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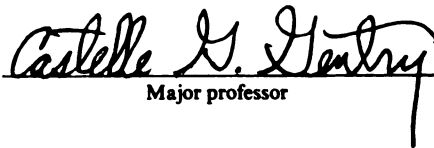
*FORMATION OF HUMAN RESOURCES (FACULTY MEMBERS)
FOR THE FEDERAL UNIVERSITY OF CEARA, BRAZIL:
PROFILE, PERCEPTIONS, AND PROCESS*

presented by

Terezinha de Jesus Pinheiro Maciel

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Education


Major professor

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AND PROCESS**

By

Terezinha de Jesus Pinheiro Maciel

A DISSERTATION

**Submitted to
Michigan State University
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Special Education**

1986

ABSTRACT

**FORMATION OF HUMAN RESOURCES (FACULTY MEMBERS) FOR THE
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AND PROCESS**

By

Terezinha de Jesus Pinheiro Maciel

This study was undertaken at the Federal University of Ceara, covering four undergraduate programs: (a) Agriculture, (b) Education, (c) Geology, and (d) Medicine. It aimed (a) to identify demographic and professional characteristics of faculty members in the programs, (b) to determine curriculum needs in terms of faculty members, (c) to determine levels of competency and usage of teaching, research, and service skills of faculty members, (d) to discover how faculty members acquired those skills, (e) to discover what mechanisms are applied by departamental chairpersons to facilitate the faculty's use of their professional skills, and (f) to offer information to the administrators at UFC to guide them in formulating effective faculty development.

Two hundred and thirty two questionnaires were sent. One hundred ninety six were returned representing ninety seven percent of the target sample of two-hundred-and-two. Interviews were conducted with sixteen chairpersons and with three program coordinators. Data were analyzed by

using descriptive statistics. Rank orders of means was used to describe the levels of competency and usage of teaching, research, and service skills of faculty in the studied programs.

From this study it was possible to conclude the following:

1. The available labor force varied among the four studied programs.
2. The composition of the faculty group was heterogeneous in terms of origin and professional levels.
3. The majority of faculty members had a high level of involvement with the institution.
4. The levels of formal education varied among the four programs.
5. The fields of study and/or areas of specialization of faculty were diversified in all levels and in all programs.
6. Faculty pursued formal education at a large number of national and foreign universities.
7. There is a need for developing upgrading/updating activities for faculty working in all programs.
8. The variation in the number of credits earned by faculty during graduate programs did not necessarily reflect the quality of education acquired.
9. The number of courses which are supported by sufficient number of professors was greater than the number of courses needing additional professors to be taught.

10. Professors perceived themselves to be more competent than incompetent for their respective teaching curricula.

11. The levels of mastery and usage of teaching, research, and service varied in all four programs.

12. Professional Practice was the most frequently used means of developing teaching, research, and service skills by faculty.

13. Several mechanisms/activities have been used or are planned for the future, in order to help professors to use their professional skills in their departmental duties.

To

**Zelia Sa Viana Camurca,
my friend and mentor,**

**Helena Maria de Sousa Ferreira,
Maria Estrela Araujo Fernandes,
my friends and colleagues,**

with gratitude and affection,

and to

**Ana Claudia, Francisco Vandenberg,
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Vladia, Antonio Neto, Abel Junior,
Renata Maria, and Paula Maria,
(the new generation of my family),**

with love and hope.

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CHAPTER I

THE PROBLEM AND RATIONALE OF THE STUDY

INTRODUCTION

The Brazilian System of Education is a centralized system that is completely controlled by the Ministry of Education and Culture. It is organized in three levels: elementary school, (first cycle); secondary school (second cycle); and higher education (third cycle).

The first cycle comprises eight grades for children from seven to fourteen years old. According to the Brazilian Constitution and to the Law of Bases and Directions for the National Educational System, the first cycle is supposed to be financed by the Federal Government. It is compulsory for all children of those ages. Its curriculum consists of required and elective subject matter. The required subjects are common to all schools in the country while the elective subjects may vary from region to region, and from state to state, in the same region.

The second cycle (secondary school) which lasts for three years and serves young people from fourteen through eighteen is also subsidized by the State Governments. Secondary schools also receive some financial aid from the

Federal Government's surpluses, but these are not regular items in the government budget. The secondary school curriculum includes subjects promoting general education, as well as subjects and activities that prepare the student for a technical profession.

The third cycle, or higher education, consists of the Institutions of Higher Education (IES). These institutions consist basically of the universities and colleges. The universities can be classified as: (a) federal (those under the legal and financial jurisdiction of the federal government); (b) state: (which depend on the State Government for financing but remain under federal jurisdiction in all other matters); and (c) private: (institutions that do not depend on the state or federal funding but must follow all governmental regulations regarding higher education in the country).

There are two types of federal universities: autarchies and foundations. Autarchies depend totally on the Federal Government (resources and laws), and are subject to strict governmental administrative control. They are almost "governmental agencies." They are referred to as "Federal Universities", at least one of which is located in each state of Brazil. In general, they are assigned the name of the state in which they are located, such as: Federal University of Ceara, Federal University of Bahia, and Federal University of Rio Grande do Sul.

Foundations universities also include the name of the

place where they are located, such as: Foundation University of Acre, Foundation University of Amazonas, and Foundation University of Maranhao. They are under the jurisdiction of specific legislation and have different sources of funding. They do receive some money from the federal government, but mainly, from other sources related to special research grants and service projects, as well as from the universities' projects, such as agricultural production and engineering. Foundations enjoy much more freedom and administrative flexibility than autarchies.

These two types of institutions constitute the federal system of universities in Brazil.

Professional schools are also Institutions of Higher Education, for example, the schools of Medicine, Agriculture, Odontology, and Education. They do not belong to a particular university, and are usually located in medium-sized cities in the interior of different states in the country. Historically, they are older than other Institutions of Higher Education, and depend financially on the Federal Government. The professional schools are governed by the legislation of the autarchies. They are, to a certain degree, equivalent to a community college in the American system of higher education.

This research report focuses on the Federal University of Ceara (UFC) which is one unit of the federal system of universities in Brazil.

The federal system of universities in Brazil has

grown greatly since the late 1960's. According to Madeira (1981), from 1960 to 1974 the number of higher education institutions in Brazil increased by 285 percent. Between 1970 and 1980 their number increased 69 percent. The number of undergraduate and graduate programs, existing in 1970 was 2,166, by 1980 it had gone up to 4,079, which represents an increase of 88 percent.

After this period of growth, the goals of the Brazilian federal system of higher education were not only for quantity (to absorb more students into the system), but, above all, for quality, to improve its teaching, research and service activities.

With these goals in mind the Brazilian educational authorities undertook a major effort during the early 1970's. One of the efforts to achieve those goals was the organization of several graduate programs within the country. van Ditmar (1975:2) states that

graduate programs in Brazil developed in the early 1960's, with a rapid expansion taking place over the last decade. While in 1965 there were only 62 graduate programs (45 Master's and 17 Doctoral programs) by 1975 the number of courses offered at this level had increased to 645 (478 M and 167 D)

Another change was to increase the number of international projects with other countries (mainly with the United States, England, Germany, France and Canada). The proposed projects were to train professionals from different fields of study who were already faculty members

in universities all over Brazil. Gunther (1982) mentions those countries as the ones which have admitted the largest number of Brazilian students to their graduate programs.

In general, Brazilian universities devoted substantial human effort, time, money, and other resources to qualify faculty members through graduate programs (master's and doctoral levels) in and outside the country in order to promote a better educational system. According to the National Plan for Graduate Studies

Higher Education is a sector that develops human resources for all the other levels of teaching and for society; the graduate courses in the strict sense - Master's and Ph.D programs - must be directed toward training people for Higher Education itself. (Brazil, 1975:7)

It was also stated in that document that

the training of faculties for the Brazilian institutions must be planned so as to allow for the possibility of meeting the demands through courses located here; in specific cases where it is impossible to do so with national talent, exchange agreements with foreign institutions must be worked out. (Brazil, 1975:8) .

Part of this developmental effort has been accomplished by other programs and organizations. Coordenacao de Aperfeicoamento de Pessoal de Nivel Superior (CAPES) (Coordination for Training of Higher Education Personnel) finances programs and scholarships for graduate programs within the country and scholarships

for graduate studies outside the country. The Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq)* (National Council for Scientific and Technological Development) promotes the expansion of opportunities for graduate studies in Brazil and abroad, and by the Plano Institucional de Capacitação Docente (PICD) (Institutional Plan for Upgrading Faculty Members) is a national program with the same objectives as the aforementioned institutions.

* CNPq was the acronym of the organization from which this council evolved, Conselho Nacional de Pesquisa -- "Pq" refers to "Pesquisa" which is no longer used in the council's name.

STATEMENT OF THE PROBLEM

As an educational institution of a third world country, the Federal University of Ceara (UFC) has to invest in the development of its own human resources. It must make decisions on the process of upgrading its faculty members and staff. In order to make those decisions, the institution needs knowledge about the current situation of existing programs to set priorities and, most importantly, to establish policies that could result in a more effective process of human resource

development.

The problem at UFC is that the central administration has limited information on the current situation of the undergraduate programs with regard to the professional characteristics of faculty, curriculum needs or departmental procedures. Acquisition of this information is essential if appropriate decisions related to human resources development are to be made.

UFC has been interested in improving its teaching and research activities, and has sent many faculty members to other universities within Brazil and abroad to pursue graduate studies.

Andrade (1979:162) says that the School of Agriculture was the first college of UFC to open up "international and national ways to get technical and scientific experiences from a more developed world." UFC made an agreement with the Superintendencia do Desenvolvimento do Nordeste (SUDENE) {Board for the Development of the Northeastern Region}, the Ministry of Education and Culture (MEC), the United States Agency for International Development (USAID), and the University of Arizona in April 1963 to establish and exchange technical and scientific experiences.

In 1966 several professors of the College of Agriculture, (today called the Center of Agriculture Sciences), went to the United States to pursue graduate studies. From 1969 to 1983, 229 professors from different

colleges of UFC have been granted leaves of absence to continue graduate studies outside the UFC campus. (UFC-DP, 1984).

In addition, UFC created the Comissao de Capacitacao de Recursos Humanos (CCRH) (Human Resources Development Commission) in the late 1970s. The commission consists of one faculty member from each center and school on campus. Its objectives are:

1. To establish a policy for human resources development at UFC, based on data from several departments, to promote faculty development;

2. To disseminate throughout the university information about fellowships and scholarship programs within the country and overseas;

3. To create and to keep up-to-date files on each faculty member of the university, which can serve as a source of information about the qualifications and the on-going training of the faculty;

4. To coordinate human resources development on campus including the following activities: (a) establish criteria for selection of candidates for further training, (b) assist trainees in their programs, and (c) evaluate the functioning of each scholarship and fellowship program on the UFC campus;

5. To assist faculty members returning from graduate studies elsewhere, while observing their performance in their department;

6. To promote events and/or activities that can help stimulate the involvement of students in research projects at the university.

However, the CCRH does not have the information necessary to achieve its objectives. It is not known by the commission and, in many cases, by the department, what the demand for a given curriculum will be for the coming semesters. It is also not known which disciplines lack faculty members to teach them. There also exists a need for planning the preparation of faculty members at the graduate level in the majority of the departments.

The process of looking outside the university for graduate studies, in general, is initiated by individual faculty members. It does not result from prior planning based on departmental needs. Currently professors decide to pursue graduate studies, get in touch with graduate programs elsewhere in Brazil and/or overseas, obtain scholarships from a national or international institution, and, with all documents in hand, ask permission from their department and center or school for leave of absence to pursue graduate studies.

At this point it is very difficult for the administration of each department to deny permission because there are other institutions involved. Once the department gives its permission, faculty members obtain a leave of absence from the university and from the Ministry of Education and Culture. They are then officially

relieved of their duties at the university and may enroll in the graduate program they have selected.

The CCRH has not played a major role in helping departments identify faculty training needs to improve teaching and the quality of research. The CCRH has also failed to achieve its objectives related to the selection of candidates for graduate studies and the observation of faculty members' performance in their programs. In addition, assistance to improve the performance of faculty members has not been provided.

Looking at another aspect of the problem, examining the existing situation on campus, is not unusual to find a faculty member, specialized in one specific area working in another completely different area, just because it is necessary to fulfill the need of the department.

No unit, institution or office exists in the university which is responsible for correcting these situations. Indeed, no one is aware of the actual situation of the great majority of faculty members who have pursued graduate studies and returned to the UFC.

PURPOSE OF THE STUDY

The main interest of this research is to examine the process of faculty training in the Federal University of

Ceara.

The motivation behind this study is the desire to reduce the gap between the information currently available to CCRH and that which is needed for the CCRH to achieve its objectives.

This study is designed to generate information about (a) professional characteristics of faculty members, and their competencies in university assigned functions, (b) curricula needs to meet enrollment demands and (c) departmental mechanisms and/or activities designed to enable professors to use their skills to fulfill their duties at the university.

The departments studied were those responsible for the undergraduate programs in Agriculture, Education, Geology and Medicine. It was also intended that the results of the study would provide guidelines for human resources development at UFC.

The specific objectives of the study are:

1. To identify demographic and professional characteristics (profiles) of faculty members in the programs of Agriculture, Education, Geology, and Medicine;

2. To determine which of the curricula in Agriculture, Education, Geology and Medicine have been assigned a sufficient number of faculty members and which have not;

3. To determine the competency levels existing among

the faculty members responsible for the curricula in Agriculture, Education, Geology, and Medicine at UFC;

4. To determine the teaching, research, and service skill levels of faculty in the programs of Agriculture, Education, Geology, and Medicine at UFC.

5. To determine how the undergraduate faculty members acquired their existing professional skills;

6. To determine which professional skills currently possessed by the undergraduate faculty are being used to carry out their duties;

7. To discover what mechanisms and/or activities are applied by departmental heads to facilitate the faculty's use of their professional skills;

8. To offer information to the administrators at UFC to guide them in formulating policies for effective faculty development.

NEED FOR THE STUDY

Henry Janne (1981) defends the idea that planning for education must be based on the planning for social development. He also says that in higher education, the planning process should be carried out by qualified professionals.

The university administration needs a clear picture

of the professional characteristics and basic demographic data of its faculty members. This is necessary if the administration is to effectively plan its future activities and to establish a coherent policy regarding the training and/or professional development of new human resources. It also needs to determine the curricular needs of the undergraduate programs in order to satisfy those needs in the future.

With these data available, UFC's administrators could determine which programs require special planning for faculty graduate or post-graduate studies, as well as other developmental activities directed to faculty members. In addition, the data would permit administrators to establish the number of years its professors would remain in the university's labor force. The undergraduate programs that should be assigned priority for faculty development could also be identified.

Information obtained through this study should provide university departments with data to assist in the planning of activities and developmental programs in a rationalized way; expending less money, using less time, and employing fewer human resources.

For the CCRH this study will supply the basic information necessary to partially achieve its objectives.

For the departments and professional programs this study will offer more organized information about

professional preparation of faculty members, curriculum needs, and the human resources needed in each department. The data derived from the study should make it much easier to organize programs for training faculty members.

The study results will provide important information for each faculty member. The results will identify the programs that lack professors with professional training. This information should make faculty members more aware of the possibilities for which they could pursue opportunities for further professional development.

Another important fact supporting the execution of this study is the current deficiency of studies undertaken to gain similar information. This was demonstrated during interviews, conducted by the researcher at the Pro-Reitoria de Pesquisa e Pos-Graduacao (PR/PPG) (Vice-Rectorry for Graduate Programs and Research). Results of those interviews indicated that no studies of UFC had been carried out that addressed the issues of (a) current qualification of faculty members and (b) curriculum needs of chosen undergraduate programs.

Finally, from 1979 to 1984, 49 dissertations were written about Brazilian education, in general, or Brazilian higher education. However the topic of this research report was not studied. (Dissertation Abstract International, 1979-1984).

Based on the above evidence it is possible to conclude that there is a significant need for information

about the professional development of the faculty at UFC.

ASSUMPTIONS

The following assumptions and concepts supported this study:

1. Faculty members are important resources in the educational process. They must devote special attention, assistance and care to having their talents, interests, abilities, skills and values developed, and cultivated. They must be able to act in the interests of the educational institution where they are employed;

2. Developing human resources within an educational institution may contribute to the improvement of the quality of instruction;

3. To place the right professional in the right position is to make an investment in human and organizational development;

4. To have knowledge of curriculum requirements and of the general characteristics of faculty members in a university is a necessary condition for the rational planning process of institutional activities;

5. The models of teaching, research, and extension services used in this study are broad enough and comprehensive enough to contribute to the performance

function within a university;

6. The competencies (skills) presented under each model are necessary to successfully perform each specific function within a university;

7. The information gathered in the interviews and with the questionnaires used is valid and useful in order to help the CCRH to accomplish its goals at UFC;

8. An institutional policy of human resources development facilitates the process of human and organizational development.

RESEARCH QUESTIONS

Several research questions were developed to generate information that would assist UFC establish an appropriate human resources development policy. There were one broad and seven specific questions.

Broad question:

What information does the Federal University of Ceara require to guide it in establishing policies that will result in effective faculty development?

Specific questions:

1. How do faculty member's profiles of demographic and professional characteristics differ among the programs of Agriculture, Education, Geology, and Medicine at the Federal University of Ceara ?

2. Which of the curricula in Agriculture, Education, Geology, and Medicine are supported by a sufficient number of faculty and which are not ?

3. What are the current levels of competency among faculty responsible for the curricula in Agriculture, Education, Geology, and Medicine at the Federal University of Ceara?

4. What are the existing teaching, research and service skill levels of faculty members in Agriculture, Education, Geology, and Medicine programs at the Federal University of Ceara ?

5. How did faculty members acquire their existing professional skills?

6. Which professional skills currently possessed by faculty are being used to carry out their duties ?

7. What mechanisms and/or activities are applied by department chairs to facilitate faculty use of their professional skills?

LIMITATIONS

During this study data were collected by communicating directly with respondents. The communication was written and oral, both of which were dependent on the respondents' perceptions, values, attitudes, and previous experiences as well as the influence of the existing social and physical environments. These factors may have limited the objectiveness of the responses.

The instruments used for collecting data, questionnaires and interviews, have inherent measurement limitations. The questionnaire consisted of closed questions which may have restricted the respondents and limited the scope of their answers. During the interviews, the presence of the interviewer who was also a professor from the School of Education at UFC, may have biased the responses of the interviewees. The nature of the relationship which was developed between the interviewer and the respondents may have also influenced the responses.

Finally, the study covered only four undergraduate programs at UFC, which limits the extent to which the results can be considered representative of the university as a whole.

DEFINITION OF TERMS

The following terms, used throughout this report, are important to understanding the study and are defined below in order to ensure clarity for the reader.

. **FEDERAL SYSTEM OF UNIVERSITIES** -- Comprises all universities organized, established, administered, and financed by the Federal Government. They are directly related to the Ministry of Education and Culture (MEC), are governed by special laws, have specific administrative structure, and at least one is located in each state of the country.

. **COORDENACAO DE APERFEICOAMENTO DE PESSOAL DE NIVEL SUPERIOR (CAPES)** -- (Coordination for Training of Higher Education Personnel) -- An agency of the Ministry of Education and Culture (MEC) whose main function is to assist in the technical and financial training of higher education personnel.

. **CONSELHO NACIONAL DE DESENVOLVIMENTO CIENTIFICO E TECNOLÓGICO (CNPq)**. National Council for Scientific and Technological Development -- CNPq was the acronym of the organization from which this council evolved, the Conselho Nacional de Pesquisa-- "Pq" refers to "Pesquisa" which is no longer used in the council's name. An Agency annexed to the Planning Secretariat of the Presidency of the Republic. CNPq provides advisory services in the

formulation of scientific and technological development policies of the nation and coordinates and supports scientific activities.

. PLANO INSTITUTIONAL DE CAPACITACAO DOCENTE (PICD) (Institutional Plan for upgrading Faculty Members) -- A national program which finances graduate education of professors working in the Brazilian institutions of higher education .

. UNIVERSIDADE FEDERAL DO CEARA (UFC) (Federal University of Ceara). A federal university located in Fortaleza, the capital city of the State of Ceara. It was founded in 1955, and has approximately 16.000 regular students and 1,454 professors. It is the institution in which the study was undertaken.

. PRO-REITORIA DE PESQUISA E POS-GRADUACAO (PR/PPG). Vice-Rectorry for Research and Graduate Studies. It is the institution responsible for research and graduate programs on the UFC campus. Some of its functions are equivalent to those of the graduate schools of universities in the United States.

. COMISSAO DE CAPACITACAO DE RECURSOS HUMANOS (CCRH) (Human Resources Development Commission) -- An agency in the Vice-Rectorry for Research and Graduate Studies responsible for all human resources activities, programs, and policies at UFC.

. CENTRO (Center) -- An academic unit comprising several departments which offer several undergraduate

programs and/or graduate programs, considered homogeneous and correlated among themselves. It is equivalent to a "College" in U.S. universities.

. FACULDADE (School) -- It is also an academic unit, with the same principles of homogeneity and correlation among the programs as the Centers, but it is more restricted in size and representation in the governing councils of the university.

. UNDERGRADUATE PROGRAM. Throughout this report the expression "undergraduate program" refers to all curricular activities including disciplines, field experiments, etc, that promote the professional formation of a student in one specific area. For example, the undergraduate program in agriculture prepares students for a bachelor's degree in agriculture. The use of the term "program" was chosen in order to avoid confusion with the term "course" which in Portuguese has more than one meaning.

. UNDERGRADUATE PROGRAM COORDINATION . An advisory board consisting of several professors and students who work in the same undergraduate program. The board is responsible for creating, organizing, and coordinating all curricular activities of that program. It is led by one of its members who is elected as coordinator for a limited period of time.

. GRADUATE STUDIES (LATO SENSU) (also called Special Studies) -- Includes two different programs:

(a) Studies for Advancement or Upgrading, a theoretical and practical program whose purpose is to expand and develop knowledge about the methodologies of Higher Education and Science. This program which has specific contents takes at least 360 hours to complete (the equivalent of 24 credits);

(b) Specialization -- A program designed to develop in depth practical and theoretical knowledge in a specific sector of learning, teacher training and scientific methodology. This program also takes at least 360 hours to complete. It is equivalent of 24 credits. Both programs are called "Graduate Studies - Lato Sensu", because students are required to have a BS or BA degree in order to be enrolled in them.

. GRADUATE STUDIES (STRICTO SENSU) -- These studies are the Master's and Doctoral programs in Brazilian universities. They follow the model of master's and doctoral programs in U.S universities.

. LIVRE-DOCENTE -- A title held by a university professor ranked below that of a full professor and above that of an associate professor. This title, which no longer exists, is the equivalent to a doctorate. It used to be awarded to faculty members who demonstrated outstanding knowledge of their specialties upon defending a dissertation or thesis.

. CURRICULUM NEED -- Curriculum needs refers to a shortage of professors, with appropriate specializations,

to teach disciplines in a curriculum of a specific undergraduate program.

. PROFESSIONAL COMPETENCY -- (also referred to as professional skills or qualifications). Competency concerns with the "adequacy for a task" or "the possession of necessary knowledge, skills and abilities to achieve an acceptable level of performance." (Chrisholm & Ely, 1976:46).

. PROFILE -- A description of the faculty members who were working in the undergraduate programs included in this study. This group description includes academic (professional backgrounds) and demographic data, considered important in order to professionally characterize the faculty members working in each program that was included in this study.

ORGANIZATION OF THIS REPORT

This report is arranged in five chapters.

Chapter I begins with an introduction, and presents the statement of the problem that was studied, the purpose for carrying out the study, the need for the study, basic assumptions relevant to the study, the research questions, and the limitations of the study. Important terms were defined and an overview of the report is provided .

Chapter II presents a review of related literature. This review covers literature about (a) development planning for the State of Ceara in Brazil, (b) the role of the university in educational and social development, (c) the Brazilian federal system of universities, (d) the Federal University of Ceara, (e) the development of human resources, (f) educational technology, (g) the development of faculty, instruction and organizations, (h) competency and competency-based education, and (i) the administration and leadership in higher education.

In Chapter III the design of and procedures used in the study are provided. Descriptions of the research population, sampling procedures, the research instruments, data collection procedures, the plan for analyzing the data, and a summary are also reported.

Chapter IV is devoted to present the analysis of the data and the statistical procedures employed.

Finally, in Chapter V the summary, conclusions, recommendations of the study and implications for further research are registered.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

INTRODUCTION

Several different theoretical concepts are relevant to this study. They were selected for reviewing as the bases for this study; (a) Development Plans for the State of Ceara to give a geographical and socio-economics profile of the overall environment for the UFC; (b) Education and Social Development: the Role of the University - to explain the expectations of society in relation to higher education under different social systems and to emphasize the role the university plays in third world countries; (c) The Brazilian Federal System of Universities to outline a brief history of higher education in Brazil, its structure and the current situation; (d) The Federal University of Ceara - to illustrate the formation, current organization and operations of the UFC; (e) Human Resources Development to focus on their importance for developing societies; (f) Educational Technology, Faculty Development, Instructional Development and Organizational Development to present the evolution, and the theoretical foundations of each area, to emphasize their importance and potential for bringing

about change and innovation in higher education; (g) Competency and Competency-Based Education to cover the theoretical framework for competency-based education, and the potential of that movement for promoting improvements in education; (h) Administration and Leadership in Higher Education to focus on the administrative processes of universities and to show the need for new leadership and incentive for excellence in the universities in developing societies.

DEVELOPMENT PLANS FOR THE STATE OF CEARA IN BRAZIL

Ceara is one of the 24 states which comprise Brazil. In 1980 its population was 5,3 million with a territorial area of 148,016 square kilometers. It is located in the Northeastern region of the country on the Atlantic Ocean, and is considered one of the three most developed states in the region. More than half of its population (52.8 percent) is less than 20 years old. The economy of the state is mainly agriculture (crops, livestock and farming), exploration of natural resources (vegetal and mineral), and the fishing industry. (PLANED, 1983).

Since 1979, the main goal of the developmental plans for the state of Ceara has been to work to overcome the conditions of underdevelopment in the best interest of the

social welfare of the whole population, on the basis of the value of the human individual to the state. (PLAMEG II, 1979; PLANED, 1983).

The developmental plan for the period of 1983-1987 stated clearly that its philosophy was to struggle for the establishment of an economically just and politically democratic society. The plan explained that to achieve this ideal condition, it was necessary to reduce poverty and unemployment, as well as to advance the democratic process in all state decisions to achieve a higher level of social organization. (PLANED, 1983:1).

Among the several objectives of both state developmental plans the following relate to this study:

Agriculture:

1. To promote the expansion of agricultural activities.
2. To support small and medium size farmers in order to achieve high crop yield and more raw materials for industry.

Education and Medicine:

1. To promote and support programs related to the social welfare of the population, especially abandoned juveniles.
2. To train human resources in different areas of study to meet the demands of the developmental process.
3. To assure enough schools to serve the entire population of seven to fourteen year olds.

4. To assure basic health services to prevent and cure diseases spreading among the population.

Geology:

1. To intensify mineral exploration, and research programs.

2. To develop industrial programs to enable more explorations in the sub-soil on state land.

In addition to the general government plans for state development, there are specific projects or programs having goals and objectives specifically related to the development of some areas and activities in the state.

One of them, the III Polo Industrial do Nordeste (Industrial Pool of Northeast Region III), 1979, was conceived for the promotion of the development of various areas of industry (textile, confection, leather, shoes, food, ceramics, cement, petrochemical products, and electronics), agriculture, and mineral exploration. These specific programs have a direct impact on the process of training human resources.

Several of the universities within the state, especially those located in the capital of the state, (Federal University of Ceara-UFC; Ceara State University-CSU; and University of Fortaleza-UNIFOR), have been cooperating with the state government in its development projects, mainly through research and training of human resources.

EDUCATION AND SOCIAL DEVELOPMENT: THE ROLE OF THE UNIVERSITY

Mandi (1981), examining the world situation in terms of education found that during the 1980's there were more than one billion people without the rudiments of the three R's. In the third world, one-third of Latin America, Africa and Asia is lacking a basic education.

On the other hand, the rate of literacy and the levels of education in the developed countries is very different from those of other nations. According to Baldwin and others (1984), the adult literacy rate in 1980 in Canada, France, Italy, the United States of America, the United Kingdom, and West Germany was 98 percent or higher.

Bock (1983:167) stated that

underdevelopment is not caused by any alleged deficiency of critical competencies among the poor and the oppressed but by the existence of an unjust political and economic structure created and maintained (partly through schooling) by the affluent and dominant.

In fact, education cannot be attributed as the only, or the most important factor in the development process. It has power, and influence in achieving the transformation of society, but not in and of itself. It has to operate in conjunction with other factors. (Bock, 1983; Silva Filho, 1976).

Frederick Harbison and Charles A. Myers (1964) believed that no modern society could come into being and continue to develop without encouraging the development of human capabilities. They also say that

it takes skilled human agents to discover and exploit natural resources, to mobilize capital, to develop technology, to produce goods and to carry on trade. Indeed, if a country is unable to develop its human resources, it cannot build anything else, whether it be a modern political system, a sense of national unity or prosperous economy. (Harbison & Myers, 1965:IX).

Mandi (1981:48), stated that "the operation of up-to-date social and political institutions and of the economy as a whole demand trained manpower." He also believes, that "the economy and social development in general are in a firm causal relationship with the accumulation of knowledge." None of the modern developed countries achieved their high standard of living without investing a great deal in education. Mandi (1981:1) said:

the developed countries of today built up their educational systems parallel to the strengthening of their economics, in one and a half or two centuries or over a still longer period of time.

Focusing on countries that belong to the socialist block, it is possible to say that socialism has never contested the value of schooling and knowledge in making society more effective economically. The socialist economic system recognizes the importance of education

(learning) because from the simplest to the most complex work requires the development of abilities that presuppose a basic amount of schooling. Education, therefore, under the socialist system, contributes to the advancement of society.

If education as a process has been considered an important factor to the development of societies in both capitalist and socialist blocks, it seems obvious that it will be also a critical aspect of the development of the third world societies. Mandi (1981:11) affirmed that

if the developing countries intend to reach a standard of medium development in a historically short time, let us say in fifty years - "officially" they expect to do better than that - then they must close the educational gap concurrently with the gigantic task of effecting investments, organizing and improving production and restructuring society.

The development of a society requires a lot of specialists and skilled manpower. It requires more years of schooling and a higher level of education. Educational institutions, organizations or agencies have a definite influence on providing human resources for the needs of the development of society. (Mandi, 1981; Janne, 1981; Silva Filho, 1976; Harbison, 1964).

Universities in the third world countries have an important task to do. As educational institutions they have to perform different functions (teaching, research and service) to contribute to the development of society.

The university must assume a commitment to act positively toward the economic, social, political and cultural development of the region where it is located. Supporting this idea is Cora's (1981:15) statement

the role of the university is fundamental in any country; however, in the underdeveloped country its role is critical, because the university has the responsibility to create, foster, and evaluate the fundamental changes in the country. The university must be the leader of any social change and must foster any scientific movement toward the development of the country.

The III Plano Basico de Desenvolvimento Cientifico e Tecnologico, 1980/1985 (III Basic Plan for Scientific and Technological Development) considered research and the training of human resources as important factors toward the regional and national development. Moreover both factors were considered priorities in the aforementioned document.

As a university of a third world country the UFC has a specific mission of contributing to the development of the region where it is located. In a report on the activities of 1983, the UFC-PR/PPG officials seemed to be aware of the importance of the university in collaborating in the process of modernization of the local society. It was mentioned in that document that one of the difficulties impeding the path to development was the lack of qualified human resources to meet the social, economic, and educational needs of the region.

The university might function as a public agency offering a humanistic and scientific education to prepare the younger generations to face the reality of their society. It may educate the youth to have a broad perspective (cosmovision or cosmopolitan vision) of themselves, of the nation and the world .

Saviani (1980:71) saw the university as an educational institution that can contribute to the regional and national development only if it will be able

to prepare educators to diffuse critically the already known scientific knowledge and to work toward an upraising of the population's cultural level in order to decrease the gap between the popular and modern culture.

More and more nowadays, education has been called on to advance the process of development and modernization in third world countries. Porter (1984:17) affirms that

the plain task for educators, when considering educational systems and practices, is to find ways of sustaining cultural identity, encouraging endogenous development which mobilizes the energy, the knowledge and the understanding of a given society, while at the same time recognising that identity and individuality have to be developed within the broader framework, namely that individual countries all share one world, one environment and reflect certain basic human needs.

It seems to be clear that the only institution able to provide this type of education is the university. To achieve this goal the university needs not only buildings,

facilities, hardware, and software; it must also rely upon human resources, a highly qualified faculty, in order to provide high quality teaching and scientific performance.

THE BRAZILIAN FEDERAL SYSTEM OF UNIVERSITIES

The university is a relatively recent historical phenomenon in Brazil considering the medieval origin of the institution. Although the ideals, aspirations, and struggles for a university in the country date from the colonial period (fifteenth century), in fact the first official Brazilian university did not come into being until 1920 with the creation of the University of Rio de Janeiro, by Decree number 14,343 dated September 7, 1920. (Teixeira, 1968; Chagas, 1967).

In terms of organization, the Brazilian universities were established by the consolidation of the existing schools of higher education. The University of Rio de Janeiro, for example, was formed by consolidating the Polytechnic, Medical, and Law Schools of Rio de Janeiro. Indeed, the new institution called a university was characterized by a conglomerate of schools previously established in isolated buildings scattered throughout the cities in which they were located. (Chagas, 1967).

These universities were also organized into isolated

administrative and academic entities, which brought about a duplication of academic, administrative, and service personnel, equipment and facilities .

From the 1920's up to the 1960's many universities were founded in the different states of the nation, all of them patterned after the original University of Rio de Janeiro.

It is important to note, however, that the University of Brasilia established by Law number 3,998 on December 5, 1961, was the first university in Brazil molded from a different pattern, having a new structural organization. It was later to become the model for the reform of Brazilian universities. (Graciane, 1982).

Teixeira (1968) stated that the creation of universities in Brazil was a process of transplantation of the European culture and models into the Brazilian system. It was, in fact, a process that caused "alienation" (lack of cultural awareness) and instability in the Brazilian institutions of higher education. Brazilian universities, however, did not change their organizational structures or administrative systems until 1968.

In the latter half of 1960's, the federal government proposed a reform for Brazilian universities by Decree-Laws number 53 on November 18, 1966; number 252 on February 28, 1967; and Law number 5,540 on November 28, 1968; which ultimately led to the establishment of the federal system of Brazilian universities. (Teixeira,

1968).

These reforms altered the organizational structure, administrative, academic systems, the curriculum of educational programs, and the personnel and faculty operations, creating new undergraduate programs, and launching the construction of campuses for the federal universities. (Graciane, 1972; Santos, 1978; Sucupira, 1968).

Again, a new imported model was adopted for the structure of Brazilian universities. This time it was not a European model, but an American one. The new model, suggested by American consultants, under an agreement between the Brazilian Ministry of Education and Culture and the United States Agency for International Development, on June 23, 1965), introduced several "innovations" in Brazilian universities, such as: (a) the expansion of the universities to absorb more students, based on the principles of accountability in the system of operations in order to obtain maximum productivity; (b) systems of departments instead of the old "catedras" (chairs); (c) basic studies (one or two years) preparatory to professional courses in a field of specialization; (d) semester systems instead of year long term; (e) a system of credits; and other less important changes. (Graciane, 1982; Santos, 1978).

Although the process of implementing the reform began in 1969 and 1970, today there are still some aspects which

have yet to be implemented in many universities in the system.

Currently (1985), with the advent of the so called "new republic" which consists of a national movement for the redemocratization of the country, the new Ministry of Education has already created a task force to study and propose a new reform for the Brazilian Federal University system.

THE FEDERAL UNIVERSITY OF CEARA - UFC

According to statute, the Federal University of Ceara is an institution of higher education, constituted as an educational autarchy, following a special regimen, and under the jurisdiction of the Ministry of Education and Culture. (UFC, 1982, art.1.)

UFC was created by Federal Law number 2,373 on December 16, 1954 and was officially established on June 25, 1955. It is located in the capital city of Fortaleza, a city with more than 1,500,000 inhabitants, located on the Atlantic coast having a territorial area of 210 squares miles. (UFC 1983; Andrade, 1979; Chagas, 1967).

The UFC initially consisted of the Schools of Law, Medicine, Agriculture, Pharmacy, and Dentistry. Over 25 years old, it has grown considerably with many new

schools, institutes and programs. (UFC 1983).

The "motto" or basic philosophy of the UFC is to reach "the universal through, or by means of the regional." This basic premise guides the institution in its policies and educational directions. It represents a commitment on the part of the UFC to conduct studies regarding the Northeastern region and regional development. (Andrade, 1979).

In the report of a task force which studied the administrative system of universities, "Seminario, Administracao das Universidades" (The Administration of Universities, 1981:52), it was stated that:

it is important that the university takes into consideration, in terms of teaching, the necessities of the society in which it operates, without forgetting the requirement of the development of knowledge.

The UFC statute registers the following as the university's main objective and functions :

1. To preserve, elaborate, develop and transmit knowledge in its different forms: pure and applied. In order to achieve this objective, the university might: (a) provide TEACHING to prepare human resources to develop technical and cultural achievements in society; (b) conduct RESEARCH and provide stimuli for the acquisition of new knowledge and techniques for developing society; (c) offer SERVICES to the community, to help its development, under its functions of teaching and research.

