Education System, it nevertheless depends on the Academic Secretariat and other Divisions and Units within the University.

Within itself, the General Coordinating Unit of the system has three separate Divisions which are in charge of administrating each of the programmes offered: 1) Basic Education, 2) Pre-School, Elementary School, and Physical Education, and 3) Graduate Programme in Distance Education. All three Divisions operate at the national level through SEAD's 74 regional centers (SEP-CCSAES, 1983, p. 133).

Each Center is locally operated by a General Director, an Administration Director, the Academic staff, secretaries, and Security staff and Services personnel.

Although it is true that each Center has its own operational infrastructure, all Centers are centrally administrated by the system's General Coordinating Unit located in Mexico City. From here, all academic and administrative activities for the entire system are defined, developed, and implemented for their use on a local or regional basis.

Needless to say, these Centers are of utmost importance to the system since it is here that the student comes into contact with the institution and its learning services. Among the most important services offered are

the student's supervision given by a group of advisors, library and bookstore facilities, study-groups, and summer courses.

c) Course Subsystem:

Based on the fact that SEAD's instructional strategy exclusively depends upon the use of printed media in the form of programmed textbooks, students' manuals, and self-applied evaluation handbooks, this system is defined as a single-media individualized strategy.

Although all these materials are designed in a way as to promote and facilitate autodidactic behaviour on the part of the student, the system's instructional strategy relies mainly on the tutor-counselor's work at each Center.

The main objective of the tutor-counselor work is to provide the student with adequate academic guidance in terms of how and what courses should be taken, how to plan and organize study-time, answering any doubts, questions and problems encountered during the study of all materials, recommending and helping organize the various study-groups and round-tables, and providing motivational support. In order to carry out all these activities, advisors and students use occasional face-to-face meetings, and telephone and postal services. Hence, the system offers advisory services to its students on a permanent basis within a flexible schedule, so that even those students who live in

remote areas can have access to these services without having to travel large distances.

The quality of these advisory services is guaranteed by the careful selection of each advisor on the basis of knowledge and expertise in specific subject areas (i.e., B.A., M.A., Ph.D.), self-directed learning, learning resource utilization, and counseling. All this is possible because of the fact that all the advisors are required to register in the M.A. programme in Distance Education that their own University offers through SEAD itself. In addition, all advisors are expected to attend nationwide and regional meetings with other advisors (SEP-CCSAES, 1983, p. 117).

d) Evaluation Subsystem:

In order to assess the student's learning progress, SEAD use three different methods: 1) Formative Evaluation through means of self-evaluation procedures contained within the evaluation handbooks, 2) Summative Evaluation through means of final examinations given by the institution whenever the student completes all the units contained within each course, and 3) Terminal Evaluation through means of a B.A. thesis that the student must submit after all the course requirements and other specific prerequisites of the programme have been fulfilled. If the thesis is accepted by the advisory committee, the student graduates.

It is important to note that the same evaluation

process is used with all M.A. students-supervisors and other people who do not work for the system but who are also enrolled in the programme. In fact, most student-supervisors have chosen research topics related to the actual operation and results of the network in which they work and study. Thus, their research and evaluation results contribute to assessing the system's efficiency and effectiveness (Noguez, 1982, p. 15).

So far, SEAD has been quite successful in the area of providing university education for thousands of teachers who were in need of upgrading their knowledge and skills in their own area. These achievements are fully supported by the number of students enrolled in the system as shown in Table 3.

Table 3

Total Number of Student Enrollments at SEAD

Year	Total number of Students Enrolled	Number of Graduates
1983	93,000	750 = 0.8%

Note. Sources: Noguez, A. (1982, p. 11); SEP-CCSAES (1983, p. 133).

In summary, this system has the potential for becoming one of the most advanced DE institutions in Mexico. Both its structure and operation seem to be adequate given the overall objectives of the system i.e., few programmes, adequate number of student enrollment, full government support, an excellent level of training of its human resources, and what appears to be an adequate local-center network.

CHAPTER IV

THE ANALYSIS OF MEXICAN DISTANCE EDUCATION SYSTEMS: DEVELOPMENT OF A MODEL

4.1 In Search of a General Distance Education Model

In order to provide a framework for descriptive analysis, the unique characteristics of each of the systems which account for formal distance education in Mexico must be delineated. This was considered to be of paramount importance in order to be able to understand, in a "holistic" manner (Schoderbek, Schoderbek, and Kefalas, 1980 p. 6), how the various modalities have been applied, and what have been their results within the particular context of Mexican education and society. By doing so, it is argued, it will be possible to not only understand the application of DE in Mexico, but also to identify its most common features and problem areas in which further work could and should be done, in order to bring DE in this context to a "satisficing" operational level (Simon, 1982, p. 36).

Given that the field of DE is still an incipient area of study which lacks an accepted and comprehensive theoretical framework, together with a generalizable procedure for systematic analysis (Keegan, 1983; Neil, 1981; Moore, 1973), it is difficult to select a methodology for studying each of the eleven systems described earlier in such a way as to be able to analyze their most important

subsystems and attributes in a systematic, efficient, and reliable way. Hence, at this stage the main problem is to be able to find a methodology or set of procedures that could help the researcher in the task of classifying and descriptively analyzing each of the Distance Education Systems under study in order to be able to identify their common factors and characteristics for the purpose of developing a general model of DE in Mexico.

4.1.1 Review and Analysis of Different Classifications of DE Models

After reviewing the literature dealing with different DE Models, it was concluded that few authors have developed classifications that could assist the researcher in the task of classifying and analyzing DE systems in a comprehensive way (Kaye & Rumble, 1981; Keegan, 1982; McAnany, et al, 1983; Neil, 1981; Perraton, 1981).

The problem inherent in most is the narrow basis for classifying and consequently evaluating a given system. McAnany, et al (1983), for example, have developed two classifications of DE Models: one for Formal, and the second for Nonformal DE systems. Within this framework, a DE system is defined not only on the basis of the nature of its curriculum structure, which may or may not lead towards the obtainment of a school certificate, diploma, or degree, but also on the basis of the nature of its instructional strategy/meth· (e.g., Dick & Carey, 1978; Romiszowski,

1981) or didactic model, itself. In fact, most of the classifications put forward are based upon one particular attribute contained within one DE subsystem, in this case the Course Subsystem.

The models presented below, based upon McAnany, et al's analysis of 23 DE systems in different parts of the Third World show well the concentration on course related components:

Models of DE in Formal Schooling

1.- Mass Media Projects

2.- Correspondence Teaching

3.- Hybrids

Models of DE in Nonformal Schooling

1.- Open Broadcasting

2.- Campaigns

3.- Listening Groups

4.- Two-way Interpersonal

Variables within DE Models

a) Instructional Mode

b) Teaching Personnel

c) Principal Medium

d) Educational Level

e) Learning Site

Having a close resemblance to the aforementioned models in terms of its Instructional Strategy or didactic method, Keegan (1982) developed a classification containing the following four DE models:

1) Correspondence Model, in which the learner depends entirely on postal contact with the institution;
2) Multi-Media Model, in which the learner has at his disposal a wide range of learning media and face-to-face sessions;
3) Consultation Model, in which the learner must attend face-to-face sessions in addition to studying at a distance;
4) Integrated Model, in which the distance learners are kept parallel with a group of on-campus students and their progress is monitored against them.

Unlike McAnany, et al's classification, this one does not differentiate between Formal and Nonformal DE models, hence it can be assumed that all four models are applicable to either format.

It is clear that Keegan's classification shows that these four DE models are defined in terms of the operational structure at the Course Subsystem level and more specifically, at the Instructional Strategy or method level. On the basis of these models, it could be argued against the validity of defining a DE system in terms of one particular attribute contained within a specific

subsystem, especially when there are at least four-key susbsystems contained within any DE System as has been suggested by Kaye & Rumble (1981); furthermore, this approach restricts the understanding of the overall emergent properties of any particular system (Checkland, 1981, pp. 74-82).

By taking a closer look at McAnany et al, and Keegan's classifications at the Formal Schooling level, it can be seen how these resemble one another. For instance, the first model, the Correspondence Model, has been included in both classifications, whereas the Mass-Media and Hybrid Models within McAnany et al's classification would be equivalent to the Multi-Media and Consultation Models respectively, suggested by Keegan; the Integrated Model could be the only one that has no parallel in both classifications.

Therefore it could be concluded that although they are very useful for defining the various Instructional Strategies at the Course Subsystem level within any DE system, these classifications still lack a more comprehensive definition as to what a DE Model is. It is interesting to note that although Keegan (1980) has suggested three approaches to identify the forms of DE, i.e., the medium, the institutional type, and the didactic model, his classification is entirely based on the third approach, thus leaving behind two factors of extreme importance for the thorough understanding and

classification of any DE system.

Unlike Keegan, Perraton (1981) has developed a classification of Nonformal DE Models which can be compared to that developed by McAnany et al within the same category. Both classifications include the following models:

Perraton (1981)	McAnany et al (1983)
1) Open Distribution	1) Open Broadcasting
2) Support for Extension Agencies	2) Campaigns
3) Support for other existing Teaching Organizations	
4) Radio Campaigns	3) Listening Groups
5) Radio Schools	
6) Farm Forums	4) Two-Way Interpersonal

By taking a careful look at the various models contained in each classification, it can be seen that they are virtually the same. For instance, the first model is the same, whereas the Campaigns model suggested by McAnany et al, could be equivalent to Perraton's models 2) and 3), since a Campaign could be used for either purpose (Coombs & Ahmed, 1974); the Listening Groups model is similar to Perraton's models 4) and 5)for obvious reasons and; finally, the Two-way Interpersonal model could very well fit into Perraton's Farm Forum's model since it is an

instructional strategy widely used in both Farm and Radio Forums, where a discussion takes place immediately after the treatment between a monitor/counsellor/change agent and the group of farmers. In fact, the Two-Way Interpersonal model could be used in any of the other Nonformal models since it is an integral part of any optimal DE strategy that includes guided didactic conversation (Holmberg, 1983) or what Bordenave (1980) calls a "humanizing communication model" (p. 165).

Although it is true that these two classifications have included some models that are defined on the basis of the Instructional method or strategy being used by the DE system like Open Broadcasting, Radio Campaigns, Listening Groups, Radio Schools, and Two-Way Interpersonal, there are some models that have a more comprehensive definition on the basis of their planning, organization, and mode of operational elements or attributes contained within the Regulation Subsystem (Kaye & Rumble, 1981). Such is the case of Support for Extension Agencies, and Support for other existing Teaching Organizations models.

Further along the line in the search for a more comprehensive classification of DE systems, two interesting classifications were uncovered that seem to be more adequate for the purpose of this research. One of these, developed by Kaye & Rumble (1981), was based on the analysis of several DE systems operating at higher levels of education. This classification contains the following

models:

1) Correspondence Tuition Independent Organization Model;
2) Conventional University with Correspondence Studies Model;
3) University level Correspondence Model;
4) Massive Centralized Correspondence Education Model;
5) Autonomous Distance Education Institution Model.

Based on the description that the authors made about the characteristics and definition of each of these models, it could be concluded that each of these are defined on the basis of two elements: their organizational status, which include aspects such as governance, origination sector, and institutional aspects (Neil, 1981), and their instructional strategy. Therefore, this classification is still restrictive in the approach taken for defining different DE systems, although it contains a more comprehensive element such as the Regulatory Subsystem. Likewise, this classification has the problem of being very specific since it is only concerned with DE systems operating at higher levels of education, thus leaving behind an large number of systems that operate at other levels of education using different formats (e.g., nonformal, and informal DE systems).

The second classification analyzed was that presented by Neil (1981) which is actually based on the work and the consensus of various participants who attended the Open

University's Tenth Anniversary International Conference, in 1979. The models contained in this classification are the following ones:

1) Classical Centre-Periphery Model: whole system control model like the Open University model;
2) Associated Centre Model: partial control excercised by the Institution with independently financed associated centers, like Spain's UNED;
3) Dispersed Centre Model: where the DE Institution cooperates with several institutions within the community in which it operates, like the Coastline Community College, California;
4) Switchboard Organization Model: where the DE Institution enables, initiates, and approves roles in the development of DE within a country, like the NFJ, Norwegian DE Institute;
5) Service Institutional Model: where the DE Institution offers services on a nationwide basis to any other institution and organization that is interested in developing DE materials such as the case of the Deutches Institut fur Fernstudien and the Universitat Tübingen, Germany.

As it has been explained by Neil, these models of DE systems were defined on the basis of "some dominant feature of organization or mode of operation" (1981, p. 140).

Thus, it is still restricted in its approach, especially because of the fact that there are more DE systems in Third World countries that could not be classified within any of the aforementioned models, but only those implemented in Developed Nations.

By taking a careful look at the models contained in this particular classification together with the one presented earlier, it can be seen that a parallel exists among the models.

For instance, the Classical Centre Periphery model has its equivalent in Kaye & Rumble's Autonomous DE model; the Associated Centre model is also equivalent -although not the same- to the University level Correspondence model; the Switchboard Organization model has its equivalent in the Massive Centralized Correspondence model; the Service Institution model could very well fit into the Correspondence Tuition Independent Organization since it could provide such services, especially if the DE institution has no government financial support; the Conventional University with Correspondence Studies model and the Dispersed Centre model could also be considered as being parallel to one another if the Conventional University decides to use its DE system for cooperating with other institutions, organizations, agencies, etc., within the community in which it was established. Although it may not always be the case, it can not be concluded that these last two models are equivalent on the basis of their

definition and mode of operation.

If the argument regarding the parallelism among the models contained within these last two classifications (i.e. Kaye & Rumble, and Neil's) is correct, then it necessarily follows that Neil's models have the same degree of limitation as the former ones, not only in terms of their definition, which is based on the system's mode of operation, but also on the level at which these models operate, i.e. university and other forms of higher education. This fact, as mentioned earlier, limits their use in the analysis of Mexican DE systems since not all Mexican systems operate at higher levels of education.

4.1.2 Finding and Improving a Distance Education Model Classification

As the result of the analysis performed in the previous section, it was decided to combine all five classifications in such a way as to enhance their usefulness within the framework of a more comprehensive scheme. This scheme will provide the researcher with what could be considered to be a powerful methodological tool for analyzing, understanding, explaining, and most important of all, developing a more comprehensive classification of DE models that could be used with this research case's subunits (i.e. Mexican DE systems) -and with other systems as well- and which would not only be based on one or two specific attributes contained within

any given subsystem, but rather on the analysis of the most important factors and attributes contained within the entire DE system.