(UFC 1982: Art.4).

In relation to teaching, the university offers programs classified into 4 different levels: (a) undergraduate; (b) graduate lato sensu : especializacão e aperfeiçoamento; (see definition of terms, chapter I); (c) graduate stricto sensu: masters' programs; and (d) extension courses. (UFC,1983, Art.45).

The curriculum of each undergraduate program must follow the "core curriculum" organized by the Ministry of Education and Culture under the Federal Council of Education, consisting of required and elective disciplines organized in a hierarchical sequence. The "core curriculum" may be supplemented by many other subjects, according to the needs and objectives of the program in different universities.

Research is one of the basic functions of the university and according to the UFC Estatuto e Regimento Geral, (1982: Art.69)

faculty must search for new knowledge and technologies and use research as an aid to educate and develop the scientific attitudes essential to a person pursuing higher education .

Extension or service is the function through which, then, UFC serves and aids the development of the community in which it is located. Several different types of activities are included under these specific functions, such as: short courses, seminars, consultation; creation, development and assistance for special projects related to

agriculture, public health, economics, industry, etc.; development of technical, educational, artistic and cultural activities; rural extension, and many others. (UFC, 1982 Art.71).

In 1970, the university was restructured according to the law which reformed the Brazilian universities, and today the UFC is organized into Centers and Schools, both comprised of academic departments.

Centers and Schools are considered units of teaching, research and extension. (See definition of terms in Chapter I). A department is a didactic and technical-scientific unit, formed of all connected disciplines (curricula) of a program, and enlisting faculty with the objective of teaching those subjects, doing research and offering services to the community. Departments have the power to rule at their respective levels on all activities, including faculty plans and distribution of tasks related to teaching, research and services. (UFC, 1982, Arts. 33-34).

The UFC has two basic research and teaching units: (a) the Center of Sciences; (b) the Center of Humanities; as well as six professional teaching and applied research units: (a) the Center of Agriculture Sciences; (b) the Center of Health Sciences; (c) the Center of Technology; (d) the School of Economics, Business Administration and Accounting; (e) the School of Education, and (f) the School of Law. There are 50 academic departments,

responsible for all curriculum activities of 43 undergraduate, and 17 graduate programs. (UFC, 1982, Art.6).

Each undergraduate and graduate program within the university is guided by a board called *coordenacao de curso* or program coordination, that is, a basic academic administrative unit with the functions of planning, assisting, controlling and evaluating all teaching activities related to a specific program. It is formed by (a) one faculty member representative for each group of correlated disciplines (for example, one professor representing the faculty teaching different courses in the Psychology field), elected by his/her peers, and (b) student representatives who constitute one-fifth of the board membership (elected by students). This group elects a professor as the coordinator. The board of coordination serves a 2 year term which may be renewed for two more additional years. (UFC, 1982, Arts. 39-40).

The board coordinates activities of different natures. Deliberative and consultative actions are taken by the collegiate as a whole. Executive actions are taken by the Coordinator as the legal representative of the group.

Administratively, the UFC is governed by the University Council - Conselho Universitario - (CONSUNI); the Council of Teaching, Research and Extension - Conselho de Ensino, Pesquisa e Extensao - (CEPE); and by the Rector.

Currently, the UFC has three campuses: (a) BENFICA where the Center of Humanities, Schools of Economics Business Administration and Accounting, Education, and Law, several administrative buildings, the Art Museum, the University Press, the University radio station, and many other units related to cultural activities are located; (b) PICI with the Centers of Agriculture Sciences, Sciences, and Technology, the Main Library, the Computer Center, and many administrative and service units; (c) PORANGABUCU the site of the Center of Health Sciences, the university hospital, and many administrative buildings. (UFC, 1983).

In 1982 the UFC had an enrollement of 16,260 students at the undergraduate and graduate levels, in addition to 10,600 students enrolled in continuing education and extension programs. It also employs 1,454 faculty members and more than 3,500 staff members. (UFC, 1983).

During 1980 and 1981, the top administration of the UFC drew up two basic documents: (a) UFC - Plano Estrategico, 1980/1984 (UFC - Strategic Plan, 1980/1984), and (b) UFC - Plano de Acoes Basicas, 1981/1984 (UFC - Plan for Basic Action, 1981/1984). Both included analyses of the current situations of the university, and its strategies, goals and the objectives set for the institution over the aforementioned period.

The first document reaffirmed the commitment of the university to the development of the communities of the

region where it is located and also presented an analysis of the affairs of the institution, strategies for further action and guidelines for planning. In the latter document, the part covering human resources, touches on several problems, among them: (a) the diminished prestige of teaching as a professional career; (b) difficulties in preparation (training) of human resources for teaching, due to the fact of little or no faculty incentive, and (c) the lack of a faculty qualification policy based on the needs of the institution and of the region.

The UFC Plano de Acoes Basicas, 1981/1984 contains a section on human resources, which states that the UFC will keep in motion the on going process of recruiting and training personnel for the improvement of the administrative process in the organization as a whole.

As regards faculty training it established the following objectives: (a) to improve faculty performance in teaching and research, and (b) to train the faculty to meet both quantitatively and qualitatively the teaching and research needs in the undergraduate and graduate programs.

Even though no mention was made as to how the objectives were to be achieved, the university took several measures with a view to upgrading its faculty.

The report The Administration of Universities, (1981:19) stated that "the basic element of the university is, without any doubt, the faculty." Thus faculty deserves

special attention in this part of the literature reviewed.

To become a faculty member at the Brazilian Federal System of Universities the professional must pass a public examination consisting of written and oral exams and an analysis of his/her "curriculum vitae." (UFC, 1982: Art.139).

A faculty member at the UFC is supposed to perform the main tasks of teaching, research and service. In addition, he/she may perform administrative duties.

The aforementioned document, (art.78-82 and 156) outlined the professional career of a faculty member in four classes: (a) Professor Auxiliar (Instructor); (b) Professor Assistente (Assistant Professor); (c) Professor Adjunto (Associate Professor), and (d) Professor Titular (Full Professor). Each class, except that of Full Professor, is comprised of four categories or levels, such as, Associate Professor I, Associate Professor II, and so on.

Professors are promoted to the next level within their class at two-year intervals. These promotions are called "horizontal" promotions because they occur automatically after the specified time interval and within the same class. "Vertical" promotions, on the other hand, are promotions from one class to another (i.e, Assistant Professor to Associate Professor). To obtain a vertical promotion, a professor must meet the established criteria

for that level.

In order to become full professors, faculty members must submit themselves to a public examination (even if they are already on the faculty of the institution). The examination process consists of a public defense of a thesis, a written exam, a credential evaluation and various other bureaucratic requirements. It is a complex process, which the administration delegates to a special committee. (UFC 1982: Art.79).

Faculty may be hired for different terms of appointment: (a) Part time: 20 hours of work per week; (b) Full time: 40 hours of work per week, and freedom to have another job; (c) Full time with "exclusive dedication": a commitment for 40 hours of work per week in the institution and allowing for no other professional activity outside the UFC.

Presently all faculty members admitted or hired by the federal system of universities are contracted under the Consolidacao das Leis do Trabalho (CLT) (Brazilian Federal Labor Law) which has been applied to university employees (including faculty) since the 1970's. According to this law, a professional hired as a faculty member, after a one year probationary contract acquires "stability" which is equivalent to tenure in the institution; and from that date on, he/she is immune from dismissal except for some very exceptional circumstances. Formally, however, the concept of tenure does not exist

under the system, called "CLT" or "the new system."

A second contractual system still exists in parallel, to the CLT system but it has gradually fallen by the wayside and is expected to be totally abolished in the next five or ten years. It came about previous to the "CLT" system, and is today called quadro or "the old system." Under this system, professors were presented to administrators at the recommendation of other faculty members, other university administrators or higher political figures, and were hired under a legal act of the Ministry of Education and Culture. According to the old system, after five years of work faculty members were automatically given tenure, wage benefits, and the right of six months of sabbatical leave for each ten years worked.

Regarding retirement, the current Brazilian Law states that a faculty member must retire (a) mandatorily at the age of 70, or (b) after 30 years of service for male professors, and 25 for females, or (c) at any age or after any number of years of work, if he/she becomes disabled. (UFC, 1982, Arts. 90-91; and Brazil, 1967, Constitutional Amendment, 18).

According to Andrade (1979), the UFC initiated the training of its faculty at the graduate level in 1965. Since then, the UFC has been participating in several different programs offered through cultural agreements with other countries, with the objective of providing

opportunities (mainly scholarships) to improve the professional level of UFC faculty and staff members.

The UFC officials believe that graduate study plays an important role as an instrument of qualification or training human resources. To UFC administrators, investing in human capital means working toward achieving improved performance in teaching and research on the campus. (UFC - PR/PPG, 1983).

There are currently several human resource development programs at the UFC. Some are national programs funded by the MEC and/or CAPES with the objective of providing assistance for up-grading the qualifications of professors in the federal system of universities. Others are related to the development of skills of undergraduate and graduate students in the field of scientific research. Still others have been instituted under related agreements with universities overseas.

Of special interest for professors are the Institutional Plan for Faculty Development "PICD I AND II" and the new agreement between UFC and the Interamerican Development Bank (called "BID III") with funds marked for graduate studies and continuing education for the UFC faculty members.

The Institutional Plan for Faculty - Plano Institucional de Capacitacao Docente (PICD) is a national program to qualify professors at the graduate level (master's and doctoral). It was created and has been

maintained by MEC through CAPES. It grants scholarships for faculty of the federal system of universities for graduate studies in Brazil and overseas. Since 1976, the UFC has benefitted from this program. According to a MEC/CAPES/PICD publication, the UFC was endowed with the following number of scholarships for Master's and doctoral programs in the country: 63 in 1976, 119 in 1977, and 122 in 1978. Although recent data on the number of scholarships granted to the UFC by this program are lacking, it is known that in all subsequent years until 1984, some faculty members have taken leaves of absence to pursue graduate studies. (UFC/DP, 1984).

The agreement between the Interamerican Development Bank and the UFC was signed in 1983 in the form of a loan permitting the UFC to achieve several of its goals: (a) the construction of some administrative and academic buildings on campus, (b) the development of agricultural projects, and (c) continuing education for professors on campus, and elsewhere.

In 1980, the UFC and Centro de Treinamento em Desenvolvimento Economico Regional (CETREDE), (Center of Training for Regional Economic Development) conducted a seminar on the university and regional development. Representatives from the administrations and faculties of all universities in the North and Northeastern regions of the country participated in the event. The final report of the seminar stated that

the quality of the undergraduate teaching process is a critical factor for consideration since teaching is an instrument used to train new human resources to meet the demands of each regional society. (Seminario, 1980: 163).

It was also noted that the universities have a pressing need for training professors to develop their teaching abilities, and, to encourage them to pursue graduate studies as a way of improving the quality of teaching in several universities of those regions.

The same report also made specific recommendations for improving research and services provided by universities in those regions.

The UFC, in its two basic planning documents, Plano Estrategico 1980/1984, and Plano de Acoes Basicas 1981/1984, set goals, objectives and strategies for improving teaching, research and service on campus, for the aforementioned period. In fact, since the early years the UFC administration has worked long and hard in the struggle to permanently meet their commitment to better quality teaching, research and service on campus. (Benevides, 1981).

HUMAN RESOURCES DEVELOPMENT

At the moment when economists began to believe that "human beings are the active agents who accumulate capital, exploit natural resources, build social economic and political organization, and carry forward national development" (Harbison, 1973:3), two factors came to the foreground: (a) Human Resources; and (b) Education.

A skilled labor force (human resources) was seen as an important means of production because of the roles it plays in modern society. The society of the second half of the twentieth century has been characterized by the fast pace of technological change, and a large dependence on specialized services and data processing activities, which made human resources a very important priority in the development of the nations. (Levitan, Mangum, and Marshall, 1981).

Human resources thereafter came to be viewed as the key to a nation's potential to bring about technological changes, improvements and developments. (Watson, 1984; Levitan, Mangum, and Marshall, 1981).

Education also became an important instrument for improving labor as a means of production, or as Atkinson (1983:25) said, "the main output of teaching for most people would be seen as knowledge, broadly defined to include such things as skills and values." He also

considers "the first output of education is the furtherance of civilization."

From these two concepts (Human Resources and Education) another emerged: Human Resources Development. It dates from the 1950's and can be described as

the process of preparing people for a productive employment role, contributing to their maximum potential in producing the combination of goods and services preferred by the society. (Levitan, Mangum, & Marshall, 1981:4).

The process of human resources development has a two way relationship with the process of education: (a) Human Resources Development takes place mainly, through training, development, and education activities; and (b) Human Resources Development brought about the appearance of new types of institutions and new theories of education. (Levitan, Mangum, & Marshall, 1981; Nadler, 1979; Franck, 1974; and Patten, Jr., 1971).

Elaborating the first statement and following Nadler's (1979) idea, human resources development can be accomplished through: (a) Training - "those activities which are designed to improve performance on the job the employee is presently doing or is being hired to do." (p.40), (b) Education - "those activities which are designed to improve the overall competence of the employee in a specific direction and beyond the job now held." (p.60), and (c) Development - "is concerned with preparing the employee so he can move with the organization as it

develops, changes and grows. The result could be a new job at higher level or an expansion of the current activities of the employee into new fields which are as yet undertermined." (p.88).

Explaining the second affirmation, Levitan, Mangun, and Marshall (1981:140) showed that to meet the demand for a more qualified labor force, new institutions began to collaborate in the process of preparing human resources: (a) elementary and secondary schools "become the focus for the development not only of a general ability to understand and function in society, but also of discipline and human relations skills, as well as basic skills in communications, and computation," (b) vocational education centers, (c) training institutions, and (d) higher education institutions: community colleges and universities.

In relation to the new developments in the field of education, the aforementioned authors cited the following as specific areas of interest : (a) vocational education, (b) career development theory, (c) career education, and (c) work experience education.

The authors also maintain that schools and training institutions have made three major contributions to employability: (a) they assist in the development of the general intellectual and manual skills essential to employment as well as of other aspects of modern life such as oral and written communication, computation, and the

like; (b) they affect values, motivation, and personality, developing the will to work and the interpersonal relations which make most work possible; and (c) they offer training in specific occupational skills.

The importance of higher education was recognized as playing a central role in labor markets and Human Resources Development. As an industry, higher education provides "employment to about 750,000 faculty members in more than 3,000 educational institutions." (Levitan, Mangum, and Marshall, 1981:167).

As a system, higher education will provide manpower for a society which will demand more and more technicians, scientists, and professionally trained personnel to meet the needs of its complexity in the last years of this century. In order to meet society's needs, higher education may try to be more effective, efficient and able to offer high quality teaching, research and service. One way to achieve this goal is to adopt and use technology and, more importantly, to rely upon more qualified human resources.

Mankind is today witnessing a new revolution which may be more radical than the industrial revolution - the information revolution. To face this challenge universities may work to improve their operations. Social scientists are now recognizing that to face the new challenges of societies, new competent professionals -- well educated people -- are the key factor in keeping

society on the path to modernization. In other words, competent human resources (professionals) are needed to the training for more competent human resources. Consequently, education, manpower, human resources development are, again, the focus of attention. (Naisbitt, 1984).

EDUCATIONAL TECHNOLOGY

As a result of a long period of evolution and the influence of many factors, trends, and shifts, the field of educational technology emerged founded upon certain basic assumptions, and at least two facts: (a) change is a constant in the world, therefore it is a constant in the social system, and consequently, in education, and (b) progress, and the need for improvement are constant in human society, therefore they are permanent needs and desires in education.

Gallegos (1984:39) stated that "education is power, and the power to control and to change education rests with the educated." Pena (1983:17), citing Ladriere, believed "technology is a force which transforms reality, and reality is nature and culture. The impact that technology has on the culture is at the same time disruptive and creative". The importance of innovation in

the educational system and in society, by extension, is thus clear.

Educational technology has been seen and used as an instrument of change and modernization in education in developed nations and third world countries, in spite of considerable difficulties and resistance. (Gallegos, 1984; Ogunmilade, 1983; Pena, 1983; Marques and Baquero, 1983).

Ajibero (1984) and Ogunmilade (1983) observed that educational communication and technology have facilitated change in education particularly at the university level. Both subscribed to the idea that educational technology should be used and considered a high priority for the effective training and development of teachers in the third world countries.

Marques and Baquero (1983:44), analyzing the teaching manpower situation in Brazil, stated that

the problem of lack of quality in the teaching process might be approached by educational technology if other strategies are used by the government at the same time such as: (1) the development of a teaching career ; (2) community participation in the educational decisions; (3) the increase of the educational budget as a whole; (4) the teachers' participation in the educational decision - making process, and: (5) the integration of the teachers at the "planning stage" of the educational process.

As stated previously, if there is a constant phenomenon in the history of mankind, it can only be change. Change is always present and always causing

obsolescence of products and processes, requiring adjustments by people and groups to new situations, bringing about innovation, and promoting more change. The process seems to be running in cycles. This process has an impact on all aspects of human life, and of course, on education as well.

Scholars have, in the process of adjustment and readiness for changes and innovation, developed special new approaches to education. As a result of the need for adapting and adjusting to change and innovation in educational organizations, three different fields have come into being: (a) Faculty Development - FD, (b) Instructional Development - ID, and (c) Organizational Development - OD.

These fields or categories had been developing for a long time and still today are used as instruments to introduce change and innovation in education. Abedor and Sachs (1978:3) explain that

FD, OD, and ID are integrally related to each other within the process of bringing about the adoption of an instructional innovation having the potential for improving teaching and learning.

FACULTY DEVELOPMENT

Faculty Development (FD) is the result of a long process of change in society and of necessity forcing changes in education, especially higher education. It was a response to change as it affected professional people.

According to Pellino, Boberg and O'Connell (1981) the faculty development movement is a recent phenomena dating from the early 1970's. In fact, it was born in the last quarter of the nineteenth century, with the establishment of the sabbatical leave programs at Harvard (1880), and Cornell and Wellesley universities.

During the 1950's and 1960's, according to the same authors, other practices were added to the sabbatical leave programs such as: release time for degree completion, travel allowances for faculty attendance at professional meetings, faculty retreats, publication incentives, and programs aimed at instructional developments. However, it was not until the 1970's that the contemporary movement for faculty development in higher education became organized on a national scale. This decade witnessed many trends, events, facts and changes which can be seen as responses to many of the problems of that period in education. (O'Connell, 1983; Pellino, Boberg and O'Connell, 1981; Preus and Williams, 1979; Bergquist and Phillips, 1977; Gaff, 1976).

Faculty Development FD can be defined as those

activities that promote faculty growth, help faculty members acquire knowledge, skills, sensitivities and techniques related to teaching and learning, or yet, as enhancing the talents, expanding the interests, improving the competence, and otherwise facilitating the professional and personal growth of faculty members, particularly in their roles as instructors. (Gaff, 1976: 10/14).

Abedor and Sachs (1978:2) summarized the concept as "activities [that] focus on the knowledge, skills, sensitivities and techniques of faculty members."

FD is an effort to make the process of instruction more effective. Moses (1985:76) suggested that

the effectiveness of teaching can be improved by developing students' learning skills, by helping staff to improve student opportunity and incentive to learn (professional development), and by improving staff ability, opportunity and incentive to teach (course, professional and organizational development).

In fact, these are important goals for the development of education as a whole. But, to achieve them a concerted effort for Faculty Development, Instructional Development and Organizational Development is required. (Abedor and Sachs, 1978; Gaff, 1976).

Analysing the conceptual framework of Faculty Development offered by Gaff (1976) it is easy to see that some of its components are directly related to this study, since they reflect part of the current situation and philosophies of Brazilian universities.

1. Faculty members are the most important educational resource of a college or university, and as such, must be given special attention and care.

2. Teaching is the primary, though by no means the only, professional activity of most faculty members.

3. Teaching is much neglected by academic tradition. The neglect can be traced to factors pervading the general academic culture, such as the lack of preparation for teaching roles during graduate education .

4. There is little systematic evidence about how good the quality of teaching and learning are in most institutions, although there is a general feeling that it can be improved.

5. Improving teaching requires working with administrators, students, and perhaps even members of the larger community, as well as with faculty members.

6. Just as faculty members receive little preparation for instructional roles, administrators have little training for the leadership, policy formulation, administrative, and managerial roles of their work. Department chairpeople, deans, vice-presidents and presidents need to develop and to encourage and support the growth of the individuals.

7. Teaching is a complex set of attitudes, knowledge, skills, motivations and values. The improvement of teaching and learning requires an awareness of the complexities involved in faculty, students, and

institutions and the avoidance of simplistic solutions.

8. Effective teaching involves helping student to attain desired learning objectives.

9. There is no single model of effective teaching or learning.

10. There is great diversity among students. Their various learning styles call for different kinds of learning.

11. Faculty members, too, are a diverse lot. Every effort should be made to assist individual faculty members in ways consistent with their diverse values, needs, and personal styles, with students' needs, and institutional goals.

12. Intrinsic interest rather than extrinsic demand is what leads individuals to seek improvement.

13. Teaching and learning are individual but not solitary activities; they occur within a social context.

Moses (1985:76) explains that, in order to improve teaching, it is possible to focus on different targets, using different activities, for instance

Focus

Development

Individual Staff Members

Professional Development

Subjects, courses

Course Development

Institutional Organization
and Environment

Organizational Development

Student

Learning Skills Development

"Faculty Development is not a remedial concept for poor teachers or underachievers," according to Gaff, (p.17) it is a way of developing professors, who are individuals, and who as such, develop "much in the same way other people do." (p.18) There is no specific process for promoting FD. For this, experts have proposed many different approaches. Some of the most common have been workshops and seminars, consultation and instructional development, grants-instructions, sabbaticals leaves and travel, subject evaluation, teaching evaluation, fellowships, collaborative research, conferences, and many others.(Moses, 1985; Preus and William, 1979; Gaff, 1976).

Fuller and Evans (1985:31) believe that "an organization is only as good as its members. This is especially true of a college or university, which can be worse, but no better than its faculty." The authors maintain that FD activities should include both younger and older faculty members, in order to provide them opportunity to develop to their full potential during their academic careers.

INSTRUCTIONAL DEVELOPMENT

Mellon (1985), analysing Instructional Development, concluded that ID can be explored from the perspective of the conflict theory which explains the mechanisms of interactions and relationships within a social system. From this perspective, ID fits the description of a social reform movement. This seems to be in agreement with the idea that ID is an instrument to bring about change in education.

Instructional Development traces its history and tradition to the Greek philosophers, but its modern evolution was marked by certain events and trends, such as: (a) the visual instruction of the 1920's, (b) audio visual instruction, programmed instruction and system theory of the 1930's and 1940's, (c) Communication, Learning Theory and Educational Psychology of the 1950's, (d) Educational Communications, Systems Design and Management of the 1960's, and (e) the student movement and the new economic and social reality of American colleges and universities in the 1960' and 1970's. (Mellon, 1985; Diamond, 1980; Gaff, 1976; Abedor and Sachs, 1978; Davis, Abedor and Witt, 1976; Saettler, 1968).

Instructional Development has been characterized as a process, a movement, an activity, a category, an academic specialization, etc., and has been defined by many

professionals in the field in various ways. Some of the definitions are;

ID activities focus on the systematic design, development, implementation and evaluation of instructional materials, lessons, courses or curricula (Abedor and Sachs, 1978:2-3).

Instructional Development is a process of systematically designing, sequencing, implementing, evaluating and constantly monitoring instruction with the intent of improving its quality and effectiveness and thereby improving learning. (Duncan, 1978:21).

Instructional Development is a systematic approach to the design, production, evaluation, and utilization of complete systems of instruction, including, all appropriate components and a management pattern for using them; instructional development is larger than instructional product development, which is concerned with only isolated products, and is larger than instructional design, which is only one phase of instructional development. (ARCT, 1977).

ID is the systematic and continuous application of learning principles and educational technology to develop the most effective and efficient learning experiences for students. (Gaff, 1976:47).

Gaff (1976:49-50) presents some basic assumptions or major propositions for the movement, which are summarized as follows:

1. The improvement of instruction involves primarily the design or redesign of the learning experiences of students, typically in the form of courses. It includes carefully deliberating the specific learning tasks

required to grasp a body of knowledge, sequencing the tasks, and making certain that students master elementary learning before they proceed to more advanced levels. In short ID is an approach that can improve the quality of education.

2. The systematic application of the instructional development process can lead to the improvement of a course. It involves the specification of learning objectives for students, the design of learning objectives for students, the design of learning experiences, and the evaluation of student achievement of the objectives.

3. Learning objectives can and should be stated in specific and measurable terms that make clear to students and teachers alike what level of performance is expected of students.

4. Accurate evaluation devices that can assess the extent to which students achieve the objectives of the course need to be used.

5. The most effective courses are those in which the objectives, learning experiences, and evaluation of students are consistent with one another.

6. Effective teaching is that which brings about student learning.

7. A complex activity such as learning, a body of material or acquiring intellectual skills may be broken down into its component parts.

8. The effectiveness and efficiency of many courses

may be improved by the use of more and different kinds of media and technology.

9. Many conditions of learning may be met by prepackaged learning materials, which may supplement or even replace traditional classroom sessions.

10. Courses may be individualized so that students may proceed through the various segments at their own pace.

The process of ID has been described and represented through different models by several of the field's professionals. Gaff (1976) affirms that the core of the process can be summarized as follows: (a) formulation of objectives, (b) design of instruction, (c) evaluation of results, and (d) revision of objectives or instruction in light of the evaluation.

The IDI model represents the process through different stages and functions:

(I) Defining : (1) identifying the problem, (2) analyzing the setting, (3) organizing management.

(II) Developing : (1) identifying objectives, (2) specifying methods, (3) constructing prototypes.

(III) Evaluating : (1) testing prototypes, (2) analysing results, (3) implementing recycle.

There are numerous models and ways of explaining the ID process; however the important fact to keep in mind is that ID is an approach to the improvement of instruction.

In applying ID to improve the quality of instruction,

developers have used many different kinds of procedures, instruments, strategies and teaching approaches. Willis (1984:31) presented eleven instructional strategies that have been used successfully in higher education:

1. To involve the client in all aspects of project planning.

2. To foster client "ownership" of ID product/process.

3. To disseminate project reports and other tangible products of the ID intervention.

4. To initiate varied projects with different clients/departments.

5. To be solution, not technology, oriented.

6. To gradually educate your constituency.

7. To focus on projects wanted by your constituency, not those that showcase your varied ID skills.

8. To maintain high visibility.

9. To maintain a small "core" staff made up of "contract" developers ... from academic departments, if possible.

10. To use a representative committee of university clients to assist in identifying and setting project priorities.

11. To meet or exceed the performance level you've set your ID unit.

The author cited reminds readers that service is behind the whole ID process. He finally says that "the

principal role of ID in higher education is to serve the needs of a diversified clientele." (Willy, 1984:32).

According to Osterman (1978), the following teaching approaches have had a high impact on undergraduate instruction:

1. Audio - Tutorial Approach to Learning - a tutorial method for guiding students' learning by means of an audiotape format. (Postlethwait, 1972).

2. Computer - Based Education - CBE - consisting of a wide variety of learning activities managed by computers. (Dyer, 1972).

3. Learning Packages - a systematic means of delivering content and process to learners. (Kapfer, 1973).

4. Personalized System of Instruction - PSI - a self-paced, mastery-oriented, student-tutored course based on study guides to communicate information to students. (Keller and Sherman, 1974).

5. Guided Design - a systematic way to lead students to solve problems and to be actively assimilating knowledge. (Wales and Stager, 1976).

Schwen and others (1979) state that "the practice of instructional development is one of integrated social and technical responses to instructional problems." Affirming that the professional developer should be more socially oriented, they categorized three different styles of helping others that can be used by ID developers:

1. The "doctor-patient" model or the prescriptive style - the developer is consulted and responds to the call with a prescription to solve the problem.

2. The "product" or "purchase" model - the developer accepts the client's diagnosis and proposed solution, he/she then provides the required knowledge, skills or products to achieve the goal.

3. Schein's approach - the developer is ignorant of the instructional content relevant to a client's problem, searches for a design process which can resolve the problem; and collaborates with the client in an attempt to jointly identify a problem, plan for its solution and judge the solutions' success.

From the literature reviewed, it is clear that to practice ID, a professional needs more than social and technical skills, he/she needs a wide range of human skills, such as: comprehension of the process of change; knowledge of system design; mastery of the use and knowledge of the instructional media production; an understanding of the process of evaluation; knowledge of the available software and hardware; ability to interact with team members, and readiness to serve others when necessary. In one word, to practice ID, it is necessary to have professional competency.

ORGANIZATIONAL DEVELOPMENT

Most fields of study today can have their history traced from a relatively recent moment or from a very ancient one. This is true in relation to Organizational Development. Looking at ancient times, Burkes (1982) says that OD has its roots back in the Old Testament times, with Moses' process of leading his people. Focusing on a more recent point of view, French and Bell (1973) place the early development of this activity in the late 1940's. Disregarding time and details, OD is the result of the contribution of many different factors: (a) the development of the socio-behavioral sciences, (b) research and studies done by different people in different fields, (c) events and meetings, and (d) publications. (Burke, 1982; Beer, 1980; Kurpius, 1979; Huse, 1975; Gaff, 1976; French and Bell, 1973).

Burke (1982:10), defines OD as "a planned process of change in an organization's culture through the utilization of behavioral science, technology, research, and theory."

Beer (1980:7-10) states that "organization development may be seen as a process for diagnosing organizational problems by looking for incongruencies between environment, structures, processes and people." Elaborating the concept further, he explains that

OD is a system - wide process of data collection, diagnosis, action planning, intervention, and evaluation aimed at (1) enhancing congruence between organizational structure, process, strategy, people, and culture; (2) developing new and creative organizational solutions; and (3) developing the organization's self-renewing capacity. It occurs through collaboration of organizational members working with a change agent using behavioral science theory, research, and technology.

French and Bell (1973:15) stated that

Organization Development is a long-range effort to improve an organization's problem-solving and renewal processes, particularly through a more effective and collaborative management of organization culture - with special emphasis on the culture of formal work teams - with the assistance of a change agent, or catalyst, and the use of the theory and technology of applied behavioral science, including action research.

Looking at it from an educational point of view,

Schmuck and others (1977:3) explained that

Organization Development is at once a conceptual framework and a strategy aimed at helping schools to become self-correcting, self-renewing system of people who are receptive to evidence that change is required and able to respond with innovative, integrated programs and arrangements.

Gaff (1976:76) sees OD as an approach used to improve instruction. He said that

Organizational Development places emphasis on the interpersonal aspect of teaching and learning. Instruction is a social as well as an individual activity, and advocates of organizational development assert that efforts to improve instruction must attend to group processes and institutional functioning as well as to the more specific teaching or learning.

Huse (1975) registers some assumptions for OD related to individuals, to people in groups and to people in organization. More importantly, Gaff (1976:77/78) presents an application of the basic OD assumptions to educational institutions. The following is a summary of his ideas.

1. The environment is basic; more than anything else, it influences the behavior of individuals.

2. An organization is a dynamic system of interrelated components; a change in any part of a system requires a change in the other parts.

3. Work groups, such as academic departments, not individuals, are the basic building blocks of an organization.

4. Synergism occurs in small groups. Classes, whole departments, and campus teams permit individuals to express opinions and feelings, and get reactions from others. Energy and ideas are unleashed, generated in small groups who share individual experiences and views.

5. Between persons in most organizations barriers develop over time that interfere with their work. Steps may be taken to overcome these barriers and get

individuals working together to accomplish common goals.

6. Training programs and learning exercises can help individuals learn to work more productively with their colleagues.

7. Department chairpeople are the front-line administrators with responsibility for maintaining a climate that facilitates teaching and learning.

8. Most organizations can be improved by a periodic review of their functioning and by initiating a process of planned change.

In terms of process, the methodological model for OD is action research. According to French and Bell (1973:18), action research consists of: (a) a preliminary diagnosis, (b) data gathering from the client group, (c) data feedback to the client group, (d) data exploration by the client group, (e) action planning; and (f) action.

Explaining the process in another manner, Burke (1982:8) listed the following steps : (a) diagnosis - interviews with both individuals and groups and observation, followed by analysis and organization of the data collected, (b) feedback - reporting back to those from whom the data were obtained, to give the collective sense of the organizational problem, (c) discussion of what these data mean and planning the steps that should be taken as a consequence, and (d) taking those steps.

OD specialists act mainly through consultation, helping clients explore problems from a holistic

perspective in search of a solution. Burke (1982:9) wrote that "for change in an organization to be OD it must (a) respond to an actual and perceived need for change on the part of the client, (b) involve the client in the planning and implementation of the change, and (c) lead to change in the organization's culture."

Kurpius (1979) explained that there are four elements in the OD process: (a) goals, (b) framework (c) methodology, and (d) people.

In the OD process, experts help people in an organization improve their interpersonal communication skills, help clients visualize and institutionalize roles and structure, and implement innovations in the organization. To this end OD experts use several different techniques, strategies and interventions. Huse (1979:79) presented a typology of change based on the depth of the intervention in the organization, in four different categories:

1. Systemwide Approaches - contingency theory of organization design, survey feedback; organizational confrontation meetings, etc.

2. Individual/Organizational Interfaces: job design; role analysis; management by objectives, etc.

3. Concern with Personal Work Style: process consultation; team building; third-party intervention, etc.

4. Intrapersonal Analysis and Relationships : life career-planning interventions; laboratory training; encounter groups; personal consultation.

Gaff (1976) mentions several difficulties in applying OD in colleges and universities. Among them were : (a) goals not very specific, (b) horizontal structures of academic institutions which results in a fragmented view of the organization, and (c) decentralization of authority and responsibility.

OD, however, is a powerful tool to help organizations to function effectively. Based on the ideas of scholars in the OD field, Gaff (1976:79-80) explained that :

an organization is most effective when: trusting, open, and honest relationships are found among participants; widespread participation in setting goals and making group decision is the rule; egalitarian relationships among individuals prevail; members share feelings and ideas and give one another useful non-threatening feedback; individuals are self-directed and assume responsibility for their behavior; conflicts among individuals are expected, faced, and managed creatively and thoroughly; support for individual growth and development is found in organizational policies and practices; respect for diverse opinion, work patterns, and life style is widespread.

This seems to be a good ideal for any university in the world.

COMPETENCY AND COMPETENCY-BASED EDUCATION

During the second half of this century societies in different countries experienced many cultural, economic, political, social, and technological changes that increasingly challenged educational systems to prepare the new generation to cope with the requirements of modernization. This, in other words, means that to face the new challenge, educational institutions should educate or train competent human beings. (Walber and Weinstein, 1984; Grant and others, 1979; Davis, Abedor and Witt, 1976).

Competence is not a simple concept: it is a macroconcept. It goes back to the Greek idea of "arete"- a power someone has to do something - or according to the Webster's Dictionary, "the sum of good qualities that make character - excellence, value, virtue." It is also considered a potential, something like data and programming inside a computer for which we have only limited access, something one has, but never knows it; or further, competence is whatever is required by the job description; or an individual's belief he/she is able to do a task. (Phillips, 1983).

Kwens, (1977:12) defined competence as "an adequate supply or sufficiency; a capacity to deal adequately with

a subject; a quality or state of being functionally adequate or of having sufficient knowledge, judgment, skill or strength."

Gilbert (1978:17-18), said that "competent people are those who can create valuable results without using excessively costly behavior." He affirmed that "human competence is a function of worthy performance (W), which is a function of the ratio of valuable accomplishments (A) to costly behavior (B)."

Chrisholm and Ely (1976:46) explained that "competence means adequacy for a task - the possession of necessary knowledge, skills and abilities to achieve an acceptable level of performance."

Competence has been analyzed by professionals from different perspectives. Gilbert (1978), studying the concept from an engineering point of view, explained that competence is directly related to performance (P), that is a transaction involving both behavior (B), and its consequence (C). In short, $P=B \rightarrow C$. Going further to explain performance, he says that behavior is a means and its consequence is an end. This end, or consequence, has to be a valuable accomplishment (A). So, a valid performance can be expressed as $P=B \rightarrow A$. But, performance has not only to be valuable (V), but also worth (W) the cost of the behavior: $W=V \rightarrow C$. So, competence, from this point of view is directly related to performance, behavior, accomplishment, value, and cost.

Chrisholm and Ely (1976:81-82) outlined the components of competence as : (a) knowledge - the body of facts and information required of each professional to operate on a day-to-day basis; it is a tool for performing on the job; (b) skill - the ability to do something, the application of knowledge to solve a problem, and (c) attitude - feelings, approaches or avoidance tendencies toward a performance of a task.

Doll, Jr. (1984:123-124) argued that competency-based education "equated, wrongly, competence with performance". This fact, he believed, was a "disservice" to the word and the notion of competence, and "also to a very exciting idea which I believe holds great pedagogic potential." He saw competence to be more than just performance. Competence as stated earlier in this chapter was a macroconcept, "greater than the sum of the individual skills."

Elaborating further this idea, Doll Jr. (1984:124), explained that

performance refers essentially to a 'doing' particularly to a 'doing' which is completed, finished, achieved. Hence, performance is a task finished. It carries no judgment of value as to how well the task is done, just that it is done."

Competence, he believed, was "essentially a state of being or a capacity". He explained that

one who is competent is one who has a certain 'fitness, sufficiency, or aptitude'; or to take the word's Latin

derivation, a competent person is one who possesses a certain confluence, 'symmetry, conjunction, or meeting together', of powers which allow him or her 'to adequately deal with a situation'. (Doll, Jr. (1984: 124).

These seem to be the type of competent professionals universities and modern society are urgently demanding.

The concept of competence is based on different principles or premises:

1. Competence is internal and external, situational and personal.

2. Competence is limited by a person's perceptions, neurological system, and character.

3. Achieving competence requires diverse learning styles.

4. Competence itself is a motivational force.

5. If a behavior is observed in one person, it is possible in another.

6. If a person has manifested a behavior once, it is possible for the person to manifest it again.

7. Knowledge about behavior corresponds to behavior possibility.

8. Demonstration of appropriate behaviors is the sine qua non for judgments of effectiveness. (Phillips, 1983: 27-28; Chickering and Claxton, 1981: 11).

Cultural and social pressures on the school system forced the emergence of a new movement in education called competency-based education - CBE. This movement was an

attempt to meet the needs of society by training more competent professionals. It has many of the qualities of a social movement. (Grant and Others, 1979).

CBE started in Oregon in the early 1970's and in 1978 more than 30 states of the USA had adopted some form of CBE. Basically, this movement was concerned with accountability and quality (mastery) results in education. It had an impact on many aspects of school activities especially teaching, curricula, evaluation and diploma requirements. (Walberg and Weinstein, 1984; Spady, 1978).

CBE is learner-centered type of instruction. It emphasizes the specification of the learner outcomes in terms of behavioral objectives. It is done on the basis of a description of performances. It can be characterized by the following components:

1. Learning outcomes - must be clear regarding criteria for performance, and must be known by all those who are involved with the instruction;

2. Time - has to be flexible and students should know WHEN, HOW LONG, and HOW often are the opportunities for instruction and evaluation.

3. Instruction - must provide a variety of instructional activities, and guide students in reaching the standards required for certification.

4. Measurement - is based on criterion - reference testing of the required outcomes and must be done frequently.

5. Certification - must be based on the performance or ability to demonstrate mastery or the required outcomes.

6. Program adaptability - must provide students with the conditions necessary to achieve the required goals. (Goldhammer and Witzel, 1981:47).

CBE can be used both at the high school and university levels, and more specifically, it can be used to develop specific performance of professionals in different fields. (Grant and others, 1979).

Riesman (1979) stated that faculty development in higher education was an attempt to develop competent academic professionals.

From these readings, it is possible to infer that CBE in higher education serves at least the following purposes:

1. To provide opportunity to develop competencies among faculty members.
2. To provide better quality teaching.
3. To train better professionals.
4. To meet the demands (needs) for a better education in modern society.

ADMINISTRATION AND LEADERSHIP IN HIGHER EDUCATION

The university today is one of the most complex organizations in modern society. Since its origins in the Middle Ages, it has grown in size and improved in quality, becoming a very complex organization, because of its structure, missions and relationships with groups inside and outside its boundaries. (Whitson & Hubert, 1982; Perkins, 1973). In short:

a college or university is a complex network of many factors that comprise the whole organism - a web of personal, professional, and organizational relations; of traditions, loyalties, and convictions; of places, purposes, and pressures. (Elmore, 1977:32).

As an organization, the university is confronted by the need for an efficient and effective system of administration (management) in order to attend to its internal needs and the demands of modern society. (Janne, 1981).

Whitson and Hubert (1982:163) states that

central to the functioning of the university is the administrative role of the department chairperson ... and the quality of leadership provided at the departmental level that determines the university effectiveness.

Focusing on the functioning of the department as one cell in the university structure, it is important to note that the chairperson is not the only person responsible

for it. Other groups also have influence. As the cited author said, "faculty influence has been reported in decisions concerning academic degree, program requirements; faculty appointment, promotion and tenure; and student affairs." (Whitson & Hubert, 1982:164).

On the other hand, departments are subject to the influence of the higher administration, most directly from the deans, who influence "over a broad range of decisions that affect departmental functioning, with central administration exerting strong influence in personnel appointments, budgetary control, planning and public relations." (Whitson & Hubert, 1982: 164).

The aforementioned authors found that departmental influence on decisions is crucial to the effectiveness of the university functioning, and concluded that "any significant improvement in the effectiveness of the university functioning must necessarily emphasize improvement in departmental functioning." (Whitson & Hubert, 1982: 173).

The chairperson is clearly a key person in the administrative process since he/she is the link between faculty, higher administration, students and others groups. He/she plays an important role in interactions among several groups. Whitson and Hubert (1982) suggest that the process of selecting, training and evaluating the chairperson should consider the managerial skills needed and performance expected of the individual to fulfill that

position.

Turner (1983) advises that higher administrators should make more effective use of department chairpersons. They should rethink the role of department chairpersons and provide opportunities for a better use of department time, in order to obtain positive attitudes toward, and improvement of, instructional quality .

In fact, he affirms that

if the department head is to become a true educational leader, in the sense of the term, a strong working relationship throughout the department must evolve. Department morale must be engendered; an esprit de corps must emerge. (Turner, 1983: 26).

Among the abilities in the repertoire of department heads are the ability :

to extract the best from teachers within the department, to stimulate creative and productive thinking, to realize a high level of cooperative problem-solving behavior; to give careful attention to open communication, to finding acceptable times for departmental interaction, to making certain that members of the department are involved in departmental decisions. (Turner, 1983:26).

Since the position of department chairperson requires involvement in different aspects of instruction, Turner also advocates that the department chairperson

must be competent not just in the subject field itself, but must be able to develop and/or revise curriculum, to lead a pilot program or field test new curriculum, and to assess and evaluate properly the efforts expended as well as the results achieved.

(Turner, 1983:27).

In relation to research which is another mission of the university, carried out by faculty in departments, he suggests that the department chairperson

should demonstrate competency in research sufficient to analyze and identify promising innovations. He/she should be able to guide the department through a self-assessment process, determining strengths and weaknesses in order to achieve departmental goals. (Turner, 1983:27).

Elmore (1977:32) affirmed that

the human resources in a college or university constitute a reservoir of talents and potentialities; the challenge facing administrators is to liberate them for our educational aims. The college community needs to create a climate in which a person with talent, imagination, and skills for leadership can make a contribution.

Universities must offer a program to develop leadership competencies and provide opportunities for chairpersons to participate in it, and to develop the abilities necessary to lead a department.

Cunningham (1976:324) described the idea of leadership as "a curious blending of leading and following, provoking and calming, disturbing and stabilizing." Saville, cited by Morris (1985:8-9) sees leadership as a process of structuring, organizing, and guiding a situation so that all members of a group can achieve common goals with maximum economy and minimum time and effort."

Analyzing the attributes of successful leaders, Abrell (1979) concluded that the following characteristics appear to be very significant : (a) active participation, (b) creating a facilitating climate, (c) providing inspiration, (d) providing justice and fairness, (e) resisting unnecessary demands, (f) recognizing talents, and (g) practicing ethical integrity .

Focusing on leadership in education, Morris (1985:9) based on Berg's idea of the topic, stated that

effective educational leaders should have a clear understanding of their function; a desire for and a knowledge of group dynamics; be academically and professionally honest; have a desire to cut red tape; be understanding, patient, imaginative and innovative; ... must exhibit the virtues of honesty, integrity, cooperation and concern for others;...and must be adaptable.

Elmore (1977:37) explained that

leadership in a college or university is a matter of cooperation and collaboration in collegial environment. ... It is a matter of data and consciousness, of power and persuasion, of decisiveness and diplomacy, of policies and personalism, of hard actualities and soft myth and traditions.

Leaders in higher education working at different levels of administration should be aware that they are responsible for the quality of education offered by the institution. They should also be aware of the changes and developments in their society that influence the process of education. They are also responsible for the labor

relations within the institution. (Morris, 1985; Janne, 1981).

Astin and Scherrei (1980) studied the relationship between four types of administrators (presidential styles) and faculty behavior, and concluded that:

1. Under a BUREAUCRATIC president, professors spent more time on administrative activities, and were more dissatisfied with the quality of the administrative services, and with the challenges, degrees of autonomy and responsibilities of their jobs.

2. Under an INTELLECTUAL president, professors devoted a large amount of time to research, and were very satisfied with the opportunities for scholarly pursuits. On the other hand, they were dissatisfied with their salaries and fringe benefits.

3. EGALITARIAN presidents were associated with a high degree of faculty satisfaction in relation to their senses of power and influence.

4. COUNSELOR presidents were more associated with faculty satisfaction than any other presidential style. Faculty claimed to be more satisfied in terms of both intrinsic and extrinsic aspects of their jobs.

University administrators may keep in mind that, in order for the organization to function effectively, they must give special attention to the individuals working there. They (the administrators) may consider the fact that human beings need incentives to be motivated in their

work to produce. In an educational setting, professors need academic freedom, a feeling of self - determination, opportunity for self - actualization, and a system of rewards for excellence.

William and Johansen (1985:147) believed that "without reward there is no incentive to maintain old skills or to acquire new ones."

Kasten (1984:500) stated that

previous research in faculty reward in colleges and universities has established relatively tight coupling between faculty work in research and institutionally dispensed rewards such as salary and promotion.

In relation to service, the author explained that

surveys of faculty have indicated that faculty consider service as having little impact on rewards; however, services related to administration such as department chairperson, dean or director of a research institute, are highly rewarded. (Kasten, 1984:501).

Research on the relationship between teaching and rewards, according to the same authors, has been inconclusive.

Newport (1985:11) advocated that the reward systems in education need to be refocused, since the reward system in most colleges and universities have been based on teaching, research and service. He emphasized that:

refocusing the reward system would result in teacher educators devoting time and energy to improve such things as teacher candidate selection procedures, program content, content organization, quality of instruction,

evaluation techniques, setting high standards, remediation, placement of students for field experiences, supervision given those in the field, procedures used to communicate graduate strengths and weaknesses to prospective employers, and building a professional relationship with public school personnel.

A reward system is important in any organization, especially in universities. It is a fact that an:

organization must reward employees because in return they are looking for certain kinds of behavior: they need competent individuals who agree to work with a high level of performance and loyalty. Individual employees, in exchange for their commitment, expect certain extrinsic rewards in the form of promotions, salary, fringe benefits, perquisites, bonuses, or stock options. Individuals also seek intrinsic rewards such as feeling of competence, achievement, responsibility, significance, influence, personal growth and meaningful contribution. (Beer and Others, 1984:113).

It has to be considered that the above affirmation is specifically related to the organization of businesses; however, what is important is that education systems administrators should be able to use what is valid to education and to leave out the ideas that do not apply to the administrative process of educational institutions.

Universities in third world societies need to think of adopting a reward system for excellence, as one of the ways to improve working conditions of their human resources.

Many studies of Brazilian higher education have

mentioned problems of university administration. Many suggestions for improvement have been offered; none of the reviewed articles, however, have mentioned the necessity for new leadership or the adoption of a reward system for excellence. Those seem to be forgotten topics.

SUMMARY

This chapter presented a review of the related literature.

It included demographic and economic information about the state of Ceara; the objectives of the state government related to some specific activities; and state development projects.

The importance of education for the development of societies with different economic systems and the role of the university in the process were demonstrated.

A brief history of the origin and evolution of the Brazilian federal system of universities was presented.

Information on the origin of the Federal University of Ceara (UFC), its objectives, functions, structure and organization, faculty, demographic data, its commitment to human resources development and to the quality of its teaching and research activities were summarized.

Special attention was given to the development of human resources as a factor in social development.

The need for change and innovation in education, as well as the contribution of Faculty Development, Instructional Development and Organizational Development as instruments to promote both processes were emphasized.

Competency and competency-based education were presented as being both requirements of modern society and means of improving the quality of education.

Different aspects of university administration were analyzed, with emphasis on the importance of departments as basic units of the administrative process, the need for effective leadership and a system of reward for excellence for faculty members.

CHAPTER III

METHODOLOGY AND PROCEDURES

INTRODUCTION

This study was done using a survey approach involving four undergraduate programs, sixteen departments, a total of 407 professors, three different Centers (Agriculture Sciences, Sciences, and Health Sciences) and one School (Education), on the campus of the Federal University of Ceara (UFC).

The broad research question to be answered was:

What information does the Federal University of Ceara require to guide it in establishing policies that will result in effective faculty development?

The more specific questions were:

1. How do faculty members' profiles of demographic and professional characteristics differ among the programs of Agriculture, Education, Geology, and Medicine at Federal University of Ceara?

2. Which of the curricula of Agriculture, Education, Geology, and Medicine are supported by a sufficient number of faculty and which are not?

3. What are the current levels of competency among the faculty responsible for the curricula in Agriculture, Education, Geology, and Medicine at the

Federal University of Ceara?.

4. What are the teaching, research, and skill levels of faculty members in Agriculture, Education, Geology, and Medicine at the Federal University of Ceara regarding teaching, research and service?

5. How did faculty acquire their professional skills?

6. Which professional skills currently possessed by faculty are being used to carry out their duties?

7. What mechanisms and/or activities are applied by department chairpersons to facilitate undergraduate faculty use of professional skills?

The literature reviewed to support this research was grouped in eleven major areas: (a) Development Plans for the State of Ceara, (b) Education and Social Development: The Role of the University, (c) The Brazilian Federal System of Universities, (d) The Federal University of Ceara, (e) Human Resources Development, (f) Educational Technology, (g) Faculty Development, (h) Instructional Development, (i) Organizational Development, (j) Competency and Competency-Based Education, and (k) Administration and Leadership in Higher Education.

This chapter deals with: (a) research questions to be answered, (b) research design, (c) research population and sample, (d) instruments used, and (e) procedures for collecting data and for analyzing collected data.

RESEARCH DESIGN

This research was designed to be a descriptive study of variables related to the training of human resources in four undergraduate programs at the UFC. The variables studied were the following:

1. Demographic and professional characteristics of faculty.
2. Needs of curriculum in terms of faculty support.
3. Faculty levels of competency in relation to curricula content.
4. Skills acquired and used by faculty in their duties at the UFC.
5. Mechanisms used to facilitate faculty's use of skills.

This study was intended to answer the one broad question and the seven specific ones, using two instruments: a questionnaire and an interview covering four undergraduate programs at UFC.

The idea of the study stemmed from the need of Human Resources Development Commission (CCRH) for more information on the process of faculty training at the UFC.

The major procedural stages which this study followed were:

1. Discussing the information needed with members of the CCRH.
2. Deciding on the primary research area and the main goals of the study.
3. Reviewing the relevant literature.
4. Designing the study, establishing major objectives, and research procedures.
5. Defining the population and selecting the sample.
6. Designing the research instruments.
7. Pre-testing and revising the research instruments and techniques.
8. Collecting data: giving questionnaires and interviewing the sample subjects.
9. Revising the objectives and research questions according to committee member suggestions.
10. Processing data, analysing the information using statistical procedures, and interpreting results.
11. Drawing conclusions and making recommendations.

RESEARCH POPULATION AND SAMPLE

The process of determining the population for this study consisted of a consultation with the Rector of the UFC and with the former Pro-Rector for Research and Graduate Studies, in order to ascertain which

undergraduate programs were considered the most important for the institution. Both indicated that there was no explicit priority determined by the university, but, since it is one of the "agencies" that trains specialized human resources for the Northeast Region of Brazil, it is clear that the areas which are considered the top priority for the State would also be the top priority for the university.

The Government Plan - Estado do Ceara - II PLAMEG 79/83 and the current plan Plano Estadual de Desenvolvimento - PLANED 1983/1987, considered the development of the following areas to be of primary importance in the State: Agriculture; Mining and Mineral Industry; and the Basic Social Program - Education, Health and Housing. These governmental plans explicitly count on the universities located in the State for help in the development of the State in scientific and technological fields as well as for the development of human resources.

Based on this information, the undergraduate programs of Agriculture, Education, Geology and Medicine were chosen as the main focus for the UFC, since they were directly related to the areas mentioned in the Government Plans.

The study population was comprised of all the professors in the undergraduate programs of Agriculture, Education, Geology, and Medicine, during the second semester of 1984, all chairpersons of departments offering

courses, activities and field experiments for those programs, and all the coordinators of the undergraduate programs being studied.

SAMPLING PROCEDURES

Because of the nature of the population, the element constants of this study were separated into non-overlapping groups, (different departments on campus), the stratified random sample procedure was chosen as the most appropriate for the case.

According to Mendenhall, Ott & Scheaffer (1971), the allocation of a stratified random sample is affected by three factors, which are (a) the total number of elements of each stratum, (b) the variability of observations within each stratum, and (c) the cost of obtaining an observation for each stratum. When there is an interest focused on a categorical variable with the objective to estimate P (proportion of the attribute of the categorical variable) and under an estimated error given by B , the size of the sample is obtained by the formula:

$$n = \frac{\sum_{i=1}^L \frac{N_i * P_i * (1-P)}{w_i}}{N^2 * D + \sum_{i=1}^L \frac{N_i * P_i * (1-P_i)}{d}}, \text{ with } D = B^2 / 4$$

where:

$w_i = (N_i/N)$ is the value of the stratum i ,
 P_i is the proportion of the attribute in the stratum i ,
 N_i is the size of the stratum i , within the population,
 N is the size of the population and
 n is the size of the sample.

In the planning process of this sample P_i was unknown, so it was used as basic assumption a constant cost per observation. Due to the fact that the cost is unknown, $P_i = 0.5$ was considered fair, since the variability is maximum when $P_i = (1-P_i) = 0.25$. In other words, an adverse situation would occur when $P_i = 1-P_i = 0.5$, and the use of such a factor does not create the risk of underestimating the size of the sample. Under these above assumptions, we have:

$$n = \frac{0.25 * N}{N * D + 0.25}, \text{ with } D = B^2/4$$

and,

$$n_i = n * \frac{N_i}{N}$$

where:

all n_i s are the size of the stratum.

This method for assignment of sample sizes to the strata is called proportional allocation because sample sizes $n_1, n_2, \dots, n_n$ are proportional to stratum size $N_1, N_2, \dots, N_n$.

With an error of estimation $B = 0.05$ we have:

$$D = \frac{B^2}{4} = \frac{(0.05)^2}{4} = 0.000625.$$

Applying the formula to the events of this study, we have:

$$n = \frac{0.25 * 407}{407 * 0.000625 + 0.25} = \frac{101.75}{0.504375} = 201.734 = 202$$

(202 = total sample).

. The sub-sample for the Agriculture undergraduate program is:

$$n_1 = 202 * \frac{106}{407} = 52.60 = 53.$$

. The sub-sample for the Education undergraduate program is:

$$n_2 = 202 * \frac{55}{407} = 27.29 = 27.$$

. The sub-sample for the Geology undergraduate program is:

$$n_3 = 202 * \frac{20}{407} = 9.92 = 10$$

. The sub-sample for the Medicine undergraduate program is:

$$n_4 = 202 * \frac{226}{407} = 112.16 = 112$$

Sample calculations for the departments in each

program are:

Undergraduate program of Agriculture:

. Department of Agricultural Economics:

$$n_i = 53 * \frac{6}{106} = 8$$

. Departments of Agricultural Engineering and Animal Sciences:

$$n_{ii} = 53 * \frac{18}{106} = 9$$

. Department of Food Sciences:

$$n_{iii} = 53 * \frac{17}{106} = 8.5 = 9$$

. Department of Plant Sciences:

$$n_{iv} = 53 * \frac{24}{106} = 12$$

. Department of Soil Sciences:

$$n_v = 53 * \frac{13}{106} = 6.5 = 7$$

Undergraduate Program of Education:

. Department of Foundations of Education:

$$n_i = 27 * \frac{22}{55} = 10.6 = 11$$

. Department of Specialized Studies in Education:

$$n_{ii} = 27 * \frac{14}{55} = 6.8 = 7$$

. Department of Teaching Theory and Practice:

$$n_{iii} = 27 * \frac{19}{55} = 9.3 = 10$$

Undergraduate Program of Geology:

. Department of Geology:

$$n = 10 * \frac{20}{20} = 10$$

Undergraduate Program of Medicine:

. Department of Clinical Medicine:

$$n_i = 112 * \frac{64}{226} = 31.7 = 32$$

. Department of Community Health:

$$n_{ii} = 112 * \frac{39}{226} = 19.3 = 19$$

. Department of Morphology :

$$n_{iii} = 112 * \frac{18}{226} = 8.9 = 9$$

. Department of Pathology and Legal Medicine:

$$n_{iv} = 112 * \frac{30}{226} = 14.8 = 15$$

. Department of Physiology and Pharmacology:

$$n_v = 112 * \frac{24}{226} = 11.8 = 12$$

. Department of Surgery :

$$n_{vj} = 112 * \frac{51}{226} = 25.2 = 25$$

After the determination of the sample of professors from each department, it was decided that the entire group of chairpersons and program coordinators would be surveyed through an interview in order to obtain data to answer research question number seven, i.e., mechanisms for facilitating faculty skills' use.

INSTRUMENTATION

Upon examination of the objectives and questions for this study it was clear that two different instruments were necessary to collect data: a questionnaire and an interview.

The questionnaire was chosen because it is an instrument that could be created and developed specifically to achieve the determined purposes of any study. In addition to this consideration, one of the most important in this case, a questionnaire can be administered to many people at the same time with no great difficulty. It is thus possible to reach several groups at a lower cost than with other instruments such as

interviews, tests and others. It is a more familiar instrument to most people than scales or tests; it is easier for subjects to respond to it because they have more time to think of the best answer for the question asked. In this way, it is possible to elicit the same type of information from each subject in the sample, which makes the process of tabulation, analysis and interpretation of data easier than data gathered through an interview.

The interview was considered important because, above all, it is flexible and adaptable to different situations with specific objectives. It allows the researcher to collect information and to elaborate on it or to go into greater depth in order to obtain more data and greater clarity. It provides an opportunity to collect data through direct verbal interaction as well as provide an immediate system of feedback which contributes to the validity of the data collected. Finally it is appropriate for use with small groups, which is the situation of this study with regards to the number of chairpersons and program coordinators.

Another step was to determine which research questions would be answered through the questionnaire and which ones would be covered by the interview.

At first, it was clear that research questions number one, two, three, four, five, and six would be covered by a questionnaire that would be organized into three parts.

The research questions to be answered by the data collected through the questionnaire were examined and from them a list of specific and restricted questions was drawn up to give a picture or framework of what was being sought in this study.

Research question number one asking for professional characteristics (professional profile) of faculty members working for the priority programs at UFC, would require that a part of the questionnaire deal with the demographic and academic formation data of the subjects.

Research questions number two and three which sought to determine the requirements of the curriculum (curriculum needs) in terms of professors able to fulfill those needs, and the level of competency of professors in each program also required a specific part of the instrument. This part was organized according to the list of disciplines related to the curriculum of each undergraduate program being studied, which was in the UFC computer.

The third part of the instrument was devised based on a study of the known and available literature, from which a model was adopted for each specific function of teaching, research and service. Following this format, it was established that a set of competencies or skills were necessary to put the model in practice. Those competencies were organized and logically presented according to the adopted model. This part of the questionnaire is related

to question four, five and six of the research, which purport to determine the professional skills of the faculty members, how they acquired them, and which one are being used to fulfill their duties within the university. At this point, all parts completed were incorporated in the first draft of the questionnaire.

The next step was to consult with two professors, one from the area of educational research and the other from the field of statistics, both from the School of Education of the UFC, to obtain their opinions on the instrument. With no major changes in the first draft, both professors suggested that the instrument was ready for a pretest. Working with a professor of statistics, it was decided that a pretest with ten subjects equivalent to those who would comprise the sample would be necessary to validate and ensure the reliability of the instrument.

Pretesting the Questionnaire

The pretest was administered randomly from the population of the study. Pretesting the questionnaire were twelve professors distributed as follows: five professors from the undergraduate program of Medicine, three from Education, two from Agriculture, and two from Geology.

The administration of the pretest marked the beginning of the data collection procedures. The subsequent steps

consisted of: (a) contact with the Pro-Rector for Research and Graduate Studies, requesting a letter of presentation of the researcher as a professor of the School of Education and as a member of the CCRH, to give to the deans of the Center of Sciences, of Agriculture Sciences, and of Health Sciences, in which the Pro - Rector requested cooperation for the study being done, (See Appendix E); (b) contact with the deans of the aforementioned Centers to ask them for a letter of presentation for the chairperson of each department included in the research, (See Appendix E); (c) contact with the chairpersons of the departments, to explain to them all the steps of that phase of the study (the pretest, questionnaires for a sample of professors in each department related to the four undergraduate programs already mentioned, and finally, an interview with the chairpersons and with the coordinators of each specific undergraduate program), and at the same time, to ask their help performing the planned task in their department.

A special situation was encountered in the Center of Health Sciences, where there was a regular meeting of the Dean with all chairpersons of departments and coordinators of programs offered by the Center set for the following day after the first contact with the Dean. He suggested and invited the researcher to participate in the final fifteen minutes of that meeting in order to be introduced to all persons who were members of the sample group, to explain about the study, and to ask for their cooperation. In

addition to this meeting, the Dean wrote a letter of presentation to each chairperson involved in the study.

Having previously randomly selected the professors in each department for the pretest, action was taken to identify each professor and to contact him/her for the application of the instrument.

In the Center of Health Sciences, and Center of Sciences, professors received and answered the questionnaires in the presence of the researcher. In the Center of Agricultural Sciences and in the School of Education, for the convenience of the sample professors, the questionnaires were given to the subjects and a time was set for having them returned, and for a brief discussion of them.

During the pretest process when contacting the selected professors, the researcher introduced herself, and explained the objective of the research and the purpose of the pretest. She then submitted the questionnaire, which had a front page consisting of a letter explaining the objectives of the study, describing how it would be conducted, and asking for their cooperation. (See Appendix E). Verbally, the researcher also asked each professor selected for the pretest to present comments, suggestions, or criticism that he/she thought would be important to improve the clarity, conciseness, and general format of the instrument.

Organizing the Final Format of the Questionnaire

When all the questionnaires were returned, the researcher conducted a brief interview with each professor, asking several questions: how he/she perceived the instrument; what were the major difficulties with the format, reading the questions, writing the answers, etc.; what suggestions he/she would like to offer; and whether he/she had any other comments.

With all the material in hand, the researcher studied the comments, critiques and suggestions presented (of which there were just a few), reviewed the instrument, made some changes, and then organized the final form of the questionnaire. The fourteen-page questionnaire was printed on sheets of 13" X 8 1/2" paper, which is the official legal size of paper in Brazil. The second part of the questionnaire, which varied from program to program, was color-coded by program to facilitate sorting the questionnaires and tabulating results. (See Appendix C).

Organizing the Interview

The process of organizing the interview was, in part, similar to the one used for administering the questionnaire. After having determined which research

questions had to be answered through an interview, a series of specific and narrower questions was established which would enable the gathering of data to answer the research question. (See Appendix D).

The next step was to consult with 3 professors of the School of Education, 2 from the areas of educational research, and one who specializes in the field of statistics, to be sure that those questions would, in fact, produce the data searched for, or in other words, support the validity and reliability of the instrument. After discussion about those questions, it was suggested that the researcher conduct an interview with a colleague to see how the colleague would feel answering the question, and how the researcher would feel doing the task. The suggestion was accepted and followed, after which everything was considered ready for the completion of the needed interviews.

DATA COLLECTION PROCEDURES

The procedures for collecting data through the questionnaire were exactly the same as those used for the pretest. The chairperson of each department was contacted to discuss the best and most rapid ways to administer the questionnaire to the subjects. The distribution of the

questionnaire to professors varied among departments on campus.

In the departments of Agricultural Economics, Foundations of Education, Specialized Studies in Education, Teaching Theory and Practice, the questionnaire was given to the sample subjects by the chairpersons during a regular meeting. The subjects were then asked to return the questionnaires to the chairperson's secretary within the timeframe indicated on the front page of the information letter. (See Appendix D). The researcher's function was only to remind those professors to answer the questionnaires, and then to return them by the deadline.

In the departments of Geology, Agricultural Engineering, Food Sciences, Plant Sciences, Soil Sciences, Physiology and Pharmacology, chairpersons received the questionnaires, distributed them to the professors by calling them into their offices, and explaining the nature of the research. The chairpersons asked the subjects to return the questionnaires by the date indicated in the cover letter. Again, the major function of the researcher was to remind professors who had not returned the instrument within the timeframe to answer it, and to bring it back to the chairperson's secretary's office.

The process of collecting data in the department of Morphology began with a meeting with the chairperson to discuss the best way to administer the questionnaire. He suggested that the most practical way would be to hold a

meeting with all the subjects of the sample and then to give the questionnaire. The researcher administered the questionnaire, gave some assistance in answering some questions and waited for the completed questionnaires. The meeting lasted one hour.

Finally, in the departments of Animal Sciences, Clinical Medicine, Pathology and Legal Medicine and Surgery, it was decided that the researcher was to stay in the department during working hours and contact each subject of the sample personally in order to explain to him/her the objective of the study, and then administer the questionnaire. This took a month and a half because not all professors are available in their departments every day. Many of them have no offices in the university. They go to the university to teach, without checking in at the secretarial office of the department, and then leave the campus. Consequently, it was necessary to look for professors in their offices, in hospitals, in classrooms (immediately before and after class meetings), and even in their homes. Some professors decided to take the questionnaires home to fill out. Others preferred to set a time for answering them with the assistance of the researcher in their offices or their homes. Some returned them to the chairperson's secretary; others decided to return them personally to the researcher; some returned them blank, and, in few cases, they were not returned at all.

Two-hundred-and-thirty-two questionnaires were distributed. This amounted to the number needed to produce a representative sample, plus an additional fifteen percent safety factor to guarantee a loss of not more than five percent of the sample due to non-returned or incomplete questionnaires. Of the 232 distributed, 196 were returned, representing approximately 97 percent of the desired sample of 202.

While data were being collected through questionnaires, the researcher set appointments to interview chairpersons and program coordinators. At a preliminary meeting, the respondent set a time for the interview. Before the questioning process, the interviewer set up the tape recorder, gave the interviewee a general idea of what the questions were about, gave him/her a copy of the guidelines for the interview, and permitted him/her some time for preparation to think of the best answers. Only when he/she felt ready to answer did the researcher begin to ask the questions and to record the answers. All interviews took place in the interviewees' office.

In the departments of Agricultural Economics and Physiology and Pharmacology, the chairperson had been changed in the previous week. In the Department of Agricultural Economics, it was decided that the current and the former chairperson would both be interviewed.

With regard to the program coordinators, contact and interviews were arranged in the same way as with the

chairpersons of departments. However, the coordinator of the undergraduate program of Agriculture refused to attend the interview, arguing that the questions presented had nothing to do with his functions as a program coordinator.

After all the questionnaires had been returned and the interviews completed, a letter was sent to all subjects thanking them for their cooperation. (See Appendix F).

The whole process of data collection lasted for approximately the three months of July, August and September of 1984.

ANALYSIS OF DATA

The following procedures were used to analyze the data collected.

For research question number one, percentages were calculated for each aspect of demographic and professional data collected. For data related to age, the number of years professors had worked at the university, and the number of credits taken during graduate studies, a mean and standard deviation was also calculated in order to facilitate the interpretation of the results.

Research question number two was analyzed from two different perspectives: (a) categories of courses belonging to each program curriculum, and (b) the number

of professors available to teach each course in each curriculum.

Categories were as follow: (a) Required (R) courses - officially required by the program to get a degree, (b) Elective (E) courses - officially part of the program as an option, and (c) Suggested as Elective (S/E) courses - all those suggested by professors for inclusion in the program. Some had already been taught, while others had not.

Regarding the number of professors available to teach courses in the four studied curricula, the following categories were used:

1. Curricula with no need for professors - Belonging to this group were all courses from each curriculum list which were chosen by professors from the three options presented in the questionnaire. The options were: (a) Teaching as a personal preference, (b) Teaching, but need time for preparation, and (c) Would teach only in an emergency. All subjects in this group had professors to teach them in a larger number than the number of the existing demand. In other words, if courses were chosen from the three options, but the demand for classes is larger than the number of faculty available to teach them, those courses were classified in another group.

2. Curricula with long-term (future) need for professors. In this group was included all subjects which were chosen from the two first options presented in the questionnaire,

which were: (a) Teaching as a personal preference, and (b) Teaching, but need time for preparation. Besides the above condition, courses were also included in this category if there were a larger number of professors to teach them than the demand for classes.

3. Curricula with medium range (near future) need for professors. This group is comprised of all courses chosen by professors only from the first option presented in the questionnaire: (teaching as a personal preference). All those courses chosen from the first and third options presented, (teaching as a personal preference, and would teach only in an emergency). In both cases, curricula must have a larger number of professors who choose to teach them than the demand for classes.

4. Curricula with short range (immediate) need for professors. In this category was included the following: (a) all courses with a higher demand for classes than the number of professors available to teach them. (b) All courses chosen only as second option (teaching, but need time for preparation. (c) All courses chosen only as a third choice (would teach only in an emergency). (d) All courses chosen from the second and third option simultaneously. (e) All courses that were not chosen at all by any professor.

These different categories were analyzed based on the percentage of the whole curriculum that they represented.

Answers to research question number three were based

on a classification of the different professors' perceptions of their own competency in a subject in relation to different courses in the program. The categories created are:

1. Level one - professors who perceived themselves as having a high level of content, knowledge and skills, and are willing and ready to teach a specific courses;
2. Level two - professors who perceived themselves as having sufficient knowledge and skills, and are interested in teaching a specific courses, but need time for preparation;
3. Level three - professors who perceived themselves as having limited knowledge and skills, with little interest in teaching a specific curriculum, but would teach in case of an emergency.

The analysis was based on the number of professors choosing a given discipline in relation to the number of required (R) and elective (E) curricula offered.

Analyses of research questions four and six were based on the percentage of answers related to each skill, for each department in the different programs. The mean and standard deviation were calculated for each skill. All the statistical means were arranged in rank order to produce the following categories :

1. High Level - skills being mastered (question four) or used (question six) by more than 70 percent of the faculty.

2. Medium Level - skills being mastered (question four) or used (question six) by a range of 30 to 70 percent of faculty.

3. Low Level - skills being mastered (question four) or used (question six) by less than 30 percent of faculty.

The questionnaire presented 25 skills related to teaching. Thirty-one were concerned with research and six with service. The skills were numbered in order of presentation, and later classified as follows:

Teaching process :

1. Skills numbered from 1 to 10 related to the planning (P) stage;
2. Skills numbered from 11 to 21 related to the interaction phase (IP) or performance of teaching;
3. Skills numbered from 22 to 25 related to the evaluation (Ev) process in teaching;

Further classification in the research process was as following:

1. Skills numbered from 1 to 16 related to the planning (P) stage;
2. Skills numbered from 17 to 20 related to bureaucratic (B) tasks ;
3. Skills numbered from 21 to 31 related to the performing (PP) phase.

Research questions number five was based on the percentage of persons possessing each skill in each department. The statistical mean and standard deviation

were calculated for each program for the different ways (professional practice, special studies and graduate studies) presented as possible forms of learning those skills. The statistical means were classified in rank order to permit a comparison of the results and to discover what methods were most used to learn those skills.

Data to answer research question number seven were collected through interviews, and examined through the use of a content analysis technique. Categories were created to classify each different mechanism being used in the studied departments of the UFC. Those categories were:

1. Types of mechanisms : (a) Formal - required by (i) departments, (ii) center, and (iii) university administration; (b) Informal - related to (i) academic life, and (ii) social life.
2. Frequency of mechanism : (a) Permanent, and (b) Temporary.
3. Number of people involved in the realization of activities: (a) Individual, and (b) Group.
4. Time frame of mechanisms in departments: (a) On going - being in practice now, and (b) suggested as future activities.

Mechanisms were grouped according to their common characteristics. Percentages for the frequency of all responses were calculated and both frequency and percentages were quoted at the end of the statement

related to each mechanism.

RULES FOR INTERPRETATION OF DATA

For research question one, in all tables, unanswered questions (zero) were not considered for the calculation of the mean and standard deviation. The percentage, by department, was calculated based on the total sample. The total for the programs was based on the number of professors with a Master's degree.

For research question two, all curricula that were not officially part of the program, but had been suggested by a faculty member as one that he/she would like to teach, were considered as suggested elective (S/E) disciplines. All calculation related to question two were done based on the total number of disciplines in the curriculum of each program.

For research question three the professors' answers on courses categorized as R (required) or as E (elective) were considered. The level four category is represented as the complementary percentage of levels one, two and three.

For research questions number four and six an unanswered question (zero) related to each skill was considered for the calculation of the mean and standard deviation.

SUMMARY

This survey study was done to answer one broad question and seven specific ones relating to the training of human resources in four undergraduate programs at the Federal University of Ceara

The population studied was comprised of professors, chairpersons of departments, and program coordinators.

A stratified random sample was considered appropriate for the type of population being studied.

Two instruments were used in this study: (a) a questionnaire, and (b) an interview. The questionnaire was composed based on the literature available on the topics, and from consultation with some research specialists. It was then pretested and reorganized to the final format for its use. The interview was organized according to questions generated by the author. They were then submitted to three research specialists to support validity and reliability. As a training exercise, the researcher and a professor of the School of Education, participated in a sample interview before it was used in this study. Questionnaires were given to the subjects in the departments where they work, and were collected a week later. Interviews took place in the offices of the interviewees.

Data generated from the responses to the questionnaires and interviews were categorized, statistically analyzed, and some of them were compared for content similarities.

The results are presented in the next chapter.

CHAPTER IV

ANALYSIS AND DISCUSSION OF RESULTS

INTRODUCTION

This chapter presents an analysis and discussion of the data collected, with findings that are fundamental to answering both the broad and the more specific research questions of the study.