Certainly, this new scheme or classification model is not intended to be a definitive classification of components and characteristics of DE systems, but rather a comprehensive synthesis of the current status of DE in terms of the knowledge gained regarding the structure, organization, and operation of DE institutions.

Likewise, it is important to mention that although the scheme presented by Neil (1981) is one of the most comprehensive and detailed instruments for analyzing DE systems that this research has so far come across with, it still leaves some room for improvements and further developments at certain levels (see Appendix A). Furthermore, being aware of the fact that all previous classifications discussed so far in this chapter (i.e. Keegan, McAnany et al, Perraton, Kaye & Rumble, and Neil's) have the potential for contributing to a better operationalization of some of the variables/ factors contained within the scheme this study is going to be using, the researcher therefore integrated them at specific levels within the overall structureof the General DE Model design for this study, together with the researcher's own improvements, whenever this was considered to be necessary.

Hence, the original Neil scheme has been modified in some respects and now contains more comprehensive detail

that will not only allow the researcher to describe, but also to explore possible relationships among factors as a more adequate basis for diagnosing malfunctionings within the systems under study, (See Table 4).

Table 4

A Scheme for Analyzing and Classifying Distance Education Systems on the Basis of their Most Important Factors and Characteristics

FACTOR	CHARACTERISTICS
1) STATUS:	1.a) Governance:
	1.a.1) Autonomous DE Institution/classical Centre Periphery Model
	1.a.2) Associated Centre
	1.a.3) Switchboard Organization/Massive Centralized Institution
	1.a.4) Service Institution/Correspondence Tuition Independent Organization
	1.a.5) Dispersed Centre Institution
	1.a.6) Conventional Institution with Correspondence Studies
	1.b) Origination:
	1.b.1) Sector:
	a) Public
	b) Private
	c) Mixed
	d) International
	1.b.2) Institutional:
	a) Teaching Institution
	b) Broadcasting Institution
	c) Government local or National Agency
	d) International Agency
	e) Other
2) QUALIFICATIONS: (accreditation)	2.a) Own
	2.b) Parent Institution
	2.c) External (government, other institutions)
	2.d) None

3) LEARNING/
COURSE: 3.a) Learning Strategy:

- 3.a.1) Single-Media
- 3.a.2) Experiential
- 3.a.3) Individualized
- 3.a.4) Multi-Media
- 3.a.5) Hybrid/Integrated
- 3.a.6) Group-oriented

3.b) Predominant Technology:

- 3.b.1) Printed Media
- 3.b.2) Television
- 3.b.3) Radio
- 3.b.4) Computers
- 3.b.5) Films
- 3.b.6) Video/Audio cassettes
- 3.b.7) Other

3.c) Learning Site: (Formal/ Non-Formal DE Systems)

Formal:

- 3.c.1) Home-based
- 3.c.2) Learning Center
- 3.c.3) School
- 3.c.4) Mixture of two/all of the above

Non-Formal:

- 3.c.5) Open Broadcasting
- 3.c.6) Informal Meetings/two-way interpersonal
- 3.c.7) Listening Groups:
  - a) Radio Schools
  - b) Radio Forums
  - c) Radio Campaigns
- 3.c.8) Campaigns:
  - a) support for extension agencies:
    1. national
    2. local
    3. international
  - b) support for other existing educational organization
  - c) support for other government plans

3.d) Student's Evaluation:

- 3.d.1) Self-administrated
- 3.d.2) Tutor/counsellor administrated
- 3.d.3) Institution-administrated
- 3.d.4) Government-administrated
- 3.d.5) Entrance examination
- 3.d.6) Lesson evaluation
- 3.d.7) Unit evaluation
- 3.d.8) Course evaluation
- 3.d.9) Final evaluation
- 3.d.10) Thesis/oral/equivalent evaluation

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4) SUBJECTS/COURSES OFFERED:

4.a) Origin:

- 4.a.1) Own set/Curriculum
- 4.a.2) Set/Curriculum of Parent Institution
- 4.a.3) Ad Hoc, own or commissioned

4.b) Nature of Courses/ Curriculum:

- 4.b.1) short-few weeks usually single self-standing topics
- 4.b.2) on-going series of related topics usually over several months at least
- 4.b.3) coherent series of courses usually for qualification
- 4.b.4) other

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5) LEVEL OF STUDIES:

5.a) Adult Higher:

- 5.a.1) Postgraduate
- 5.a.2) Bachelor's degree

5.b) Adult Non-higher:

- 5.b.1) College equivalent
- 5.b.2) Vocational
- 5.b.3) Bachillerato
- 5.b.4) Technical-Industrial
- 5.b.5) Techno-Agricultural
- 5.b.6) Literacy
- 5.b.7) Technological
- 5.b.8) Basic education
- 5.b.9) Secondary or Junior high school
- 5.b.10) Job-training

5.c) Junior High School or equivalent for teenagers

5.d) Elementary School or Basic Education (children)

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6) SCALE OF OPERATION:

6.a) Urban/Semi-Urban:

6.a.1) Small (few hundreds of students)
6.a.2) Medium (few thousands of students)
6.a.3) Large (tens of thousands of students)
6.a.4) Very large (hundreds of thousands)

6.b) Rural:

6.b.1) Small (community/ village level)
6.b.2) Medium (municipality based)
6.b.3) Large (provincial/state level)
6.b.4) Very Large (nationwide)

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7) LEARNING MATERIALS:

7.a) Creation:

7.a.1) in-house
7.a.2) external (commissioned or bought in)
7.a.3) mixed

7.b) Production:

7.b.1) in-house
7.b.2) contracted out
7.b.3) mixed

7.c) Delivery System:

7.c.1) own
7.c.2) external (government or private)
7.c.3) mixed

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8) STUDENTS:

8.a) Registration:

8.a.1) own system
8.a.2) system provided by parent institution
8.a.3) system provided by external institution
8.a.4) no registration required

8.b) Entry Requirements:

- 8.b.1) none
- 8.b.2) none except age
- 8.b.3) based on previous qualifications
- 8.b.4) age plus qualifications
- 8.b.5) others

8.c) Sources of Support:

- 8.c.1) in-house resources
- 8.c.2) external resources
- 8.c.3) mixed
- 8.c.4) other (e.g. none)

9) ACADEMIC STAFF:

9.a) Own Full-time

9.b) Own Part-time

9.c) Part-time external Consultants

9.d) Mixed

9.e) Other

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10) FINANCE:

10.a) Self-financing

10.b) Non-Self-financing:

- 10.b.1) Government support
- 10.b.2) International Agency support
- 10.b.3) Private sector support
- 10.b.4) Other Institutions support
- 10.b.5) Parent Institution support
- 10.b.6) Combined support

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11) GOALS/OBJECTIVES/PURPOSES:

11.a) Expand educational opportunities within traditional system

11.b) Decentralize the educational system

11.c) Provide on-the-job training

11.d) Provide second-opportunity to dropout people

11.e) Provide specialized education according to the needs of the country

11.f) Provide Continuing-education-like services

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12) SYSTEM'S EVALUATION THROUGH OUTCOME MEASURES:

12.a) Cost Measures per Unit

12.b) Learning:

12.b.1) exams
12.b.2) homeworks
12.b.3) workshops
12.b.4) excercises
12.b.5) tutorial

12.c) Correlates of Learning: Traditional vs. DE students

12.c.1) exam scores
12.c.2) dropout rates
12.c.3) pass rates
12.c.4) graduation success

12.d) Exam pass rates: how many students passed or failed on a given set of tests

12.e) Graduation rate

12.f) Dropout rate

12.g) Comparison with other alternatives on the basis of:

a) benefits, and
b) effectiveness

12.h) Survival of the institution through the years

12.i) Quality of Instructional Materials

12.j) Amount of study demanded

The contributions made to Neil's original scheme took place at different levels:

1) The first improvement took place within Factor 1, i.e. Status, at the Governance level (1.a). At this level the original scheme did not include a specific distinction among the various DE models since it only considers those systems that are "self-governing, non-self-governing (parental institution), non-self-governing (member of a consortium), and other". As it is, this distinction is too general and there is room for operationalizing it even further; thus it was decided to do so by introducing Neil's (1981), and Kaye & Rumble's (1981) classifications, which combined, provided the researcher with a more precise classification than those considered in the original version.
2) The second addition to the scheme was made within Factor 3 Learning/Course, at the Learning Strategy level (3.a). At this level the original version included only three sub-levels, namely "distance learning only, distance learning plus face-to-face component, and distance learning primarly by group methods". Although this operationalization may be useful, it is still not comprehensive enough in terms of defining the most common strategies used by DE systems. Hence at this level the researcher introduced Escotet's classification of instructional strategies (1980) for the purpose of

providing clearer understanding regarding the nature of the various and most commonly used strategies. The researcher also edited from Neil's original scheme the element entitled "Media Range", since it was found to be of little use in the understanding of a DE system and was confusing when it was applied to the Mexican systems since Media, and not the Range, is what counts. Furthermore, since in the Learning Strategy section (3.a) it was already defined the kind of media that is being used, and in section 3.b the predominant technology, it was found that this is sufficient to establish a clear distinction about the nature of the media used and its unique characteristics.

3) Within Factor 3, but at the Predominant Technology Level (3.b), the original scheme includes a general distinction between "print, print with feedback, and broadcast" as predominant technologies in DE systems. This distinction, from the researcher's point of view, is rather general and fails to define in more precise terms other technologies in addition to print; hence it was decided to break down the broadcast sub-level according to the information gathered on the Mexican DE systems, in terms of the media most commonly used.

4) Within Factor 3, in the original scheme no provision had been taken for introducing an element (i.e. sub-level) that is of paramount importance and which was considered by McAnany et al, (1983), when they identified the

variables that play the most important role within each of their models (i.e. mass media, correspondence teaching, hybrids, open broadcasting, campaigns, listening groups, and two-way interpersonal models): the Learning Site (3.c). The researcher believes that by introducing this new variable within the original scheme the overall operationalization of Factor 3 will be strengthened in several ways: first, to be able to define in more precise terms where learning takes place, or at least most of it, secondly, to find out about the nature of the physical distance between the learner and the institution, thirdly, to be able to evaluate whether or not the learning strategy followed by the system relates to the adequacy of the learning site itself, as well as the technology used, and last but not least, to provide a basis for making a clear distinction between the most common learning sites within Formal and Nonformal DE systems. All this will allow one to clarify and understand, even better, the variables that to a great extent define the concept of distance education.

Likewise, at the Learning Site level, the researcher introduced Perraton's classification (1981) combined with that developed by McAnany et al (1983), at the Nonformal education level, because of the importance of the distinction between Formal and Nonformal DE systems, especially since many DE systems operating in Third

World nations today are of a nonformal nature (Young, Perraton, Jenkins, and Dodds, 1980; Bordenave, 1977).

5) Lastly, within Factor 3, another addition took place within the original scheme's structure. This improvement refers to the introduction of a fifth variable called Student's Evaluation (3.d) which is, from the researcher's perspective, a critical point to be analyzed whenever a thorough study of a DE system takes place. This fifth variable was developed on the basis of the knowledge gained by the researcher regarding the nature of the students' evaluation process that takes place within each of the Mexican DE systems, and also on the basis of the importance given to it by other scholars in the field (Escotet, 1980; Haynes, 1984; Holmberg, 1985; Kaye & Rumble, 1981; Keegan & Rumble, 1982; McAnany et al 1983).

   Besides the fact that evaluation of any kind is a critical aspect within the teaching-learning process, this variable could also be used as one of the most important catalysts in the process of analyzing the partial effectiveness of the DE institution, hence its inclusion within the scheme.

6) Within Factor 5, Level of Studies, some additions were made to the original "adult, non-higher, and adult higher" levels in terms of defining even further the Adult, Non-Higher category into ten levels from its original three-level classification. This was done

because of the fact that these three-levels lack specification as to what are the most common "work or survival related and formal schooling studies" used in the original version. Therefore, the "survival related" aspect was expanded on the basis of the curriculum being offered in each of the eleven Mexican DE systems (see Table 4, Factor 5, level 5.b). Likewise, three other levels were added within this same factor which will allow one to classify those DE systems that are not exclusively directed to the adult population, but youngsters and children as well, at the high school, Junior high school, and Elementary school education levels, something that the original scheme did not consider.

7) Within Factor 6, Scale of Operation, a distinction was made between Rural and Urban/Semi-Urban DE systems (6.a, and 6.b), since the original version addresses only the actual size of the system but without considering the context in which it operates, which is something that the researcher considers to be very important as a means for evaluating how efficient DE systems have been within a specific context, particularly in terms of expanding educational opportunities to those sectors of the population that can not attend traditional school.

Certainly, this aspect reflects one of the most relevant goals of DE systems in Third World countries, although its importance may be reduced in more

industrialized countries where DE is generally directed towards the urban population.

Although these additions were made, the original "small, medium, large, and very large" levels remained the same, since these were considered to be an adequate scale for measuring the size that any DE system may have.

8) Within Factor 7, Learning Materials, a small addition was made at the level called Delivery System, and more specifically at the sub-level 7.c.2, where the original "external" was further defined in terms of either government or private delivery systems, since in Mexico DE systems use any of these. This distiction may also be applicable to other systems in Latin America, like Brazil for example.

9) Within Factor 10, Finance, a more specific distinction between the different forms of "Non-self-financing" was made (10.b). This was done because the original version only distinguishes between "self-financing and non-self-financing" systems, without elaborating the second level in terms of the different sources of financial support that a DE system may have. This distinction, it is argued, could have important consequences in one's understanding of the way any given DE system has been implemented, together with its goals, governance, curriculum, and overall operational process, since it is well known that those who finance a project are also the

ones who either control its purposes and direction or, at least, have a great deal to do with it, an aspect that in Third World nations may have tremendous importance and consequences.

10) One of the most important additions that was made to the original scheme tnat included ten-factors, is the addition of Factors 11, and 12.

Factor 11 (i.e. Goals/Objectives/Purposes), was introduced because it was considered to be of utmost importance in the analysis of any DE system. This factor defines the overall structure and operation of the system, and also is a measure against which the success or failure of the system could be evaluated in an objective way. Hence, based on the analysis of the Mexican DE systems the researcher operationalized this factor in terms of six different levels that reflect the most important rationale behind the creation of most Mexican DE systems, although, once again, new levels could be added in order to make this Factor much more comprehensive.

The second addition was the creation of Factor 12, which is entirely based on the work that McAnany et al (1983) did on the analysis of the variables that are considered to be an adequate and reliable measure of the efficiency of any DE system as a whole.