**The main question answered by this study is:
What information does the Federal University of Ceara require to guide it in establishing policies that will result in effective faculty development?**

The more specific questions are:

- 1. How do faculty member profiles of demographic and professional characteristics differ among the programs of Agriculture, Education, Geology, and Medicine at Federal University of Ceara?**
- 2. Which of the curricula of Agriculture, Education, Geology, and Medicine are supported by sufficient members of faculty and which are not ?**
- 3. What are the current levels of competency among faculty responsible for the curricula in Agriculture, Education, Geology, and Medicine at Federal University of Ceara?**
- 4. What are the teaching, research, and service skill levels of faculty member in Agriculture, Education,**

Geology, and Medicine at Federal University of Ceara?

4. What are the teaching, research, and service skill levels of faculty member in Agriculture, Education, Geology, and Medicine at Federal University of Ceara?

5. How did faculty acquire their professional skills?

6. Which professional skills currently possessed by faculty are being used to carry out their duties?

7. What mechanisms and/or activities are applied by Department chairpersons to facilitate faculty use of their professional skills?

Results are presented from the data collected in order to answer each question above.

DATA COLLECTION

Data were collected through a questionnaire for professors, and an interview for chairpersons of Departments and Program coordinators.

Of the 232 questionnaires sent 196 were returned, representing about 97 percent of the total sample of 202.

Interviews were conducted with all sixteen chairpersons and the three program coordinators. The Agriculture Program Coordinator refused to respond to the interview explaining that topics covered by the questioning process were not related to his functions.

STUDY'S POPULATION

The population for this study was comprised of 407 professors working in the undergraduate programs of Agriculture (106), Education (55), Geology (20), and Medicine (226), and the chairpersons of all Departments responsible for the curricula of those programs; and all program coordinators.

RESEARCH QUESTION NUMBER ONE DIFFERENCES IN FACULTY DEMOGRAPHIC AND PROFESSIONAL CHARACTERISTICS IN THE AGRICULTURE, EDUCATION, GEOLOGY, AND MEDICINE PROGRAMS

The sampled subjects were asked to answer several questions about their demographic and professional backgrounds, Such as: (a) demographic - data and place of birth, and nationality; (b) professional - contractual status, number of hours worked per week at the UFC; professional levels; Center or School and Department with which professors were affiliated; the number of years at the university; and current activities outside of UFC. Inquiries were also made about their formal education: undergraduate, graduate and special studies; focusing on their fields of study, and/or areas of specialization; the institution where they studied; year of completion and length of the programs: time or credits.

The percentages of response frequencies and, in some cases, the means and standard deviations, were calculated for each question.

Since the undergraduate Geology curriculum is offered by only one Department, the frequencies of answers in that program do not reflect an average of the Department, but the overall data of that Department.

Professors working in the undergraduate programs of Agriculture, Education, Geology and Medicine ranged in age from 28 to 73 years old. In the Agriculture program the range was from 32 to 65 years. In Education the ages ranged from 32 to 61. In Geology, the variation was from 34 to 50 and in Medicine it was from 28 to 73 years of age. The highest mean age was 46, in the Education program; the lowest was 41.2, in the Geology program. The standard deviation shows that the largest variation was in the program of Medicine ($SD.=10.6$) and the smallest was in the program of Geology, ($SD.=5.6$). At least one professor in each area failed to respond to the age question. The non-responses were not considered in the calculation of the means and standard deviations. See Table 1.

TABLE 1
AGE PROFILE OF FACULTY MEMBERS OF
UNDERGRADUATE PROGRAMS

AGE X	AGRICULTURE		EDUCATION		GEOLOGY		MEDICINE	
	f.	%	f	%	f	%	f	%
28	-	-	-	-	-	-	01	0.9
29	-	-	-	-	-	-	01	0.9
30	-	-	-	-	-	-	04	3.8
31	-	-	-	-	-	-	03	2.8
32	01	1.9	-	-	-	-	04	3.8
33	01	1.9	-	-	-	-	04	3.8
34	02	3.8	02	6.8	02	20.0	06	5.7
35	-	-	-	-	-	-	06	5.7
36	02	3.8	-	-	-	-	04	3.8
37	-	-	-	-	01	10.0	02	1.9
38	03	5.7	01	3.4	01	10.0	03	2.8
39	01	1.9	-	-	-	-	02	1.9
40	04	7.6	03	10.3	-	-	01	0.9
41	-	-	01	3.4	-	-	03	2.8
42	05	9.6	02	6.8	-	-	01	0.9
43	02	3.8	-	-	01	10.0	01	0.9
44	06	11.5	-	-	-	-	04	3.8
45	03	5.7	05	17.2	03	30.0	03	2.8
46	01	1.9	01	3.4	-	-	04	3.8
47	03	5.7	02	6.8	-	-	01	0.9
48	04	7.6	02	6.8	-	-	05	4.7
49	03	5.7	-	-	-	-	04	3.8
50	01	1.9	01	3.4	01	10.0	03	2.8
51	01	1.9	02	6.8	-	-	01	0.9
52	-	-	-	-	-	-	03	2.8
53	04	7.6	-	-	-	-	02	1.9
54	-	-	02	6.8	-	-	04	3.8
55	-	-	01	3.4	-	-	01	0.9
56	01	1.9	01	3.4	-	-	05	4.7
57	-	-	-	-	-	-	01	0.9
58	01	1.9	-	-	-	-	02	1.9
59	-	-	-	-	-	-	02	1.9
61	-	-	01	3.4	-	-	01	0.9
63	-	-	-	-	-	-	01	0.9
65	01	1.9	-	-	-	-	01	0.9
66	-	-	-	-	-	-	02	1.9
69	-	-	-	-	-	-	01	0.9
73	-	-	-	-	-	-	01	0.9
N/Ind*	02	3.8	02	6.8	01	10.0	07	6.6
Total	52	99.0	29	98.9	10	100.0	105	98.6
X		44.6		46.0		41.2		44.3
SD.		6.6		6.6		5.6		10.6

* Not indicated

Table 2 shows the length of time faculty members from the four undergraduate programs have been teaching at UFC. Faculty members in the Agriculture program ranged from 2 to 42 years of employment; in Education the range was from 2 to 22 years; in Geology, the range was from 2 to 21 years; and in Medicine, from 1 to 36 years.

The highest mean of 15.2 years was found in the Agriculture program, and the lowest was 9.2 years in the Geology program. The largest difference is in Medicine group ($SD = 9.4$) and the least dispersion was found in Education ($SD = 5.9$).

It is interesting to note that there was one professor who reportedly had been teaching for 40 years. According to the Brazilian Labor Law a male professor can be retired after 30 years of work, or compulsorily at the age of 70.

A large majority of the faculty in the four undergraduate programs examined was Brazilian. Among the 196 sampled subjects, only one was a Portuguese native and another of Pakistani origin. Four professors did not answer the question. See Table 3.

TABLE 2
NUMBER OF YEARS WORKED AT UFC BY
PROFESSORS OF UNDERGRADUATE PROGRAMS

YEARS WORKED X	AGRICULTURE		EDUCATION		GEOLOGY		MEDICINE	
	f	%	f	%	f	%	f	%
01	-	-	-	-	-	-	06	5.7
02	01	1.9	03	10.3	01	10.0	07	6.6
03	02	3.8	-	-	-	-	-	-
04	-	-	01	3.4	03	30.0	04	3.8
05	02	3.8	02	6.8	-	-	09	8.5
06	04	7.6	02	6.8	-	-	06	5.7
07	03	5.7	01	3.4	01	10.0	03	2.8
08	03	5.7	01	3.4	-	-	01	0.9
09	03	5.7	-	-	01	10.0	02	1.9
10	02	3.8	-	-	-	-	04	3.8
11	02	3.8	04	13.7	01	10.0	02	1.9
12	01	1.9	04	13.7	01	10.0	06	5.7
13	-	-	01	3.4	-	-	-	-
14	-	-	-	-	-	-	01	0.9
15	01	1.9	01	3.4	-	-	04	3.8
17	-	-	02	6.8	-	-	03	2.8
18	07	13.4	03	10.3	01	10.0	02	1.9
19	07	13.4	-	-	-	-	02	1.9
20	02	3.8	02	6.8	-	-	05	4.7
21	02	3.8	-	-	01	10.0	06	5.7
22	02	3.8	01	3.4	-	-	02	1.9
23	01	1.9	-	-	-	-	01	0.9
24	-	-	-	-	-	-	09	8.5
25	02	3.8	-	-	-	-	04	3.8
26	01	1.9	-	-	-	-	01	0.9
27	01	1.9	-	-	-	-	02	1.9
28	01	1.9	-	-	-	-	01	0.9
29	-	-	-	-	-	-	02	1.9
31	01	1.9	-	-	-	-	03	2.8
33	-	-	-	-	-	-	01	0.9
36	-	-	-	-	-	-	01	0.9
42	01	1.9	-	-	-	-	-	-
N/Ind.*	-	-	01	3.4	-	-	05	4.7
Total	52	99.0	29	99.0	10	100.0	105	99.0
X		15.2		11.3		9.2		14.3
SD.		8.3		5.9		6.3		9.4

* Not indicated.

TABLE 3
FACULTYS' CITIZENSHIP

NATION	AGRICULTURE		EDUCATION		GEOLOGY		MEDICINE	
	f	%	f	%	f	%	f	%
Brazil	49	94.2	29	100.0	10	100.0	102	97.1
Pakistan	01	1.9	-	-	-	-	-	-
Portugal	-	-	-	-	-	-	01	0.9
N/Ind.*	02	3.8	-	-	-	-	02	1.9
Total	52	99.9	29	100.0	10	100.0	105	99.9

* Not indicated.

The undergraduate Medical program included the largest number of professors from different states in Brazil and from other countries. It was followed by Education, Geology and Agriculture. In 3 out of the 4 programs studied, several professors failed to respond to this question. Table 3 indicates that only 2 professors were not Brazilian citizens. In Table 4, it can be seen that some professors were born in Canada, Portugal, and Peru, which may indicate they are already naturalized Brazilians, or they were born there while their parents were studying abroad.

In the programs studied, the rank of the largest number of professors was assistant professor (42 percent), followed by associate professors (36 percent). Instructors represent 15 percent, and full professors represented the smallest rank category with 6 percent. Three subjects did not indicate the category they belong to. See Table 5.

One-hundred-sixty-one professors or 82 percent of the

PLACE OF BIRTH	AGRICULTURE		EDUCATION		GEOLOGY		MEDICINE	
	f	%	f	%	f	%	f	%
. Amazonas	01	1.9	-	-	-	-	01	0.9
. Alagoas	-	-	-	-	02	20.0	01	0.9
. Bahia	-	-	-	-	-	-	01	0.9
. Ceara	45	86.5	19	65.5	03	30.0	81	77.1
. Cariao- Alijo/Port.-	-	-	-	-	-	-	01	0.9
. Malveiras /Portugal	-	-	-	-	01	10.0	-	-
. Maranhao	01	1.9	-	-	01	10.0	04	3.8
. Minas Gerais	-	-	-	-	-	-	01	0.9
. Montreal/ Canada	-	-	01	3.4	-	-	-	-
. Para	-	-	02	6.8	-	-	-	-
. Paraiba	-	-	-	-	01	10.0	02	1.9
. Pernambuco	-	-	01	3.4	-	-	-	-
. Peru	-	-	-	-	-	-	01	0.9
. Piaui	02	3.8	-	-	-	-	02	1.9
. Rio de/ Janeiro	01	1.9	01	3.4	01	10.0	05	4.7
. Rio G./ Norte	-	-	-	-	-	-	01	0.9
. Rio G./ Sul	-	-	01	3.4	01	10.0	-	-
. Santa Catarina	-	-	01	3.4	-	-	-	-
. N/Ind.*	02	3.8	03	10.3	-	-	04	3.8
Total	52	99.8	29	99.6	10	100.0	105	99.5

* Not indicated.

TABLE 5
FACULTY PROFESSIONAL LEVELS

PROFESSIONAL LEVEL	AGRICULTURE		EDUCATION		GEOLOGY		MEDICINE	
	f	%	f	%	f	%	f	%
Instructor	12	23.0	01	3.4	03	30.0	13	12.4
Assistant Professor	34	65.3	14	48.2	02	20.0	33	31.4
Associate Professor	05	9.6	10	34.4	04	40.0	51	48.5
Professor	01	1.9	02	6.8	01	10.0	07	6.6
N/Ind.*	-	-	02	6.8	-	-	01	0.9
Total	52	99.8	29	99.6	10	100.0	105	99.8

* Not indicated.

Only 34 professors or 17 percent of faculty members were under contract according to the old system (quadro). Only one subject did not indicate his/her contractual status. See table 6.

TABLE 6
FACULTY CONTRACTUAL STATUS

CONTRACTUAL STATUS	AGRICULTURE		EDUCATION		GEOLOGY		MEDICINE	
	f	%	f	%	f	%	f	%
Old System (quadro)	09	17.3	-	-	-	-	25	23.8
New System (Brazilian Labor Law)	43	82.6	29	100.0	10	100.0	79	75.2
N/Ind.*	-	-	-	-	-	-	01	0.9
Total	52	99.9	29	100.0	10	100.0	105	99.9

* Not indicated.

Ninety-four professors, or 50 percent, worked 40 hours per week under a special contract of exclusive

dedication+(ED). Exclusive dedication (ED) means they cannot engage in any activities such as teaching, consultation, administration, etc., outside of UFC. Twenty-two percent of the faculty work 40 hours per week without the exclusive dedication regimen; and 24 percent of the faculty have appointments of 20 hours per week. Table 7 shows that the programs with the largest number of professors working 40 hours a week were Education and Geology, followed by Agriculture. Medicine had the largest number of faculty with the least number of working hours.

TABLE 7
HOURS WORKED PER WEEK BY PROFESSORS AT UFC

HOURS WORKED PER WEEK	AGRICULTURE		EDUCATION		GEOLOGY		MEDICINE	
	f	%	f	%	f	%	f	%
20 hours	04	7.6	-	-	-	-	43	40.9
40 hours	04	7.6	15	51.7	01	10.0	34	32.3
40 hours+ED	44	84.6	14	48.2	09	90.0	27	25.7
N/Ind *	-	-	-	-	-	-	01	0.9
Total	52	99.8	29	99.9	10	100.0	105	99.8

* Not indicated.

In the Agriculture program, 86 percent of the faculty did not have any outside employment, while, 13 percent had some kind of activity in addition to working at UFC. Among the faculty in the Education program, 51 percent had outside employment; however all of the other employment was related to education. Three professors, or 10 percent, did not respond as to whether or not they worked outside

the UFC. In Geology 100 percent of the professors had no other professional activities besides those at the UFC. In Medicine, 47 percent of the professors did not indicate whether they engaged in other activities outside the UFC, 49 percent of professors had employment related to health care (hospitals and/or clinics), and 4 percent taught in institutions other than the UFC. See Table 8.

Formal Education

In the Agriculture program, 100 percent of the professors have a BA or BS degree (See Table 9). It was found that in the programs of Education and Geology, some professors have more than one degree at this level. In the Medicine program, (in Brazil there is a BS program in Medicine) 99 percent have the same degree. One professor did not indicate his/her degree at that level, however, he/she must have a BA or BS degree, since a BA or a BS degree is the minimum requirement to teach at the third cycle or superior level under the Brazilian Educational Law.

The highest percentage of professors attaining the MA or MS level, was from Agriculture, followed by Education. The lowest percentage was from Medicine.

At the doctoral level, again, the highest percentage of completion of doctorate degrees is found in Agriculture, followed by Education. The lowest percentage is also in Medicine.

TABLE 8
ACTIVITIES PERFORMED BY FACULTY OUTSIDE UFC

ACTIVITIES OUTSIDE UFC.	AGRICULTURE		EDUCATION		GEOLOGY		MEDICINE	
	f	%	f	%	f	%	f	%
.Teaching	02	3.8	12	41.3	-	-	04	3.8
.Consultation for private organization	03	5.7	-	-	-	-	-	-
.Consultation for Government Agencies	02	3.8	-	-	-	-	-	-
.Adminis- tration	-	-	01	3.4	-	-	-	-
.School Supervision	-	-	01	3.4	-	-	-	-
.Project Coordination	-	-	01	3.4	-	-	-	-
.Hospital Activities	-	-	-	-	-	-	38	36.1
.Private Clinics	-	-	-	-	-	-	14	13.3
.None	45	86.5	11	37.9	10	100.0	-	-
.N/Ind.+	-	-	03	10.3	-	-	50	47.6
Total	52	99.8	29	99.7	10	100.0	106	100.8*

* Professors with more than one activity.

+ Not indicated.

The category "Special Studies I" represents the courses of graduate studies - lato sensu - aperfeicoamento and /or especializacao. The number of professors pursuing those courses was 60 percent from Agriculture; 93 percent

from Education; 40 percent from Geology; and 24 percent from Medicine.

Special Studies II is the category that includes the medical internship experience. More than half of the Medical faculty (53 percent) had that experience.

Special Studies III is the Livre Docencia level. Only one professor, or 2 percent, from the Agriculture faculty holds that title, while 9 professors or 4 percent, from the faculty of Medicine hold that title.

Post-doctorate studies included in category Special Studies IV were the privilege of 2 professors, one percent, from the Medicine faculty.

All professors (100 percent) working in the undergraduate program of Agriculture have a BA or BS degree. The highest percentage of professors having a MA or MS degree is found in the Department of Agricultural Economics and Animal Sciences (100 percent) followed by the Departments of Agricultural Engineering (87 percent) and Food and Soil Sciences (83 percent). The lowest percentage belongs to the Department of Plant Sciences (78 percent).

TABLE 9
FORMAL EDUCATION OF FACULTY MEMBERS WORKING
IN FOUR UNDERGRADUATE PROGRAMS AT UFC

LEVELS OF FORMAL EDUCATION	AGRICULTURE		EDUCATION		GEOLOGY		MEDICINE	
	f	%	f	%	f	%	f	%
BA or BS	52	100.0	33	113.7*	11	110.0*	104	99.0
MA or MS	46	88.4	24	82.7	06	60.0	25	12.7
Ph.D	22	42.3	09	31.0	02	20.0	07	3.5
Special/ Studies								
I	31	59.6	27	93.1	04	40.0	47	23.9
II	-	-	-	-	-	-	105	100.0
III	01	1.9	-	-	-	-	09	4.5
IV	-	-	-	-	-	-	02	1.0
N/Ind.+	-	-	-	-	-	-	01	0.5

* Professors with more than one degree.

+ Not indicated.

All Departments have faculty members pursuing Ph.D degrees. Listed from the highest to the lowest, the percentages were: the Soil Science Department (67 percent), the Agricultural Economics Department (62 percent), the Plant Sciences Department (43 percent), the Agricultural Engineering and the Food Sciences Departments (33 percent) and the Animal Sciences Department (22 percent).

Professors from all Departments have taken courses of Aperfeiçoamento and/or Especialização. (Graduate Studies). The highest percentage of those having taken such courses is found in the Department of Animal Sciences (100 percent) followed by the Departments of Agricultural Economics (87 percent) and Food Sciences (83 percent). The

lowest percentage is found in Agricultural Engineering and Soil Sciences, with the second lowest found in Plant Sciences. Only one professor from the Department of Plant Sciences pursues the title of Livre Docente. See Table 10.

All faculty members in the Education program have a BA or BS degree (Table 11). Some of them have more than one undergraduate degree. The Department of Foundations of Education had the lowest percentage of professors holding a MA or MS degree, no one pursuing a doctorate degree, and the lowest percentage of members pursuing special studies (Aperfeiçoamento and/or Especialização).

In the Department of Specialized Studies in Education 100 percent of the faculty members held BA or BS degrees, while pursuing MA or MS and Ph.D degrees as well, and Special Studies I certificates.

In the Department of Teaching Theory and Practice more than 100 percent held a BA or BS degrees and Special Studies I certificates. This indicates that several professors have more than one degree and certificates in studies at those levels. Eighty three percent of professors have a MA or MS degree and one professor has a Ph.D.

TABLE 10
FORMAL EDUCATION OF FACULTY MEMBERS WORKING
IN THE AGRICULTURE PROGRAM.

LEVELS	DEPARTMENTS*												TOTAL	
	AGRI. ECO.		AGRI. ENG.		ANIM. SCS.		FOOD SCS.		PLAN. SCS.		SOIL SCS.			
	f	%	f	%	f	%	f	%	f	%	f	%		
BA or BS	08	100.0	09	100.0	09	100.0	06	100.0	14	100.0	06	100.0	52	100.0
MA or MS	08	100.0	08	88.8	09	100.0	05	83.3	11	78.5	05	83.3	46	88.4
Ph.D	06	62.5	03	33.3	02	22.2	02	33.3	06	42.8	04	66.6	22	42.3
Special Studies														
I	07	87.5	03	33.3	09	100.0	05	83.3	05	35.7	02	33.3	31	59.6
III	-	-	-	-	-	-	-	-	01	7.1	-	-	01	1.9

*** See Appendix A.**

TABLE 11
FORMAL EDUCATION OF FACULTY MEMBERS WORKING
IN THE EDUCATION PROGRAM

LEVELS OF FORMAL EDUCATION	FOUNDATION OF EDUCATION		DEPARTMENTS+ SPECIAL STUDIES IN ED.		TEACHING THEORY & PRACTICE		TOTAL	
	f	%	f	%	f	%	f	%
BA or BS	12	100.0	08	100.0	13	108.3*	33	113.7
MA or MS	06	66.6	08	100.0	10	83.3	24	82.7
Ph.D	-	-	08	100.0	01	8.3	09	31.0
Special/ Studies.I	03	25.0	08	100.0	16	133.3	27	93.1

+ See Appendix A.

* Professors with more than one degree.

All professors in the Geology program hold a BA or BS degrees; and one professor holds 2 degrees at this level. Sixty percent of the faculty possess MA or MS degrees, 20 percent have a doctoral degree, and 40 percent pursue Special Studies I (Aperfeiçoamento and/or Especializacão) certificates. See Table 12.

TABLE 12
FORMAL EDUCATION OF FACULTY MEMBERS WORKING
IN THE GEOLOGY PROGRAM

LEVELS OF FORMAL EDUCATION	GEOLOGY	
	f	%
BA or BS	11	110.0*
MA or MS	06	60.0
Ph.D	02	20.0
Special Studies I	04	40.0

* Professors with more than one degree.

Table 13 shows levels of formal education among the faculty working in the Medicine program. In 5 out of 6 Departments 100 percent of the professors hold BA or BS degrees. In the Department of Surgery, 99 percent have one of the aforementioned degrees. One professor did not indicate any degree at that level. However he/she had to have a degree at this level as it is a legal requirement to practice Medicine and teach at the university.

The highest percentage of those holding MA or MS degrees is found in the Department of Physiology and Pharmacology (60 percent), followed by the Department of Pathology and Legal Medicine (43 percent), and Morphology (9 percent). The lowest percentage was seen in the Department of Surgery (8 percent).

Four Departments have faculty holding Ph.Ds: one professor in the Clinical Medicine Department (3 percent), one in the Morphology Department (10 percent), 2 at the Pathology and Legal Medicine Department (14 percent), and 3 at the Physiology and Pharmacology Department (30 percent). In the category "Special Studies I" (Aperfeiçoamento and/or Especialização) the highest percentage of completion was found in the Department of Community Health (94 percent), followed by the Department of Morphology (82 percent), and Pathology and Legal Medicine (78 percent). The Department of Surgery was not

TABLE 13
FORMAL EDUCATION OF PROFESSORS WORKING IN THE MEDICINE PROGRAM

LEVELS	DEPARTMENTS#												TOTAL	
	CLIN. MED.		COMM. HEALT.		MORPH.		PATH. LEG. MED.		PHYS. PHAR.		SURG.			
	f	x	f	x	f	x	f	x	f	x	f	x	f	x
BA/BS	30	100.0	16	100.0	11	100.0	14	100.0	10	100.0	23	95.8	104	99.0
MA/MS	06	20.0	04	25.0	01	9.0	06	42.8	06	60.0	02	8.3	25	12.7
Ph.D	01	3.3	-	-	01	9.0	02	14.2	03	30.0	-	-	07	3.5
Special Studies														
I	04	13.3	15	93.7	09	81.8	11	78.5	08	80.0	-	-	47	23.9
II	42	140.0*	10	62.5	-	-	06	42.8	01	10.0	46	191.6*	106	53.5
III	02	6.6	02	12.5	-	-	02	14.2	-	-	03	12.5	09	4.5
IV	-	-	-	-	-	-	-	-	02	20.0	-	-	02	1.0
N/Ind+	-	-	-	-	-	-	-	-	-	-	01	4.1	01	0.5

See Appendix A.

* Professors with more than one internship.

+ Not indicated.

represented in this category.

The category of Special Studies II, which represents medical internships, has its highest percentage of participants from the Department of Surgery (192 percent), which is explained by the fact that members of that group have had more than one internship. A similar result is found in the Department of Clinical Medicine from which 140 percent have had medical internship experience. The lowest percentage of participation was found in the Department of Physiology and Pharmacology (10 percent), followed by the Department of Community Health (62 percent). Faculty members from the Department of Morphology reported none or did not indicate any experience in this category.

Special Studies III shows the number of professors holding the title of Livre Docente. The highest percentage of participation here is in the Department of Pathology and Legal Medicine (14 percent), followed by the Department of Surgery (12 percent). None of the professors from the Department of Morphology and Physiology and Pharmacology were pursuing this title.

Only 2 professors from the Department of Physiology and Pharmacology had pursued post-doctoral studies (category: Special Studies IV).

Formal Education: Undergraduate Studies

All calculations in the tables for this question were done based on the total number of professors in each department, not only based on the number of answers presented in each column.

The undergraduate program in Agriculture's faculty have gotten degrees in the following fields: Agriculture (82 percent), Veterinary Medicine (6 percent), Pharmacology (4 percent), Economics and Chemical Engineering, and Forestry Engineering, 2 percent each. The Department of Food Sciences showed the largest variety of professionals from different fields of study. The Department of Agricultural Engineering and Soil Sciences have professionals with backgrounds in the area of Agriculture only. See Table 14.

Professors working in the undergraduate program of Agriculture did their undergraduate studies in eight different institutions in Brazil (Table 15). Greater than three - fourths of them, or 79 percent, studied at the Center of Agriculture Sciences at the UFC. Six percent studied at the School of Veterinarian Medicine at Ceara State University, 4 percent studied at the Center of Health Sciences at UFC, and at the Federal University of Pernambuco. These data indicate that the majority of the professors in Agriculture had similar experiences during their undergraduate studies, since they were trained at

TABLE 14
FIELDS OF STUDY AMONG FACULTY MEMBERS IN THE AGRICULTURE PROGRAM

FIELDS OF STUDY	DEPARTMENTS*										TOTAL	
	AGRI. ECO. f	AGRI. ECO. %	AGRI. ENG. f	AGRI. ENG. %	ANIM. SCS. f	ANIM. SCS. %	FOOD SCS. f	FOOD SCS. %	PLAN. SCS. f	PLAN. SCS. %	SOIL SCS. f	SOIL SCS. %
Agriculture	07 87.5	09 100.0	06 66.6	02 33.3	13 92.5	06 100.0	43 82.6					
Economics	01 12.5	-	-	-	-	-	01 1.9					
Veterinary												
Medicine	-	-	03 33.3	-	-	-	03 5.7					
Chemical												
Engineering	-	-	-	01 16.6	-	-	01 1.9					
Industrial												
Chemistry	-	-	-	01 16.6	-	-	01 1.9					
Pharmacology	-	-	-	02 33.3	-	-	02 3.8					
Forestry	-	-	-	-	01 7.1	-	01 1.9					
Total	08 100.0	09 100.0	09 99.9	06 99.9	14 99.9	06 100.0	52 99.7					

* See Appendix A.

TABLE 16
INSTITUTIONS AT WHICH AGRICULTURE FACULTY MEMBERS
EARNED THEIR UNDERGRADUATE DEGREES

INSTITU- TIONS*	AGRI. ECO.		AGRI. ENG.		ANIM. SCS.		FOOD SCS.		PLAN. SCS.		SOIL SCS.		TOTAL	
	f	x	f	x	f	x	f	x	f	x	f	x	f	x
UFC-CAS	06	75.0	09	100.0	05	55.5	02	33.3	13	92.8	06	100.0	41	78.8
(C-B)	01	12.5	-	-	-	-	-	-	-	-	-	-	01	1.9
WPAU (P)	01	12.5	-	-	-	-	-	-	-	-	-	-	-	-
UFC-SEBAC	01	12.5	-	-	-	-	-	-	-	-	-	-	01	1.9
(C-B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUPb	-	-	-	-	01	11.1	-	-	-	-	-	-	01	1.9
(Pb-B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UFC-CHS	-	-	-	-	-	-	02	33.3	-	-	-	-	02	3.8
(C-B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UFC-CT	-	-	-	-	-	-	01	16.6	-	-	-	-	01	1.9
(C-B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FUPr.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(Pr.-B)	-	-	-	-	-	-	01	16.6	01	7.1	-	-	02	3.8
CSU-SVM	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(C-B)	-	-	-	-	03	33.3	-	-	-	-	-	-	03	5.7
Total	08	100.0	09	100.0	09	99.9	06	99.8	14	99.9	06	100.0	52	99.7

* See Appendix B.

* See Appendix A.

the UFC.

Faculty in the Agriculture program completed their undergraduate studies during a 36-year time span from 1942 to 1978. The year with the most graduates was 1966 (15 percent), followed by 1965 (11 percent), and 1963 (10 percent). During 1967 and 1968, 8 percent completed degrees. Each of the other years was represented by only 6 percent or less of the total number of graduates. See Table 16.

Professors working in the Education undergraduate program graduated in the following areas: Education (a majority of 68 percent) and Philosophy (15 percent). All other areas indicated (Mathematics, Languages, Biology, Public Administration, Political Economics, Theology and Economics), contributed, each, only 3 percent of the total number of professionals. See Table 17.

Forty percent of the professors from the Education program did their undergraduate studies at the School of Education - UFC. Twenty-three percent studied at Ceara State University, but did not indicate the specific school or programs. Eleven percent studied at Ceara State University - in the Department of Education. This information demonstrates that more than 75 percent of these professors did their undergraduate studies in the same State and city, although in different universities. All other institutions combined prepared only 3 percent of the professionals in the group. Two professors did not

TABLE 16
GRADUATION YEARS FOR FACULTY MEMBERS IN THE AGRICULTURE
PROGRAM

YEAR OF COMPLE- TION	AGRI. ECO.		AGRI. ENG.		ANIM. SCS.		FOOD SCS.		PLAN. SCS.		SOIL SCS.		TOTAL	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
1942	-	-	01	11.1	-	-	-	-	-	-	-	-	01	1.9
1950	-	-	-	-	-	-	01	16.6	-	-	-	-	01	1.9
1954	-	-	-	-	-	-	01	16.6	-	-	-	-	01	1.9
1956	-	-	-	-	01	11.1	-	-	01	7.1	-	-	02	3.8
1958	-	-	-	-	-	-	-	-	01	7.1	-	-	01	1.9
1959	-	-	-	-	-	-	01	16.6	01	7.1	-	-	02	3.8
1960	-	-	-	-	01	11.1	01	16.6	-	-	-	-	02	3.8
1962	01	12.5	-	-	-	-	-	-	02	14.2	-	-	03	5.7
1963	-	-	02	22.2	01	11.1	-	-	01	7.1	01	16.6	05	9.6
1965	-	-	01	11.1	-	-	-	-	03	21.4	02	33.3	06	11.5
1966	02	25.0	01	11.1	-	-	-	-	03	21.4	02	33.3	08	15.3
1967	-	-	-	-	04	44.4	-	-	-	-	-	-	04	7.6
1968	01	12.5	01	11.1	01	11.1	-	-	01	7.1	-	-	04	7.6
1969	01	12.5	-	-	-	-	-	-	-	-	-	-	01	1.9
1970	01	12.5	01	11.1	-	-	01	16.6	-	-	-	-	03	5.7
1971	-	-	-	-	-	-	-	-	-	-	01	16.6	01	1.9
1972	-	-	-	-	-	-	-	-	01	7.1	-	-	01	1.9
1973	-	-	01	11.1	-	-	-	-	-	-	-	-	01	1.9
1974	-	-	-	-	01	11.1	01	16.6	-	-	-	-	02	3.8
1975	-	-	01	11.1	-	-	-	-	-	-	-	-	01	1.9
1976	01	12.5	-	-	-	-	-	-	-	-	-	-	01	1.9
1978	01	12.5	-	-	-	-	-	-	-	-	-	-	01	1.9
Total	08	100.0	09	99.9	09	99.9	06	99.8	14	99.9	06	99.8	52	99.1

* See Appendix A.

TABLE 17
FIELD OF STUDY AMONG FACULTY MEMBERS IN THE
EDUCATION PROGRAM

FIELD OF STUDY	FOUNDATION OF EDUCATION		DEPARTMENTS+ SPECIAL STUDIES IN EDUC.		TEACHING THEORY & PRACTICE		TOTAL	
	f	%	f	%	f	%	f	%
Education	06	50.0	07	87.5	10	76.9	23	67.6
Mathematics	01	8.3	-	-	-	-	01	2.8
Languages	01	8.3	-	-	-	-	01	2.8
Biology	01	8.3	-	-	-	-	01	2.8
Philosophy	02	16.6	01	12.5	02	15.3	05	14.2
Public Adminis- tration	01	8.3	-	-	-	-	01	2.8
Political Economics	-	-	01	12.5	-	-	01	2.8
Theology	-	-	01	12.5	-	-	01	2.8
Economics	-	-	-	-	01	7.6	01	2.8
Total	12	99.8	10	125.0*	13	99.8	35	99.5

+ See Appendix A.

* Professors with more than one degree

indicate where they had studied. See Table 18.

This faculty group completed their undergraduate studies in the years from 1959 to 1976. The year 1971 saw the most graduates (14 percent) followed by 1969 with 11 percent. 1963 and 1970 each saw 9 percent of the professors completing their degrees. In the years of 1960, 1966, 1967 and 1976, 2 professors each year completed their degrees. In each of the other years only one professor completed his/her degree. Three faculty members did not indicate their year of completion of the program.

TABLE 18
INSTITUTIONS AT WHICH EDUCATION FACULTY
MEMBERS EARNED THEIR UNDERGRADUATE
DEGREES

INSTITUTIONS+	FOUNDATION OF EDUCATION		DEPARTMENTS**				TOTAL	
			SPECIAL STUDIES IN EDUC.		TEACHING THEORY & PRACTICE			
			f	%	f	%		
UFC/FACED (C/B)	07	58.3	02	25.0	05	38.4	14	40.0
FURJ (RJ/B)	01	8.3	-	-	-	-	01	2.8
CSU (C/B)	02	16.6	-	-	06	46.1	08	22.8
CSU-FAPICE (C/B)	-	-	04	50.0	-	-	04	11.4
SUU (RJ/B)	-	-	01	12.5	-	-	01	2.8
ICP (P/F)	-	-	01	12.5	-	-	01	2.8
STSP (SP/B)	-	-	01	12.5	-	-	01	2.8
UP XIII (P/F)	-	-	01	12.5	-	-	01	2.8
CUP-SPS&L (Pe./B)	-	-	-	-	01	7.6	01	2.8
UFC-SBA (C/B)	-	-	-	-	01	7.6	01	2.8
N/Ind.#	02	16.6	-	-	-	-	02	5.7
Total	12	99.8	10	125.0*	13	99.7	35	99.5

+ See Appendix B.

* Professors with more than one degree.

Not indicated.

** See Appendix A.

As far as individual departments are concerned, professors in the Department of Foundations of Education finished their undergraduate studies more recently than the others.

The Department of Teaching Theory and Practice has the faculty graduating in the largest range of years - 12. As a group they completed their degrees mainly in the 1960's and beginning of the 1970's. See Table 19.

Ninety percent of the professors in the program of

Geology are geologists. Ten percent were licensed to teach Geological Sciences. Ten percent are mathematicians. Notice that one faculty member holds Bachelor's degrees in 2 fields. See Table 20.

The UFC is the institution with the highest number of professors who are also alumni (4). Three professors completed their studies at the Federal University of Pernambuco and only one professor each studied at the 4 other institutions. See Table 21.

TABLE 19
GRADUATION YEARS FOR FACULTY MEMBERS IN THE
EDUCATION PROGRAM

YEAR OF COMPLE- TION	FOUNDATION OF EDUCATION		DEPARTMENTS# SPECIAL STUDIES IN EDUC.		TEACHING THEORY & PRACTICE		TOTAL	
	f	%	f	%	f	%	f	%
1959	-	-	-	-	01	7.6	01	2.8
1960	-	-	01	12.5	01	7.6	02	5.7
1962	-	-	-	-	01	7.6	01	2.8
1963	-	-	03	37.5	-	-	03	8.5
1964	-	-	-	-	01	7.6	01	2.8
1965	-	-	-	-	01	7.6	01	2.8
1966	01	8.3	01	12.5	-	-	02	5.7
1967	01	8.3	-	-	01	7.6	02	5.7
1968	-	-	-	-	01	7.6	01	2.8
1969	02	16.6	02	25.0	-	-	04	11.4
1970	-	-	-	-	03	23.0	03	8.5
1971	01	8.3	01	12.5	03	23.0	05	14.2
1972	01	8.3	01	12.5	-	-	02	5.7
1974	01	8.3	-	-	-	-	01	2.8
1975	01	8.3	-	-	-	-	01	2.8
1976	02	16.6	-	-	-	-	02	5.7
N/Ind.+	02	16.6	01	12.5	-	-	03	8.5
Total	12	99.6	10	125.0*	13	99.2	35	99.2

See Appendix A.