As well, within Factor 12, two small additions were made: the first of these took place within level 12.b,

Learning, where instead of having just one sub-level i.e. exams, as suggested by McAnany et al, now has two more based on the practice that exams alone are not the only way of evaluating the student in DE systems, but through other forms like homework and workshops as well.

Needless to say, this level could be expanded even further. However, based on the analysis of the Mexican systems under study, it was concluded that these three (12.b.1; 12.b.2; and 12.b.3) sub-levels are the most common ones.

The second and last addition to this Factor took place at level 12.g, Comparisons with other alternatives. This level now includes two levels of comparisons: a) in terms of its effectiveness, and b) in terms of its benefits. The reason behind this differentiation was based on the vagueness of the original level contained in McAnany et al's classification: "Comparisons with other alternatives" only, which may lead to confusion. Thus, the researcher decided to add these two levels as parameters for making a more adequate comparison among different educational alternatives against the DE one.

4.2 Application of the Improved Scheme to the Analysis of Mexican Distance Education Systems

After having developed a more comprehensive scheme, the task is to use it for the purpose of analyzing,

understanding, and classifying each of the Mexican DE systems. This practice, it is argued, will allow the researcher to develop a general model of DE for Mexico on the basis of a common pattern of behaviour, and consequently, to be able to develop a solid chain of evidence as to what has so far been the success of this model as measured by its general terminal efficiency (i.e., graduation rate).

The analysis and classification of each DE system was done through the use of a matrix in which all the factors, together with their respective levels and sub-levels, are listed on the left hand-side, using their code numbers as a reference (i.e. 1.a.1; 3.a; 11.b, etc.), whilst each of the DE institutions under study placed on the top were given the following code in Roman numerals for their identification:

I) Sistema Primaria Intensiva para Adultos;
II) Sistema de Cursos Comunitarios- Primaria Rural;
III) Telesecundaria;
IV) Sistema Ensenanza Abierta- Colegio de Bachilleres;
V) Sistema Preparatoria Abierta;
VI) Colegio Nacional de Educacion Profesional Tecnica
VII) Sistema Abierto de Educacion Tecnologica Industrial;
VIII) Sistema de Tecnologico Abierto;
IX) Sistema Universidad Abierta;
X) Sistema Abierto de Ensenanza;
XI) Sistema de Educacion a Distancia de la Universidad

Pedagogica Nacional.

Moreover, all systems were orderly placed, from left to right, starting with the most and ending with the least efficient system.

The application of the scheme to the analysis of each case is shown in Table 5 (p. 144).

Table 5

Application of the Scheme to the Analysis of Mexican Distance Education Systems

FACTORS	SYSTEMS								
	III	IX	X	IV	VIII	II	V	XI	VII
1) STATUS									
1.a):									
1.a.1.			1						
1.a.2.									
1.a.3.									
1.a.4.				1					
1.a.5.		1			1		1		1
1.a.6.			1	1		1		1	
1.b):									
1.b.1.a		1		1	1		1	1	1
1.b.1.b									
1.b.1.c									
1.b.1.d									
1.b.2.a			1	1		1		1	
1.b.2.b									
1.b.2.c		1		1			1		
1.b.2.d									
1.b.2.e									
2) QUALFS									
2.a.									1
2.b.			1	1		1		1	
2.c.		1				1			
2.d.									
3) LRNG/CRS									
3.a):									
3.a.1.					1		1	1	1
3.a.2.		1				1			1
3.a.3.				1		1		1	1
3.a.4.		1	1	1					1
3.a.5.			1						
3.a.6.		1							

	III	IX	X	IV	VIII	II	V	XI	VII
3.b):									
3.b.1.		1	1	1	1	1	1	1	1
3.b.2.	1		1						
3.b.3.									
3.b.4.									
3.b.5.									
3.b.6.		1	1						
3.b.7.									
3.c):									
3.c.1.		1	1	1	1	1	1	1	1
3.c.2.				1	1	1		1	1
3.c.3.	1		1	1					
3.c.4.									
3.c.5.									
3.c.6.									
3.c.7.a.									
3.c.7.b.									
3.c.7.c.									
3.c.8.a.									
3.c.8.a1.									
3.c.8.a2.									
3.c.8.a3.									
3.c.8.b.									
3.c.8.c.									
3.d):									
3.d.1.		1	1	1			1	1	
3.d.2.	1		1	1	1	1	1	1	1
3.d.3.		1	1				1	1	1
3.d.4.	1					1			
3.d.5.									
3.d.6.			1	1					
3.d.7.			1						1
3.d.8.	1	1	1	1	1	1	1	1	1
3.d.9.		1	1					1	1
3.d.10.		1	1		1			1	
4) SBJ/CRS									
4.a):									
4.a.1.		1	1						1
4.a.2.	1	1	1	1	1		1	1	
4.a.3.						1			
4.b):									
4.b.1.									

	III	IX	X	IV	VIII	II	V	XI	VII
4.b.2.									
4.b.3.	1	1	1	1	1	1	1	1	1
4.b.4.									

5) LEVOFSTS

5.a):

5.a.1.		1						1	
5.a.2.		1	1		1			1	

5.b):

5.b.1.							1		
5.b.2.			1						
5.b.3.				1					
5.b.4.								1	
5.b.5.									
5.b.6.									
5.b.7.		1					1		
5.b.8.									
5.b.9.									
5.b.10.									

5.c.	1								
5.d.						1			

6) SCLOFOP

6.a):

6.a.1.									
6.a.2.		1	1		1				1
6.a.3.				1			1		
6.a.4.	1							1	

6.b):

6.b.1.									
6.b.2.									
6.b.3.									
6.b.4.	1					1		1	

7) LRNGMATS

7.a):

7.a.1.		1	1	1	1	1	1	1	1
7.a.2.									
7.a.3.	1								

	III	IX	X	IV	VIII	II	V	XI	VII
7.b):									
7.b.1.		1	1	1	1	1	1	1	1
7.b.2.									
7.b.3.	1								
7.c):									
7.c.1.		1	1	1	1			1	1
7.c.2.	1	1			1	1			
7.c.3.									
8) STDTS									
8.a):									
8.a.1.	1	1	1		1	1		1	1
8.a.2.				1	1		1		
8.a.3.									
8.a.4.									
8.b):									
8.b.1.						1			
8.b.2.									
8.b.3.	1	1	1		1		1	1	1
8.b.4.				1					
8.b.5.		1	1						
8.c):									
8.c.1.		1	1	1	1			1	1
8.c.2.									
8.c.3.	1				1	1			
8.c.4.									
9) ACADSFF									
9.a.		1	1	1	1	1	1	1	1
9.b.			1						
9.c.		1							
9.d.	1	1							
9.e.									
10) INCE									
10.a.									
10.b):									
10.b.1.	1	1	1	1	1	1	1	1	1
10.b.2.									

	III	IX	X	IV	VIII	II	V	XI	VII
10.b.3.									
10.b.4.									
10.b.5.		1	1	1	1		1	1	1
10.b.6.									
11) GOALS									
11.a.	1	1	1	1	1	1	1	1	1
11.b.		1				1	1		
11.c.								1	
11.d.		1		1					1
11.e.			1		1				1
11.f.									
12) SYSEVA									
12.a.	1								
12.b):									
12.b.1.	1	1	1	1	1	1	1	1	1
12.b.2.									
12.b.3.			1						1
12.b.4.						1			
12.b.5.									
12.c):									
12.c.1.	1								
12.c.2.									
12.c.3.									
12.c.4.	1								
12.d.									
12.e.	1	1	1	1	1	1	1	1	1
12.f.	1	1	1			1	1		
12.g.	1								
12.h.	1								
12.i.	1								
12.j.									

Note. Legend: 1=presence of this factor within the system. The name of each factor has been abbreviated (see Table 4 for details).

The results of the previous analysis indicate that there are 28 common factors in at least 50% of the Systems. The common factors found were:

CODE	FACTORS
1.a.5	Dispersed Centre Institution
1.a.6	Conventional Institution with Correspondence Studies
1.b.1a	Public Sector
1.b.2a	Teaching Institution
1.b.2c	Government local or National Agency
2.b	Parent Institution
3.a.4	Multi-media Strategy
3.b.1	Printed media
3.c.1	Home based
3.c.2	Learning Center
3.d.1	Self-administrated evaluation (lessons)
3.d.2	Tutor-Counsellor administrated evaluation
3.d.8	Course evaluation
4.a 2	Set/Curriculum of parent institution
4.b.3	Coherent series of courses for qualification
7.a.1	In-house creation of materials
7.b.1	In-house production of materials
7.c.1	Own delivery system /or/
7.c.2	External delivery system (government)
8.a.1	Own system registers its students

8.b.3	Entry requirements based on qualifications
8.c.1	In-house student support resources
9.a.	Full-time academic staff
10.b.1	Government's financial support and,
10.b.5	Parent institution financial support
11.a	Expand educational opportunities within the traditional educational system
12.b.1	Evaluation of learning through exams
12.e	Graduation rate being the most common dependent measure of the efficiency and effectiveness of the system

Hence, it could be said that the most common Mexican model of DE is a system that contains most of the factors mentioned above. Furthermore, on the basis of the terminal efficiency rate (i.e. graduation rate) reported for each individual system (with the exception of two systems, namely, The Open Intensive Elementary School System for Adults, and the Open Education System at the National College for Technical-Professional Education), the average terminal efficiency or graduation rate of the Mexican DE systems in general stands at 13% (see Table 6), including Telesecundaria, which is certainly not representative of the population since it has a very high terminal efficiency rate (i.e. 82%). Without taking into account Telesecundaria's percentage, the average terminal

Table 6

Terminal Efficiency Rate of Mexican Formal Distance Education Systems

SYSTEM	YEAR	TOTAL NUMBER OF STUDENTS ENROLLED	TOTAL NUMBER OF GRADUATES	COMPLETION RATE (%)
1)Telesecundaria (System III)	1983	270,000	221,400	(82%)
2)SUA-UNAM (System IX)	1983	4,313	520	(12%)
3)SAE-IPN (System X)	1983	2,877	276	(9.5%)
4)Colegio de Bachilleres (System IV)	1983	22,071	1,150	(5.2%)
5)Tecnologico Abierto (System VIII)	1983	6,032	176	(2.9%)
6)Cursos Comunitarios Primaria Rural (System II)	1979*	127,000	3,016	(2.3%)
7)Preparatoria Abierta (System V)	1983	65,819	890	(1.3%)
8)Universidad Pedagogica-DE (System XI)	1983	93,178	750	(0.8%)
9)Educacion Tecnologica Industrial (System VII)	1983	4,000	23	(0.5%)

Note. Although there are eleven systems in operation, two were excluded from the analysis because of a lack of data related to their graduation rate.

* Most recent data available as of March, 1987.

efficiency will be even lower at 4.3%.

4.3 Implications of this Model within the Context of Mexican Education and its Future needs

According to statistics reported by the Mexican government, the country presently faces a large shortage in terms of the number of people that it requires in order to satisfy its most important development needs. These figures show that currently there is a 60% shortage of professionals with a higher education background, and 40% at the technical-vocational or specialized high school level. In other words, there is a need to prepare 530,000 people in diverse areas of higher education, and close to 200,000 at the technical-vocational level (Comision Consultora de Empleo y Productividad; Subcomision de Recursos Humanos, 1982; in Alvarez-Manilla et al, 1982, p. 112).

Likewise, these projections also show that the present educational structure of the country will not be able to accomodate large numbers of students in the next decade, since an average of 1,652,533 young people between the ages of 15-17 who should start their high school education will be left without the opportunity to do so. Furthermore, the shortage of places at the higher education level will be even worse if we consider the fact that an overwhelming 7,272,233 young adults between the ages of 18-22 will not be able to enter the system (see Table 7).

Table 7

Mexico's Education Projections from 1990-2000 at High School and Higher Education Levels

	HIGH SCHOOL EDUCATION LEVEL		
	1990	1995	2000
Student Demand	6,314,500	6,515,100	6,369,200
Student Supply	3,869,000	4,994,100	5,378,100

Total shortage of places: 4,957,600 (or 25.8%)

	HIGHER EDUCATION LEVEL		
	1990	1995	2000
Student Demand	9,384,400	9,525,100	11,129,700
Student Supply	2,226,800	2,909,900	3,085,800

Total shortage of places: 21,816,700 (or 72%)

Note. Source: Consejo Nacional de Poblacion (SPP), Secretaria de Programacion y Presupuesto, 1982 (Alvarez-Manilla et al, 1982, p. 95).

So far, these grim results tend to support the idea that lies behind the development of DE systems in Mexico, and the urgent need to expand educational opportunities, especially at High School and University / Higher Education levels. However, this goal by itself does not necessarily justify the problem of the low terminal efficiency rate that these systems have.

Indeed, the emphasis that has been given to the mere expansion of the traditional school system, at all levels, with the use of DE, has had a negative and detrimental effect upon the qualitative aspect of the problem since it seems that government officials have been neglecting the internal efficiency of each of these systems. As a consequence, the terminal efficiency levels of the DE systems in Mexico are very low, when compared to traditional educational systems within the country. On the other hand, we could also say that the quantitative aspect of the problem has not been solved entirely either since, although DE systems have expanded educational opportunities to thousands of people, the number of graduates has been very low. Therefore, the quantity of the system's output has not been adequate in terms of the goals and objectives that were defined by the government.

The researcher considers that if DE systems in Mexico are implemented within the so called "democratization" of education framework, but in a simple and rather demagogical-political way, without paying enough attention

to the adequate operation and evaluation of the systems for corrective action purposes, the fulfillment and achievement of the needs and goals contemplated within the National Development, the National Educational, and Education for All plans, will become unattainable since neither education and training nor development will be fully achieved.

Based on the results of this study, the researcher is inclined to indicate that there is a critical need to revise and modify the present role and practice of DE in Mexico, otherwise the potential that this branch of education may have for helping alleviate the educational nightmare that the country is about to face in the year 2000 -when nearly 60 million children, youngsters, and adults will be demanding educational services- will be almost nill and very expensive in terms of costs, time, and human resources (Alvarez-Manilla et al, 1982, p. 85).

CHAPTER V

RESULTS AND INTERPRETATION

5.1 Organizing the Data

The first step in the analysis of the results obtained in the previous chapter (see Section 4.2, Table 5), was to organize all the data into six different clusters. Each of these represents a different unit of analysis which is intended to help focus the attention and discussion on one particular level at a time.

The clusters are units of analysis in which all factors that are common (i.e. factors which are shared or that are a part of some systems) to those systems having similar graduation rates, are grouped. Therefore, the intended purpose for having these 'groups of factors', is to facilitate the analysis by 'clustering' those system's components which are considered by the researcher to be plausible, exemplatory indicators of the systems' most important output: Their graduation rate.

The clusters also indicate the type of factors grouped in accordance with the level of efficiency (i.e. graduation rate in percentages) of the system they come from. Two levels are used to indicate this: More and less efficient. By this the researcher means the graduation rate level or Terminal efficiency of each system given in percentages, where the most efficient system is one with the highest graduation rate (i.e. 82%); The more efficient systems are

the three systems with the highest graduation rates (i.e. 82%, 12% and 9.5%); The less efficient systems are those having the lowest graduation rates (i.e. 5.2%, 2.9%, 2.3%, 1.3%, 0.8%, and 0.5%); and finally, The least efficient system is the one having the lowest graduation rate of all the systems analysed (i.e. 0.5%).

The clusters are:

1) Factors that are unique to the most efficient system, and those factors that are present in all systems but the most efficient one;
2) Factors that are common to the most efficient systems only;
3) Factors that are common to the least efficient systems only;
4) Factors that are unique to the least efficient system of all;
5) Factors that appear with greater frequency in the most efficient systems and with lesser frequency in the least efficient ones;
6) Factors that appear with greater frequency in the least efficient systems and with lesser in the most efficient ones.

By organizing the results into different units of analysis the researcher is attempting a kind of analytical triangulation (in Case Study Research this technique is known as Negative Case Studies [Kidder, 1981) through which

one single pool of data can be analyzed in different yet complementary ways.

This practice will provide the researcher with the information needed for establishing a chain of evidence as to those factors which are most likely to be related to the high, medium, and low terminal efficiency of these systems. It is important to highlight the fact that since there is no first-hand information related to the terminal efficiency rate of both the Sistema Primaria Intensiva para Adultos System, and the Colegio Nacional de Educacion Profesional Tecnica System, the researcher decided to exclude them from this analysis, bringing the total number of systems under study to nine.

The terminal efficiency levels of the nine systems of concern:

System III: 82% terminal efficiency (high)

System IX: 12% terminal efficiency (medium)

System X: 9.5% terminal efficiency (medium)

System IV: 5.2% terminal efficiency (low)

System VIII: 2.9% terminal efficiency (low)

System II: 2.3% terminal efficiency (low)

System V: 1.3% terminal efficiency (low)

System XI: 0.8% terminal efficiency (low)

System VII: 0.5% terminal efficiency (low)

5.2 Analysis and Interpretation of the Data

At this level of analysis the researcher is mainly concerned with describing and analyzing those factors that are related to the polytomous dependent variable (Kennedy, 1983) i.e., graduation rate, and providing a plausible argument as to how and why these particular factors may be,to some extent, within a "producer-product" (Ackoff, 1967) relationship, linked.

Although no initial propositions have been established for pinpointing these factors, and how and why they might be related to graduation, each cluster contains an implicit proposition as to the identification of factors in relation to one single system, or a group of them. The propositions as to the how and why questions will be formulated later on in order to direct the discussion and provide a rationale to the findings.

5.2.1 Factors that are Unique to the Most Efficient System, and those that are Present in All Systems but the Most Efficient One

This particular cluster is intented to explore and identify those factors that are exclusively a part of the most efficient system of all, Telesecundaria, and which are not shared by any of the remaining eight systems under study. The identification of these "unique" factors will provide the researcher with a ground for exploring the possibility of these factors being, to some extent, the

reason behind Telesecundaria's success.

In addition, this cluster also explores and identifies those factors that are shared by all systems under study with the exception of Telesecundaria.

The identification of these common factors will provide the researcher with a basis for exploring the possibility of these factors being, at least partially, the reason behind their lower graduation rates as compared to Telesecundaria's success.

The following are the factors that appear exclusively in the most efficient system: Telesecundaria (82% graduation rate):

a) Group-oriented learning strategy
b) Junior High School level of education
c) Mixed creation of materials (in-house and commissioned)
d) Mixed production of materials (in-house and contracted out)
e) Cost measures per Unit Evaluation
f) Correlates of learning based on exam scores between traditional Junior High School students, and Telesecundaria's
g) Comparison of graduation success rate between the traditional system and Telesecundaria
h) Comparison with other alternatives on the basis of benefits and effectiveness
i) Survival of the institution through the years
j) Evaluation of the quality of its Instructional Materials

Although at first glance it could be concluded that, if taken all together, these factors are the major contributors to the outstanding terminal efficiency of Telesecundaria, it is also important to take into account those factors that do not appear in this system but do so in all the other systems, for the purpose of a more comprehensive understanding of some of the reasons behind the enormous difference in terminal efficiency levels among the systems under study. Hence, both the presence and the absence of certain factors may provide us with a better explanation in relation to the large variance that exists among these systems.

The following are the factors contained in all systems but Telesecundaria:

a) Printed media as the predominant technology
b) Home-based learning site
c) In-House creation of materials
d) In-House production of materials
e) The use of full time academic staff

Based on these two sets of factors, four propositions are to be discussed next:

- The relevance that group learning has in relation to the cultural and cognitive style of Mexican students;
- The inadequacy of relying to a large extent on both the printed media as the only carrier and home-based as the learning site of instruction, in relation to the specific characteristics of Mexican students;

- The exploration of possible reasons why a mixed creation and production of materials has an advantage over the in-house approach, under the light of a political and economical framework; and
- The use of evaluation as a key to success, and the possible reasons behind its neglect in most DE systems in Mexico.

Group Learning

Although there is no body of research evidence that would conclusively indicate that group learning per se is the most adequate learning strategy to be used by Mexican DE systems, and that this practice also has a high positive correlation with the terminal efficiency level of these systems, nevertheless there is some evidence suggesting that Latin Americans in general are of a cooperative rather than competitive nature (Escotet, 1978). Holtzman, Diaz-Guerrero and Swartz (1975) provide support for this assumption in their study of personal development in two cultures which concluded that Mexican students are cooperative while their North American counterparts are competitive, and that these two "preferred learning environments" are directly related to the cultural patterns of behaviour and the educational system as well.

The data obtained in this study clearly indicate that with the singular exception of Telesecundaria, all the other systems make extensive use of an independent-home-

based study strategy. Therefore, this evidence suggests that the use of a group-oriented approach to learning within Mexican DE Systems has a positive impact upon the system's overall output as compared to those systems which use an independant-home-based approach.

Print Media and Home Based Learning

This second proposition can also be discussed within the context of the above mentioned argument, especially in terms of the apparent negative effects that a home-based learning strategy might have upon a population of students which has a tendency to interact and depend extensively on their peers and professors inside the classroom environment, therefore reducing the opportunity to work independently, or to develop self-learning practices.

In general terms, the Mexican educational system induces the student to depend almost entirely on the teacher for his/her learning, founded on the idea that the student is more a recipient of knowledge and information rather than a generator of it. This has had as a consequence the use of a memoristic approach to learning rather than one which promotes rational thinking and problem-solving on the part of the student (Alvarez-Manilla et al, 1982; Munoz-Izquierdo, 1983).

As a consequence, the idea suggesting that DE systems "require an independent student with self-discipline [and] with a high capacity for analysis and synthesis" (Escotet,

1983, p. 152) places a highly difficult task on the Mexican DE student who, unless provided with the necessary and adequate skills for learning independently, could either fail or drop out from the system sometime during the initial stages of his/her studies (Weitzner & Fonseca, 1984), thus contributing to the low terminal efficiency rate of the system.

It is important to mention that some Mexican DE systems have included as part of their curriculum the use of preparatory or propeadeutic courses for teaching students how to learn at a distance before they start taking courses. Hence, a thorough evaluation process in order to assess the effectiveness of these propeadeutic courses could help identify potential problems with the students.

On the other hand, it is important to realize the fact that an independent-home-based type of education requires on the part of the student not only a good deal of motivation and self-discipline, analytical thinking, and adequate administration of the study-time schedule, but also, and not less important, a place to carry on all these activities.

Unfortunately, most DE students who come from the disadvantaged sectors of Mexican society and whose families live in rural and semi-urban areas of the country (SEP, 1981), do not have adequate study facilities at home. Problems range from space to basic services such as

electricity.

Hence, the lack of both adequate skills for carrying independent learning and a proper place to work at home may be contributing to some extent to the low graduation rate in these systems, with the only exception of Telesecundaria.

Likewise, it is important to mention that the use of printed media as the only carrier of instruction also has some important implications within the context of Mexican DE systems.

Such implications are derived from the assumption that all formal DE systems are addressed to those sectors of the population that, in general terms, have been amongst the least well educated groups and which include high numbers of drop outs from the traditional system together with people that have been away from school for several years.

All these characteristics may be increasing the possibility that large numbers of students who are enrolled in DE institutions do not have adequate reading skills, thereby reducing the effect that the instructional content might have on the students' level of learning. Furthermore, this possibility is indicated in our own data since none of the systems have entry examinations that could help identify weaknesses in the reading skills of the students, including reading comprehension.

In a similar vein, our argument could take a more provocative approach if we consider the fact that the

printed word, which uses a digital code, could only serve those students who have the ability to deal with abstractions (Schramm, 1977), something that a person who has been in a deprived socio-economical and educational environment, like the majority of DE students in Mexico have been, may find very difficult to cope with simply because of a lack of adequate analytical thinking skills. This is, as mentioned earlier, one of the most important abilities that the student must posses in order to study at a distance.

It is interesting to note that according to our data Telesecundaria is the only system that does not use print media as the main carrier of instruction, but instead as support media to television. Likewise, our data also indicate that although the second and third most efficient systems use printed media as the main carrier of instruction, these systems also make extensive use of television and other audio-visual devices, while those systems that are the least efficient rely exclusively on print media.

Perhaps the best argument to support and explain this evidence is that although there is no one best medium, the use of a multi-media approach which combines both digital and iconic codes seems to be more adequate for promoting and facilitating learning, especially when dealing with a target audience that has the characteristics of Mexican DE students.

Mixed Creation and Production of Materials

To explain how and why the use of a mixed approach to the creation and production of instructional materials is related to the higher terminal efficiency level of a particular DE system, is not a simple task. Nevertheless, the route chosen for exploring the reasons behind this result is one based on the political and financial aspects of Mexican DE systems.

Although the researcher was not able to gather any data concerning the nature of the budget for each DE system, and even less on the amount of money that each of these allocates for the creation and production of materials, it is important to consider the assumption that unless a system has sufficient economic resources derived from political commitment, it will be forced to create and produce its own materials using an in-house approach, thereby compromising the quality of these materials.

Indeed, the fact that Telesecundaria uses some private and government facilities in order to create and produce its materials (e.g., this system makes use of Televisa's facilities, undoubtedly the most powerful private broadcasting consortium in the country, for the production and transmission of its televised lessons) perhaps not only denotes more economic strength but most important of all, a kind of political commitment on the part of government officials within SEP (Secretariat of Public Education), which more than evident when we consider the survival of

the institution throughout 19 years in a country where project continuity has indeed a special meaning, due to its uncommonness.

Undoubtedly, political commitment goes hand in hand with more and better economic support, and this is something that not all Mexican DE systems have enjoyed, as in the case of the Sistema Universidad Abierta at UNAM (Guevara, 1981), or the now extinct Radioprimaria system (Spain, 1973).

Furthermore, it is important to understand that while most DE systems in Mexico were established on the basis of a real educational need (i.e., the expansion of educational opportunities due to an increasing demand for educational services), it is also fair to say that their creation denotes a political interest which paradoxically rarely includes political commitment. Without this last key element, the amount of money that is allocated to each system will be inadequate, thus forcing the institution to develop its own facilities for creating and producing its own materials. Moreover, in most cases these materials are exactly the same or very simmilar to those used by the traditional parent institution, a practice that may help reduce even further the production costs but to the detriment of the DE student who needs a more sophisticated material design.

Finally, it is important to acknowledge that while it is true that most Mexican DE systems that produce their own

materials have had problems with their quality -even those produced by Telesecundaria (Molina, 1983)- it is also fair to say that in some instances the materials have turned out to be very good as in the case of the autodidactic package developed by the Instituto Tecnologico de Estudios Superiores de Monterrey (ITESM), which is used at the traditional high school level in Monterrey City. However, it must also be said that ITESM is one of the wealthiest and most successful private educational institutions in the whole country, and this certainly allowed for pilot-testing and other formative evaluation procedures which contributed to the high quality of the materials.

Evaluation

The need for evaluation as an integral part of a DE system is of paramount importance not only for assessing the students' level of achievement, but in order to improve aspects related to the operation and structure of the entire organization as well (Holmberg, 1985; McAnany et al, 1983; UNED, 1983; Daniel and Snowden, 1981, in Neil; Kaye and Rumble, 1981; Escotet, 1980; Mayo, 1980).

Unfortunately, and with the only exception of Telesecundaria (see Mayo, McAnany, and Klees, 1973; Mayo, J., 1973), all the other systems have neglected to a large extent the relevance of evaluation in relation to aspects such as: formative evaluation during the development stages of their materials; pilot-testing of these materials before

they are sent out for distribution; comparison with other alternatives in terms of costs, benefits, and effectiveness; drop out, retention, and graduation rates within the institution itself as compared to other similar institutions; cost measures per unit evaluation; and comparison with other institutions based on exam scores and graduation success (McAnany et al, 1983).

The results of this neglectfulness have had as a consequence the lack of vital information for decision-making purposes that in turn could help lead these systems towards better operational structures and practices in order to produce more adequate outcomes.

Perhaps the lack of evaluation in these systems responds more to ignorance than to fear or maliciousness on the part of those who are responsible for their administration. This argument can be supported by the fact that all systems, without exception, include a more or less thorough plan for evaluating the students' learning and also information regarding the total number of students enrolled on a yearly basis, together with data concerning the number of graduates. Hence, the fact that this kind of information is available but is not being used for corrective purposes seems a bit awkward.

Likewise, the fact that these systems have placed all the weight of evaluation on the students' level of achievement through the application of different exams and the like, but without paying attention to other aspects

that indicate the obvious lack of efficiency in terms of the reduced number of students who are able to graduate, provides us with a clue as to the unique and narrow way in which evaluation is conceived and applied within these systems, together with either the lack of interest in or understanding of a crucial concept such as efficiency.

Furthermore, perhaps this lack of evaluation is not only due to ignorance but, more importantly, to the fact that as long as the system is able to serve the purpose of expanding educational opportunities to more people in a rather simplistic, expansionistic manner, regardless of the number of graduates it is capable of producing, the DE system is considered to be fulfilling its most important goal and responsibility.