* Professors with more than one degree.

+ Not indicated.

TABLE 20
FIELD OF STUDY AMONG FACULTY MEMBERS IN
THE GEOLOGY PROGRAM.

FIELD OF STUDY	GEOLOGY	
	f	%
Geology	09	90.0
Licence in Geological Sciences	01	10.0
Mathematics	01	10.0
Total	11	110.0*

* Professors with more than one degree.

TABLE 21
INSTITUTIONS AT WHICH GEOLOGY FACULTY
EARNED THEIR UNDERGRADUATE DEGREES

INSTITUTIONS+	GEOLOGY	
	f	%
UFC (C/B)	04	40.0
FUPe (Pe/B)	03	30.0
FURJ (RJ/B)	01	10.0
FURGS (RGS/B)	01	10.0
UNIFOR (C/B)	01	10.0
CUL (L/P)	01	10.0
Total	11	110.0*

+See Appendix B.

* Professors with more than one degree

The years in which this group completed their BA or BS degrees ranged from 1962 to 1980. The greatest number of professors finished in the years 1974 and 1980. All other years had one professor graduating . See Table 22.

TABLE 22
GRADUATION YEARS FOR FACULTY MEMBERS IN THE
GEOLOGY PROGRAM

YEAR OF COMPLETION	GEOLOGY	
	f	%
1962	01	10.0
1965	01	10.0
1966	01	10.0
1967	01	10.0
1971	01	10.0
1973	01	10.0
1974	02	20.0
1977	01	10.0
1980	02	20.0
Total		11 110.0*

* Professors with more than one degree.

Ninety percent of faculty in the Medicine program hold degrees in Medicine (Table 23) . Of these, 4 percent have a background in Pharmacology and Biochemistry, and about 2 percent of the professors are Doctors of Veterinary Medicine. Other professionals come from areas of Dentistry, Pharmacology and Clinical Analysis, and Statistics. One professor did not indicate his/her background.

One-hundred percent of the professors in the Department of Clinical Medicine have degrees in Medicine. The Departments of Physiology and Pharmacology, and Pathology and Legal Medicine have a larger variety of professionals from different fields.

TABLE 23
FIELD OF STUDY AMONG FACULTY MEMBERS IN THE MEDICINE
PROGRAM

FIELD OF STUDY	CLIN. MED. f	x	COMM. HEALT. f	x	MORPH. f	x	DEPARTMENTS+				PHYS. PHAR. f	x	SURG. f	x	TOTAL f	x
							PATH. LEG.MED.	f	x	f						
Medicine	30	100.0	16	93.7	10	90.9	12	85.7	05	50.0	23	95.8	95	90.4		
Dentistry	-	-	-	-	01	9.0	-	-	-	-	-	-	01	0.9		
Pharm.& Biochem.	-	-	-	-	-	-	01	7.1	03	30.0	-	-	04	3.8		
Pharm.& Clinical	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Analys.	-	-	-	-	-	-	-	-	01	10.0	-	-	01	0.9		
Veterin.	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Medic.	-	-	-	-	-	-	01	7.1	01	10.0	-	-	02	1.9		
Statist.	-	-	01	6.2	-	-	-	-	-	-	-	-	01	0.9		
N/Ind.*	-	-	-	-	-	-	-	-	-	-	01	4.1	01	0.9		
Total	30	100.0	16	99.9	11	99.9	14	99.9	10	100.0	24	99.9	105	99.7		

+ See Appendix A.

* Not indicated.

Table 24 shows that 77 percent of the professors from the Medicine program did their undergraduate studies in the UFC Center of Health Sciences, 5 percent at the Federal University of Rio de Janeiro, and 4 percent at the Federal University of Pernambuco. The Department of Community Health includes professors who studied at a greater variety of institutions. The Departments of Morphology, and Pathology and Legal Medicine, have faculty from only 3 different institutions. Two professors did not respond to this question.

Professors from the undergraduate Medical program completed their bachelors' degrees in a range of years spanning from 1934 to 1982. Only one professor finished his/her studies in 1934. Less than 5 percent graduated in the 1940's; around 22 percent graduate in the 1950's; 28 percent finished during the 1960's; and the largest concentration of graduates, about 35 percent completed their degrees in the 1970's. Only 6 percent graduated in the 1980's. Two professors did not indicate when they had completed their studies.

The Department of Pathology and Legal Medicine shows the largest range from 1934 to 1982. The smallest range is found in the Department of Physiology and Pharmacology. See. Table 25.

TABLE 24
INSTITUTIONS AT WHICH MEDICINE FACULTY MEMBERS EARNED THEIR
UNDERGRADUATE DEGREES

INSTITU- TIONS*	DEPARTMENTS**													
	CLIN. MED.		COMM. HEALT.		MORPH.		PATH. LEG.MED.		PHYS. PHAR.		SURG.		TOTAL	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
UFC-CBS														
(C-B)	25	83.3	09	56.2	08	72.7	12	85.7	08	80.0	19	79.1	81	77.1
SMSRJ														
(RJ-B)	01	3.2	-	-	-	-	-	-	-	-	-	-	01	0.9
FURJ														
(RJ-B)	03	10.0	-	-	-	-	01	7.1	-	-	01	4.1	05	4.7
FUBa														
(Ba-B)	01	3.2	02	12.5	-	-	-	-	-	-	-	-	03	2.8
UFC-CS														
(C-B)	-	-	01	6.2	-	-	-	-	-	-	-	-	01	0.9
VSMRJ														
(RJ-B)	-	-	01	6.2	-	-	-	-	-	-	-	-	01	0.9
FSM(RJ-B)	-	-	01	6.2	-	-	-	-	-	-	-	-	01	0.9
UG(RJ-B)	-	-	01	6.2	-	-	-	-	-	-	-	-	01	0.9
FUPe														
(Pe-B)	-	-	01	6.2	01	9.0	-	-	01	10.0	01	4.1	04	3.8
SM & S														
(RJ-B)	-	-	-	-	01	9.0	-	-	-	-	02	8.3	03	2.8
CSU-SVM														
(C-B)	-	-	-	-	-	-	01	7.1	01	10.0	-	-	02	1.9
N/Ind.+	-	-	-	-	01	9.0	-	-	-	-	01	4.1	02	1.9
Total	30	99.7	16	99.7	11	99.7	14	99.9	10	100.0	24	99.7	105	99.5

* See Appendix B.

** See Appendix A.

+ Not indicated.

TABLE 25
GRADUATION YEARS FOR FACULTY MEMBERS IN THE MEDICINE PROGRAM

YEAR OF COMPLE- TION	CLIN. MED.		COMM. HEALT.		MORPH.		DEPARTMENTS+ PATH. LEG.MED.		PHYS. PHAR.		SURG.		TOTAL	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
1934	-	-	-	-	-	-	01	7.1	-	-	-	-	01	0.9
1940	-	-	-	-	-	-	-	-	-	-	01	4.1	01	0.9
1941	-	-	01	6.2	-	-	-	-	-	-	-	-	01	0.9
1946	-	-	01	6.2	-	-	-	-	-	-	01	4.1	02	1.9
1947	-	-	-	-	01	9.0	-	-	-	-	-	-	01	0.9
1951	-	-	01	6.2	-	-	-	-	-	-	-	-	01	0.9
1952	02	6.6	01	6.2	-	-	-	-	-	-	-	-	03	2.8
1953	01	3.3	-	-	-	-	-	-	01	10.0	-	-	02	1.9
1954	01	3.3	-	-	01	9.0	-	-	-	-	02	8.3	04	3.8
1955	-	-	-	-	-	-	-	-	-	-	01	4.1	01	0.9
1956	-	-	01	6.2	02	18.1	01	7.1	-	-	02	8.3	06	5.7
1957	01	3.3	-	-	-	-	-	-	-	-	-	-	01	0.9
1958	03	10.0	-	-	-	-	-	-	-	-	01	4.1	04	3.8
1959	01	3.3	01	6.2	-	-	-	-	-	-	-	-	02	1.9
1961	-	-	01	6.2	-	-	01	7.1	01	10.0	03	12.5	06	5.7
1962	03	10.0	01	6.2	-	-	-	-	-	-	01	4.1	05	4.7
1963	02	6.6	01	6.2	-	-	-	-	-	-	-	-	03	2.8
1964	01	3.3	-	-	-	-	-	-	-	-	-	-	01	0.9
1965	03	10.0	-	-	-	-	-	-	-	-	01	4.1	04	3.8
1966	01	3.3	-	-	-	-	01	7.1	01	10.0	-	-	03	2.8
1967	-	-	-	-	01	9.0	-	-	-	-	-	-	01	0.9
1968	-	-	-	-	-	-	01	7.1	01	10.0	01	4.1	03	2.8
1969	-	-	01	6.2	-	-	-	-	01	10.0	02	8.3	04	3.8
1970	02	6.6	01	6.2	-	-	-	-	-	-	-	-	03	2.8
1971	01	3.3	-	-	-	-	-	-	-	-	01	4.1	02	1.9
1972	01	3.3	-	-	02	18.1	02	14.2	-	-	01	4.1	06	5.7
1973	-	-	-	-	-	-	01	7.1	01	10.0	-	-	02	1.9
1974	-	-	-	-	-	-	-	-	-	-	01	4.1	01	0.9
1975	02	6.6	-	-	-	-	02	14.2	-	-	01	4.1	05	4.7
1976	02	6.6	03	18.7	-	-	-	-	01	10.0	01	4.1	07	6.6
1977	-	-	02	12.5	01	9.0	01	7.1	-	-	01	4.1	05	4.7
1978	01	3.3	-	-	-	-	-	-	02	20.0	01	4.1	04	3.8
1979	-	-	-	-	-	-	02	14.2	-	-	-	-	02	1.9
1980	-	-	-	-	02	18.1	-	-	-	-	-	-	02	1.9
1981	02	6.6	-	-	-	-	-	-	-	-	-	-	02	1.9
1982	-	-	-	-	01	9.0	01	7.1	-	-	-	-	02	1.9
N/Ind.*	-	-	-	-	-	-	-	-	01	10.0	01	4.1	02	1.9
Total	30	99.3	16	99.4	11	99.3	14	99.4	10	100.0	24	98.9	105	98.8

+ See Appendix A.

* Not indicated.

Formal Education - Graduate Level: Master's Program

To facilitate the analysis of the data concerned with fields of study, very specific areas of specialization were grouped into broader fields.

Faculty in Agriculture had studied and been specialized in 18 different areas during their master's programs. The highest concentration falls in the area of Agricultural Economics (15 percent), and Animal Sciences (15 percent). Water Sciences Engineering was a field of Specialization for 11 percent of the professors. About 9 percent specialized in Plant Sciences, and 6 percent each in Soil Sciences (Physics, Chemistry, and Fertility), and Plant Sciences (Genetic Breeding in Plants). None of the other areas of specialization accounted for more than 5 percent of the professors.

The calculation of percentages was done from the total sample of subjects in each Department, and not only those who have gotten an BA or BS degree. See Table 26.

The Agriculture faculty earned their master's degrees at eighteen different institutions from five different countries. Sixty percent studied at Brazilian universities located in five states. More than 30 percent studied at five American Universities located in different states. Others have studied in Chile, Mexico and Pakistan.

TABLE 26
MASTERS' PROGRAM AREA OF SPECIALIZATION FOR
THE AGRICULTURE PROGRAMS FACULTY

AREAS OF SPECIAL- IZATION	DEPARTMENTS*							
	AGRIC. ECON.		AGRIC. ENG.		ANIMAL SCS.		TOTAL	
	f	%	f	%	f	%	f	%
Agricultural Economics	07	87.5	-	-	-	-	07	15.2
Rural Extension	01	12.5	-	-	-	-	01	2.1
Water Sciences Engineering	-	-	05	55.5	-	-	05	10.8
Agricultural Engineering	-	-	02	22.2	-	-	02	4.3
Agrometer- ology	-	-	01	11.1	-	-	01	2.1
Animal Sciences	-	-	-	-	02	22.2	02	4.3
Animal Nutrition	-	-	-	-	07	77.7	07	15.2
Total	08	100.0	08	88.8	09	99.9		
	FOOD SCS.		PLANT SCS.		SOIL SCS.		TOTAL	
	f	%	f	%	f	%	f	%
Food Engineer- ing	02	33.3	-	-	-	-	02	4.3
Microbiology/ Immunology	02	33.3	-	-	-	-	02	4.3
Dairy/Food Sciences	01	16.6	-	-	-	-	01	2.1
Genetics Breeding	-	-	03	21.4	-	-	03	6.5
Plant Sciences Seed	-	-	04	28.5	-	-	04	8.6
Technology	-	-	02	14.2	-	-	02	4.3
Horticulture	-	-	02	14.2	-	-	02	4.3
Soil Sciences	-	-	-	-	03	50.0	03	6.5
Soil Genesis/ Morphology	-	-	-	-	01	16.6	01	2.1
Soil Nutrition	-	-	-	-	01	16.6	01	2.1
Total	05	83.2	11	78.3	05	83.2	46	99.1

* See Appendix A.

The Department of Agriculture Engineering and Animal Sciences were tied for the highest number of faculty completing Special Studies I programs. The lowest level of Special Studies I completion was found in the Department of Plant and Soil Sciences. See Table 27.

Table 28 shows that from 1961 to 1983, professors from the different Departments in the Agriculture program have been enrolled in studies leading to the Master's degree. The 1970's was the decade in which most of the professors completed their Master's degrees. This figure indicates that professors who had their degree during the 1960's and early '70's may need benefit from postgraduate courses intended to update their academic backgrounds, if they haven't already done so.

The number of credits in master's programs which professors of Agriculture have earned ranges from 24 to 110. Twenty-one persons did not indicate the number of credits required or taken in their academic programs.

Considering only those who did indicate the amount of credits taken, the mean of 38.3 appears to be an adequate number of semester credit hours for a master's program. The standard deviation shows that the variation among those programs is very large.

TABLE 27
INSTITUTIONS WHERE FACULTY'S MEMBERS OF THE AGRICULTURE
PROGRAM EARNED THEIR MASTER'S DEGREES

INSTITU- TIONS*	DEPARTMENTS**														TOTAL	
	AGRI. ECO.		AGRI. ENG.		ANIM. SCS.		FOOD SCS.		PLANT SCS.		SOIL SCS.					
	f	%	f	%	f	%	f	%	f	%	f	%	f	%		
WPAU(P)	01	12.5	-	-	-	-	-	-	-	-	-	-	01	2.1		
CSU(C-USA)	01	12.5	-	-	-	-	-	-	-	-	-	-	01	2.1		
UFC-SBA (C-B)	01	12.5	-	-	-	-	-	-	-	-	-	-	01	2.1		
USP-ESALQ (SP-B)	01	12.5	01	11.1	01	11.1	-	-	03	21.4	02	33.3	08	17.3		
FUV (MG-B)	03	37.5	-	-	02	22.1	-	-	02	14.2	01	16.6	08	17.3		
UWM(W-(USA)	01	12.5	-	-	-	-	-	-	-	-	-	-	01	2.1		
FURGS-IHR (RGS-B)	-	-	01	11.1	-	-	-	-	-	-	01	16.6	02	4.3		
FUSH (RGS-B)	-	-	01	11.1	01	11.1	-	-	-	-	-	-	02	4.3		
NSA (M)	-	-	01	11.1	-	-	-	-	-	-	-	-	01	2.1		
UFC-CAS (C-B)	-	-	01	11.1	02	22.2	-	-	-	-	-	-	03	6.5		
UCD (C-USA)	-	-	01	11.1	-	-	01	16.6	-	-	-	-	02	4.3		
UAT (A-USA)	-	-	02	22.2	01	11.1	01	16.6	05	35.7	01	16.6	10	21.7		
UC (C)	-	-	-	-	01	11.1	-	-	-	-	-	-	01	2.1		
FUNG-SVM (MG-B)	-	-	-	-	01	11.1	-	-	-	-	-	-	01	2.1		
CSU (SP-B)	-	-	-	-	-	-	01	16.6	-	-	-	-	01	2.1		
USP (SP-B)	-	-	-	-	-	-	01	16.6	-	-	-	-	01	2.1		
FURJ (RJ-B)	-	-	-	-	-	-	01	16.6	-	-	-	-	01	2.1		
MSUS (M-USA)	-	-	-	-	-	-	-	-	01	7.1	-	-	01	2.1		
Total	08	100.0	08	88.8	09	99.8	05	83.0	11	78.4	05	83.1	46	98.8		

* See Appendix B.

** See Appendix A.

TABLE 28
YEARS OF COMPLETION OF MASTER DEGREE FOR THE AGRICULTURE
PROGRAM FACULTY

YEAR OF COMPLE- TION	AGRI. ECO.		AGRI. ENG.		ANIM. SCS.		FOOD SCS.		PLAN. SCS.		SOIL SCS.		TOTAL	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%
1961	-	-	-	-	-	-	01	16.6	-	-	-	-	01	2.1
1966	-	-	01	11.1	01	11.1	-	-	-	-	-	-	02	4.3
1968	-	-	-	-	-	-	-	-	02	14.2	-	-	02	4.3
1969	-	-	-	-	01	11.1	-	-	02	14.2	-	-	03	6.5
1970	04	50.0	-	-	-	-	01	16.6	03	21.4	03	50.0	11	23.9
1971	-	-	01	11.1	-	-	-	-	01	7.1	-	-	02	4.3
1972	01	12.5	-	-	02	22.2	01	16.6	01	7.1	01	16.6	06	13.4
1973	02	25.0	02	22.2	01	11.1	-	-	-	-	-	-	05	10.8
1974	-	-	01	11.1	-	-	-	-	-	-	-	-	01	2.1
1976	-	-	-	-	-	-	-	-	02	14.2	01	16.6	03	6.5
1977	-	-	-	-	02	22.2	-	-	-	-	-	-	02	4.3
1978	-	-	01	11.1	01	11.1	01	16.6	-	-	-	-	03	6.5
1980	01	12.5	01	11.1	-	-	-	-	-	-	-	-	02	4.3
1982	-	-	-	-	-	-	01	16.6	-	-	-	-	01	2.1
1983	-	-	01	11.1	01	11.1	-	-	-	-	-	-	02	4.3
Total	08	100.0	08	88.8	09	99.9	05	83.0	11	78.2	05	83.2	46	99.7

* See Appendix A.

The highest mean (49.5) credits was found in the Department of Agriculture Engineering, due to the fact that one member took 58 credits and another took 110 toward their Master's degrees. The lowest mean (28.5) found in the Department of Agricultural Economics. This was largely a consequence of having a large number of professors who failed to indicate how many credits they had taken toward their master's programs. See Table 29.

Examining the Agriculture program as a whole, and focusing on the coursework done by the professors to obtain their Masters' degrees, there was as noticeable representation of a large variety of academic backgrounds, but there was not a large number of professors in any single area of specialization. In terms of institutions where the studies were done, there was a relatively large variation, since only one Department had more than 20 percent of its members graduated from the same university. There was no large concentration in one specific year of completion of those studies. However, in the years of 1970, 1972, and 1973, the largest number of professors had finished their Masters's programs.

TABLE 29
NUMBER OF CREDITS TAKEN BY AGRICULTURE PROGRAM FACULTY DURING
THEIR MASTER'S STUDIES

CREDITS	DEPARTMENTS+															
	AGRI. ECO.		AGRI ENG.		ANIM. SCS.		FOOD SCS.		PLAN. SCS.		SOIL SCS.		TOTAL			
	f	x	f	x	f	x	f	x	f	x	f	x	f	x		
24	01	12.5	-	-	-	-	-	-	01	7.1	-	-	02	4.3		
27	-	-	-	-	01	11.1	-	-	-	-	-	-	01	2.1		
30	03	37.5	01	11.1	01	11.1	01	16.6	01	7.1	01	16.6	08	17.3		
32	-	-	-	-	01	11.1	-	-	-	-	-	-	01	2.1		
33	-	-	01	11.1	-	-	-	-	-	-	01	16.6	02	4.3		
35	-	-	-	-	-	-	01	16.6	-	-	-	-	01	2.1		
36	-	-	01	11.1	-	-	-	-	-	-	-	-	01	2.1		
37	-	-	-	-	-	-	-	-	01	7.1	-	-	01	2.1		
40	-	-	01	11.1	-	-	-	-	-	-	-	-	01	2.1		
41	-	-	-	-	01	11.1	-	-	-	-	-	-	01	2.1		
42	-	-	-	-	-	-	-	-	01	7.1	-	-	01	2.1		
48	-	-	01	11.1	01	11.1	-	-	-	-	-	-	02	4.3		
50	-	-	01	11.1	-	-	-	-	-	-	-	-	01	2.1		
58	-	-	-	-	01	11.1	-	-	-	-	-	-	01	2.1		
110	-	-	01	11.1	-	-	-	-	-	-	-	-	01	2.1		
N/Ind.*04	50.0	01	11.1	03	33.3	03	50.0	07	50.0	03	50.0	21	45.6			
Total	08	100.0	08	88.8	09	99.9	06	83.2	11	78.4	06	83.2	46	98.9		
Mean		28.5		49.5		39.3		32.5		33.2		31.5		38.3		
SD		3.0		27.6		11.9		3.5		7.8		2.1		17.1		

+ See Appendix A.

* Not indicated.

There was a large difference in the number of credits taken for Master's degrees. The mean may be considered low in some programs (less than 30 credits) and high for ones with more than 48 credits.

Professors working in Education completed Masters degrees in 15 different areas of specialization. The highest level of completion was in Education, in general, with no specification, and in Teaching, followed by Curricula and Instruction. Counseling and Guidance is the third major area of specialization. All other areas had only one professor obtaining his/her degree in that area. See Table 30.

Faculty members from the Education program took their master's degrees from 16 institutions in 3 different countries. The largest number were taken at Brazilian universities, followed by American universities.

The professors of the Department of Foundations of Education had studied in 6 different institutions, 2 professors from the Department of Specialized Studies in Education had graduated from the same institution, and 4 members of the Department of Teaching Theory and Practice had completed their studies at the same institution. See Table 31.

TABLE 30
MASTERS' PROGRAM AREAS OF SPECIALIZATION
FOR EDUCATION PROGRAM FACULTY

AREA OF SPECIAL- IZATION	FOUNDAT. OF EDUCAT.		DEPARTMENTS*				TOTAL	
	f	%	f	%	f	%	f	%
Education	03	33.3	01	12.5	-	-	04	16.6
School								
Adminis- tration	01	11.1	-	-	-	-	01	4.1
Educational								
Planning	01	11.1	-	-	-	-	01	4.1
Rural								
Sociology	01	11.1	-	-	-	-	01	4.1
Educational								
Psychology	-	-	01	12.5	-	-	01	4.1
Curriculum/ Instruction	-	-	03	37.5	-	-	03	12.5
Curriculum/ Planning	-	-	01	12.5	-	-	01	4.1
Philosophy/ Psychology	-	-	01	12.5	-	-	01	4.1
Teacher of								
Social								
Studies	-	-	01	12.5	-	-	01	4.1
Teaching	-	-	-	-	04	33.3	04	16.6
Research/ Planning	-	-	-	-	01	8.3	01	4.1
Economics								
of Education	-	-	-	-	01	8.3	01	4.1
Counseling & Guidance	-	-	-	-	02	16.6	02	8.3
Educational								
Administration & Supervision	-	-	-	-	01	8.3	01	4.1
Theory of								
Economics	-	-	-	-	01	8.3	01	4.1
Total	06	66.6	08	100.0	10	83.1	24	99.1

* See Appendix A.

TABLE 31
INSTITUTIONS WHERE FACULTY MEMBERS OF THE
EDUCATION PROGRAM EARNED THEIR MASTER'S DEGREE

INSTITUTION*	DEPARTMENTS**							
	FOUNDATION OF EDUCATION		SPECIAL STUDIES IN EDUC.		TEACHING THEORY & PRACTICE		TOTAL	
	f	%	f	%	f	%	f	%
CSU (C/USA)	01	11.1	-	-	-	-	01	4.1
FSU (F/USA)	01	11.1	-	-	-	-	01	4.1
ISUN (F/USA)	01	11.1	01	12.5	-	-	02	8.2
USP-ESALQ (SP/B)	01	11.1	-	-	-	-	01	4.1
UFC-FACED (C/B)	01	11.1	-	-	04	33.3	05	20.8
PUC (RJ/B)	01	11.1	-	-	01	8.3	02	8.3
UWM (W/USA)	-	-	02	25.0	-	-	02	8.3
SDSC (W/USA)	-	-	01	12.5	-	-	01	4.1
CICM (Q/C)	-	-	01	12.5	-	-	01	4.1
FUSM (RGS/B)	-	-	01	12.5	-	-	01	4.1
UPP (P/USA)	-	-	01	12.5	-	-	01	4.1
IST (SP/B)	-	-	01	12.5	-	-	01	4.1
ISR (SP/B)	-	-	-	-	01	8.3	01	4.1
UFC (C/B)	-	-	-	-	02	16.6	02	8.3
TU (L/USA)	-	-	-	-	01	8.3	01	4.1
UC (SP/B)	-	-	-	-	01	8.3	01	4.1
Total	06	66.6	08	100.0	10	83.1	24	99.1

* See Appendix B.

** See Appendix A.

The year of completion of Master's programs among professors working in Education range from 1962 to 1983. Two professors responded that they were still working toward the Master's degree. More than 50 percent of the faculty finished their programs during the 1970's. The professors from the Department of Specialized Studies in Education had studied during the 1960's and early 1970's. The group from the Department of Foundations of Education

had completed their studies during the 1970's, and in the Department of Teaching Theory and Practice faculty had completed their studies more recently. See Table 32.

TABLE 32
YEARS OF COMPLETION OF MASTERS DEGREE FOR
THE EDUCATION PROGRAM FACULTY

YEAR OF COMPLE- TION	DEPARTAMENTS*							
	FOUNDATION OF EDUCATION		SPECIAL STUDIES IN EDUC.		TEACHING THEORY & PRACTICE		TOTAL	
	f	%	f	%	f	%	f	%
1962	-	-	01	12.5	-	-	01	4.1
1963	-	-	01	12.5	-	-	01	4.1
1964	-	-	01	12.5	-	-	01	4.1
1965	-	-	02	25.0	-	-	02	8.3
1970	01	11.1	01	12.5	-	-	02	8.3
1973	01	11.1	02	25.0	-	-	03	12.5
1975	01	11.1	-	-	-	-	01	4.1
1976	01	11.1	-	-	-	-	01	4.1
1977	-	-	-	-	02	16.6	02	8.3
1978	01	11.1	-	-	01	8.3	02	8.3
1979	-	-	-	-	02	16.6	02	8.3
1980	-	-	-	-	02	16.6	02	8.3
1982	-	-	-	-	01	8.3	01	4.1
1983	-	-	-	-	01	8.3	01	4.1
On going	01	11.1	-	-	01	8.3	02	8.3
Total	06	66.6	08	100.0	10	83.0	24	99.3

* See Appendix A.

Table 33 shows the variation in the number of semester credits taken by professors from the Education program during their studies for the Masters degree. The range was from 24 to 58 credits. None of the professors earned the same number of credits. Ten of them failed to inform the researcher of the credits taken. Data show that the number of credits in the Master programs can vary

greatly. Due to the lack of information from some of the subjects sampled in this particular program, the statistical means ($x=34$; $x=33$; $x=41$) and the standard deviations ($SD=5$; $SD=6.2$; $SD=13.4$) do not reflect this reality.

There was a large variety of areas of specialization and the number of institutions where faculty of Education had studied. There was a moderate range of years of degree completion and the number of credits earned. Data show the Education group to be more heterogeneous than homogeneous, in terms of the factors examined above.

Sixty percent of the professors in the Geology program earned Master's degrees. They specialized in 4 different areas, and had studied in 3 different institutions. Professors in this program completed their Master's studies in the range of years from 1968 to 1981. Credits taken for the Master's program varied from 36 to 60. Two professors did not respond to the question related to credits. See Tables 34 to 37.

TABLE 33
NUMBER OF CREDITS TAKEN BY THE EDUCATION
PROGRAM FACULTY DURING THEIR MASTER'S
STUDIES

CREDITS	FOUNDATION OF EDUCATION		DEPARTMENTS+ SPECIAL STUDIES IN EDUC.		TEACHING THEORY & PRACTICE		TOTAL	
	f	%	f	%	f	%	f	%
24	-	-	-	-	01	8.3	01	4.1
26	-	-	01	12.5	-	-	01	4.1
29	01	11.1	-	-	-	-	01	4.1
30	-	-	01	12.5	-	-	01	4.1
32	01	11.1	-	-	-	-	01	4.1
33	-	-	-	-	01	8.3	01	4.1
34	01	11.1	-	-	-	-	01	4.1
35	-	-	-	-	01	8.3	01	4.1
36	-	-	01	12.5	-	-	01	4.1
40	-	-	01	12.5	-	-	01	4.1
41	01	11.1	-	-	-	-	01	4.1
42	-	-	-	-	01	8.3	01	4.1
56	-	-	-	-	01	8.3	01	4.1
58	-	-	-	-	01	8.3	01	4.1
N/Ind.*	02	22.2	04	50.0	04	33.3	10	41.6
Total	06	66.6	08	100.0	10	83.1	24	99.0
Mean		34.0		33.0		41.3		36.8
S.D.		5.0		6.2		13.4		10.0

+ See Appendix A.

* Not indicated.

TABLE 34
MASTERS' PROGRAM AREAS OF SPECIALIZATION
FOR THE GEOLOGY PROGRAM FACULTY

AREA OF SPECIALIZATION	GEOLOGY	
	f	%
Geophysics	01	10.0
Geology	02	20.0
Geosciences	02	20.0
Geological Engineering	01	10.0
Total	06	60.0

TABLE 35
INSTITUTIONS WHERE FACULTY MEMBERS OF THE
GEOLOGY PROGRAM EARNED THEIR MASTER'S
DEGREE

INSTITUTIONS*	GEOLOGY	
	f	%
FUB (B-B)	03	30.0
FURJ (RJ-B)	02	20.0
CSM-G (C-USA)	01	10.0
Total	06	60.0

* See Appendix B.

TABLE 36
YEARS OF COMPLETION OF MASTERS DEGREES FOR
THE GEOLOGY PROGRAM FACULTY

YEAR	GEOLOGY	
	f	%
1968	01	10.0
1974	01	10.0
1975	01	10.0
1976	01	10.0
1977	01	10.0
1981	01	10.0
Total	06	60.0

TABLE 37
NUMBER OF CREDITS TAKEN BY THE GEOLOGY
PROGRAM FACULTY DURING THEIR MASTER'S
STUDIES

NUMBER OF CREDITS	GEOLOGY	
	f	%
36	01	10.0
38	01	10.0
45	01	10.0
60	01	10.0
N/Ind.*	02	20.0
Total	06	60.0
Mean		44.7
S.D.		10.8
* Not indicated.		

Medical School faculty had Master's degrees in 18 different areas of specialization (Table 38). The Departments of Clinical Medicine, and Pathology and Legal Medicine had the largest variety of specialization. The Department of Physiology and Pharmacology Department included 4 professors with Masters in the same area. Professors from more than one department chose to specialize in Pharmacology and Education: Teaching. While it might be expected that a professor of Medicine would specialize in Pharmacology, a specialization in Education: Teaching seems unusual. This might have occurred because, at the UPC, there are Master programs available in those areas.

Table 39 shows that the Professors of Medicine pursued their studies toward their Master's degrees at 12

institutions located in 3 different countries. The highest participation was at the UFC, in 2 schools: Health Sciences and Education. All professors from the Department of Pathology and Legal Medicine studied at different institutions, while fewer from the Department of Clinical Medicine studied at different universities. In the Department of Physiology and Pharmacology, 4 professors had done their studies at the same institutions.

The Medical School faculty completed their Master's degrees in the years from 1972 to 1983. The largest number of degrees completed was in 1983 with 6 professors graduating. In 1979, 1981, and 1982 three of them finished their graduate studies. One professor reported that he was to be in a continuing Master's program. See Table 40.

The number of credits taken by Medical School faculty in each of the different Master's programs varied from 26 to 120. The average (mean) for the whole group was 42.9. The standard deviation of 30.9 indicates that the variation was high. Six professors did not report the amount of credits taken, which makes it difficult to have a real index of credits taken. A Master's program with 100 or 120 credits seems to be more a doctoral program than a Master's program. These data, however, are not complete enough to give an idea of the quality of the aforementioned programs. See Table 41.

TABLE 38
MASTERS' PROGRAM AREAS OF SPECIALIZATION
FOR THE MEDICINE PROGRAM FACULTY

AREAS OF SPECIAL- IZATION	DEPARTMENTS*							
	CLIN. MED.		COMM. HEALT.		MORPH.		TOTAL	
	f	%	f	%	f	%	f	%
Clinical								
Medicine	01	3.3	-	-	-	-	01	4.0
Cardiology	01	3.3	-	-	-	-	01	4.0
Dermatology	01	3.3	-	-	-	-	01	4.0
Pneumology	01	3.3	-	-	-	-	01	4.0
Gastro- enterology	01	3.3	-	-	-	-	01	4.0
Public								
Health	-	-	01	6.2	-	-	01	4.0
Gynaecology	-	-	01	6.2	-	-	01	4.0
Bio-								
statistics	-	-	01	6.2	-	-	01	4.0
Child								
Neurology	-	-	01	6.2	-	-	01	4.0
Education:								
Teaching	-	-	-	-	01	9.0	01	4.0
Pharmacology	01	3.3	-	-	-	-	01	4.0
Total	06	19.8	04	24.8	01	9.0		
	PATH. LEG.MED.		PHYS. PHAR.		SURG.		TOTAL	
	f	%	f	%	f	%	f	%
Education:								
Teaching	01	7.1	-	-	-	-	01	4.0
Infectious-								
Parasites								
Diseases	01	7.1	-	-	-	-	01	4.0
Immunology	01	7.1	-	-	-	-	01	4.0
Genetics of								
Micro-								
organisms	01	7.1	-	-	-	-	01	4.0
Human								
Pathology	01	7.1	-	-	-	-	01	4.0
Tropical								
Parasitology	01	7.1	-	-	-	-	01	4.0
Pharmacology	-	-	04	40.0	01	4.1	05	20.0
Kidney								
Physiology	-	-	01	10.0	-	-	01	4.0
Biochemistry	-	-	01	10.0	-	-	01	4.0
Orthopedics/ Traumatology	-	-	-	-	01	4.1	01	4.0
Total	06	42.6	06	60.0	02	8.2	25	100.0

* See Appendix A.

TABLE 39
INSTITUTIONS WHERE FACULTY MEMBERS OF THE MEDICINE PROGRAM
EARNED THEIR MASTERS DEGREES

INSTITUTIONS*	DEPARTMENTS**									
	CLIN. MED.	COMM. HEALT.	MORPH.	PATH. LEG.MED.	PHYS. PHAR.	SURG.	TOTAL			
	f x	f x	f x	f x	f x	f x	f x	f x	f x	f x
USP-SMRP										
(SP-B)	01 3.3	01 6.2	-	01 7.1	01 10.0	-	-	04	16.0	
FURJ (RJ-B)	02 6.6	-	-	01 7.1	-	01 4.1	04	16.0		
FUMG (MG-B)	01 3.3	-	-	-	-	-	01	4.0		
PSM (SP-B)	01 3.3	-	-	01 7.1	-	-	02	8.0		
UFC-CMS										
(C-B)	01 3.3	-	-	-	04 40.0	01 4.1	06	24.0		
TMI (A-B)	-	01 6.2	-	-	-	-	01	4.0		
USP (SP-B)	-	01 6.2	-	-	-	-	01	4.0		
ULR (M-U)	-	01 6.2	-	-	-	-	01	4.0		
UFC-FACED										
(C-B)	-	-	01 9.0	01 7.1	-	-	02	8.0		
FUBa (Ba-B)	-	-	-	01 7.1	-	-	01	4.0		
UFR (T-F)	-	-	-	01 7.1	-	-	01	4.0		
FUPe (Pe-B)	-	-	-	-	01 10.0	-	01	4.0		
Total	06 19.8	04 24.8	01 9.0	06 42.6	06 60.0	02 8.2	25 100.0			

* See Appendix B.

** See Appendix A.

TABLE 40
YEARS OF COMPLETION OF MASTERS DEGREE FOR THE MEDICINE
PROGRAM FACULTY

YEARS OF COMPLE- TION	CLIN. MED.		COMM. HEALT.		MORPH.		DEPARTMENTS*		PATH. LEG.MED.		PHYS. PHAR.		SURG.		TOTAL	
	f	x	f	x	f	x	f	x	f	x	f	x	f	x	f	x
1972	-	-	01	6.2	-	-	-	-	-	-	-	-	-	-	01	4.0
1974	-	-	01	6.2	-	-	-	-	01	10.0	-	-	-	-	02	8.0
1976	01	3.3	-	-	-	-	-	-	-	-	-	-	-	-	01	4.0
1977	-	-	-	-	-	-	02	14.2	-	-	-	-	-	-	02	8.0
1978	-	-	-	-	-	-	-	-	01	10.0	-	-	-	-	01	4.0
1979	02	6.6	01	6.2	-	-	-	-	-	-	-	-	-	-	03	12.0
1980	01	3.3	-	-	-	-	-	-	-	-	-	01	4.1	-	02	8.0
1981	-	-	01	6.2	-	-	02	14.2	-	-	-	-	-	-	03	12.0
1982	01	3.3	-	-	-	-	-	-	-	-	02	20.0	-	-	03	12.0
1983	01	3.3	-	-	01	9.0	02	14.2	02	20.0	02	20.0	-	-	06	24.0
On going	-	-	-	-	-	-	-	-	-	-	-	-	01	4.1	01	4.0
Total	06	19.8	04	24.8	01	9.0	06	42.6	06	60.0	02	8.2	02	8.2	25	100.0

* See Appendix A.