So far, there is some evidence which indicates that the Federal government of Mexico has been more concerned with the mere expansion of the entire educational system and less with matters concerning the evaluation of the quality of contents, teaching, learning, and graduation rates (Muñoz-Izquierdo, 1983; Alvarez-Manilla et al, 1982; Castrejon, 1981; Espinosa, 1977). This latter problem becomes even more pressing when the statistics indicate that out of every 3 million students who enter elementary school, only 29% complete the six years of it; 6.7% complete Junior High School; 3% complete High School; and only 1% manage to graduate from University or, in other words, only 36,000 of the initial 3 million students

(Castrejon, 1983).

Full Time Academic Staff

Surprisingly, our data also indicate that with the only exception of Telesecundaria all the other DE systems use their own full time (or equivalent) academic staff.

Although this factor may in some way be related to the terminal efficiency of the various systems, a more plausible explanation for this factor is that the majority of these systems are linked to a parent institution from which they have taken their academic staff; since the DE system is considered an integral part of the parent institution, then their human resources are considered full time. In the case of Telesecundaria, however,this system is not considered to be a wing to the traditional Junior High School system -although it uses the same curriculum structure and contents- but is rather an independent unit within the entire educational system of the country, thereby allowing the system to hire both full and part time staff.

Based on this last statement, a plausible explanation as to the contribution of this factor to the graduation rates of DE Systems is that since more staff from traditional institutions are being used by most DE systems, and in general few individuals have had specific training to work in a DE system, the quality of instruction is somehow being affected. Again in the case of

Telesecundaria, the system is in a better position to hire people from the outside who have the qualifications needed (although this is not always the case) and work in a DE environment without any imposition whatsoever from a parent institution , since it is an independent system.

5.2.2 Factors that are Common to the Most Efficient Systems

The following factors are present exclusively in the most efficient systems (i.e., Systems III, IX, X):

a) T.V. as predominant technology;
b) Video/audio cassettes as predominant technology;
c) School as learning site;
d) Entry requirements are unspecified;
e) The use of mixed academic staff (i.e., full and part-time staff);

Based on these factors, the following propositions are to be discussed next:

- The adequacy of a combined approach to instruction in which both printed and audio-visual media are used in Mexican DE systems.
- The relationship between group learning techniques as a "preferred learning environment" and the school as the learning site.

Combined Approach to Instruction

This proposition can be considered to be a follow up

to the one discussed earlier in section 5.2.1 (see proposition 2), since it is a second ramification of the importance that a multi-media approach to instruction within Mexican DE practice has, especially with regard to the use of TV and other Audio-visual materials in combination with printed ones.

According to data obtained, the three most efficient systems (i.e., Telesecundaria, Sistema Universidad Abierta-UNAM, and Sistema Abierto de Ensenanza-IPN) use a combination of media within their instructional strategy.

Although it is true that there is a tremendous gap in terms of terminal efficiency levels between Telesecundaria and the systems operated by UNAM and IPN respectively (a 65-70% difference), it is also true that the fact that these three systems are using more than one medium, and therefore more than one communication channel at a time for conveying their instructional messages, appears to be accounting for some of the difference between the most and the least efficient Mexican DE systems.

On the basis of what has been said so far, the following proposition will be discussed: The differences that any given combination of instructional media might have upon the students' level of learning diminishes whenever the instructional content becomes more relevant to the individual. In other words, the more relevant the instructional content becomes, the less important becomes the use of one or a particular combination of media.

Although the researcher is not in a position to test the validity of the aforementioned proposition, he nevertheless has come across some theoretical developments which suggest that "the more novel the information, the more unique to its symbolic carrier will the acquired meaning be" (Salomon, 1979, p. 81). This, in fact, provides some support to the possibility that the more familiar the instructional content is to the student, the less dependent the message becomes on the medium, thus the less important the medium becomes per se. By the same token, we could say that the more novel the content is to the student, the more important the medium becomes together with its symbol system.

If this is true, then the use of a multi-media approach in which both printed materials and audio-visual materials are combined whenever a novel content is being taught will provide the student with both concrete and abstract symbols which are needed for understanding the particular content in a more adequate way, as opposed to the strategy that makes use of one medium, particularly the printed word, for introducing novel content to a group of students that to start with may be lacking adequate reading comprehension and analytical thinking skills to fully understand the abstract symbol system of the printed word.

At this point, one might wonder why DE in Mexico has been addressed to serve those sectors of the population that are amongst the most disadvantaged groups, not only in

socio-economic terms but in the educational arena as well, instead of having put these systems to the service of those who are better "equipped", intellectually speaking that is, to cope with the rigorous discipline and independent-learning approach used in DE and leave the traditional system to take care of the most disadvantaged ones.

Although it is a fact that most DE systems in Mexico do not have either the money or the facilities to produce audio-visual materials, this part of instruction could be replaced perhaps by the use of graphic materials and drawings that could become an integral part of the printed package, thus facilitating the understanding of the instructional content.

So far there is some evidence which indicates that where the aforementioned practice has been carried out in countries like Venezuela, the use of graphic and colorful materials within the self-instructional packages proved to be better suited to the learning style of Venezuelan students (Escotet, 1972). In Mexico perhaps this might also be the case, thus DE institutions that make their own materials could benefit from this experience. Nevertheless, some testing and evaluation has to be done first before this practice is introduced, especially within the rural areas.

School and Learning Centers

This second proposition can also be considered to be a

follow up to those discussed earlier in section 5.2.1 (see propositions 1 and 2).

Based on the results of this study, the three most efficient DE systems use the school either as a primary or a secondary learning site, while the rest of the systems (i.e. the least efficient) make use, surprisingly enough, of learning centers and home as the main learning site.

Indeed, Telesecundaria is the only system which uses the teleclassroom as the primary learning site, while both UNAM and IPN's Open systems make use of a combined approach of home and school as learning sites.

A plausible reason as to why those systems which use school alone, and school plus home-based instruction as learning sites, are more efficient than those that use home plus learning centers could be because Mexican DE students have not been able to make an adequate transition to an independent home-based learning strategy, even when they have access to a tutor/counsellor within the various learning centers. Furthermore, although most Mexican DE systems have claimed that students' supervision is available at all times, perhaps the students cannot attend personal or group meetings with their tutors on a regular basis. This might therefore be affecting their motivation and sense of directedness in their studies. On the other hand, and assuming that the students do attend these meetings on a more or less regular basis, it is still possible that the quality of the supervisory work is not as

adequate as it might be, therefore having a negative effect upon the students' level of achievement.

The importance of tutorial activities within DE practice is something that can not be denied. Some recent studies have shown that the tutor/counsellor plays an unquestionably important role within the DE system as a support to the student through which better attitudes towards studying at a distance, study perseverance, and better study techniques can be both reinforced and induced (Rekkedal, 1985). In this same study, Rekkedal also found that the isolation that students feel while studying at a distance is something that cannot be counterbalanced through the use of tutor/counsellors alone, but more through means of local study centers, face-to-face teaching, and study circles.

On the basis of this research evidence, and taking into consideration the preference for group-oriented learning activities of Mexican DE students as discussed earlier, one is inclined to question the widespread belief that the use of learning centers alone will directly address the students' needs for organizing in a better way their study time, or to enhance their perseverance to complete their studies. And unless the tutor/counsellors are well trained for offering the student a more adequate and attractive tutoring system through which aspects such as turn-around time of corrected assignments and examination results, guidance and practical techniques for

studying at a distance, reading comprehension and writing skills (this aspect could be a part of a preparatory course as well), study perseverance, friendly and personal contact with the student, availability to the student through means of correspondance, telephone, or direct contact, at an adequate and efficient level, the mere presence of a person called tutor/counsellor is not enough. These factors are especially important when dealing with a target population that undoubtedly is far less well educated and more socio-economically, culturally, and nutritionally deprived than Mexican students who attend regular, traditional schools.

According to the research results reported by Weitzner and Fonseca (1984), the role of the teleclassroom Coordinator within Telesecundaria is of paramount importance for providing students with a kind of positive reinforcement in relation to their study efforts. Indifference on the part of the Teleclassroom Coordinator towards the students' efforts is, unquestionably, damaging to the students' self-esteem and study perseverance, especially when taking into consideration the intrinsic characteristics of Telesecundaria's students.

According to Rekkedal's report, although face-to-face teaching and study circles help reduce the students' feeling of isolation, they do not necessarily provide all the other essential elements that a good tutorial/counselling work contributes. The fact that Telesecundaria, UNAM, and IPN's Open learning systems make

use of the school facilities to carry out to some extent their teaching/learning practices (and in the case of the latter ones the use of home-based strategies, as well) must be having a positive effect upon the students' perseverance and attitudes in an indirect way.

In the case of Telesecundaria, all students must attend classes for at least 6 hours a day, so in this case the student is surrounded by an environment that clearly resembles that of a traditional school with which he/she is familiar and comfortable with. Perhaps this is one of the best strategies to be used with Mexican students at that age since they are still very young and need more direct supervision and contact with both their coordinators and peers.

In the other two cases, however, their target population is composed of University students who live, in general terms, inside Mexico City's Metropolitan area thereby having easy access to their Professors and other University facilities such as libraries at any time. Hence, although UNAM and IPN students receive their study materials and carry out a good part of their learning activities at home, they can always have direct and easy access to the University campus and this might be reinforcing their perseverance and attitudes while also reducing their feeling of isolation as well.

The environmental structure surrounding Telesecundaria, UNAM, and IPN's students has the aura of a

traditional school which may have helped avoid a number of the most common problems related with studying at a distance. Furthermore, although it might be argued that these systems, and in particular Telesecundaria, are not "pure" DE systems in the sense authors like Holmberg (1977; 1985), Keegan (1980), Flink (1975), Moore (1973), and Peters (1973) define DE systems, they might be considered to be hybrid and rigidly paced systems which may be contributing to the reduction of drop out rates, as Daniel and Stroud (1981) have suggested.

Regardless of all this, it is a fact that there is a marked difference between these three systems and those that have used to a large extent a home-based and learning center strategy. Perhaps this outcome might find its most plausibe explanation in that, given the intrinsic characteristics of Mexican DE students, a more formal in-school approach to DE has better results.

5.2.3 Factors that are Common to the Least Efficient Systems

The following are the factors that appear exclusively in the least efficient systems i.e., Systems IV, VIII, II, V, XI, and VII:

a) Single-medium learning strategy;
b) Individualized instruction;
c) Learning center and home-based instruction as learning sites;

d) Students registration provided by parent institution.

The first three factors that appear in the majority of the least efficient systems (i.e. with an average graduation rate of 2.17% as compared to 34.5% in the most efficient systems) have been discussed earlier, thus at this point it has been decided not to state any formal proposition to direct the discussion but rather to expand a bit further the previous arguments stated earlier. Not surprisingly, factor a) appears in four of the six systems. Hence, although it could be argued that this factor appears in only 66% of the least efficient systems, it nonetheless provides us with further indication as to its contribution to the low efficiency level of these systems.

On the basis of this evidence the researcher is once again inclined to argue against the validity for the use of one single medium strategy, no matter which one it is, within Mexican DE systems; furthermore, the argument against this approach is mainly because of the intrinsic characteristics of Mexican DE students who, as mentioned earlier, belong to the less well educated and most impoverished sectors, economically and culturally speaking, of Mexican society.

It is of paramount importance to make clear that this particular group of students (i.e., DE students) are not less intelligent and incapable of acquiring knowledge at the same level as their traditional school counterparts,

but rather that the use of the printed word in particular as the only carrier of instruction, may be posing a burden to these students since they may lack the adequate skills to manipulate and extract meaning from an abstract symbol system, especially when dealing with material that is novel to them and which therefore may need to be preceded by a more concrete symbol system (i.e., visual media), in order to provide these students with prerequisite knowledge before they move into a higher cognitive and intellectual level.

From this perspective, it seems to be that what most Mexican DE systems are doing is simply providing exactly the same content under the same structure as traditional systems do, but with the only difference being that instead of having a teacher presenting the content, the textbook, package, self-instructional material, or the equivalent, takes charge of this responsibility. Still worse, this practice has been used without any previous evaluation regarding the students' abilities and skills to carry out learning activities under this approach, therefore neglecting the fact, on an <u>a priori</u> basis, that this group of students may have different skills, and learning abilities that perhaps are not best addressed neither by independent study nor through the use of the printed word alone. Needless to say, extensive evaluation and research in this area should be done before Federal authorities continue in the expansion of education into rural and semi-

urban areas of the country, through means of DE.

The fact that factor b) (i.e., individualized instruction) is present in 66% of the least efficient systems, provided the researcher with further evidence as to its contribution to the low terminal efficiency rate of these systems.

As mentioned earlier, independent-study requires a great deal of motivation, self-discipline, self-organization, and a high capacity for analysis and synthesis on the part of the student, and adequate facilities and time for studying at home. Unfortunately, these traits and physical factors are something that a Mexican worker, peasant, or rural teacher barely have, not only because of the deprived socio-economic and educational environment in which they live, but also because most DE institutions do not provide their students with good preparatory courses that could teach them all the necessary skills needed for doing a programme of studies at a distance. Moreover, and on the basis of the results obtained from this study, it is also doubtful and questionable that the efficiency of the so called learning centers that most of these systems use for providing student services, since those systems that make use of the centers have had very low terminal efficiency results. Undoubtedly, the idea of providing preparatory courses and learning center facilities is not what is disputed here, but rather their quality and effectiveness within the

context of these particular systems.

Perhaps Mexican DE systems should provide their students with more group learning and face-to-face activities as means of counterbalancing the problems caused by an independent-home-based learning strategy, especially in a population with the characteristics of Mexican DE students.

So far, the evidence from this study indicates that those systems that have included within their teaching/learning strategy a more "traditional school approach" such as classroom meetings, easy access to the institution's facilities, peer interaction, and a more consistent tutor/counsellor-student interaction, are doing considerably better than those systems that do not provide these opportunities.

Indeed, the fact that 83% of the least efficient systems use Learning centers and a Home-based approach to learning, is an indicator as to the validity of their use within the context of Mexican DE Systems.

Finally, it is important to mention that although factor d) (i.e., students registration provided by parent institution) is present in 50% of the least efficient cases, the researcher considers this factor to be a management characteristic of those systems that were developed as appendices of traditional institutions. As such, it does not provide plausible evidence as to its logical relationship or contribution to the dependent

variable under study.

5.2.4 Factors that are Unique to the Least Efficient System of All

The following two factors appear exclusively in the least efficient system i.e., system VII, Sistema Abierto de Educacion Tecnologica Industrial- SAETI:

a) Adult Technical -Industrial level of studies; and

b) Own qualifications/accreditation of its students.