This group of faculty specialized in a large variety of areas in different institutions. The Federal University of Ceara, the University of Sao Paulo, and the University of Rio de Janeiro accepted the largest number of professors for Master's level studies from the several Departments responsible for the Medicine program in the UFC.

In terms of years of completion, the studies were concentrated in a range of 11 years, but spread out during this period in a such way that not more than two professors from the same Department had completed their degrees in the same year.

Finally, the number of credits required for the Master's varied greatly in 4 programs, the credits taken by professors during their Master's program (anywhere from 36 to 120 semester credits) often could be considered enough for a doctoral program. Data show that Masters studies for professors of Medicine are balanced and heterogeneous in terms of the factors studied.

TABLE 41
NUMBER OF CREDITS TAKEN BY THE MEDICINE PROGRAM FACULTY DURING
THEIR MASTER'S STUDIES

CREDITS	CLIN. MED.		COMM. HEALT.		MORPH.		DEPARTMENTS+ PATH. LEG.MED.		PHYS. PHAR.		SURG.		TOTAL	
	f	x	f	x	f	x	f	x	f	x	f	x	f	x
36	-	-	01	7.1	-	-	-	-	-	-	-	-	01	4.0
44	-	-	-	-	-	-	-	-	01	10.0	-	-	01	4.0
46	-	-	-	-	-	-	-	-	01	10.0	-	-	01	4.0
48	06	20.0	01	7.1	-	01	7.1	-	-	-	01	4.1	09	36.0
49	-	-	-	-	-	-	-	-	01	10.0	-	-	01	4.0
53	-	-	-	-	-	-	-	-	01	10.0	-	-	01	4.0
60	-	-	-	-	-	-	01	7.1	-	-	-	-	01	4.0
61	-	-	-	-	-	-	01	7.1	-	-	-	-	01	4.0
72	-	-	-	-	-	-	01	7.1	-	-	-	-	01	4.0
100	-	-	01	7.1	-	-	-	-	-	-	-	-	01	4.0
120	-	-	-	-	-	-	01	7.1	-	-	-	-	01	4.0
N/Ind.*	-	-	01	7.1	01	9.0	01	7.1	01	10.0	01	4.1	06	24.0
Total	06	20.0	04	28.4	01	9.0	06	42.6	06	60.0	02	8.2	25	100.0
Mean		48.0		61.3		0		72.2		48.0		48.0		56.4
SD		0		34.0		0		28.0		3.9		0		20.5

+ See Appendix A.

* Not indicated.

Formal Education - Graduate Level: Doctoral Program

Faculty from the Agriculture program completed their doctoral studies in 19 areas of specialization (Table 42). Three professors studied Rural Economics, and two studied Soil and Plant Nutrition. Each other area had only one professor completing a doctorate. The percentage of faculty with doctoral degrees is still very low. The department with the highest percentage of faculty with doctorates is the Department of Soil Sciences, with the next highest being the Department of Agricultural Economics. The lowest percentage was the Department of Animal Sciences.

The faculty group from Agriculture completed doctoral studies at 12 institutions in 4 different countries (Table 43). Seven professors studied at the University of Arizona - Tucson (USA); 3 studied at the University of Sao Paulo (Brazil); 2 studied at the University of Sao Paulo - Luiz de Queiroz School of Agriculture; 2 studied at Oregon State University - Corvallis (USA). The remaining faculty studied at several other institutions. The Department with the largest number of professors from different institutions was Agricultural Economics. The Department with the largest number of people having studied at the same institution is Plant Sciences.

TABLE 42
DOCTORAL AREAS OF SPECIALIZATION FOR THE
AGRICULTURE PROGRAM FACULTY

AREAS OF SPECIAL- IZATION	DEPARTMENTS*							
	AGRI. ECO.		AGRI. ENG.		ANIM. SCS.		TOTAL	
	f	%	f	%	f	%	f	%
Rural Economics	03	37.5	-	-	-	-	03	13.6
Theory of Economics	01	12.5	-	-	-	-	01	4.5
Agricultural Economics	01	12.5	-	-	-	-	01	4.5
Soil/Plant Nutrition	-	-	01	11.1	-	-	01	4.5
Soil/Water Engineering	-	-	01	11.1	-	-	01	4.5
Irrigation/Engineering	-	-	01	11.1	-	-	01	4.5
Animal Sciences	-	-	-	-	01	11.1	01	4.5
Animal Nutrition	-	-	-	-	01	11.1	01	4.5
Total	05	62.5	03	33.3	02	22.2		
	FOOD SCS.		PLAN. SCS.		SOIL SCS.		TOTAL	
	f	%	f	%	f	%	f	%
Microbiology/Immunology	01	16.6	-	-	-	-	01	4.5
Biochems.& Nutrition	01	16.6	-	-	-	-	01	4.5
Genetic Breeding of Cultivated Plant	-	-	01	7.1	-	-	01	4.5
Botany	-	-	01	7.1	-	-	01	4.5
Plant Scs. Crop Ecology	-	-	01	7.1	-	-	01	4.5
Seed Techn.	-	-	01	7.1	-	-	01	4.5
Horticulture Plant Pathology	-	-	-	-	01	16.6	01	4.5
Soil/Plant Nutrition	-	-	-	-	02	33.3	02	9.0
Soil Chemistry/Fertilizing	-	-	-	-	01	16.6	01	4.5
Total	02	33.2	06	42.6	04	66.5	22	99.1

* See Appendix A.

TABLE 43
INSTITUTIONS WHERE THE AGRICULTURE PROGRAM FACULTY EARNED
THEIR DOCTORAL DEGREES

INSTITUTIONS*	AGRI.		AGRI.		ANIM.		FOOD		PLAN.		SOIL		TOTAL	
	ECO.	f x	ENG.	f x	SCS.	f x	SCS.	f x	SCS.	f x	SCS.	f x	f x	f x
OSU (O/USA)	01 12.5	-	-	-	-	-	-	01 7.1	-	-	-	-	02 9.0	-
OSU (O/USA)	01 12.5	-	-	-	-	-	-	-	-	-	-	-	01 4.5	-
UMI (M/F)	01 12.5	-	-	-	-	-	-	-	-	-	-	-	01 4.5	-
USP (SP/B)	01 12.5	-	-	-	-	-	01 16.6	-	-	-	01 16.6	-	03 13.6	-
UP X (P/F)	01 12.5	-	-	-	-	-	-	-	-	-	-	-	01 4.5	-
USP/ESALQ	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(SP/B)	-	-	01 11.1	-	-	-	-	-	-	-	01 16.6	-	02 9.0	-
UUL (U/USA)	-	-	01 11.1	-	-	-	-	-	-	-	-	-	01 4.5	-
UP XI-CD'O	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(F)	-	-	01 11.1	-	-	-	-	-	-	-	-	-	01 4.5	-
CTGRA (F)	-	-	-	-	01 11.1	-	-	-	-	-	-	-	01 4.5	-
UPM (S)	-	-	-	-	01 11.1	-	-	-	-	-	-	-	01 4.5	-
UAT (A/USA)	-	-	-	-	-	-	01 16.6	04 28.5	02 33.3	-	-	-	07 31.8	-
UAF (A/USA)	-	-	-	-	-	-	-	01 7.1	-	-	-	-	01 4.5	-
Total	05 62.5	03 33.3	02 22.2	02 33.2	06 42.7	04 66.5	22 99.4	-	-	-	-	-	-	-

* See Appendix B.

** See Appendix A.

Professors who pursued doctoral studies in the program of Agriculture completed them during the 1970's. The years of 1979 and 1983 had the largest number of those completing a doctorate. In 1977, 3 professors completed their degrees. One professor reported himself to be still working toward a doctorate. See Table 44.

The number of credits earned by professors during their doctoral programs varied from 40 to 151. Eleven professors failed to report the number of credits taken during their studies. The calculation of the mean and of the standard deviation was done based on the ones who gave the information; however it does not give an accurate reflection of the real situation. See Table 45.

This group of faculty specialized in a large number of areas and studied in a number of different universities. One exception was the University of Arizona-Tucson: 7 professors from 3 Departments in this program studied there. Observations similar to those made for the Medicine program can be made in relation to year of completion of studies, which were concentrated in a block of 10 years, but fairly evenly distributed within this period. The number of credits earned by members of this group varied greatly.

TABLE 44
YEARS OF COMPLETION OF DOCTORAL STUDIES BY THE AGRICULTURE
PROGRAM FACULTY

YEAR OF COMPLE- TION	DEPARTMENTS*											
	AGRI. ECO.	AGRI. ENG.	ANIM. SCS.	FOOD SCS.	PLAN. SCS.	SOIL SCS.	TOTAL					
	f	x	f	x	f	x	f	x	f	x	f	x
1972	-	-	-	-	-	-	01	7.1	01	16.6	02	9.0
1975	-	-	-	-	-	-	-	-	01	16.6	01	4.5
1976	-	-	-	-	-	-	01	7.1	-	-	01	4.5
1977	02	25.0	-	-	-	-	01	7.1	-	-	03	13.6
1978	-	-	01	11.1	-	-	-	-	01	16.6	02	9.0
1979	-	-	01	11.1	-	-	01	7.1	01	16.6	04	18.1
1980	01	12.5	-	-	-	-	-	-	-	-	01	4.5
1981	-	-	-	01	11.1	-	-	-	-	-	01	4.5
1982	02	25.0	-	-	-	-	-	-	-	-	02	9.0
1983	-	-	01	11.1	01	11.1	-	02	14.2	-	04	18.1
On Going	-	-	-	-	-	-	01	16.6	-	-	01	4.5
Total	05	62.5	03	33.3	02	22.2	02	33.2	06	42.6	04	66.4
22	99.3											

* See Appendix A.

TABLE 45
NUMBER OF CREDITS EARNED AT DOCTORAL LEVEL BY THE AGRICULTURE
PROGRAM FACULTY

CREDITS	AGRI.		AGRI.		ANIM.		FOOD		PLAN.		SOIL		TOTAL	
	ECO.	ENG.	ECO.	ENG.	SCS.	SCS.	SCS.	SCS.	SCS.	SCS.	SCS.	SCS.	f	x
40	01	12.5	-	-	-	-	-	-	-	-	-	-	01	4.5
56	-	-	-	-	-	-	01	16.6	-	-	-	-	01	4.5
62	-	-	-	-	-	-	-	-	-	-	01	16.6	01	4.5
65	-	-	-	-	01	11.1	-	-	-	-	-	-	01	4.5
80	-	-	-	-	-	-	-	-	01	7.1	-	-	01	4.5
96	-	-	01	11.1	-	-	-	-	01	7.1	-	-	02	9.0
100	-	-	01	11.1	-	-	-	-	-	-	-	-	01	4.5
109	01	12.5	-	-	-	-	-	-	-	-	-	-	01	4.5
110	-	-	01	11.1	-	-	-	-	-	-	-	-	01	4.5
151	01	12.5	-	-	-	-	-	-	-	-	-	-	01	4.5
N/Ind.*	02	25.0	-	-	01	11.1	01	16.6	04	28.5	03	50.0	11	50.0
Total	05	62.5	03	33.3	02	22.2	02	33.2	06	42.7	04	66.6	22	99.5
Mean	100.0	102.0			65.0		56.0		88.0		62.0		87.0	
SD	56.0	7.2			0		0		11.3		0		31.2	

+ See Appendix A.

* Not Indicated.

Education faculty members pursued their doctoral studies in 9 different areas of specialization. None of the professors from the Foundation of Education Department held a doctorate; all of the faculty from the Department of Specialized Studies in Education have doctorates, and one faculty member in the Department of Theory and Practice of Teaching was reported to be in an ongoing doctoral program. See Table 46.

TABLE 46
DOCTORAL AREAS OF SPECIALIZATION FOR THE
EDUCATION PROGRAM FACULTY

AREAS OF SPECIAL- IZATION	DEPARTMENTS*				TOTAL	
	SPECIAL. STUDIES IN EDUC.		TEACHING THEORY & PRACTICE.			
	f	%	f	%	f	%
Educational Psychology	01	12.5	-	-	01	11.1
Child Language. Acquisition	01	12.5	-	-	01	11.1
Curriculum & Instruction	01	12.5	-	-	01	11.1
Evaluation & Planning	01	12.5	-	-	01	11.1
Education & Development	01	12.5	-	-	01	11.1
Rural Education	01	12.5	-	-	01	11.1
Comparative Education	01	12.5	-	-	01	11.1
Education	01	12.5	-	-	01	11.1
Counseling & Guidance	-	-	01	8.3	01	11.1
Total	08	100.0	01	8.3	09	99.9

* See Appendix A.

Professors from the School of Education completed their doctoral studies at 8 institutions in 3 different countries. Only 2 faculty members, from 2 different departments, studied at the same institution. See Table 47.

TABLE 47
INSTITUTIONS WHERE THE EDUCATION PROGRAM
FACULTY EARNED THEIR DOCTORAL

INSTITU- TIONS*	DEPARTMENTS**				TOTAL	
	SPECIAL STUDIES IN EDUC.		TEACHING THEORY & PRACTICE			
	f	%	f	%	f	%
CUI (NY/USA)	01	12.5	-	-	01	11.1
TU (L/USA)	01	12.5	01	8.3	02	22.2
USIUSD (C/USA)	01	12.5	-	-	01	11.1
FURGS (RGS/B)	01	12.5	-	-	01	11.1
UPXN (P/F)	01	12.5	-	-	01	11.1
UPP (P/USA)	01	12.5	-	-	01	11.1
UTA (T/USA)	01	12.5	-	-	01	11.1
UP (P/USA)	01	12.5	-	-	01	11.1
Total	08	100.0	01	8.3	09	99.9

* See Appendix B.

** See Appendix A.

Since 1977, several professors of Education have completed their doctoral studies. In 1979, 2 professors finished their programs. In each of the other years one professor completed a doctorate. See Table 48.

TABLE 48
YEARS OF COMPLETION OF DOCTORAL STUDIES BY
THE EDUCATION PROGRAM FACULTY

YEAR OF COMPLE- TION	DEPARTMENTS*				TOTAL	
	SPECIAL STUDIES IN EDUC.		TEACHING THEORY & PRACTICE			
	f	%	f	%	f	%
1977	01	12.5	-	-	01	11.1
1978	01	12.5	-	-	01	11.1
1979	02	25.0	-	-	02	22.2
1980	01	12.5	-	-	01	11.1
1982	01	12.5	-	-	01	11.1
1983	01	12.5	-	-	01	11.1
Ongoing	01	12.5	01	8.3	01	22.2
Total	08	100.0	01	8.3	09	99.9

* See Appendix A.

The number of credits taken by Education professors during doctoral studies varied from 48 to 120. Three professor failed to inform this researcher of the number of credits taken, and 2 reported that they were in a continuing program. See Table 49 .

Doctoral programs completed by professors of Education followed the same general pattern of graduate studies as in other programs; Education professors specialized in a large number of areas; professors studied at a large number of institutions as well. Professors took a large range of years for completing those studies, and there was a large variety in the number of credits earned during those studies. Results show that there was more heterogeneity than homogeneity within the program of

Education.

TABLE 49
NUMBER OF CREDITS EARNED AT DOCTORAL LEVEL
BY THE EDUCATION PROGRAM PROGRAM

CREDITS	DEPARTMENTS+ SPECIAL STUDIES IN EDUC.		TEACHING THEORY & PRACTICE		TOTAL	
	f	%	f	%	f	%
48	01	12.5	-	-	01	11.1
60	01	12.5	-	-	01	11.1
90	01	12.5	-	-	01	11.1
120	01	12.5	-	-	01	11.1
On going	01	12.5	01	8.3	02	22.2
N/Ind.*	03	37.5	-	-	03	33.3
Total	08	100.0	01	8.8	09	99.9
Mean		79.5	-	-		79.5
S.D.		32.2	-	-		32.2

+ See Appendix A.

* Not indicated.

Among the faculty of the Geology program, 2 members had completed a doctorate, in 2 different areas, at the same university during the 1970's. The number of credits taken by them varied from 60 to 90, with a mean of 75 credits. These professors represented 20 percent of the Geology sub-sample. See Tables 50-53.

The number of professors from this group pursuing doctoral level degrees was so low (only 2 professors) that, in terms of areas of specialization, years of degree completion, and number of credits earned, the statistical results were all different from previously studied programs.

TABLE 50
DOCTORAL AREAS OF SPECIALIZATION FOR THE
GEOLOGY PROGRAM FACULTY

AREAS OF SPECIALIZATION	GEOLOGY	
	f	%
Geosciences: Geological Resources	01	10.0
General and Applied Geology	01	10.0
Total	02	20.0

TABLE 51
INSTITUTIONS WHERE THE GEOLOGY PROGRAM
FACULTY EARNED DOCTORAL DEGREES

INSTITUTIONS*	GEOLOGY	
	f	%
USP (SP/B)	02	20.0
Total	02	20.0

* See Appendix B.

TABLE 52
YEARS OF COMPLETION OF DOCTORAL STUDIES FOR
THE GEOLOGY PROGRAM FACULTY

YEAR OF COMPLETION	GEOLOGY	
	f	%
1974	01	10.0
1979	01	10.0
Total	02	20.0

TABLE 53
NUMBER OF CREDITS EARNED AT DOCTORAL LEVEL
BY THE GEOLOGY PROGRAM FACULTY

NUMBER OF CREDITS	GEOLOGY	
	f	%
60	01	10.0
90	01	10.0
Total	02	20.0
Mean		75.0
S.D.		21.2

In the Medical School 7 professors had pursued doctoral studies in 6 different areas of specialization. The highest percentage of those holding doctorates was from the Department of Physiology and Pharmacology (30 percent) followed by Pathology and Legal Medicine with 14 percent. Two Departments, Community Health and Surgery, have no doctorates from their faculty group. See Table 54.

Professors holding doctorate degrees studied in 6 universities in 4 different countries: Brazil, France, England and West Germany. Two of them studied at the same university (University of Sao Paulo/Brazil); however, they are employed in different departments. See Table 55.

This group completed their doctorate in the years from 1966 to 1983. The year with the largest number of graduates was 1981. Only one professor completed his/her degree in 1966. See Table 56.

TABLE 54
DOCTORAL AREA OF SPECIALIZATION FOR THE
MEDICINE PROGRAM FACULTY

AREA OF SPECIAL- IZATION	DEPARTMENTS*									
	CLIN. MED.		MORPH.		PATH. LEG.MED.		PHYS. PHAR.		TOTAL	
	f	x	f	x	f	x	f	x	f	x
Clinical Medicine	01	3.2	-	-	-	-	-	-	01	14.2
Neuro- Anatomy	-	-	01	9.0	-	-	-	-	01	14.2
Microbiology & Immunology	-	-	-	-	01	7.1	-	-	01	14.2
Natural Sciences	-	-	-	-	01	7.1	-	-	01	14.2
Pharmacology.	-	-	-	-	-	-	02	20.0	02	28.5
Biochemistry	-	-	-	-	-	-	01	10.0	01	14.2
Total	01	3.2	01	9.0	02	14.2	03	30.0	07	99.5

* See Appendix A.

TABLE 55
INSTITUTIONS WHERE THE MEDICINE PROGRAM
FACULTY EARNED THEIR DOCTORAL DEGREES

INSTITUTIONS*	DEPARTMENTS**									
	CLIN. MED.		MORPH.		PATH. & LEG. MED.		PHYS. PHAR.		TOTAL	
	f	%	f	%	f	%	f	%	f	%
FUB (WG)	01	3.2	-	-	-	-	-	-	01	14.2
USP (SP/B)	-	-	01	9.0	-	-	01	10.0	02	28.5
PSM (SP/B)	-	-	-	-	01	7.1	-	-	01	14.2
UPMC (F)	-	-	-	-	01	7.1	-	-	01	14.2
USP-SMRP (SP/B)	-	-	-	-	-	-	01	10.0	01	14.2
UO (E)	-	-	-	-	-	-	01	10.0	01	14.2
Total	01	3.2	01	9.0	02	14.2	03	30.0	07	99.5

* See Appendix B.

** See Appendix A.

TABLE 56
YEARS OF COMPLETION OF DOCTORAL STUDIES FOR
THE MEDICINE PROGRAM FACULTY

YEAR OF COMPLETION	DEPARTMENTS*									
	CLIN. MED.		MORPH.		PATH. & LEG. MED.		PHYS. PHAR.		TOTAL	
	f	%	f	%	f	%	f	%	f	%
1966	-	-	-	-	-	-	01	10.0	01	14.2
1977	01	3.2	-	-	-	-	-	-	01	14.2
1979	-	-	01	9.0	-	-	-	-	01	14.2
1981	-	-	-	-	01	7.1	01	10.0	02	28.5
1982	-	-	-	-	-	-	01	10.0	01	14.2
1983	-	-	-	-	01	7.1	-	-	01	14.2
Total	01	3.2	01	9.0	02	14.2	03	30.0	07	99.5

* See Appendix A.

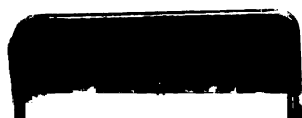
The number of credits taken by medical faculty toward their doctoral degrees varied from 72 to 96. The mean and the standard deviation do not indicate an accurate picture of reality, due to the fact that some faculty members failed to report the number of credits earned during their studies. See Table 57.

Faculty from the Medical School holding doctorates did their studies in different areas of specialization, except in Pharmacology, in which there are 2 professors in the same area. All had studied at different institutions, except for 2 who went to the same university; and all finished their programs in different years, with the exception of 1981, when 2 professors finished. The number of credits was also a factor that varied a lot in this group.

TABLE 57
NUMBER OF CREDITS EARNED AT DOCTORAL LEVEL BY
THE MEDICINE PROGRAM FACULTY

CREDITS	DEPARTMENTS*									
	CLIN. MED.		MORPH.		PATH.& LEG.MED.		PHYS. PHARM.		TOTAL	
	f	%	f	%	f	%	f	%	f	%
72	01	3.2	-	-	01	7.1	-	-	02	28.5
90	-	-	-	-	01	7.1	-	-	01	14.2
96	-	-	-	-	-	-	01	10.0	01	14.2
N/Ind	-	-	01	9.0	-	-	02	20.0	03	42.8
Total	01	3.2	01	9.0	02	14.2	03	30.0	07	99.7
Mean		72.0		-		81.0		96.0		86.0
SD		0		-		12.7		0		12.4

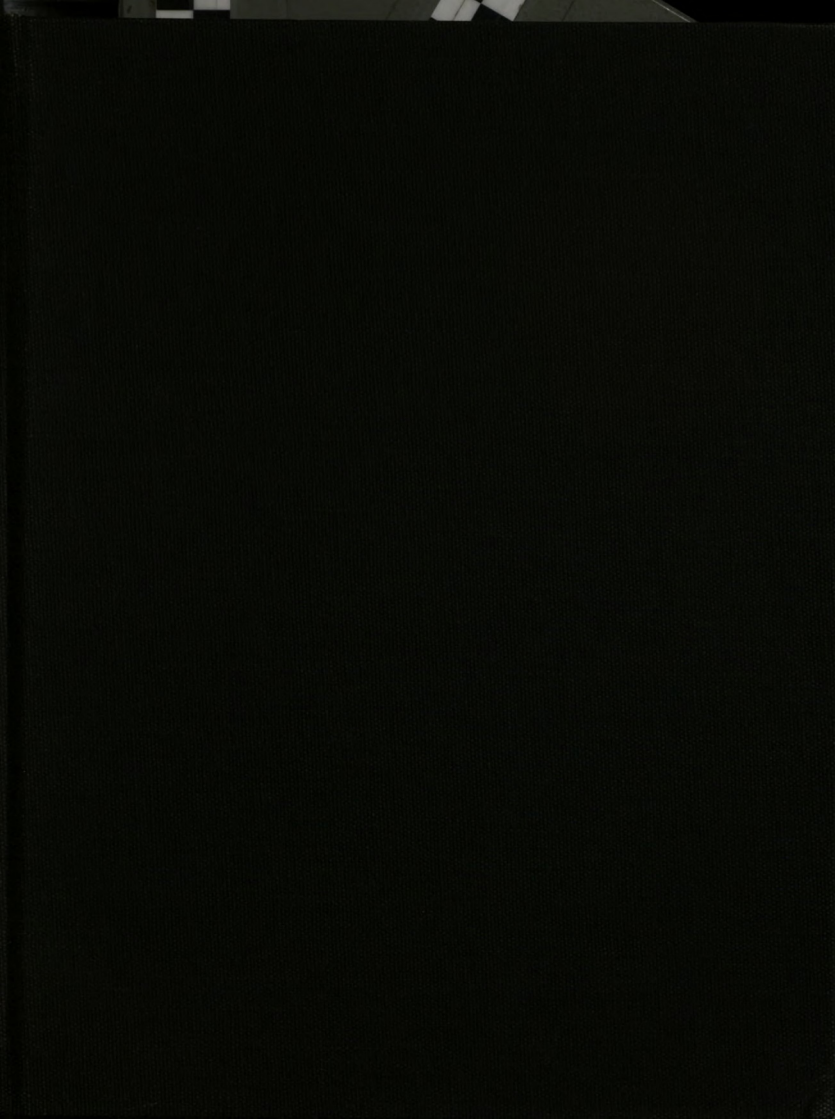
* See Appendix A.



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**RESEARCH QUESTION NUMBER TWO
DIFFERENCE IN FACULTY SUPPORT AMONG CURRICULA**

First curricula of Agriculture, Education, Geology, and Medicine were first classified as : (a) Required (R); (b) Elective (E), and (c) Suggested as Elective (S/E).

Secondly, they were categorized as follow:

1. Curricula with no need for professors - Belonging to this group are the courses from each curriculum list, which were chosen by professors from the three options presented in the questionnaire. The options were: (a) Teaching as a personal preference, (b) Teaching, but need time for preparation, and (c) Would teach only in an emergency. There were more professors to teach these courses than were needed. In other words, if courses were chosen from the three options, but the demand for classes is larger than the number of faculty available to teach them, those courses were classified in another group.

2. Curricula with long range (future) need for professors- In this group was included all subjects which were chosen from the two first options presented in the questionnaire, which were: (a) Teaching as a personal preference, and (b) Teaching, but need time for preparation. Besides the above condition, courses were included in this category if there were a larger number of professors to teach them than the demand for classes.

3. Curricula with medium range (near future) need for professors - This group is comprised of all courses chosen by professors only from the first option presented in questionnaire: (teaching as a personal preference). All those courses chosen from the first and third options presented, (teaching as a personal preference, and would teach only in an emergency). In both cases, curricula must have a larger number of professors who choose to teach them than the demand for classes.

4. Curricula with short range (immediate) need for professors - In this category was included the following:

- (a) all courses with a higher demand for classes than the number of professors available to teach them.
- (b) All courses chosen only as a second option (teaching, but need time for preparation.
- (c) All courses chosen only as a third choice (would teach only in an emergency).
- (d) All courses chosen from the second and third option simultaneously.
- (e) All courses that were not chosen at all by any professor.

The analysis was based on the percentage of each block of courses in relation to the whole curriculum.

Agriculture

The curriculum in Agriculture is composed of 65 courses.

Examining the whole list of courses of the of the Agriculture program, 26 percent of the total curriculum or 17 courses were found to be taught by professors who had chosen those courses from the 3 options presented. They were all required (R), but one was an elective courses (E). Data on Table 58 show those courses will require no additional professors to teach them, if the future demand is likely to remain unchanged.

A second group of courses of the same program, which represents 14 percent or 9 courses comprised 4 required courses (R), 2 electives and 3 which were suggested as elective (S/E). This courses count on professors who had chosen to teach them as first or second choices.

In previous semesters the number of professors able to teach these curricula exceeded the demand for these courses. Courses from this group will have no new demand for additional professors to teach them in the semesters ahead, since the current demand for classes will tend to remain the same. See Table 59.

TABLE 58
AGRICULTURE CURRICULA WITH NO NEED FOR
ADDITIONAL FACULTY TO MEET THE DEMAND FOR
CLASSES

No. COURSES	STATUS	OPTIONS*			DEMAND
		A	B	C	
01 Agriculture I	R	3	3	3	2
02 Principles of Genetic Breeding in Cultivated Plant	R	3	1	1	2
03 Horticulture I	R	3	1	1	1
04 Soils II	R	2	2	2	2
05 Non-Ruminants: Swine & Equine Sciences	R	2	2	3	1
06 Horticulture II	R	2	1	2	2
07 Non-Ruminants: Poultry & Rabbit Sciences	R	2	3	1	1
08 Introduction to Animal Husbandry	R	2	1	2	2
09 Genetic Principles in Animal Breeding	R	2	1	1	1
10 Soils I	R	1	4	3	1
11 Agricultural Experimentation	R	1	3	1	0
12 General Animal Husbandry	R	1	2	2	1
13 Rural Economics II	R	1	3	2	0
14 Ruminants' Nutrition	R	1	2	4	1
15 Non-Ruminants' Nutrition	R	1	1	4	0
16 Forestry	R	1	2	1	1
17 Horticulture III	R	1	1	2	0

 This group represents 26 percent of the whole curriculum.

* Options: A = Teaching as personal preference.

B = Teaching, but need time for preparation.

C = Would teach only in an emergency.

TABLE 59
AGRICULTURE CURRICULA WITH LONG RANGE NEED
FOR FACULTY TO MEET THE DEMAND FOR CLASSES.

No.	COURSES	STATUS	OPTIONS*			DEMAND
			A	B	C	
01	Meteorology & Agricultural Climatology	R	2	2	-	2
02	Agricultural Hydraulics I	R	4	2	-	2
03	Rural Economics III	R	4	2	-	1
04	Soils III	R	1	4	-	2
05	Elements of Agroclimatology	E	1	1	-	1
06	Drainage Soil Salinity	E	1	1	-	0
07	Rural Sociology	S/E	1	1	-	0
08	Regional Development	S/E	1	1	-	0
09	Bee Sciences	S/E	1	2	-	0

 This group represents 14 percent of the whole curriculum.

* Options: A = Teaching as personal preference.

B = Teaching, but need time for preparation.

C = Would teach only in an emergency.

A third group of curricula included 18 disciplines and represents 28 percent of the total. In this group, 6 were required (R), one was elective (E) and 11 were suggested as elective (S/E). Five of them were chosen twice (as first and third options to teach) and others were chosen only once, as a first choice. Those subjects which were taught in previous semesters required fewer sections than could have been offered. Results show that more than twice as many professors as needed chose to teach them, and that most of those suggested as electives have not been taught yet, and so, this group of curricula has no pressing need for new professors to teach it, but

in the near future a new demand may raise concern. See Table. 60.

The final group of curricula for the Agriculture program represents 32 percent of the total. Sixteen disciplines were required (R), 4 were suggested as elective (S/E) and one was an elective (E). Three of the required courses have shown a greater demand for classes than there are professors who chose them as first teaching choices. Five curricula were chosen only as a second choice; and 5 were not chosen by any professors at all.

Data in Table 61 show that this group of curricula will need more professors to teach it in the future provided the demand for classes remains unchanged. Therefore, there is a short range need for faculty to teach them.

Education

The curriculum of Education is comprised of 52 disciplines. Forty-six percent of the curriculum was chosen by professors from among the 3 options presented; all of those disciplines can rely upon the availability a greater number of professors to teach them, than is required by student demand. All, but one which is an elective (E) are required (R) disciplines. Results from Table 62 show that if the demand for those courses will remain the same, there is no need of additional faculty to teach them.

TABLE 60
AGRICULTURE CURRICULA WITH MEDIUM RANGE
NEED FOR FACULTY TO MEET THE DEMAND FOR
CLASSES

No. COURSES	STATUS	OPTIONS*			DEMAND
		A	B	C	
01 Agricultural Machinery I	R	1	-	2	1
02 Agricultural Machinery II	R	2	-	1	1
03 Plant Pathology	R	1	-	1	1
04 Forrage & Native Pastures Studies	R	3	-	2	1
05 Special Topics in Animal Husbandry	E	1	-	1	-
06 Rural Economics I	R	5	-	-	2
07 Rural Extension	R	2	-	-	1
08 Agriculture Politics	S/E	1	-	-	-
09 Agriculture Problems	S/E	1	-	-	-
10 Irrigation Project	S/E	1	-	-	1
11 Irrigation Systems	S/E	1	-	-	-
12 Weed Control Process	S/E	1	-	-	-
13 Food Microbiology	S/E	1	-	-	-
14 Rural Electrification	S/E	1	-	-	-
15 Soil Biology	S/E	1	-	-	-
16 Soil Fertility	S/E	1	-	-	1
17 Superficial Drainage	S/E	1	-	-	-
18 Fertilizers and Fertilization Process	S/E	1	-	-	1

 This group represents 28 percent of the whole curriculum.

* Options: A = Teaching as personal preference.

B = Teaching, but need time for preparation.

C = Would teach only in an emergency.

TABLE 61
AGRICULTURE CURRICULA WITH SHORT RANGE
NEED FOR FACULTY TO MEET THE DEMAND FOR
CLASSES

No. COURSES	STATUS	OPTIONS*			DEMAND
		A	B	C	
01 Agriculture II	R	1	2	1	4
02 Agriculture III	R	2	1	2	4
03 Agricultural Hydraulics II	R	2	1	1	3
04 Seed Technology	R	-	4	5	1
05 Sheep & Goat Scs.	R	-	3	1	-
06 Agricultural Microbiology	R	-	2	2	1
07 Special Topics in Plant Sciences	R	-	2	2	-
08 Rural Construction	R	-	1	2	-
09 Agricultural Drainage	S/E	-	1	1	-
10 Management & Conservation of Renewable Natural Resources	S/E	-	1	1	-
11 Recuperation of Deteriorated Areas	S/E	-	1	1	-
12 Plant Physiology	R	-	4	-	-
13 Cattle Sciences	R	-	2	-	1
14 Ecology of Animal Husbandry	R	-	1	-	-
15 Plant Systematic	R	-	1	-	-
16 Genetics Principles	S/E	-	1	-	-
17 Agricultural Products Technology I	R	-	-	-	1
18 Agricultural Products Technology II	R	-	-	-	2
19 Agricultural Entomology & Parasitology I	R	-	-	-	-
20 Agricultural Entomology & Parasitology II	R	-	-	-	-
21 Fishing Industry Economics	R	-	-	-	1

 This group represents 32 percent of the whole curriculum.

* Options: A = Teaching as personal preference.

B = Teaching, but need time for preparation.

C = Would teach only in an emergency.

TABLE 62
EDUCATION CURRICULA WITH NO NEED FOR
ADDITIONAL FACULTY TO MEET THE DEMAND
FOR CLASSES

No.	COURSES	STATUS	OPTIONS*			DEMAND
			A	B	C	
01	General Methodology of Teaching III	R	10	4	1	4
02	Introduction to Education	R	7	8	6	2
03	Field Experience in Primary School	R	6	1	2	4
04	Psychology Education	R	5	3	3	2
05	Field Experience in Secondary School	R	5	4	2	3
06	Development of Education in Brazil	R	4	6	1	-
07	Psychology of Learning	R	4	2	6	2
08	Sociology of Education	R	4	5	4	2
09	Philosophy of Education	R	4	6	3	1
10	Curriculum & Instruction	R	4	5	1	1
11	Structure & Functioning of System of Teaching in Primary Schools	R	3	1	6	3
12	Structure & Functioning of System of Teaching in Secondary Schools	R	3	2	4	2
13	Principles & Methods of School Administration	R	3	3	3	2
14	School Administration in Primary School	R	3	1	4	1

TABLE 62 Continued

No.	COURSES	STATUS	OPTIONS*			DEMAND
			A	B	C	
15	School Administration in Secondary School	R	3	2	3	1
16	History of Education	R	2	4	4	-
17	Methodology of Teaching in Primary School	R	2	3	1	2
18	Educational Measurements	R	2	4	1	1
19	Principle and Methods of School Supervision	R	2	2	3	2
20	Supervision in Primary School	R	2	1	3	1
21	Supervision in Secondary School	R	2	2	3	1
22	Field Experience in Supervision in Primary & Secondary Schools	R	2	1	2	3
23	Field Experience in School Administration in Primary & Second Schools	R	1	1	3	-
24	Principles & Methods of Educational Research	R	1	8	3	1

 This group represents 44 percent of the whole curriculum.

* Options: A = Teaching as personal preference.

B = Teaching, but need time for preparation.

C = Would teach only in an emergency.

TABLE 63
EDUCATION CURRICULA WITH A LONG RANGE NEED
FOR FACULTY TO MEET THE DEMAND FOR
CLASSES

No.	COURSES	STATUS	OPTIONS*			DEMAND
			A	B	C	
	Statistics Applied to Education	R	3	3	-	3
02	Counseling & Guidance in Primary School	R	1	1	-	1
03	Counseling & Guidance in Secondary School	R	1	1	-	1
04	General Methodology of Teaching IV	R	6	5	-	-
05	Field Experience in Counseling & Guidance in Primary & Secondary Schools I	R	1	1	-	2
06	Field Experience in Counseling & Guidance in Primary & Secondary Schools II	R	1	1	-	2
07	Structure & Functioning of the Teaching System in Primary & Secondary Schools.	R	2	1	-	3

 This group represents 11 percent of the total curriculum.

* Options: A = Teaching as personal preference.
 B = Teaching, but need time for preparation.
 C = Would teach only in an emergency.

Table 64 presents a group of 15 curricula representing 29 percent of the disciplines of the program. This group is comprised of 4 required (R) disciplines and 11 suggested as electives (S/E). Two of them were chosen by professors as first and third options; the 13 others were considered as only first choices by professors. All the curricula that have been taught in this group can rely

on the same current level of staff to meet the demand for classes. The data may indicate that if the demand for classes of those courses remains the same in future semesters, there will be no pressing need to hire or train new professors to teach them. The need for more faculty for those subjects was considered to be of medium range.

This final group of curricula in the Education program contains one required (R) discipline, and 5 suggested as electives (S/E). One of the curricula was chosen twice, as second and third choices; 4 were chosen only as a second option and one was not chosen by any faculty members at all. Even considering the fact that there are some subjects that had no demand until now, and in view of the necessity of having faculty members to teach all disciplines in the program, it is clear that this group definitely needs more professors available to teach them within a relatively short period of time. See Table 65.

TABLE 64
EDUCATION CURRICULUM WITH MEDIUM RANGE
NEED FOR FACULTY TO MEET THE DEMAND FOR
CLASSES

No. COURSES	STATUS	OPTIONS*			DEMAND
		A	B	C	
01 Principles & Methods of Counseling & Guidance	R	2	-	1	2
02 Economics of Education	S/E	1	-	1	-
03 Field Experience in Primary & Secondary Schools	R	1	-	-	1
04 Vocational Guidance	R	1	-	-	1
05 Methodology of Teaching in Primary & Secondary Schools	R	1	-	-	1
06 Anthropology of Education	S/E	2	-	-	-
07 Comparative Education	S/E	1	-	-	-
08 Ethnography of Education	S/E	1	-	-	-
09 Evaluation of Educational Systems	S/E	1	-	-	-
10 Legislation of Teaching	S/E	1	-	-	-
11 Introduction to Economics	S/E	1	-	-	-
12 School & Community	S/E	1	-	-	-
13 Sociology of Higher Education	S/E	1	-	-	-
14 Structure & Functioning of Higher Education Teaching	S/E	1	-	-	-
15 Non-Formal Education	S/E	1	-	-	-

 This group represents 29 percent of the whole curriculum.

* Options: A = Teaching as personal preference.
 B = Teaching, but need time for preparation.
 C = Would teach only in an emergency.

TABLE 65
EDUCATION CURRICULA WITH SHORT RANGE
NEED FOR FACULTY TO MEET THE DEMAND
FOR CLASSES.

No. COURSES	STATUS	OPTIONS*			DEMAND
		A	B	C	
01 Scientific Methodology	S/E	-	1	1	-
02 Group Dynamic	S/E	-	1	-	-
03 Language Acquisition	S/E	-	1	-	-
04 Special Education	S/E	-	1	-	-
05 Sociology of Teaching	S/E	-	1	-	-
06 Methodology of Teaching in Primary School II	R	-	-	-	1

 This group represents 19 percent of the whole curriculum.

* Options: A = Teaching as personal preference.

B = Teaching, but need time for preparation.

C = Would teach only in an emergency.

Geology

Forty-four courses are in the Geology program. The first block of them is formed by 11 required (R) and 2 elective (E) disciplines, all of which were selected by professors from among the 3 options presented. All of them have had a lower demand for classes than the number of faculty available to teach them. Therefore there is no need for more professors to teach them. See Table 66.

TABLE 66
GEOLOGY CURRICULA WITH NO NEED FOR
ADDITIONAL FACULTY TO MEET THE DEMAND FOR CLASSES

No.	COURSES	STATUS	OPTIONS*			DEMAND
			A	B	C	
01	Field Geology	R	3	2	1	2
02	Crystallography	R	2	2	2	2
03	Geochemistry	R	2	2	1	1
04	Geophysics	R	2	1	3	1
05	Hydrogeology	R	2	2	1	1
06	Mineralogy I	R	2	2	1	1
07	Sedimentology	R	2	1	2	1
08	Structural Geology	R	2	1	2	1
09	Geological Drawing	R	1	2	2	-
10	Stratigraphy	R	1	2	1	1
11	Mineralogy II	R	1	3	1	1
12	Genesis of Mineral Deposits	R	1	2	2	1
13	Mineral Resources of Brazil	R	1	2	1	-

 This group represents 29 percent of the whole curriculum.

* Options: A = Teaching as personal preference.

B = Teaching, but need time for preparation.

C = Would teach only in an emergency.

A second curriculum group in this program has 3 required (R) courses and one elective (E) course. All of them were chosen as a personal preferences and as disciplines that would require preparation before they could be taught. All of them had a lower demand for classes than the amount of professors available to teach them. They can be considered to be curricula with long range need for faculty to teach them . See Table 67.

TABLE 67
GEOLOGY CURRICULA WITH LONG RANGE NEED FOR
FACULTY TO MEET THE DEMAND FOR CLASSES

No.	COURSES	STATUS	OPTIONS*			DEMAND
			A	B	C	
01	General Geology	R	3	3	-	2
02	Practice of General Geology	R	3	2	-	1
03	Photogeology	R	1	3	-	-
04	Geotectonics	R	1	2	-	1

 This group represents 9 percent of the whole curriculum.

* Options: A = Teaching as personal preference.
 B = Teaching, but need time for preparation.
 C = Would teach only in an emergency.

The third group in the same program has 4 required (R) curricula, 2 electives (E) and 2 suggested as elective (S/E). Three of them were selected as personal preferences, and courses that professors would teach only in an emergency. Others were chosen only as personal preferences. If the demand for classes remains unchanged these curricula will have a moderate need for faculty trained to teach them. See Table 68.

TABLE 68
GEOLOGY CURRICULA WITH MEDIUM RANGE NEED
FOR FACULTY TO MEET THE DEMAND FOR CLASSES

No.	COURSES	STATUS	OPTIONS*			DEMAND
			A	B	C	
01	Economics of Geology	R	2	-	1	1
02	Geochronology	R	1	-	2	1
03	Marine Geology	R	1	-	2	-
04	Geological Prospection: Geochemistry	R	3	-	-	-
05	Geological Prospection: Geophysics	R	2	-	-	-
06	Final Report for Graduation	R	1	-	-	1
07	Mineral Macroscopy	S/E	1	-	-	-
08	Mineral Resources Evaluation	S/E	1	-	-	-

 This group represents 18 percent of the whole curriculum

* Options: A = Teaching as personal preference.
 B = Teaching, but need time for preparation.
 C = Would teach only in an emergency.

Table 69 contains a curriculum group of 10 required (R), 8 elective, and one suggested as elective (S/E) disciplines. None of them were selected as the personal preference of faculty. Eight of them were chosen as disciplines that would require additional training or would be taught only in emergencies. Four others were considered to be disciplines that professors would teach, if given time for preparation; 5 would be taught only in emergencies, and 2 of them were chosen by no faculty members.

This data indicates that this group of curricula has

an immediate need for the preparation of faculty members to teach those disciplines listed in the curricula, especially since 53 percent of the group is comprised of required courses.

TABLE 69
GEOLOGY CURRICULA WITH SHORT RANGE NEED
FOR FACULTY TO MEET THE DEMAND FOR
CLASSES

No. COURSES	STATUS	OPTIONS*			DEMAND
		A	B	C	
01 Geology of Brazil	R	-	2	1	1
02 Metamorphic Petrography	R	-	2	3	-
03 Geomorphology	R	-	1	2	-
04 Geotechnics	R	-	1	1	1
05 Igneous Petrography	R	-	1	3	1
06 Mining	R	-	1	1	-
07 Mineral Economics	E	-	2	1	-
08 Photogametry	E	-	1	1	-
09 Energy Resources	R	-	3	-	-
10 Historical Geology	R	-	3	-	-
11 Geological Prospection:					
Mineral	R	-	1	-	-
12 Open Pit Mining	E	-	2	-	-
13 Rock Mechanics	E	-	-	2	-
14 Cartography	E	-	-	1	-
15 Geosciences Planning	E	-	-	1	-
16 Micropaleontology	E	-	-	1	-
17 General Pedology	E	-	-	1	-
18 Paleontology	R	-	-	-	-
19 Geology Elements	S/E	-	-	-	1

This group represents 43 percent of the whole curriculum.

* Options: A = Teaching as personal preference.

B = Teaching, but need time for preparation.

C = Would teach only in an emergency.

Medicine

The Medical School has 90 courses in its curriculum. In a group of 40 courses, 29 courses were classified as required (R), 6 as elective (E), and 5 suggested as elective (S/E). They were chosen by professors from the 3 options presented; all of them have shown a lesser demand for classes than the amount of professors able to teach them. Therefore these courses have no need for additional faculty to teach them. See Table 70.

A second group from the same program is formed of 5 disciplines classified as suggested as elective (S/E). They have been chosen as personal preferences and as disciplines that can be taught a prior period of preparation. All of them show a greater number of faculty able to teach them than the existing demand for classes. Data show that in the long term these disciplines will have no pressing demand for faculty to teach these courses. See Table 71.

The third group of courses from the Medical program has one required (R) and 22 suggested as elective (S/E) subject-matters. The first 3 courses were chosen by some faculty as personal preferences, and by others as disciplines that could be taught in emergencies. All the others were selected as preferred disciplines. Some of these curricula have been taught before, while others have

TABLE 70
MEDICINE CURRICULA WITH NO NEED FOR
ADDITIONAL FACULTY TO MEET THE DEMAND
FOR CLASSES

No. COURSES	STATUS	OPTIONS*			DEMAND
		A	B	C	
01 Clinical Surgery:					
General	R	11	3	3	9
02 Human Anatomy I	R	9	10	9	6
03 Human Anatomy II	R	8	6	8	7
04 Internship: General & Clinical Medicine	R	8	4	1	2
05 Histology & Human Embriology	R	7	3	9	5
06 Introduction to Clinical Medicine	R	6	15	8	4
07 Pediatrics	R	6	11	7	5
08 Pathology	R	5	8	2	3
09 Medical Pharmacology	R	5	3	4	3
10 Physio-Pathology- Anatomy	R	5	5	2	1
11 Pharmacology	R	4	6	8	4
12 Human Physiology III	R	4	7	6	4
13 Medical Parasitology	R	4	4	6	4
14 Medical Psychology	R	4	5	2	2
15 Dermatology	R	4	2	3	3
16 Vital Statistics	R	3	4	3	2
17 Fundamental Radiology	R	3	7	5	3
18 Treatment of Infectious Diseases	R	3	12	10	1
19 Urology	R	3	2	3	3
20 Foundations of Human Physiology & Biophysics	R	2	4	6	1
21 Medical Genetics	R	2	5	5	2
22 Medical Immunology	R	2	10	6	1
23 Medical Microbiology	R	2	4	5	2
24 Ophthalmology	R	2	2	2	1
25 Neurology	R	2	1	2	1

TABLE 70 Continued

No. COURSES	STATUS	OPTIONS*			DEMAND
		A	B	C	
26 Otorhinolaryngology	R	2	2	4	3
27 Puericulture	R	2	6	7	-
28 Social Medicine	R	1	8	6	2
29 Psychiatry	R	1	1	4	-
30 Rheumatology	E	6	4	6	1
31 Clinical Endocrinology	E	5	6	4	2
32 Internal Medicine	E	4	15	5	4
33 Clinical Radiology	E	4	6	1	3
34 Medical Bacteriology	E	3	4	6	1
35 Human Immuno-Pathology	E	2	5	5	-
36 Clinical Medicine:					
Cardiology	S/E	7	3	1	5
37 Clinical					
Gastroenterology	S/E	5	5	5	-
38 Pediatrics: Neonatology	S/E	3	2	1	2
39 Clinical Surgery:					
Chest and					
Cardiovascular	S/E	2	1	1	1
40 Neuroanatomy	S/E	1	1	1	-

 This group represents 44 percent of the whole curriculum.

* Options: A = Teaching as personal preference.

B = Teaching, but need time for preparation.

C = Would teach only in an emergency.

TABLE 71
MEDICINE CURRICULA WITH LONG RANGE NEED FOR
FACULTY TO MEET THE DEMAND FOR CLASSES

No.	COURSES	STATUS	OPTIONS*			DEMAND
			A	B	C	
01	Clinical Surgery: Urology	S/E	4	1	-	-
02	Clinical Medicine Treatment of Parasites Diseases	S/E	1	1	-	1
03	Internship: Treatment of Infectious & Parasites Diseases	S/E	1	1	-	-
04	Internship: Nephrology	S/E	3	1	-	3
05	Internship: Orthopedics and Traumatology	S/E	1	1	-	1

 This group represents 5 percent of the whole curriculum.

* Options: A = Teaching as personal preference.

B = Teaching, but need time for preparation.

C = Would teach only in an emergency.

not. Considering the fact that, until the time when these data were collected, the demand for classes had been smaller than the number of professors available to teach them. Those courses have a medium range need of professors to teach them. See Table 72.

The fourth group of courses in this program is comprised of 22 disciplines: 7 required (R), 6 elective (E) and 9 suggested as elective (S/E). The first 5 of those courses were selected by professors from the 3 options presented; however, the demand for classes is

TABLE 72
MEDICINE CURRICULA WITH MEDIUM RANGE
NEED FOR FACULTY TO MEET THE DEMAND
FOR CLASSES

No. COURSES	STATUS	OPTIONS*			DEMAND
		A	B	C	
01 Legal Medicine & Deontology	R	2	-	2	-
02 Clinical Medicine: Angiology	S/E	1	-	1	-
03 Clin.Med.:Neurology	S/E	1	-	1	-
04 Clin.Med.:Dermatology	S/E	1	-	-	-
05 Clin.Med.:Nephrology	S/E	2	-	-	2
06 Clin.Med.:Pneumatology	S/E	1	-	-	1
07 Clin.Med.:Rheumatology	S/E	2	-	-	2
08 Clinical Surgery: Neurology	S/E	1	-	-	1
09 Clin.Surg.:Pediatrics	S/E	2	-	-	-
10 Internship:Cardiology	S/E	4	-	-	3
11 Internship: Gastroenterology	S/E	1	-	-	-
12 Internship:Pediatrics Surgery	S/E	1	-	-	1
13 Inter.: Rheumatology	S/E	2	-	-	1
14 Internship: Urology	S/E	1	-	-	-
15 Internship:Clinical Radiology	S/E	1	-	-	1
16 Internship:Oncology	S/E	1	-	-	-
17 Hansenology	S/E	1	-	-	-
18 Medical Entomology	S/E	1	-	-	-
19 Medical Biochemistry	S/E	1	-	-	1
20 Mouth & Facial Anatomy	S/E	1	-	-	1
21 Public Health-Nutrition	S/E	1	-	-	-
22 Technology Applied to Health	S/E	1	-	-	-
23 Micro-Plastic Surgery	S/E	1	-	-	-

 This group represents 25 percent of the whole curriculum.

* Options: A = Teaching as personal preference.
 B = Teaching, but need time for preparation.
 C = Would teach only in an emergency.

greater than the number of professors who have chosen them as personal teaching preferences. One subject from this list was chosen as a personal preference as well as one that would be taught only in an emergency. Three disciplines in this group were chosen by professors as second and third choices. Two other disciplines were chosen only as second options; 6 other courses would have been taught by sampled professors only in an emergency; and finally, 5 of these subjects were not chosen by any faculty from the options presented. These data indicate that this block of curricula has a pressing need for professors to teach it. See Table 73.

Table 74 displays a synthesis of the curriculum needs of the four studied programs.

In terms of curriculum status, it was found that 65 percent of the subjects from the Agriculture program, 63 percent from Education, 64 percent from Geology, and 41 percent from Medicine were required (R); whereas 8 percent of the Agriculture subjects, 6 percent of the Education subjects, 29 percent of the Geology subjects, and 13 percent of the Medicine subjects were elective (E). Twenty-eight percent of the Agriculture subjects, 31 percent of the Education subjects, 7 percent of the Geology subjects, and 46 percent of the Medicine subjects were suggested as electives (S/E).

TABLE 73
MEDICINE CURRICULA WITH SHORT RANGE NEED
FOR FACULTY TO MEET THE DEMAND FOR
CLASSES

No. COURSES	STATUS	OPTIONS*			DEMAND
		A	B	C	
01 Basic Studies of Techniques of Surgery & Anesthesiology	R	10	3	3	14
02 Traumatology-Orthopedics	R	2	4	3	4
03 Obstetrics- Gynaecology	R	2	4	4	5
04 Proctology	E	1	3	2	2
05 Clinical Medicine Internal Medicine	S/E	2	4	2	3
06 Internship: General Surgery	R	8	-	1	12
07 General Clinical Medicine	R	-	1	2	1
08 Clinical Cytology	E	-	1	1	1
09 Clinical Hematology	E	-	4	5	-
10 Treatment of Parasites Diseases	R	-	1	-	-
11 Internship Endocrinology and Diabetes	S/E	-	1	-	1
12 Complementary Methods of Diagnosis	R	-	-	1	-
13 Clinical Surgery: Abdominal	S/E	-	-	1	-
14 Clin.Surg.: Chest	S/E	-	-	2	-
15 Clin Surg.: Head-Neck	S/E	-	-	1	-
16 Internship: Hematology	S/E	-	-	1	-
17 Neuroradiology	S/E	-	-	1	-
18 Neuropediatrics	E	-	-	-	1
19 Hepatology	E	-	-	-	-
20 Special Epidemiology	E	-	-	-	-
21 Social Hygiene	S/E	-	-	-	1
22 Pathological Bioagents	S/E	-	-	-	1

 This group represents 25 percent of the whole curriculum.

* Options: A = Teaching as personal preference.

B = Teaching, but need time for preparation.

C = Would teach only in an emergency.

Data from Table 74 also show that 26 percent of the Agriculture curricula, 44 percent of the Education curricula, 29 percent of the Geology curricula, and 44 percent of the Medicine, were perceived as not requiring any additional faculty members to teach them, since they can rely upon more than one professor being available to meet the demand for classes.

Fourteen percent of the Agriculture curricula, 8 percent of the Education curricula, 9 percent of the Geology curricula, and 5.5 percent of the Medicine curricula, fall into the category of long range needs for more professors, since they were chosen by professors in the first (teaching as a personal preference) and second (teaching, but need time for preparation) options, and have a greater number of professors to teach them than called for by the existing demand for classes.

The category of medium range needs for professors includes: 28 percent of the curricula in the Agriculture program; 29 percent of the Education curricula, 18 percent of the Geology curricula, and 25 percent of the Medicine curricula. These curricula were taught by professors who have chosen them as the first or third choices, and there were more professors than needed to meet the demand for sections.

Finally, the category concerned with short range period or immediate need of professors, includes: 32 percent of the curricula in Agriculture; 19 percent of the

Education curricula, 43 percent of the Geology curricula, and 24 percent of the Medicine curricula.

TABLE 74
CURRICULA STATUS AND PERCEPTIONS OF REQUIREMENTS FOR THE
PROGRAMS IN AGRICULTURE, EDUCATION, GEOLOGY, MEDICINE

CURRICULA STATUS	AGRICULTURE		EDUCATION		GEOLOGY		MEDICINE	
	f	%	f	%	f	%	f	%
Required	42	64.6	33	63.4	28	63.6	37	41.1
Elective	05	7.6	03	5.7	13	29.5	12	13.3
Suggested as Elective	18	27.6	16	30.7	03	6.8	41	45.5
Total	65	99.8	52	99.8	44	99.9	90	99.9
CURRICULA REQUIREMENTS								
None	17	26.1	24	46.1	13	29.5	40	44.4
Long range	09	13.8	07	13.4	04	9.0	05	5.5
Medium range	18	27.6	15	28.8	08	18.1	23	25.5
Short range	21	32.3	06	11.5	19	43.1	22	24.4
Total	65	99.7	52	99.8	44	99.7	90	99.8

RESEARCH QUESTION NUMBER THREE
COMPETENCY LEVELS PERCEIVED AS EXISTING AMONG PROFESSORS
RESPONSIBLE FOR THE CURRICULA IN AGRICULTURE, EDUCATION,
GEOLOGY, AND MEDICINE

To answer this question, four categories were created in order to classify the faculty in different levels. The categories were:

1. Level One - Professors who perceived themselves as having a high level of content knowledge and skills, and are willing and ready to teach a specific curriculum.

2. Level Two - Professors who perceived themselves as having sufficient knowledge and skills, and are interested in teaching a specific curriculum but need time for preparation.

3. Level Three - Professors who perceived themselves as having limited knowledge and skills, with little interest in teaching a specific curriculum, but would teach it in an emergency.

For purposes of classifying professors' answers, only curricula categorized as required (R) or as elective (E) were considered, since most of the others, suggested as elective - (S/E), have not been officialy considered part of the curriculum.

Table 75 shows that, in the Agriculture program, at level one, 72 percent of the courses was perceived as having professors who considered themselves competent to teach them. Twenty-eight percent of the courses was seen to lack professors who perceived themselves able, at that level, to teach them.

Professors considered themselves competent, at level two, to teach 74 percent of the courses but not the other 25 percent.

At level three, results show that for 64 percent of the courses there were professors who classified themselves as competent to teach them; but at that level none of the professors considered themselves competent to teach the other 36 percent of the curriculum .

TABLE 75
PROFESSORS' SELF-PERCEPTION OF COMPETENCY
LEVELS IN RELATION TO THE CURRICULA OF
AGRICULTURE

LEVEL	PERCEPTION OF COMPETENCY		TOTAL
	COMPETENT %	INCOMPETENT %	
One	72.2	27.6	99.8
Two	74.3	25.5	99.8
Three	63.6	36.0	99.6

In Education, it was found that, at level one, 97 percent of the curricula are taught by professors who perceived themselves to be competent to teach them; there were no professors who considered themselves competent to teach 3 percent of the curricula.

At level two, 86 percent of the courses were considered to have professors who classified themselves as competent to teach any discipline from this group; professors considered themselves not competent to teach 14 percent of the subjects at this level.

At level three, the perceptions of professors varied as follows: professors saw themselves competent to teach 69 percent of the courses; they did not feel competent to teach 30 percent of the curricula. See table 76.

TABLE 76
PROFESSORS' SELF-PERCEPTION OF COMPETENCY
LEVELS IN RELATION TO THE CURRICULA OF
EDUCATION

LEVEL	PERCEPTION OF COMPETENCY		TOTAL
	COMPETENT	INCOMPETENT	
	%	%	%
One	96.8	2.7	99.5
Two	85.8	13.8	99.6
Three	69.3	30.5	99.8

Table 77 shows that the variation in perceptions of competency for teaching different curricula in the Geology program was smaller than in others.

At level one, professors perceived themselves competent to teach 56 percent of the courses, and not able to teach the other 44 percent.

At level two, professors considered themselves competent to teach 70 percent of the courses. No one considered him/herself competent to teach 29 percent of the subjects in the curriculum.

At level three, the figures were: 71 percent of the curricula professors feel competent to teach. Professors did not consider themselves competent to teach the other 29 percent.

TABLE 77
PROFESSORS' SELF-PERCEPTION OF COMPETENCY
LEVELS IN RELATION TO THE CURRICULA OF
GEOLOGY

LEVEL	PERCEPTION OF COMPETENCY		TOTAL
	COMPETENT %	INCOMPETENT %	
One	55.9	44.0	99.9
Two	70.5	29.2	99.7
Three	70.6	29.2	99.8

As can be seen in Table 78, the Medical School showed a wide variation.

At level one, faculty perceived themselves as competent to teach 83 percent of the courses, and unable to teach 16 percent of the subjects of the program.

At level two, professors considered themselves competent to teach 87 percent of the curriculum. No one among the faculty who considered him/herself able to teach 12 percent of the curriculum.

Finally at level three, professors perceived themselves competent to teach 91 percent of the curriculum; one considered him/herself competent to teach 8 percent of the curriculum.

TABLE 78
PROFESSORS' SELF-PERCEPTION OF COMPETENCY
LEVELS IN RELATION TO THE CURRICULA OF
MEDICINE

LEVEL	PERCEPTION OF COMPETENCY		TOTAL
	COMPETENT	INCOMPETENT	
	%	%	%
One	83.2	16.3	99.5
Two	87.2	12.2	99.4
Three	91.4	8.1	99.5

RESEARCH QUESTION NUMBER FOUR
AGRICULTURE, EDUCATION, GEOLOGY AND MEDICINE FACULTY
PERCEPTION OF TEACHING, RESEARCH, AND SERVICE SKILLS
LEVELS OF MASTERY

All discussions of results were based on percentage of answers related to each skill for each department in the program, and on the means and standard deviations for each program as a whole. All statistical means were then arranged in rank order from the highest to the lowest.

A system of categories was created to classify the results as follows:

1. High Level - skills mastered by more than 70 percent faculty;
2. Medium Level - skills mastered by a range of 30 to 70 percent of the faculty;
3. Low level - skills mastered by less than 30 percent of faculty.

The instrument for collecting data (questionnaire)

presented 25 skills related to teaching, 31 concerning research and 6 connected with service.

In order to facilitate the analysis of results, skills were categorized as follows:

Teaching process - skills numbered from 1 to 10 were related to the planning (P) stage; skills numbered from 11 to 21 were related to the interaction phase (IP) or performance of teaching; skills numbered from 22 to 25 were concerned with the evaluation (Ev) process in teaching.

Research process - planning stage (P) skills were numbered 1 to 16; bureaucratic tasks (B) skills were numbered 17 to 20; and performing phase (PP) skills were numbered 21 to 31.

Service process - there was no categorization for these skills since they all are related to the performance of the process. It was understood that for service, a professional should possess the skills in question.

Faculty's Perception of Teaching Skills Mastered

In the Agriculture Program the mean of skills related to the teaching process varied from 100 percent to 16 percent. Standard deviation varied from zero to 23.3. Professors working in the program perceived themselves to have mastered 56 percent of the skills at the highest level. One skill in this block was perceived to have been

mastered by 100 percent of the faculty. The lowest mean found was 75 percent and the standard deviation varied from zero to 18.9. Only 2 skills were perceived to be completely lacking among the entire faculty of two departments in the program.

Professors perceived that 40 percent of the skills had been mastered by a range of 69 percent to 38 percent of the professors, varying from 15.8 (SD) to 28.9 (SD). Less than 30 percent of faculty claimed to have mastered only one skill. Skills related to the planning and interaction phases were considered to have been mastered to a greater degree than those related to the performance and evaluation phases. See Table 79.

In Education, the highest mean found was 89 percent and the lowest was zero. Standard deviation varied from 28.4 to zero.

Professors perceived themselves as having mastered 60 percent of the teaching skills at the high level; 28 percent at the medium level; and 12, at the low level.

TABLE 79
TEACHING SKILLS PERCEIVED MASTERED BY
PROFESSORS IN THE AGRICULTURE PROGRAM

RANK	PROCESS PHASE**	TEACHING SKILLS	MEAN %	SD
01	P	To organize an instructional plan for a class.	100.0	0.0
02	IP	To interact positively with students (to give them attention, information, task directions, etc.).	97.2	6.8
03	IP	To create pleasant learning situations (to avoid tension, fear, or anxiety in classroom).	94.8	8.0
04	P	To determine competencies (skills) necessary for students, (what students have to learn in order to pass in a specific discipline).	92.3	9.7
05	P	To select and organize teaching content according to the objectives.	91.6	9.8
06	IP	To communicate with students (to listen to them before interacting).	90.2	9.0
07	P	To select teaching procedures (methods and techniques) appropriate to the discipline you teach.	83.9	18.5
08	P	To develop instructional objectives.	82.3	14.3
09	IP	To create learning situations adequate for the needs of the students (a practical and up to date teaching process relying upon students participation).	82.1	18.5
10	IP	To organize an instructional plan for a course (discipline).	81.6	12.9
11	P	To organize an instructional plan for a unit of study.	80.9	17.9
12	P	To select instructional resources (material and equipment) necessary for the teaching process.	77.4	6.2
13	P	To do a diagnosis of a teaching situation, (example: to obtain basic information about students, course duration, facilities, resources to make decisions and planning.	74.9	15.3

TABLE 79 Continued

RANK	PROCESS PHASE**	TEACHING SKILLS	MEAN %	SD
14	IP	To use special instruments in classrooms (example, projectors, specific instruments for each area of study).	74.9	18.9*
15	Ev	To develop special instruments to evaluate students (tests, specific tasks, observation sheets. etc).	69.0	18.8
16	P	To determine the minimum requirements for students to enroll in a specific discipline.	64.4	18.1
17	IP	To use specific teaching techniques in labs.(practical classes).	63.2	28.9
18	Ev	To evaluate students based on previous criteria.	56.2	18.7
19	IP	To use specific teaching techniques in the classroom.	55.6	23.0
20	IP	To develop special techniques for teaching a specific topic.	55.1	17.2
21	IP	To use specific instruments in labs.	54.4	18.1
22	Ev	To utilize special instruments in the evaluation process.	48.8	15.8
23	IP	To demonstrate the development of practical skills for students, in a gradual, clear and logical way, (example: teaching specific abilities related to the use of specific instruments as in surgical techniques).	42.5	17.7
24	Ev	To evaluate students in relation to specific skills, performance and behavior in a professional situation as in field experiences, internships, etc.	37.6	23.3+
25	IP	To use games and simulations appropriate for the classroom.	16.3	10.1#

* High Level = 56.0 percent.

+ Medium Level = 40.0 percent.

Low Level = 4.0 percent.

** Process Phase: P = Planning Phase.

IP = Interaction Phase.

Ev = Evaluation Phase.

One skill (to use specific instruments in labs.) was considered completely lacking among professors in all departments; and another (to develop special instruments to evaluate students, test specific tasks, observation sheets, etc.) was considered mastered by all professors in only one department.

Professors also indicated a higher level of mastery of the planning skills related to teaching than the other skills. See Table 80.

In the Geology program, 40 percent of the teaching skills were considered mastered by more than 70 percent of the faculty members; 56 percent of those skills were considered to be mastered by a range of 30 percent to 70 percent of professors, and only 4 percent of the skills were considered mastered by less than 30 percent of faculty. Since the whole program includes only one department, there was no variation ($SD = \text{zero}$).

Mastery of skills related to the planning stages of the teaching process was found to be higher than the others. See Table 81.

The means related to teaching skills in the Medicine program varied from 90 percent to 15 percent. Standard deviation varied from 27.8 to 8.0.

More than 70 percent of the faculty felt that they have mastered 40 percent of the teaching skills.

TABLE 80
TEACHING SKILLS PERCEIVED MASTERED BY PROFESSORS IN
THE EDUCATION PROGRAM

RANK	PROCESS PHASE**	TEACHING SKILLS	MEAN %	SD.
01	P	To organize an instructional plan for a unit of study.	89.3	2.0
02	IP	To communicate with students (to listen to them before interacting).	89.3	2.0
03	IP	To interact positively with students (to give them attention, information, task directions, etc.)	89.3	2.0
04	IP	To create pleasant learning situations (to avoid tension, fear or anxiety in classroom).	85.6	7.1
05	P	To organize an instructional plan for a class.	85.1	8.8
06	P	To select instructional resources (material and equipment) necessary for the teaching process.	82.3	6.9
07	P	To do a diagnosis of a teaching situation, (example: to obtain basic information about students, course duration, facilities, resources to make decisions and planning.	81.4	8.9
08	P	To organize an instructional plan for a course (discipline).	80.9	16.0
09	EV	To develop special instruments to evaluate students (tests, specific tasks, observation sheets. etc).	79.1	19.0
10	P	To select and organize teaching content according to the objectives .	78.6	4.2
11	EV	To utilize special instruments in the evaluation process.	78.6	4.2
12	P	To select teaching procedures (methods and techniques) appropriate to the discipline you teach.	78.2	13.8
13	IP	To create learning situations adequate for the needs of the students (a practical and up to date teaching process, relying upon students participation).	77.2	14.5

TABLE 80 Continued

RANK	PROCESS PHASE**	TEACHING SKILLS	MEAN %	SD
14	P	To determine competencies (skills) necessary for students, (what students have to learn in order to pass in a specific discipline).	75.4	13.1
15	P	To develop instructional objectives.	71.2	19.6*
16	IP	To use specific teaching techniques in the classroom.	68.5	11.2
17	P	To determine the minimum requirements for students to enroll in a specific discipline.	68.0	6.3
18	IP	To use special instruments in classrooms (example, projectors, specific instruments for each area of study).	65.0	2.3
19	P	To develop special techniques for teaching a specific topic.	64.8	17.6
20	EV	To evaluate students based on previous criteria.	61.0	9.5
21	EV	To evaluate students in relation to specific skills, performance and behavior in a professional situation as in field experiences, internships, etc.	52.3	9.2
22	IP	To use games and simulations appropriate for the classroom.	42.5	28.4+
23	IP	To use specific teaching techniques in labs.(practical classes).	13.8	12.7
24	IP	To demonstrate the development of practical skills for students, in a gradual, clear and logical way, (example: teaching specific abilities related to the use of specific instruments as in surgical techniques).	10.6	2.1
25	IP	To use specific instruments in labs.	0.0	0.0#

* High Level = 60.0 percent.

+ Medium Level = 28.0 percent.

Low Level = 12.0 percent.

** Process Phase: P = Planning Phase.

IP = Interaction Phase.

Ev = Evaluation Phase.

TABLE 81
TEACHING SKILLS PERCEIVED MASTERED BY PROFESSORS IN
THE GEOLOGY PROGRAM.

RANK	PROCESS PHASE**	TEACHING SKILLS	MEAN %	SD
01	P	To determine the minimum requirements for students to enroll in a specific discipline.	90.0	0.0
02	P	To develop instructional objectives	90.0	0.0
03	P	To organize an instructional plan for a class.	90.0	0.0
04	IP	To communicate with students (to listen to them before interacting).	90.0	0.0
05	IP	To interact positively with students (to give them attention, information, task directions, etc.)	90.0	0.0
06	P	To determine competencies (skills) necessary for students, (what students have to learn in order to pass in a specific discipline).	80.0	0.0
07	P	To select and organize teaching content according to the objectives .	80.0	0.0
08	P	To select teaching procedures (methods and techniques) appropriate to the discipline you teach.	80.0	0.0
09	P	To organize an instructional plan for a course (discipline).	80.0	0.0
10	IP	To use special instruments in classrooms (example, projectors, specific instruments for each area of study).	80.0	0.0*
11	P	To select instructional resources (material and equipment) necessary for the teaching process.	70.0	0.0
12	IP	To use specific teaching techniques in the classroom.	70.0	0.0
13	IP	To create pleasant learning situations (to avoid tension, fear or anxiety in classroom).	70.0	0.0
14	EV	To develop special instruments to evaluate students (tests, specific tasks, observation sheets, etc.)	70.0	0.0

TABLE 81 Continued

RANK	PROCESS PHASE**	TEACHING SKILLS	MEAN %	SD
15	P	To do a diagnosis of a teaching situation, (example: to obtain basic information about students, course duration, facilities, resources to make decisions and planning.	60.0	0.0
16	P	To organize an instructional plan for a unit of study.	60.0	0.0
17	IP	To use specific teaching techniques in labs. (practical classes).	60.0	0.0
18	IP	To create learning situations adequate for the needs of the students (a practical and up to date teaching process, relying upon students participation).	60.0	0.0
19	EV	To evaluate students based on previous criteria .	50.0	0.0
20	EV	To evaluate students in relation to specific skills, performance and behavior in a professional situation as in field experiences, internships, etc..	50.0	0.0
21	IP	To develop special techniques for teaching a specific topic.	40.0	0.0
22	IP	To use specific instruments in labs.	40.0	0.0
23	IP	To demonstrate the development of practical skills for students, in a gradual, clear and logical way, (example: teaching specific abilities related to the use of specific instruments as in surgical techniques).	40.0	0.0
24	EV	To utilize special instruments in the evaluation process.	40.0	0.0+
25	IP	To use games and simulations appropriate for the classroom.	20.0	0.0#

* High Level = 40.0 percent.

+ Medium Level = 56.0 percent.

Low Level = 4.0 percent.

** Process Phase: P = Planning Phase.

IP = Interaction Phase.

Ev = Evaluation Phase.

At the medium level (a range of more than 30 percent to 70 percent of professors) faculty members perceived themselves as having mastered 52 percent of the skills; 4 percent of the skills were rated as having been mastered by less than 18 percent of the faculty members.

In this program skills related to the interaction phase in teaching were rated higher than others. See Table 82.

Faculty's Perception of Research Skills Mastered

In the Agriculture program, the mean related to the perception of the research skills varied from 87 percent to 39 percent and the standard deviation was from 28.6 to 6.6.

More than 70 percent of the faculty considered themselves to have mastered 38 percent of the research skills presented; 61 percent of those skills were considered mastered by a range of less than 70 percent to more than 30 percent of the professors.

In relation to the different phases of the research process, skills were more or less evenly distributed as to perception of mastery, however skills related to the performing phase were rated a bit higher than others. See Table 83.

TABLE 82
TEACHING SKILLS PERCEIVED MASTERED BY PROFESSORS IN
MEDICINE PROGRAM.