Based on these two factors, the following propositions will be discussed next:

- The inadequacy of SAETI's curriculum structure and content for Distance Learning, and
- The lack of outside regulation on the system, and its negative effects upon the overall efficiency levels of the system.

Curriculum Structure

Although SAETI's officials have claimed that a new structure was introduced together with other important improvements after its 1980-81 crisis, it seems that, at least in the area of curriculum development, this system is still following a very tough approach to instruction through which a very heavy course-work load and rigorous deadline policy have been kept.

Indeed, at SAETI, the student is required to complete

between 48-60 courses over a period of six semesters through means of an independent-home-based learning strategy most of the time. Furthermore, the deadlines for completing each of the various didactic packages are quite strict and perhaps not very realistic, especially if it is taken into consideration the fact that a large number of its students have work and family responsibilities. The fact that since, on average, SAETI's students are expected to complete their programme within a 42 month period, that is six months later than any traditional student, then it appears understandable why the number of students' enrollments and the number of graduates are very low.

Based on the information obtained on this system (see section 2.2.7, Table 2), the inadequacy of the imposed time limits for completing the entire curriculum could be argued, since after 42 months of intensive study only 23 students have managed to complete it. In other words, more than 99% of the students have had in one way or another, problems in getting the entire course-work completed on time.

On the basis of this, the development of a curriculum structure that would be equivalent to the traditional one but with far less number of courses, could have a more positive impact upon the overall system's efficiency. Likewise, and based upon the nature of some of the courses which require experiential learning, it would be necessary to develop an appropiate structure within each learning

center for providing the student with adequate services, unless, of course, some kind of kit is introduced within the instructional package so that the students could carry out some of these excercises on their own.

It is also important to note that although this system is supposed to be providing a technical-industrial education and training, the evidence shows that the nature of its curriculum content which is divided into Social Sciences, Physical-Mathematical Sciences, and Chemical-Biological Sciences, is the same as that being offered in the traditional school system. This provides further evidence as to the system's limitations in terms of being able to provide the kind of vocational training that it was intended to offer. Thus, as it is now, this system has basically the same curriculum content as any other high school system operating either in the traditional environment or at a distance, such as the Preparatoria Abierta system, but with the only difference being the large number of courses and the rigorous deadline policy for completing the programme at a distance.

Outside Regulation

As a follow up to the previous discussion, the researcher is inclined to propose that although this system (SAETI) may be legally regulated and recognized by SEP, it is the only one that has its own student accreditation procedures without SEP or any other parental institution

supervising it. Hence, it seems to be that this lack of regulatory practice from any external authority could be affecting the overall performance of this system in terms of not being able to help revise and improve certain malfunctionings and inadequate results.

Therefore, the fact that no apparent regulatory action is being excercised from the outside upon the system, may be contributing to some extent to its very low terminal efficiency rate, an argument that is supported with the evidence that all of the rest of the systems under study have some kind of external supervision.

As far as the results from this study indicate, there seems to be some connection between SAETI's very low terminal efficiency rate and its highly demanding curriculum structure, rigorous deadline policy, and nonexistent supervisory action from an external agency upon the system's operation and results.

5.2.5 Factors that Appear with Greater Frequency in the Most Efficient Systems and with Lesser Frequency in the Least Efficient Ones

The following are the factors that appear with greater frequency in the most efficient systems, (i.e. systems III, IX and X) and less within the least efficient ones (i.e. systems IV, VIII, II, V, XI AND VII):

a) Multi-media learning strategy;

b) Own set of courses/curriculum;

c) Use of an external delivery system (government or private);

d) Students' registration is carried out by the own system;

e) Evaluation of the system's drop out rate.

Given that some of these factors appear in three of the most efficient cases, it was decided to center the discussion on those factors that have greater recurrence. A more general discussion is provided on those factors that are present in two cases only. This is carried out because those factors that have greater frequency (i.e., Multi-media learning strategy; use of an external delivery system; students' registration is carried out by their own system; and drop out evaluation), can provide stronger evidence as to their connectedness with the dependent variable, while the other factor (i.e., own set of courses/curriculum) provides partial evidence only.

Hitherto, the discussion regarding the adequacy of a multi-media teaching/learning strategy in Mexico's DE practice has been directed to support the evidence that the three most efficient systems use a combination of printed and audiovisual media, together with other forms of face-to-face interaction between tutors/counsellors and students on a regular basis. However, the fact that this strategy is also used by system IV, the Colegio de Bachilleres Open System, which has a low terminal efficiency rate, might contradict the validity of earlier argumentations.

Although system IV also uses a multi-media combination

of self-instructional, audio-visual, graphics, and other visual materials, it is important to highlight the fact that this system offers a Vocational-oriented curriculum through which technical courses are being offered (46 courses in total).

Hence, it is plausible that to a large extent due to the nature of this curriculum and the large number of courses that the students has to take, a low number of students have been able to graduate. Furthermore, it could be said that the volume of courses is indeed a variable that to some extent may be affecting the system's terminal efficiency rate, especially when a rigorous deadline policy is being followed.

On the other hand, the idea introduced earlier regarding the relationship between the medium being used and the instructional content conveyed through it could be expanded. That is, although the effect and importance of any given combination of media may increase whenever the content is novel to the individual, it may also be the case that the impact and advantages of this combination upon the students' level of learning is considerably reduced whenever the curriculum content and the learning pace are inadequate, especially when dealing with a curriculum content that because of its intrinsic characteristics requires experiential or hands-on practice. This experiential learning approach is very difficult to provide in a DE environment even when optimal production facilities

and techniques are used in the elaboration of audio-visual materials, which is certainly not the case in the Bachilleres' Open System.

Likewise, a plausible explanation can be provided for the fact that the least efficient system of all, SAETI, also uses a multi-media strategy. This explanation is based on the fact that although SAETI uses a combination of printed materials, tutorial services, and audio-visual materials, the system has recognized that because of severe budgetary constraints not all of these resources and elements can be made available to all students. Furthermore, the fact that this system has a large number of courses and tough deadlines for the completion of each module may also be reducing the positive impact that all the media and resources combined-if any- could be having on the students' level of achievement, and consequently, upon the overall retention and graduation rates of the system.

Thus, the evidence indicates that even when a system like Bachilleres may have an inadequate curriculum structure and content for being taught at a distance, the use of a multi-media strategy has helped achieve better results than all the rest of the least efficient systems, especially when compared to SAETI which uses a similar instructional strategy but under more severe constraints.

The fact that 66% of the most and only 33% of the least efficient systems use an external delivery system may be an indicator as to the adequacy of this approach within

Mexico's DE network.

In referring back to the previous discussion concerning the relationship between political commitment and better economic support, the researcher is inclined to think that inadequate economic support may be forcing some systems to develop their own materials with in-house facilities, which, in general terms, are either the same as those used by their parent institutions, or new and original materials that have not been tested on a pilot-basis or with low standards of quality.

However, the fact that both UNAM and IPN's Open University systems also make use of their own delivery systems and still have better terminal results than all of the least efficient ones, could be explained on the basis that these two institutions make use of an already established, quite efficient, and well known infrastructure that is part of conventional universities. They have thus reduced to some extent the chances of developing the same kind of problems as those systems that do not have an adequate infrastructure even within their parent institutions.

Nevertheless, whenever a DE system does not have an adequate delivery system on its own, it may use one from either the government or a private institution such as Telesecundaria which uses Televisa's facilities, or the IPN, Cursos Comunitarios, and Preparatoria Open systems, which make use of already established government facilities

that, although at times may be inadequate, nonetheless are much better than those that could be developed by any given system on its own.

In regard to factor d) i.e., students' registration, which appears in all of the most efficient cases and in 66% of the least efficient ones, the researcher considers that this factor does not help discriminate clearly among the systems. Hence, either this factor is not an adequate indicator for helping explain the difference in the overall performance of the system or, and more plausibly, it is a factor that may depend upon the nature of the registration process. In other words, it all depends upon whether or not the system at the time of registration demands higher standards of acceptance from the applicant such as grade average, previous job experience, specific qualifications, and the like that could help the system screen the potential candidates and consequently increase and maintain higher standards of education, which in turn may increase the probability of having more and better graduates.

In relation to factor e), Drop-out Evaluation, it could be said that its presence in a DE system might be important since this factor apppears in 100% of the most efficient systems and only in 33% of the least efficient cases.

The relevance of this particular factor may rely upon the valauble information it could provide to system administrators regarding its efficiency, a practice that

has been very useful to the most successful DE systems in Mexico and that should be used more extensively by the least efficient systems, given its intrinsic importance to be able to make adjustments to the system in order to enhance its retention rate and thus have more graduates. Therefore, a plausible argument is that systems which practice Drop-out evaluation, somehow increase their chances of having more graduates than those systems that do not practice it.

5.2.6 Factors that Appear with Greater Frequency in the Least Efficient Systems and with Lesser Frequency in the Most Efficient Ones

The following are the factors that appear with greater frequency in the least efficient systems, and with lesser frequency in the most efficient ones:

a) Dispersed Centre Institution;
b) Printed-media as predominant technology;
c) Home-based learning site;
d) In-house creation and production of materials;
e) Own full-time academic staff;and
f) Parent institution provides financial support.

In relation to factor a) i.e., dispersed centre institution, the data shows that this factor is also contained within Telesecundaria, in addition to 80% of the

least efficient cases. A plausible reason as to why this factor is contained within the most efficient systems is that since it did not originate within the walls of an already existent conventional institution, it had more adequate infrastructures for operating as a "dispersed centre institution" throughout the country. The least efficient ones, on the other hand, may be lacking such complex infrastructure and instead are using a more conventional like structure and operation, which is very similar to that used by their parent conventional institution, and which may not be adequate for carrying out their tasks at a distance. In other words, Telesecundaria is a "dispersed centre institution" which has been designed to function from the beginning, as a Distance Education System with no resemblance to any Traditional High School System.

It is also important to note that while both UNAM and IPN's Open learning systems were developed within the walls of conventional universities, these systems have a different structure and operation than the least efficient systems since they are semi-independent units that, to a large extent, are being regulated by an Open Learning Unit which has a more adequate infrastructure, resources, and procedures to offer courses at a distance.

Discussion on factors: b), c), d), and e).

The fact that printed media is the predominant teaching technology among those systems with lower

graduation rates, can be taken as one additional argument favouring the use of a multi-media approach as practiced in those systems with higher graduation rates (see section 5.2.2).

Somehow the use of printed media complemented with T.V. lessons and video/audio cassettes, is having a better impact upon Mexican DE students. Perhaps this impact is based on the advantages of the electronic media to enhance the attractiveness and comprehension of the instructional message, since it can provide students with vicarious experiences that no other media can. In addition to this, the use of printed media alone can be a burden to any DE students in Mexico, given the fact that the majority of them live in the rural areas or come from a deprived environment where the percentage of illiteracy is higher than average.

Surprisingly enough, the use of a Home-based approach to learning also appears to be contributing, in one way or another, to the outcome of these systems; especially if attention is given to the fact that the most successful Mexican DE systems use School as their predominant learning site (see section 5.2.2).

This result shows as well that for some reason--perhaps culturally based--those systems which use a combination of School and Home within their instructional strategy, are more efficient than those using a Home-based approach. In this sense, Rekkedal's study (1985) becomes

even more relevant to DE praxis, since isolation must be avoided by adding face-to-face interaction, study circles and local study centers. Additionally, the idea developed by Daniel and Marquis (1979) for "getting the mixture right" between independence and interaction in DE, is extremely relevant and applicable at this particular point (and at the predominant technology level as well) in this study.

In relation to factor d) i.e. in-house Creation and Production of materials, it is important to highlight the fact that Telesecundaria, which is by far the most successful DE system in Mexico, uses a combined approach where some materials are produced by their own system and others are contracted. This, to some extent, is a valuable piece of information since this variable is one of the 10 critical differences between Telesecundaria and the rest of the systems.

However, the use of a combined approach to the creation and production of materials by itself, can not be thought as being of much weight in contributing to the differences found in the system, if another factor is not taken simultaneously into account: Evaluation of the Quality of the Instructional Materials.

This critical factor shows up only in Telesecundaria, therefore suggesting that a combined approach in the Creation/Production of materials plus Quality evaluation of those materials is contributing to the success of Mexican

DE Systems as opposed to those systems which entirely create and produce their own materials with no further evaluation involved.

The analysis performed on the systems shows also that the use of own-full-time academic staff is somehow affecting the efficiency level of the majority of DE systems in Mexico. This is further supported by the fact that among the systems with higher graduation rates (i.e. systems III, IX and X) a common factor is the use of mixed academic staff.

A plausible partial explanation to this issue may be found in the financial area of DE Systems: Given the fact that Telesecundaria and both University systems UNAM and IPN depend upon Government funding, it may be the case that they could afford to pay better salaries to their academic staff and therefore, hire specialized people on a part-time basis as consultants or advisors on matters concerning academic content and teaching. In contrast, the other systems which receive their financial support from a parent institution, can not afford to do the same, and therefore need to hire unspecialized people on a full-time basis without access to part-time advisors or consultants.

Unfortunately, information related to the finances of these systems was inaccessible to the researcher, nevertheless, through the knowledge gained about which institution, either private or government, is supporting each system, it is possible to have a better idea as to the

quantity of the financial support offered to them.

Therefore, once again, the researcher is inclined to offer a plausible explanation as to the impact of using Own-full-time staff in Mexican DE Systems on the basis of a second factor : The Financial Support provided to the system. In addition to this, it is important to consider the fact that the most efficient system of all, Telesecundaria, uses a mixed academic staff approach, thus pointing to the relevance that government financial support has on the efficiency of a DE system, and also to the positive impact that the use of a mixed academic staff approach seems to have upon the overall output of Mexican DE Systems (e.g. Telesecundaria).

Undoubtedly, this last point must be further researched in order to see whether or not a second DE system--besides Telesecundaria--has a mixed academic staff approach and a high terminal efficiency level. This could constitute solid evidence as to the contribution of this particular factor to the overall result of a DE System in Mexico.

An adequate explanation regarding the greater frequency of factor f) i.e. Parent institution provides financial support, among the least efficient cases, may be based on the fact that most DE systems in Mexico are largely underfinanced, especially those that because of their status as mere appendages to a traditional/conventional institution have their economic

resources directly controlled by their parent institutions. Even in cases like UNAM and IPN's Open Learning systems, the conventional universities are the ones in charge of allocating their financial resources. However, this in itself does not help us explain why UNAM and IPN's systems are more efficient than the other ones.

Perhaps an adequate explanation to this matter can be found in the fact that within a university structure, the risks of having some kind of misallocation of economic resources are less probable than within a tightly controlled and dependent high school/vocational DE system. Both UNAM and IPN's systems have a more independent and solid structure with their own administrative body, which may be a kind of deterrent to any potential mismanagement or unsatisfactory financial decision from their conventional counterparts. Whereas in the case of the other systems, this independence is nonexistent and therefore they are entirely dependent upon the decisions being made within their parent institutions, usually by the same people who run both.

Hence, it may be that the contribution of this particular factor to the dependent variable is conditioned by the nature of the governance of the DE system, an aspect that was earlier discussed. Thus, it could be said that if taken in isolation, factor f) does not help explain the difference that exists in terms of the efficiency results among the systems, unless this factor is analyzed within a

more comprehensive framework: The Governance of the DE institution.

Finally, it is important to emphasize that because of the lack of information regarding the financial situation of DE systems in Mexico, it is even more difficult to assess the impact of factor f). However, it is well known that a system like Telesecundaria which happens to be directly financed by SEP, or any other government agency, has a better chance of getting more adequate funding since no third party is involved.

Within this chapter, the researcher attempted to provide a solid explanation to the questions of, " How and Why" for the differences between all Mexican DE systems in terms of their terminal efficiency rates.

Based on the data that were obtained from previous analyses on these systems, rather than a conclusive interpretation, the researcher attempted to develop a comprehensive and plausible chain of evidence as to which factors are most likely contributing to the high and low efficiency rates of the systems. Hence, the main purpose so far has been to identify these factors and use them as a means through which the phenomenon of DE in Mexico could be better described and understood.

In summary, the objectives stated in the first section of this study (see chapter I) have been developed in this chapter, namely:

a) A description of the most salient characteristics for

each system in terms of their overall organization, specific subsystems, internal operational structure and results, was interpreted by using the data from Chapter IV, where a scheme for analyzing each system was developed and applied. The results obtained were factors which give definition to the organization, subsystems, structure and results of each of the systems under consideration.

b) By using the results obtained in Chapter IV where the general scheme for analyzing mexican DE systems was developed, common characteristics and patterns of behaviour were identified and discussed, using different clusters for grouping those systems sharing common factors and having similar graduation rates.

c) The thorough identification of factors that are present in the most and least efficient systems was also achieved, with the use of different clusters as units of analysis.

d) Different propositions and plausible explanations were developed along this chapter in an attempt to provide a rationale as to the way in which each factor contributes to the terminal efficiency of each system. Furthermore, the Analytical Triangulation method was used for explaining how the absence or presence of each factor may affect the results of each system and groups of them.

In the next chapter of this dissertation the objectives will be to summarize the findings in a conclusive manner, and on the basis of this, provide some feasible recommendations to DE planners and administrators with regard to improvements that might take place, together with the limitations of this study and some suggestions for further research.

CHAPTER VI

CONCLUSIONS, AND FINAL CONSIDERATIONS

6.1 Internal Efficiency

The results from this study indicate that the internal efficiency level of formal DE in Mexico as a whole, is far from being optimal or even satisfactory--especially if the average graduation rate of Telesecundaria is taken as a yardstick against which the other systems are compared--given the tremendous difference that exists between the number of students who enroll in the various systems and those who graduate (the average graduation rate of DE systems in Mexico is 13%).

Although it could be argued that these poor results might be to a large extent the product of many environmental factors which surround both the structure and operation of each of these systems, including the students themselves, this study has produced evidence which suggests that the graduation level may be the product, to varying degrees, of particular internal factors contained within each system.

On the basis of these results the researcher is inclined to conclude that key factors identified as a) learning strategy, b) predominant technology, c) learning site, d) academic staff, e) creation, production of learning materials, and f) evaluation of the system through outcome measures are the primary internal

"necessary producers" (Ackoff, 1967) of the differences between the various systems in terms of their graduation levels. Figure 4 summarizes the primary factors discriminating between the Most and the Least Efficient Systems.

LEAST EFFICIENT	MOST EFFICIENT
1) Single-Media Learning Strategy	1) Multi-Media Learning Strategy
2) Printed Media as Predominant Technology	2) Printed and A/V Media as Predominant Technology
3) Home-Based Learning Approach	3) Combined Learning Approach
4) Own-Full-Time Academic Staff	4) Mixed Academic Staff
5) In-House Creation, Production of Learning Materials	5) External and In-House Creation and Production of Learning Materials
6) Lack of Evaluation Trough Outcome Measures	6) Use of Evaluation Through Outcome Measures

Figure 4. Primary Factors Discriminating Between Most and Least Efficient Systems Based on Completion Rate

Although the researcher is well aware of the fact that other variables are also contributing to some extent to these differences, the aforementioned are those factors that because of their common and contrasting appearance in

the most efficient system of all, the most efficient systems, the least efficient systems, and in all systems but the most efficient of all, are considered them to be the main necessary producers of the differences among the systems.

6.1.1 Learning Strategy

Within this particular factor, the differences among the systems are partially produced by the use of either a multi-media, or a single-media strategy, within an individualized, experiential, or group-oriented approach to learning.

Hence, the conclusion is that those systems that make use of a multi-media strategy (e.g., a combination of print and audio-visual materials), as opposed to those systems that use a single-media strategy (e.g., printed materials alone), have a better graduation rate. Furthermore, those systems that in addition to a multi-media strategy also make use of either experiential or group-oriented learning activities, as opposed to those systems that use a strictly individualized approach, also have a better graduation rate.

Therefore, we are inclined to suggest that the development and use of multi-media instructional packages within Mexican formal DE systems is recommendable -and the literature consistently supports this recommendation (Bates, 1984; Courrier,1981; Mayo, et al, 1976; Wells,

1976; Dodds,1972)- since it seems to contribute, in combination with experiential or group learning activities, to the higher graduation rate of a DE system.

On the practical side, it could be said that the use of a multi-media strategy does not necessarily means the use of expensive and sophisticated equipment and facilities, but rather that it could also be developed through means of more simple and less expensive resources. For instance, the development of a more visually-oriented textbook (i.e., programmed or self-instructional) content in which an adequate number of good quality pictures, drawings, graphics, and the like, could perhaps provide the students with a more 'conceptually-accessible' material, which in turn might facilitate learning and make the entire process more enjoyable. A second instance for the use of a multi-media package would be one in which audio-cassettes in combination with a visually-oriented instructional package could make the learning content even more accessible to the student. Furthermore, the use of audio-cassettes could also provide the student at a distance with a simple and practical two-way communication channel with tutors/counsellors and other fellow students.

Yet, in an even better scenario, those systems that already have learning center facilities should make sure that adequate audio-visual materials are at place so that all students living nearby the center could attend group-oriented sessions in which contents that require audio-

visual content presentation could be shown on a regular basis, especially during the week-ends, thus leaving the independent-learning part of instruction for home-study during the week. Likewise, all tutorial/counselling services should be provided on a daily basis not only using face-to-face interaction but also by means of telephone, postal service, or even short-wave radio transmitters, especially in the remotest areas of the countryside.

Whatever the case might be, it is very important to stress three important ideas: 1) before DE institutions decide to introduce a multi-media strategy, it is absolutely necessary and indispensable to carry out a target audience analysis. This analysis should concentrate on aspects such as cognitive styles, study-habits, interests, educational background, time constraints for studying at home, family and work responsibilities, future job-related plans, and other aspects that would be considered to be important to know about the student population; 2) it is also necessary to perform a needs assessment on the target audience and the community, or the context in which they live and work. This last point is particularly relevant at both the curriculum and the instructional levels within which the learning strategy aspect is a key element; and 3) to make use of formative evaluation at the pilot-testing level, and all along the development process as well, for the purpose of timely identification of potential problems related to the

quality, structure, format, organization, and overall effectiveness of the multi-media package, before it is put in place.

Finally, research of any kind in the area of multi-media packages for Mexican DE students, in aspects such as the different formats that could be used under different conditions, with different audiences, and teaching different subjects, must be carried out whenever possible, if not by the institution itself, then by universities and other government institutions dedicated to educational research.

6.1.2 Predominant Technology

Within this particular factor, the differences among the systems are partially produced by the use of either printed materials alone, or a combination of printed and other forms of audio-visual materials.

Hence, the conclusion is that those systems which make use of printed media only under an independent-home-based approach, have lower graduation rates than those systems using a combination of printed and audio-visual media, even when the latter are used under an independent-home-based approach. Furthermore, those systems that use audio-visual media as the predominant technology (e.g., television), in conjunction with printed materials and under experiential or group-oriented learning approaches, have a much higher graduation rate than those systems that use any of the

aforementioned technologies and approaches.

Again, at this level, the researcher recommends that the use of a multi-media strategy within which printed and audio-visual materials are properly combined, is highly recommendable in the context of Mexican DE practice, since this factor seems to be contributing to the higher graduation rates of the systems.

Given the similarity of this factor with the one previously discussed, it is believed that aspects such as evaluation, research, and other practical ideas could also be applied within this factor. However, one final thing should be added, and that is the more extensive and creative use of radio programming within these systems, whenever possible. Also, a more extensive use of slide-shows, films, and videosis suggested, whenever possible, within the learning centers or at any other learning facility already in place.

6.1.3 Learning Site

Within this particular factor, the differences among the systems are partially produced by the use of either an individualized-home-based approach, a school-experiential approach, a combination of home-based and learning center approaches, or a mixture of all of these.

Hence, the conclusion is that those systems that use a school-experiential approach to learning have a much higher graduation rate than those systems using any of the other

approaches. However, it can also be said that those systems that make use of a mixed-approach within which individualized-home-based, school-experiential, and learning center approaches to learning are combined, in one way or another, have a higher graduation rate than those systems that use an individualized-home-based approach only, or a combination of the latter with learning centers. Furthermore, those systems that use an individualized-home-based approach only have the lowest graduation rates among all systems.

Consequently, the researcher is inclined to suggest the use, if not entirely, then at least to some extent, especially with younger students and those who are just starting their courses at the DE institution, of a school-experiential approach. This approach, it is argued, does not necessarily have to be one in which the conventional/traditional school environment is to be reproduced, but instead one in which regular seminars, discussion-group sessions, talks, workshops, audio-visual presentations, and other activities alike, could be implemented within the walls of any well-known establishment or organization e.g., churches, theatres, civic centers, elementary schools, etc., for the purpose of facilitating the transition from a highly dependent school system to a more independent approach to learning.

With regard to the use of a combined approach in which the home and learning centers are used as the main learning

sites, the researcher would like to express a second thought. Although the results indicate that those systems that use a combined approach have low graduation rates, the use of learning centers is still recommendable especially for introducing a school-experiential approach, and other forms of group-oriented activities that seem to be having better results with other systems. To put it more succinctly, the use of learning centers per se is not the issue in this respect, but rather the quality of the services that most systems have claimed to provide.

This study has presented the information given to the researcher by management officials within each institution regarding the nature of the services that are supposedly being offered to all students at each center. It would hence be interesting to conduct a second study in which students could be surveyed, or direct information collected through observation, in order to find out whether or not these services are indeed being provided as officials say they are.

Finally, it is important to note that since most systems that are using learning centers have shown low graduation levels, there is the possibility of something being wrong with the entire tutorial/counselling aspect of the systems, since most learning centers are used for these purposes. If so, then one of the key elements of any DE system is being affected and consequently, the whole system is in jeopardy.

Hence, a practical recommendation should include not only the more extensive use of experiential and school related activities within Mexican DE systems, but also to evaluate thoroughly the work being done within the already existent learning centers for the purpose of being able to assess more adequately the quality of the services provided.

Undoubtedly, an exciting and promising area of research within this factor would be to test the nature and the frequency of different experiential-learning formats, together with the most adequate ways of providing tutorial/counselling activities to students, in a similar way as Rekkedal (1985) did with Norwegian students (i.e., a cross-cultural study). However, in doing a study of this nature the researcher should be very much aware of the differences that exist between European and Latinamerican students, in order not to repeat the same kind of errors that were made ir areas such as Communication and Development, and Innovation Diffusion research (Rogers, 1983;1976), in generalizing results from one particular context or situation to another when there is no group-equivalency nor similarity of context.

6.1.4 Academic Staff

Within this particular factor, the differences among the various systems are partially produced by either the use of a mixed-academic staff, or an own-full-time staff. Hence, the researcher concludes that those systems that have a mixed-academic staff have considerably better graduation rates than those systems using their own full-time staff.

Although the idea for the use of a mixed-staff within Mexican DE systems is recommendable, the researcher concludes that much evaluation is needed in this area in order to determine to what extent and in which way the use of an academic staff, that belongs to a large extent to the conventional parent institution, affects the process and quality of the production of learning materials, the tutorial/counselling activities, and the curriculum being offered by the institution.

Undoubtedly, within this factor the variable costs are something that can not and should not be overlooked, since many Mexican systems are underfinanced and it is likely that they are in no position to hire qualified external resources, even on a part-time basis.

6.1.5 Creation, Production, and Delivery of Learning Materials

Within this particular factor, the differences among the systems are partially produced by the use of either an

in-house creation/production of materials, or a mixture of in-house and external creation/production of materials. Furthermore, these differences are also partially produced by the use of either an internal or an external delivery system.

Hence, the researcher concludes that those systems that are using a mixture of in-house and external creation/production of materials have a higher graduation rate than those systems that use an in-house approach only. Likewise, those systems that use an external delivery system have higher graduation rates than those systems that use their own delivery systems.

Again, as in the previous factor, although the use of a mixture of in-house and external production and delivery of learning materials might be recommended, the researcher believes that there is still much to be learned about the nature and consequences of this particular factor. Likewise, it is also important to note that this factor is linked, to a large extent, to the financial aspect of the institution. thus making it difficult to offer a clear recommendation.

Therefore, a Process Evaluation Research Study is very much needed for the purpose of identifying the strengths and weaknesses of an in-house approach, e.g., the nature of the in-house creation, production , and delivery process, and the extent to which the budget allocated to this operational aspect is affecting the entire process, and

consequently, the product itself. Also, it would be interesting to compare the results of this study with one to be carried out within a system like Telesecundaria, which uses a mixed-approach, in order to assess more adequatedly the advantages and disadvantages of both.

In the meantime, without further evidence, even if a system would be inclined to accept the aforementioned recommendation concerning what appears to be the adequacy of a mixed-approach ipso facto, if the system under consideration does not have the adequate financial resources at its disposal, this recommendation cannot be implemented.

Finally, it is important to highlight that some systems that use an in-house approach have produced and delivered high quality materials. However, it is also necessary to emphasize that these systems (e.g., the Open High School), belong to wealthier conventional institutions, something that provides us with further evidence as to the connection between the financial aspect of the institution, and the creation, production, and delivery of learning materials.

6.1.6 System's Evaluation through Outcome Measures

Within this particular factor, the differences among the various systems are partially produced by either the use of a comprehensive form of evaluation, the evaluation of some of its outcomes (e.g., drop out, and learning results), or the evaluation of the system on the sole basis

of the students' level of achievement.

Hence, this study concludes that those systems that perform a thorough and comprehensive evaluation of their most important outcomes such as cost measures per unit, students' learning, comparison of students' level of achievement between traditional and DE institutions, drop out, retention, and graduation rates, comparison with other alternatives on the basis of benefits and effectiveness, survival of the institution through the years, and the quality of its instructional materials, have a much higher graduation rate than those systems which perform a partial evaluation on aspects such as drop out rates, and students' level of achievement only. Likewise, a second conclusion is that those systems that perform at least two different kinds of evaluations: drop out, and students' learning (like Telesecundaria), generally speaking, have a higher graduation rate than those systems that base the entire evaluation of the institution upon the results obtained by the students through examinations, once or twice during the year.

Consequently, the use of a comprehensive plan for evaluating aspects of major importance such as those mentioned earlier is strongy recommended, plus curriculum structure and contents on the basis of regular needs assessment and target audience analysis, for the purpose of improving the decision-making process of these institutions, especially when expansion and innovations are

under consideration.

Undoubtedly, the use of a comprehensive plan for evaluating some, if not all, important processes and outcomes within a DE system requires both adequate economic and human resources. Nevertheless, any investment that is made in this regard will, in both the short and long-term, pay dividends to the institution in terms of a more satisfactory efficiency level such as in the case of Telesecundaria, which even though it had and still has a series of malfunctionings, seems to be investing more and more resources into research and evaluation for the purpose of being able to detect, on time, any kind of serious problems and weakness within its various subsystems.

Again, it is important to emphasize that although the factors that were discussed within this section can be considered to be the main internal necessary producers of the differences among the nine systems in terms of their graduation rates, the impact that the remaining factors analyzed throughout chapter IV have had in one way or another on the systems' graduation levels can not be neglected.

Finally, perhaps the most solid piece of evidence that this study could possibly have concerning the low internal efficiency level of formal DE in Mexico comes from the fact that in the year 1983-84 there were a total of 595,290 students enrolled in nine of the eleven systems previously analyzed, and a total number of 228,201 graduates.

At first glance perhaps this figure would not seem to be such a bad result. However, it is important to note that out of the total number of students, 221,400 were graduated from Telesecundaria, a system that had an average 76% terminal efficiency rate between 1977 and 1983. The remaining 6,801 graduates correspond to the other eight systems combined.

6.2 Has Formal DE in Mexico Achieved its Objectives ?

On the basis of the evidence produced in this study, one of the most important conclusions is that the objectives which triggered the development of formal DE in Mexico have been partially accomplished, mainly because of the systems' ability to enroll thousands of students who otherwise would have been left without the opportunity to study. In other words, the goal of expanding educational opportunities to those sectors of Mexican society that are considered to be amongst the most disadvantaged has been, to some extent, achieved. Likewise, the goal of providing a second opportunity to those who, at some point, dropped out from the school system has also been accomplished overall.

However, with regard to goals such as the improvement of the students' socio-economic level through means of obtaining a certificate, diploma, or equivalent that could in turn help them obtain a better job and/or salary, the improvement of job-related skills through vocational and technical-industrial training, the introduction of more

relevant curriculum content based on individual and regional needs, and helping reduce the socio-economic differences between the urban, semi-urban, and rural areas of the country, can not be said to have been achieved.

This conclusion is based on the evidence that all those systems that were developed for the purpose of providing vocational, high school or "bachillerato", and technical-industrial education and training have had the lowest graduation rates (i.e., ranging from 0.5% to 5.2%). By the same token, the improvement of job-related skills has also been affected since only a low portion of the students who work in the industrial sector of the economy have been able to acquire all the necessary skills as defined by the curriculum content and the objectives within each system (i.e., vocational, and technical-industrial systems) since a low number of them have managed to graduate.

On the other hand, the idea of introducing a more relevant curriculum content has been, in general terms, neglected by most systems since the majority have incorporated the same or very similar curriculum structures and contents as those used by their conventional parent-institutions or their traditional school counterparts.

Finally, the goal of helping reduce the socio-economic, cultural, and educational gap between the urban, semi-urban, and rural areas is very difficult to accomplish mainly due to two reasons: first, because education on its

own can not help reduce these differences unless it is accompanied by other simultaneous actions related to the socio-economic improvement of these regions, especially the rural areas; and secondly, because few systems have been put in place for the purpose of addressing the educational needs of the rural population, and those systems that are addressing the needs of the semi-urban population like workers, service personnel, etc., have shown very low graduation levels. Consequently, the output coming from these systems is not large enough to significantly contribute to the accomplishment of such a goal.

Hence, the researcher suggests that the limited effectiveness of formal DE in Mexico as exemplified by the low number of graduates that the majority of formal DE systems are producing, might be due in large part, to the nature of the curriculum content being offered and the inappropriateness of the goals towards which these systems are addressed.

6.3 Limitations of the Study

As in any other research endeavour, this study has a number of limitations. Amongst the most important are the following:

a) The researcher's inability to spend more time in the field for the purpose of collecting more data not only from the people in charge of running each institution, but students, tutors, teachers, instructional designers, and

producers, and also from his own observations as to how these systems operate on a daily basis, has had a definite impact upon the amount and the quality of the data used in this study.

Under ideal circumstances, the researcher should have spent at least 8 months doing more field-work. However, on the practical side, this was impossible to do mainly because of time and financial constraints. Thus, instead of spending eight months the researcher spent only three months during the summer of 1984.

b) Likewise, there are some limitations in terms of generalizability of results which are inherent to the nature of the problem under study. This is to say, that because DE institutions are very much context-bound, the researcher is not in the best position to generalize the results from this study even to other Mexican DE cases operating at different educational levels, and using different formats (e.g., nonformal, and informal DE systems). However, this was never attempted. Instead the researcher tried to generalize the results and methodology of this study to the still emergent theory of DE.

c) Also, this study presents some limitations in terms of the method used for analyzing the various factors contained within each system, and in groups of systems, respectively. This is to say that perhaps by trying to apply what is called a "Negative Case Study", or methodological triangulation through which a single pool of

data is analyzed by means of more than one analytical procedure (e.g., factors contained within the most efficient system, the most efficient systems, the least efficient systems, etc.), the researcher might have been introducing a kind of error which is conceptually equivalent to that known as "experimentwise error" (Keppel & Saufley, 1980) in statistical analysis. However, it was decided that even when there was the possibility of some repetition while analyzing the different factors contained within the systems, it was worth taking this risk since new factors and levels (i.e., dimensions) were uncovered in each subsequent analysis. Hence, if this study were to comply with aspects such as convergent validity, then it would be necessary to analyze the data from different, yet, complementary perspectives, even when repeating the same analytical process could increase, separately, the chances of error.

d) A fourth limitation would be the one related to the scheme that was developed in Chapter IV of this study, in the sense that the researcher considers this scheme to be still at the "pilot-testing stage"; therefore, new factors and levels could be added in order to make it more comprehensive and discriminatory from its present state.

Nevertheless, the researcher thinks that this "screening-instrument" has provided this study with a satisfactory procedure through which DE systems, regardless of their level, format, or context, may be analyzed from

now on. Much credit for this, of course, should be given to the work of prominent scholars and researchers in this area of education who are interested in the analysis of DE systems.

e) This study chose as its units of analysis all the DE Systems in Mexico, which included University, High School, Secondary and Primary levels of education. Further research in this area should seperate each of these levels to allow more generalizability to other systems operating at the same levels, in other parts of the world.

f) Finally, other limitations may stem from the fact that this study is one of the very few, as far as it is known, conducted in the area of DE using a qualitative research methodology. Undoubtedly, the experience of using this approach for gaining knowledge on the phenomenon of formal DE in Mexico contributes both to methodological paradigms for future Case Study research, and to the development of theory, in this important area of Educational Technology.

Footnotes

[1]The major difference between DE and Open learning is that the former is primarily a delivery system, whereas Open learning is the absence of a selection method for allowing entrance into an educational system. In this study both terms will be used synonymously since in Mexico, the concept of Open learning is used to refer those systems which use a distance education delivery of materials as well as the establishment of some kind of entrance requirements.

[2]Revelatory and exploratory are two concepts that are not to be confused with one another, since the former can be defined as the product or consequence of the latter. In other words, through an exploratory application of case study methodology, revelatory data, information or knowledge will be obtained for the purpose of helping the researcher describe more accurately what until now remained inaccessible, or undetected by previous research, if any.

[3]According to Yin (1985), "a proposition serves the purpose of directing the researcher's attention to something that should be examined within the scope of study [...] On the other hand, a proposition also reflects important theoretical issues and indicates where to look for relevant evidence" (p. 30).

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APPENDIX A

Generic Models Used to Develop The Scheme for Analyzing and Classifying DE Systems in Mexico

Escotet Model

Escotet (1980) Distance Education

Learning Strategies' Model

1. - Single-Media Distance Learning

2. - Multi-Media Distance Learning

3. - Experiential Distance Learning

4. - Individialized Distance Learning

5. - Group-Oriented Distance Learning

6. - Hybrid-Integrated Distance Learning

Source: Escotet, M. A. (1980). Tendencias de la Educación Superior a Distancia. [Tendencies in higher distance education]. Costa Rica: Editorial Universidad Nacional de Educacion a Distancia. (p. 110).

Kaye & Rumble Model

A systems view of distance learning

SUB-SYSTEM 1 : COURSES

SUB-SYSTEM 2 : STUDENTS

SUB-SYSTEM 3 : LOGISTICS

SUB-SYSTEM 4 : DECISION-MAKING AND CONTROL

Source: Kaye, A., & Rumble, G. (1981). Analysing distance learning systems. In M. W. Neil (Ed.), Education of adults at a distance. (p. 233). London: The Open University Press.

Keegan Model

Keegan's Model (1982)

1) Autonomous Institutions:

a) Public and Private Correspondence Schools and Colleges

b) Autonomous Multi-Media Distance Teaching Institutions

2) Mixed or Hybrid Institutions:

a) Independent Study Divisions of Extension Colleges of Universities

b) Integrated Mode External Studies.

Source: Keegan, D. (1982). From New Delhi to Vancouver: Trends in distance education. In J. S. Daniel, M. Stroud, and J. Thompson (Eds.), Learning at a distance: A world perspective. Edmonton: Athabasca University, ICDE.

McAnany et al Model

Distance Education Models for Formal Education

VARIABLE	Formal DE models		
	MASS MEDIA	HYBRID	CORRESPONDENCE COURSES
Instructional mode	group	Individual with occasional group activity	Individual
Teaching personnel	Monitor; not subject expert; direct contact	Tutor: acts at a distance with occasional face-to-face contact; subject matter expert	Tutor: acts at a distance; subject matter expert
Principal medium	TV-radio	Multi-media	Print
Educational level	Primary jr. secondary	Sr. secondary higher ed.	Sr. secondary higher ed.
Learning site	School learning center other centers	Home or learning center	Home
Examples	Maranhao (Bz) Telesecundaria (Mx) Radioprimaria (Mx)	British Open Univ. Everyman's Univ.(Is) Radio Santa Maria (DomRep)	POSGRAD (Bz) other traditional correspondence

Source: McAnany, E. G., Oliviera, B. J., Orivel, F., & Stone, J. (1983). Distance education: Evaluating new approaches in education for developing countries. Evaluation in Education, 6, 302. London: Pergamon Press.

Neil Model

	ASPECTS OF ORGANIZATION AND/OR MANAGEMENT (similarity factors)	CLASSIFICATION DIFFERENCES (a)	(b)	(c)	(d)
I	STATUS				
	1 Governance	Self-governing	non-self-governing (one parent institution)	non-self-governing (member of consortium)	other
	2 Origination				
	i Sector	public	private	mixed	international
	ii Institutional	teaching institution	broadcasting institution	government(local or national) or international agency	other
II	QUALIFICATIONS (accreditation)	own	parent institution	external	none
III	LEARNING SYSTEM OF 'DL UNIT'				
	1 Learning mode or strategy	distance learning only, primarily by individual on own	distance learning plus siginificant face-to-face component	distance learning primarily by group methods (usually with tutor, supervisor, animateur, etc.)	other
	2 Predominant technology	print (without feedback)	print (with feedback)	broadcast	other
	3 Media range	wide (multimedia)	narrow or single (non-multi-media)		
IV	SUBJECTS/TOPICS OFFERED (specified list)				
	1 Origin	own set	set or subset of parent institution	ad hoc (own or commissioned)	subset of external institutions subjects/ topics
	2 Nature of 'courses'	short(few weeks) usually single self-standing topics	on-going series of related topics; usually over several months at least	coherent series of courses usually for qualification	other

V	LEVEL OF STUDIES				
	1 Adult, non-higher	basic literacy/ numeracy	work or survival related (non-formal)	formal(professional vocational) 'schooling' up to pre-higher level	leisure or or other
	2 Adult, higher	first degree or higher level diploma (years 1 and 2)	first degree or higher level diploma (years 3 and 4)	postgraduate	
VI	SCALE OF OPERATION	small (few hundreds of students)	medium (few thousands of of students)	large (tens of thousands of students)	very large (hundreds of thousands of students)
VII	LEARNING MATERIALS				
	1 Creation	in-house	external (commissioned or brought in)	mixed	
	2 Production	in-house	contracted out	mixed	
	3 Delivery system	own	external	mixed	
VIII	STUDENTS				
	1 Registration	own system	system provided by parent institution	system provided by external institution	group registration or none required
	2 Entry requirements	none except age	based on previous	other qualifications	
	3 Sources of support	in-house ressources	external ressources	mixed	other (e.g., none)
IX	ACADEMIC STAFF	own, full-time for DL only (e.g. permanent, seconded contracted)	own, part-time for DL (e.g. by sharing with parent institution)	part-time external consultants	other (e.g., mixed staffing)
X	FINANCE	self-financing	non-self-financing		

Source: Neil, W. M. (Ed.). (1981). Education of adults at a distance: A report of The Open University's tenth anniversary international conference. London: Kogan Page.

Perraton Model

Perraton suggests distinctions between six models
(open distribution,
support for extension agencies,
support for other existing organizations,
farm forums,
radio campaigns, and
radio schools).

Source: Perraton, H. (1981). Methodologies for nonformal education. In M. W. Neil (Ed.)., Education of adults at a distance. Milton Keynes: The Open University Press.