RANK	PROCESS PHASE**	TEACHING SKILLS	MEAN %	SD
01	IP	To interact positively with students (to give them attention, information, task directions, etc.)	90.4	9.8
02	IP	To create pleasant learning situations (to avoid tension, fear or anxiety in classroom).	86.5	10.4
03	IP	To create learning situations adequate for the needs of the students (a practical and up to date teaching process, relying upon students participation).	84.6	12.1
04	IP	To communicate with students (to listen to them before interacting).	81.5	13.6
05	P	To organize an instructional plan for a class.	81.4	12.9
06	P	To determine competencies (skills) necessary for students, (what students have to learn in order to pass in a specific discipline).	81.1	8.8
07	IP	To use special instruments in classrooms (example, projectors, specific instruments for each area of study.	77.6	13.6
08	P	To organize an instructional plan for a course (discipline).	73.6	17.3
09	P	To select teaching procedures (methods and techniques) appropriate to the discipline you teach.	73.0	13.3
10	P	To develop instructional objectives.	72.4	12.5
11	P	To select instructional resources (material and equipment) necessary for the teaching process.	70.1	8.8*
12	P	To select and organize teaching content according to the objectives	69.5	8.0
13	EV	To develop special instruments to evaluate students (tests, specific tasks, observation sheets. etc).	69.1	18.1

TABLE 82 Continued

RANK	PROCESS PHASE**	TEACHING SKILLS	MEAN %	SD
14	P	To do a diagnosis of a teaching situation, (example: to obtain basic information about students, course duration, facilities, resources to make decisions and planning.	69.0	8.8
15	P	To organize an instructional plan for a unit of study.	68.6	16.9
16	IP	To use specific teaching techniques in the classroom.	63.7	17.6
17	EV	To evaluate students based on previous criteria	63.6	18.4
18	IP	To demonstrate the development of practical skills for students, in a gradual, clear and logical way, (example: teaching specific abilities related to the use of specific instruments as in surgical techniques).	63.3	12.6
19	IP	To use specific teaching techniques in labs. (practical classes).	62.4	25.8
20	P	To determine the minimum requirements for students to enroll in a specific discipline.	61.7	10.5
21	IP	To develop special techniques for teaching a specific topic.	60.4	16.4
22	EV	To utilize special instruments in the evaluation process.	54.5	16.3
23	EV	To evaluate students in relation to specific skills, performance and behavior in a professional situation as in field experiences, internships, etc.	52.8	18.8
24	IP	To use specific instruments in labs.	46.2	27.8+
25	IP	To use games and simulations appropriate for the classroom.	14.7	17.7#

* High Level = 44.0 percent.

+ Medium Level = 52.0 percent.

Low Level = 4.0 percent.

** Process Phase: P = Planning Phase.

IP = Interaction Phase.

Ev = Evaluation Phase.

TABLE 83
RESEARCH SKILLS PERCEIVED MASTERED BY
PROFESSORS WORKING IN THE AGRICULTURE PROGRAM

RANK	PROCESS PHASE**	RESEARCH SKILLS	MEAN %	SD
01	PP	To collect data.	87.0	16.3
02	PP	To write the final report of the study.	84.8	15.4
03	P	To prepare a budget for the research.	79.7	17.8
04	B	To register the research in the academic department where you work.	79.7	13.8
05	PP	To describe the findings.	78.1	13.8
06	P	To prepare the final draft of the proposal for the research.	76.6	18.8
07	P	To define a research problem.	76.2	6.6
08	B	To register the research project in center where you are located.	76.0	19.7
09	P	To write a rationale for the study.	75.8	14.1
10	P	To determine the objectives of the research.	73.0	13.1
11	PP	To analyze the data collected.	72.3	15.0
12	P	To determine all variables and/or categories in the study.	70.2	19.0*
13	P	To describe the instrument to be utilized.	67.9	14.3
14	B	To get in touch with granting agencies to obtain funding.	67.0	20.2
15	P	To determine the hypothesis or questions to be studied.	66.5	22.0
16	P	To select instruments to be utilized (questionnaire, interview, lab or field techniques, etc.).	66.3	15.9
17	PP	To utilize special instruments to do research in your area of interest.	65.2	9.9
18	B	To register the research project in the Vice-Rectorcy for Research and Graduate Studies.	65.1	23.6
19	P	To review the existing literature.	64.1	17.7

TABLE 83 Continued

RANK	PROCESS PHASE**	RESEARCH SKILLS	MEAN %	SD
20	PP	To use special techniques for field studies, in your areas of interest, to achieve the proposed objectives.	62.5	25.4
21	P	To outline the theory and fundamental concepts for the study.	62.0	14.5
22	P	To establish the scope and limitation of the study.	61.8	8.6
23	PP	To obtain cooperation of people and/or institutions in the country and overseas, for the on going research.	61.8	20.8
24	PP	To utilize appropriate instruments or resources to collect data.	58.8	24.4
25	PP	To utilize instruments or statistical techniques appropriate for your area of interest.	56.9	18.9
26	P	To describe the data analysis procedures.	55.7	7.2
27	P	To describe methodological and/or statistical procedures to choose the sample.	54.4	13.5
28	PP	To use appropriate lab' techniques for your areas of interest to achieve the proposed objectives.	53.6	28.6
29	PP	To analyze the data collected.	48.6	14.5
30	P	To describe the relevant terms used in the study.	46.0	7.6
31	PP	To develop special instruments for the studies in your specific areas of interest (creation of new types of equipment, new techniques, etc.)	39.1	14.3+

* High Level = 37.8 percent.

+ Medium Level = 61.2 percent.

** Process Phase: P = Planning Phase.

B = Bureaucratic Tasks.

PP = Performance Phase.

In Education, the average perception of the research skills that had been mastered varied from 62 percent to zero, and the standard deviation was from 25.2 to zero.

None of the skills was perceived as being mastered by more than 70 percent of faculty.

In this program, 30-70 percent of the faculty considered that they had mastered 84 percent of the skills -- a medium range of mastery of the skills found in this process. Sixteen percent of the skills were mastered by less than 30 percent of the professors.

One skill, (to use appropriate laboratory techniques for your areas of interest to achieve the proposed objectives), was seen to be totally lacking among professors in all departments.

Skills related to the performing phase (PP) in the research process scored higher than others, however, there was a fairly even distribution of skills concerned with the three phases of the process. See Table 84 .

In the Geology program more than 70 percent of faculty perceived themselves as having mastered 52 percent of the research skills; a range of 30 percent to 70 percent of professors mastered 45 percent of the research skills and less than 30 percent of professors perceived themselves having mastered 3 percent of the skills related to the research process.

TABLE 84
RESEARCH SKILLS PERCEIVED MASTERED BY
PROFESSORS IN THE EDUCATION PROGRAM

RANK	PROCESS PHASE*	RESEARCH SKILLS	MEAN %	SD
01	PP	To write the final report of the study.	61.6	5.6
02	PP	To use special techniques for field studies, in your areas of interest, to achieve the proposed objectives.	55.5	20.9
03	PP	To describe the findings.	49.9	16.6
04	B	To register the research in the academic department where you work.	49.5	11.3
05	PP	To collect data.	48.6	14.6
06	PP	To utilize special instruments to do research in your area of interest.	48.6	14.6
07	P	To write a rationale for the study.	48.1	25.2
08	B	To register the research project in center where you are located.	48.1	25.2
09	P	To determine the objectives of the research.	46.7	10.5
10	P	To select instruments to be utilized (questionnaire, interview, lab or field techniques).	46.7	10.5
11	PP	To utilize appropriate instruments or resources to collect data.	44.9	20.6
12	P	To define a research problem.	43.9	6.2
13	PP	To analyze the data collected.	43.0	13.3
14	P	To determine the hypothesis or questions to be studied.	42.5	16.7
15	P	To review the existing literature.	41.1	3.4
16	P	To prepare the final draft of the proposal for the research.	40.2	8.6
17	B	To register the research project in the Vice-Rectorcy for Research and Graduate Studies .	39.8	13.1
18	P	To describe the instrument to be utilized.	38.8	17.3
19	PP	To utilize instruments or statistical techniques appropriate for your area of interest.	38.8	9.6

TABLE 84 Continued

RANK	PROCESS PHASE*	RESEARCH SKILLS	MEAN %	SD
20	P	To establish the scope and limitation of the study.	36.1	12.7
21	P	To describe the data analysis procedures.	35.1	20.0
22	P	To describe methodological and/or statistical procedures to choose the sample.	35.1	20.0
23	P	To outline the theory and fundamental concepts for the study.	34.2	9.7
24	P	To determine all variables and/or categories in the study.	33.3	8.3
25	P	To prepare a budget for the research.	31.4	19.5
26	PP	To obtain cooperation of people and/or institutions in the country and overseas, for the on going research.	31.0	7.9+
27	P	To justify the selection of the statistical procedures.	29.6	10.4
28	B	To get in touch with granting agencies to obtain funding.	29.6	17.8
29	P	To describe the relevant terms used in the study.	27.7	4.7
30	PP	To develop special instruments for the studies in your specific areas of interest (creation of new types of equipment, new techniques, etc.)	25.4	10.8
31	PP	To use appropriate lab' techniques for your areas of interest to achieve the proposed objectives.	0.0	0.0#

+ Medium Level = 83.8 percent.

Low Level = 16.1 percent.

* Process Phase: P = Planning Phase.

B = Bureaucratic Phase.

PP = Performance Phase.

Among this group of faculty, 6 research skills were considered to have been mastered by 100 percent of the faculty, and no skill was considered lacking.

Concerning the different phases of the research process, there was a balanced distribution; however, skills related to planning (P) scored a bit higher than others. See Table 85.

In Medicine, the average of research skills considered mastered by professors ranged from 35 to 15 percent, with the standard deviation from 25.9 to 9.7.

More than 70 percent of faculty believed that no skill had been fully mastered; 30 to 35 percent of the professors in this program considered themselves to have mastered 26 percent of the research skills; while less than 30 percent of faculty mastered 74 percent of the research skills presented.

In general, planning (P) skills scored higher than others in terms of the phases of the research process. See Table 86.

TABLE 85
RESEARCH SKILLS PERCEIVED MASTERED BY
PROFESSORS IN THE GEOLOGY PROGRAM

RANK	PROCESS PHASE**	RESEARCH SKILLS	MEAN %	SD
01	P	To write a rationale for the study.	100.0	0.0
02	P	To determine the objectives of the research.	100.0	0.0
03	P	To prepare a budget for the research.	100.0	0.0
04	P	To prepare the final draft of the proposal for the research.	100.0	0.0
05	B	To register the research in the academic department where you work.	100.0	0.0
06	PP	To write the final report of the study.	100.0	0.0
07	P	To select instruments to be utilized (questionnaire, interview, lab or field techniques, etc.).	90.0	0.0
08	B	To register the research project in center where you are located.	90.0	0.0
09	B	To register the research project in the Vice-Rector's Office for Research and Graduate Studies.	90.0	0.0
10	PP	To use appropriate lab' techniques for your areas of interest to achieve the proposed objectives.	90.0	0.0
11	P	To review the existing literature.	80.0	0.0
12	P	To determine the hypothesis or questions to be studied.	80.0	0.0
13	B	To get in touch with granting agencies to obtain funding.	80.0	0.0
14	PP	To use special techniques for field studies, in your areas of interest, to achieve the proposed objectives.	80.0	0.0
15	PP	To use appropriate lab' techniques for your areas of interest to achieve the proposed objectives.	80.0	0.0
16	PP	To analyze the data collected.	80.0	0.0*
17	P	To define a research problem.	70.0	0.0
18	P	To establish the scope and limitation of the study.	70.0	0.0
19	PP	To utilize appropriate instruments or resources to collect data.	70.0	0.0

TABLE 85 Continued

RANK	PROCESS PHASE**	RESEARCH SKILLS	MEAN %	SD
20	P	To outline the theory and fundamental concepts for the study.	60.0	0.0
21	PP	To utilize special instruments to do research in your area of interest.	60.0	0.0
22	PP	To analyze the data collected.	60.0	0.0
23	P	To determine all variables and/or categories in the study.	50.0	0.0
24	P	To describe methodological and/or statistical procedures to choose the sample.	50.0	0.0
25	PP	To obtain cooperation of people and/or institutions in the country and overseas, for the on going research.	40.0	0.0
26	P	To describe the instrument to be utilized.	30.0	0.0
27	P	To describe the data analysis procedures.	30.0	0.0
28	P	To describe the relevant terms used in the study.	30.0	0.0
29	PP	To develop special instruments for the studies in your specific areas of interest (creation of new types of equipment, new techniques, etc.)	30.0	0.0
30	PP	To utilize instruments or statistical techniques appropriate for your area of interest.	30.0	0.0+
31	P	To justify the selection of the statistical procedures.	20.0	0.0#

* High Level = 51.6 percent.

+ Medium Level = 45.1 percent.

Low Level = 3.2 percent.

** Process Phase: P = Planning Phase.

B = Bureaucratic Tasks.

PP = Performance Phase.

TABLE 86
RESEARCH SKILLS PERCEIVED MASTERED BY
PROFESSORS IN THE MEDICINE PROGRAM

RANK	PROCESS PHASE*	RESEARCH SKILLS	MEAN %	SD
01	P	To review the existing literature.	35.2	10.5
02	P	To determine the objectives of the research.	32.2	18.5
03	P	To define a research problem.	32.0	22.3
04	PP	To collect data.	32.0	22.9
05	PP	To write the final report of the study.	31.5	25.9
06	P	To select instruments to be utilized (questionnaire, interview, lab or field techniques, etc.)	31.4	21.6
07	P	To describe the instrument to be utilized.	30.8	23.2
08	P	To write a rationale for the study.	30.3	16.0+
09	PP	To describe the findings.	29.8	22.9
10	B	To register the research in the academic department where you work.	28.7	25.3
11	PP	To utilize special instruments to do research in your area of interest.	28.4	22.5
12	PP	To analyze the data collected.	27.6	24.7
13	B	To register the research project in center where you are located.	26.5	22.5
14	P	To outline the theory and fundamental concepts for the study.	25.9	9.7
15	P	To determine the hypothesis or questions to be studied.	25.9	17.4
16	P	To use appropriate lab' techniques for your areas of interest to achieve the proposed objectives.	25.5	25.6
17	P	To prepare the final draft of the proposal for the research.	25.3	21.2
18	B	To register the research project in the Vice-Rectory for Research and Graduate Studies .	25.2	23.0
19	P	To describe methodological and/or statistical procedures to choose the sample.	24.6	16.1

TABLE 86 Continued

RANK	PROCESS PHASE*	RESEARCH SKILLS	MEAN %	SD
20	P	To determine all variables and/or categories in the study.	24.5	18.4
21	PP	To establish the scope and limitation of the study.	24.5	20.1
22	P	To use special techniques for field studies, in your areas of interest, to achieve the proposed objectives.	23.6	15.0
23	PP	To prepare a budget for the research.	20.5	18.2
24	P	To utilize appropriate instruments or resources to collect data.	19.5	18.0
25	PP	To justify the selection of the statistical procedures.	19.3	15.9
26	P	To describe the data analysis procedures.	19.0	9.9
27	B	To get in touch with granting agencies to obtain funding.	18.4	10.4
28	PP	To develop special instruments for the studies in your specific areas of interest (creation of new types of equipment, new techniques, etc).	17.5	17.4
29	PP	To obtain cooperation of people and/or institutions in the country and overseas, for the on going research.	16.9	19.0
30	PP	To describe the relevant terms used in the study.	16.0	15.1
31	PP	To utilize instruments or statistical techniques appropriate for your area of interest.	15.5	15.3#

+ Medium Level = 26.0 percent.

Low Level = 74.0 percent.

* Process Phase: P = Planning Phase.

B = Bureaucratic Tasks.

PP = Performance Phase.

Faculty's Perception of Service Skills Mastered

In the Agriculture program professors perceived themselves as having a level of mastery of service skills lower than an average of 30 percent. The variation of the mean of the skills considered as being mastered was from 26 percent to 10 percent, and the standard deviation was from 20.4 to 12.9. Data show that in each department of Agriculture there was at least one service skill which was not mastered by any professor. See table 87.

Table 88 shows that more than 70 percent of the Education professors considered themselves as having mastered one service skill. All other service skills were mastered by a range of 41 percent to 67 percent of the faculty. The standard deviation varied from 18.1 to 4.1, which indicates that some departments had a much higher level of mastery in some skills than others.

Geology professors perceived themselves to have low levels of mastery in relation to service skills. The highest percentage found was 50 percent of the professors mastering one skill; another was mastered by 40 percent and all others were mastered by 20 percent of the faculty. See table 89.

TABLE 87
SERVICE SKILLS PERCEIVED MASTERED BY PROFESSORS
IN THE AGRICULTURE PROGRAM.

RANK	SERVICE SKILLS	MEAN %	SD
01	To develop activities able to provide students with contact with the reality of communities through collection of information, transmission of knowledge, services and other activities.	25.6	20.4
02	To communicate or to apply through specific programs or activities, the theoretical and/or practical knowledge elaborated within the university to the communities that have been participating in the aforementioned programs or activities.	21.9	16.0
03	To do a survey of the community problems to determine the needs for extension programs.	15.8	16.4
04	To propose activities or actions programs for communities which will provide feedback to teaching and research activities.	15.1	13.9
05	To observe and respect community values involved in extension programs.	13.7	12.9
06	To transform information gathered from the community action programs or activities in resources, aids, or activities adequated for the improvement of the life pattern of the involved groups.	10.0	13.1#

Low Level= 100.0 percent.

TABLE 88
SERVICE SKILLS PERCEIVED MASTERED BY PROFESSORS
IN THE EDUCATION PROGRAM.

RANK	SERVICE SKILLS	MEAN %	SD
01	To observe and respect community values involved in extension programs.	72.2	4.8*
02	To develop activities able to provide students with contact with the reality of communities through collection of information, transmission of knowledge, services and other activities.	66.6	8.3
03	To do a survey of the community problems to determine the needs for extension programs.	62.4	4.1
04	To propose activities or actions programs for communities which will provide feedback to teaching and research activities.	60.6	18.1
05	To transform information gathered from the community action programs or activities in resources, aids or activities adequate for the improvement of the life pattern of the involved groups.	46.7	14.7
06	To communicate or to apply through specific programs or activities, the theoretical and/or practical knowledge elaborated within the university to the communities that have been participating in the aforementioned programs or activities.	40.7	15.2+

* High Level = 16.6 percent.

+ Medium Level = 83.3 percent.

TABLE 89
SERVICE SKILLS PERCEIVED MASTERED BY PROFESSORS
IN THE GEOLOGY PROGRAM

RANK	SERVICE SKILLS	MEAN %	SD
01	To develop activities able to provide students with contact with the reality of communities, through collection of information, transmission of knowledge, services and other activities.	50.0	0.0
02	To communicate or to apply through specific programs or activities, the theoretical and/or practical knowledge elaborated within the university to the communities that have been participating in the aforementioned programs or activities.	40.0	0.0*
03	To do a survey of the community problems to determine the needs for extension programs.	20.0	0.0
04	To propose activities or actions programs for communities which will provide feedback to teaching and research activities.	20.0	0.0
05	To observe and respect community values involved in extension programs.	20.0	0.0
06	To transform information gathered from the community action programs or activities in resources, aids or activities adequated for the improvement of the life pattern of the involved groups.	20.0	0.0*

* Medium Level = 33.3 percent.

+ Low Level = 66.6 percent.

Many fewer faculty members in the Medicine program had mastered service skills. The highest average found was 30 percent of professors mastering one skill; the lowest was 15 percent of faculty also mastering one skill. Standard deviation decreased from 13.5 to 6.7, which indicates a great variation among departments. In one department 3 skills were classified as lacking among the professors. See table 90.

**RESEARCH QUESTION NUMBER FIVE
METHODS IN WHICH FACULTY MEMBERS PERCEIVED THEMSELVES TO
HAVE ACQUIRED THEIR EXISTING TEACHING, RESEARCH, AND
SERVICE SKILLS**

The percentage for each skill was calculated for each department of each program, then the mean and standard deviations were calculated for each program, using the different possible methods (Professional Practice; Special Studies; Graduate Studies) for developing such skills. Finally, statistical means were classified in rank order from the highest to the lowest to permit a comparison of means resulting from each method and to discover which was the one most commonly used to develop those skills.

TABLE 90
SERVICE SKILLS PERCEIVED MASTERED BY PROFESSORS
IN THE MEDICINE PROGRAM

RANK	SERVICE SKILLS	MEAN %	SD
01	To develop activities able to provide students with contact with the reality of communities through collection of information, transmission of knowledge, services and other activities.	30.0	13.5
02	To propose activities or actions programs for communities which will provide feedback to teaching and research activities.	22.5	10.7
03	To observe and respect community values involved in extension programs.	19.4	12.8
04	To communicate or to apply through specific programs or activities, the theoretical and/or practical knowledge elaborated within the university to the communities that have been participating in the aforementioned programs or activities.	18.1	7.5
05	To transform information gathered from the community action programs or activities in resources, aids or activities adequated for the improvement of the life pattern of the involved groups.	16.6	6.7
06	To do a survey of the community problems to determine the needs for extension programs.	15.5	10.6#

Low Level = 100,0 percent.

Table 91 shows that the most common way of acquiring teaching skills for all professors in all programs was professional experience. In agriculture, the highest mean under professional practice was 100 percent and the lowest was 16 percent; in Education, the mean ranged from 89 percent to zero percent; in Geology, from 90 percent to 20 percent, and in Medicine, it ranged from 90 percent to 18 percent.

The standard deviation varied widely, and, in many cases it was greater than the mean, which indicates that in many departments in the programs there were several answers scored zero.

In relation to Special Studies, the mean in Agriculture varied from 17 to 3 percent; in Education it ranged from 25 percent to zero; in Geology, the highest mean was 10 percent and the lowest was zero percent; and in Medicine the range was from 25 percent to less than 1 percent.

Regarding Graduate Studies, the variation in means were as follows: in Agriculture, it ranged from 36 to 9 percent; in Education from 47 percent to zero; in Geology it varied from 20 percent to zero; and in Medicine it went from 18 to less than 2 percent.

TABLE 91
FACULTY PERCEPTIONS OF METHODS MOST USED TO ACQUIRE
TEACHING SKILLS IN THE PROGRAMS OF AGRICULTURE,
EDUCATION, GEOLOGY, AND MEDICINE.

METHODS	LEVELS			
	HIGH		LOW	
	MEAN	SD	MEAN	SD
	%		%	
PROFESSIONAL PRACTICE				
Agriculture	100.0	27.5	16.3	0.0
Education	89.3	28.4	0.0	0.0
Geology	90.0	0.0	20.0	0.0
Medicine	90.4	27.8	17.7	8.0
SPECIAL STUDIES				
Agriculture	17.1	20.9	2.9	4.7
Education	25.0	26.0	0.0	0.0
Geology	10.0	0.0	0.0	0.0
Medicine	25.0	26.4	0.6	1.6
GRADUATE STUDIES				
Agriculture	36.1	27.8	9.1	2.8
Education	47.2	36.9	0.0	0.0
Geology	20.0	0.0	0.0	0.0
Medicine	18.3	16.2	1.6	4.0

Examining the 4 programs. data also show that in Agriculture, Education, and Geology, Graduate Studies were more important and more frequently used as a way for developing teaching skills than Special Studies. Only in Medicine did Special Studies seem to be used more often than Graduate Studies.

This result could be explained by the fact that in Medicine, Special Studies are done with a higher frequency than Graduate Studies. On the other hand, Graduate Studies

for faculty in the programs of Agriculture, Education, and Geology are much more common and frequent than in the Medicine program.

Professors of Agriculture, Geology, and Medicine, acquired research skills more often through Professional Practice than through Special Studies or Graduate Studies. In Education, however, professors developed those skills more often through Graduate Studies. This fact seems to reflect reality, since there has never been much of a tradition of research in that area at the UFC.

Focusing on Professional Practice, the mean variations were as follow: in Agriculture, the highest was 87 percent and the lowest 39 percent; in Education: the highest was 61 percent and the lowest zero; in Geology, means ranged from 100 to 20 percent; and in Medicine from 35 to 15 percent.

Under Special Studies, results showed the following: in Agriculture, the mean varied from 18 to 3 percent; in education it ranged from 26 percent to zero; in Geology, it ranged from 30 percent to zero; and in Medicine it went from 19 to 4 percent.

An analysis of Graduate Studies findings showed that Agriculture had the highest of 77 percent and the lowest 10 percent; in Education the highest was 79 and the lowest was 4 percent; Geology showed a high of 70 percent and a low of zero; and Medicine showed a high of 31 and a low of 8 percent.

In all 4 programs there was a large variation in the standard deviations, and in many cases the SD was larger than the mean itself, a fact which demonstrates that many sampled subjects did not respond to that specific question (zero answers). See Table 92.

TABLE 92
FACULTY PERCEPTIONS OF METHODS MOST USED TO ACQUIRE
RESEARCH SKILLS IN THE PROGRAMS AGRICULTURE,
EDUCATION, GEOLOGY, AND MEDICINE

METHODS	LEVELS			
	HIGH MEAN %	SD	LOW MEAN %	SD
PROFESSIONAL PRACTICE				
Agriculture	87.0	28.6	39.1	6.6
Education	61.5	37.5	0.0	0.0
Geology	100.0	0.0	20.0	0.0
Medicine	35.2	25.9	15.5	9.7
SPECIAL STUDIES				
Agriculture	18.1	16.9	2.7	6.7
Education	25.9	24.0	0.0	0.0
Geology	30.0	0.0	0.0	0.0
Medicine	19.2	15.2	3.9	5.6
GRADUATE STUDIES				
Agriculture	77.3	26.3	10.4	6.2
Education	79.1	32.7	4.1	3.2
Geology	70.0	0.0	0.0	0.0
Medicine	30.7	24.4	7.8	7.9

In relation to service skills, results showed that the statistical means concerned with learning through Professional Practice were higher than those in Special Studies, and Graduate Studies, in all programs.

In Agriculture, Education, and Geology, professors developed service skills more often through Graduate Studies than through Special Studies. In Medicine, it appeared that Special Studies were a better way to acquire them.

In Agriculture, the statistical mean for Professional Practice in skill acquisition varied from 26 to 10 percent; under Special Studies it was from 2 percent to zero; and under Graduate Studies from 17 to 2 percent.

In Education the following results were found: Professional Practice had a high mean of 72 percent and a low of 41 percent; Special Studies had a high mean of 7 percent and a low of zero; under Graduate Studies, the high mean was 24 percent, and the low was 16 percent.

The Geology program yielded the following findings: under Professional Practice, the high mean was 50 percent and the low 20 percent; under Special Studies all answers were zero; and for Graduate Studies, the mean varied from 10 percent to zero.

In Medicine, the mean under Professional Practice varied from 31 to 15 percent; under Special Studies, it was from 7 to 2 percent; under Graduate Studies, the high mean was 5 and the low was 2 percent.

Standard deviation shows that there were a lot of zero responses for different departments. The overall findings suggest that service skills seem to be learned more through Professional Practice than in any other way. See Table 93.

TABLE 93
FACULTY PERCEPTIONS OF METHODS MOST USED TO ACQUIRE
SERVICE SKILLS IN THE PROGRAMS OF AGRICULTURE,
EDUCATION, GEOLOGY, AND MEDICINE

METHODS	LEVELS			
	HIGH		LOW	
	MEAN	SD	MEAN	SD
	%		%	
PROFESSIONAL PRACTICE				
Agriculture	25.6	20.4	10.0	12.9
Education	72.2	18.1	40.7	4.1
Geology	50.0	0.0	20.0	0.0
Medicine	30.6	13.5	15.5	6.7
SPECIAL STUDIES				
Agriculture	1.8	4.5	0.0	0.0
Education	6.9	7.2	0.0	0.0
Geology	0.0	0.0	0.0	0.0
Medicine	6.7	8.7	2.4	2.9
GRADUATE STUDIES				
Agriculture	16.9	12.9	2.0	5.1
Education	24.0	36.0	16.2	19.2
Geology	10.0	0.0	0.0	0.0
Medicine	4.8	8.5	1.7	2.9

RESEARCH QUESTION NUMBER SIX
PROFESSIONAL SKILLS CURRENTLY PERCEIVED AS POSSESSED BY
FACULTY IN THE AGRICULTURE, EDUCATION, GEOLOGY, AND
MEDICINE PROGRAM WHICH ARE BEING USED TO CARRY OUT DUTIES
AT THE UFC

To answer this question the percentage of responses related to each skill being used by professors in each department was calculated for all four programs being studied.

The mean and the standard deviation for each skill were calculated. Means were ranked in order to classify skills from the most used (highest) to least used (lowest).

Finally, the following categories of levels of usage were created, and the results were analysed based on those categories:

1. High level - skills being used by more than 70 percent of faculty;
2. Medium level - skills being used by a range of 30 to 70 percent of faculty;
3. Low level - skills being used by less than 30 percent of faculty.

Results were also analyzed in terms of the different phase of the teaching and research processes, as it was done in question four. The results are given below.

Faculty's Perception of Teaching Skills Used

The mean percentage related to teaching skills in the Agriculture program ranged from 73 to 7 percent, in Education it ranged from 85 percent to zero, in Geology it went from 70 percent to zero, and in Medicine, the variation was from 82 to 4 percent. The standard deviations varied from 25.9 to 6.4 in Agriculture, from 34.9 to zero in Education, and from 21.5 to 3.6 Medicine. There was no difference in Geology. See Tables 94 to 97.

More than 70 percent of the Agriculture faculty perceived themselves as using the 3 different skills which accounted for 12 percent of the total skills. Thirty to 70 percent of the faculty perceived themselves as using 84 percent of the skills. Less than 30 percent of faculty perceived themselves as using the remaining skills, which comprised 4 percent of the total. The skills used most often by professors in this program were the ones related to the interaction phase and to the planning stage. See Table 94.

More than 70 percent of the Education professors perceived themselves as using a group of 13 skills which comprised 52 percent of the total number of planning, performing and evaluating skills. However, within the group the largest number of skills used were related to the planning phase. Thirty to 70 percent of the faculty

TABLE 94
TEACHING SKILLS PERCEIVED USED BY PROFESSORS IN THE
AGRICULTURE PROGRAM

RANK	PROCESS PHASE**	TEACHING SKILLS	MEAN %	SD
01	P	To organize an instructional plan for a class.	72.8	11.3
02	IP	To communicate with students (to listen to them before interacting).	72.7	7.2
03	IP	To interact positively with students (to give them attention, information, task directions, etc.)	71.6	21.7*
04	P	To select teaching procedures (methods and techniques) appropriate to the discipline you teach.	66.0	7.4
05	P	To organize an instructional plan for a course (discipline).	63.0	6.4
06	P	To select and organize teaching content according to the objectives.	61.4	10.2
07	IP	To create pleasant learning situations (to avoid tension, fear or anxiety in classroom).	61.4	18.5
08	P	To determine competencies (skills) necessary for students, (what students have to learn in order to pass in a specific discipline).	61.2	15.0
09	IP	To use special instruments in classrooms (example, projectors, specific instruments for each area of study).	58.0	20.1
10	IP	To create learning situations adequate for the needs of the students (a practical and up to date teaching process, relying upon students participation.)	57.4	12.9
11	P	To organize an instructional plan for a unit of study.	53.2	11.8
12	P	To develop instructional objectives.	51.7	21.8
13	Ev	To develop special instruments to evaluate students (tests, specific tasks, observation sheets. etc).	50.8	17.6
14	P	To select instructional resources (material and equipment) necessary for the teaching process.	49.8	12.3

TABLE 94 Continued

RANK	PROCESS PHASE**	TEACHING SKILLS	MEAN %	SD
15	IP	To use specific teaching techniques in labs.(practical classes).	48.2	22.0
16	P	To do a diagnosis of a teaching situation, (example: to obtain basic information about students, course duration, facilities, resources to make decisions and planning.	40.0	18.2
17	Ev	To utilize special instruments in the evaluation process.	34.5	20.6
18	IP	To use specific teaching techniques in the classroom.	34.2	14.4
19	P	To determine the minimum requirements for students to enroll in a specific discipline.	33.9	11.6
20	IP	To use specific instruments in labs.	32.5	22.2
21	Ev	To develop special techniques for teaching a specific topic.	32.3	20.1
22	Ev	To evaluate students based on previous criteria .	31.8	15.2
23	IP	To demonstrate the development of practical skills for students, in a gradual, clear and logical way, (example: teaching specific abilities related to the use of specific instruments as in surgical techniques).	27.6	18.2
24	IP	To evaluate students in relation to specific skills, performance and behavior in a professional situation as in field experiences, internships, etc.	16.7	25.9+
25	IP	To use games and simulations appropriate for the classroom.	7.2	8.8#

* High Level = 12.0 percent.

+ Medium Level = 84.0 percent.

Low Level = 4.0 percent.

** Process Phase: P = Planning Phase.

IP = Interaction Phase.

Ev = Evaluation Phase.

indicated that they used 9 skills which made up 36 percent of the total. In this block, the largest number of skills were related to the performing phase. Less than 30 percent of the faculty indicated that they used the remaining three performing phase skills which comprises 12 percent of the total number. In fact nobody reported using one of those skills. See Table 95.

In Geology more than 70 percent of the professors answered that they were using 44 percent of the teaching skills presented; a range from 30 to 70 percent indicated they were using 36 percent of those skills; and less than 30 percent of the faculty were using 20 percent of the teaching skills. Within this block there was one skill not being used at all.

An evaluation of the results for the different phases in the process of teaching showed that, for the first group of skills, professors in this program used equal number of interaction and planning phase skills. In the second and third groups, professors used an even distribution of skills from the 3 phases. See Table 96.

In the Medical program more than 70 percent of the faculty perceived themselves as using 24 percent of the teaching skills presented. In this block, skills related to the interaction phase of teaching predominate over the other skills. Thirty to 70 percent of the faculty indicated that they used a second group of 16 skills or 68 percent of the total in this group, the largest number of

TABLE 95
TEACHING SKILLS PERCEIVED USED BY PROFESSORS IN THE
EDUCATION PROGRAM

RANK	PROCESS PHASE**	TEACHING SKILLS	MEAN %	SD
01	IP	To communicate with students (to listen to them before interacting).	85.6	7.1
02	EV	To develop special instruments to evaluate students (tests, specific tasks, observation sheets, etc).	82.8	4.9
03	IP	To interact positively with students (to give them attention, information, task directions, etc.)	81.9	13.4
04	EV	To utilize special instruments in the evaluation process.	78.6	4.2
05	P	To organize an instructional plan for a course (discipline).	77.7	12.7
06	P	To select teaching procedures (methods and techniques) appropriate to the discipline you teach.	76.3	10.5
07	P	To select instructional resources (material and equipment) necessary for the teaching process.	76.3	10.5
08	P	To determine competencies (skills) necessary for students, (what students have to learn in order to pass in a specific discipline).	74.9	8.3
09	P	To select and organize teaching content according to the objectives .	74.9	8.3
10	P	To organize an instructional plan for a class.	73.1	5.7
11	P	To organize an instructional plan for a unit of study.	72.2	4.8
12	P	To develop instructional objectives.	70.8	11.0
13	P	To create learning situations adequate for the needs of the students (a practical and up to date teaching process , relying upon student participation.)	70.3	23.9*
14	IP	To use specific teaching techniques in the classroom.	69.8	16.2

TABLE 95 Continued

RANK	PROCESS PHASE**	TEACHING SKILLS	MEAN %	SD
15	P	To do a diagnosis of a teaching situation, (example: to obtain basic information about students, course duration, facilities, resources to make decisions and planning.	67.1	17.7
16	IP	To develop special techniques for teaching a specific topic.	62.4	27.3
17	EV	To evaluate students based on previous criteria.	54.1	18.1
18	IP	To create pleasant learning situations (to avoid tension, fear or anxiety in classroom).	54.0	21.7
19	IP	To use games and simulations appropriate for the classroom.	41.2	26.8
20	EV	To evaluate students in relation to specific skills, performance and behavior in a professional situation as in field experiences, internships, etc.	40.2	34.9
21	P	To determine the minimum requirements for students to enroll in a specific discipline.	36.1	12.7
22	IP	To use special instruments in classrooms (example, projectors, specific instruments for each area of study).	31.4	19.5+
23	IP	To use specific teaching techniques in labs.(practical classes).	13.8	12.7
24	IP	To demonstrate the development of practical skills for students, in a gradual, clear and logical way, (example: teaching specific abilities related to the use of specific instruments as in surgical techniques).	2.7	4.7
25	IP	To use specific instruments in labs.	0.0	0.0#

* High Level = 52.0 percent.

+ Medium Level = 36.0 percent.

Low Level = 12.0 percent.

** Process Phase: P = Planning Phase.

IP = Interaction Phase.

Ev = Evaluation Phase.

TABLE 96
TEACHING SKILLS PERCEIVED USED BY PROFESSORS IN THE
GEOLOGY PROGRAM

RANK	PROCESS PHASE**	TEACHING SKILLS	MEAN %	SD
01	IP	To use special instruments in classrooms (example, projectors, specific instruments for each area of study).	70.0	0.0
02	IP	To interact positively with students (to give them attention, information, task directions, etc.)	70.0	0.0
03	P	To determine competencies (skills) necessary for students, (what students have to learn in order to pass in a specific discipline).	60.0	0.0
04	P	To select teaching procedures (methods and techniques) appropriate to the discipline you teach.	60.0	0.0
05	IP	To communicate with students (to listen to them before interacting).	60.0	0.0
06	P	To determine the minimum requirements for students to enroll in a specific discipline.	50.0	0.0
07	P	To develop instructional objectives.	50.0	0.0
08	P	To select and organize teaching content according to the objectives.	50.0	0.0
09	IP	To use specific teaching techniques in the classroom.	50.0	0.0
10	IP	To create pleasant learning situations (to avoid tension, fear or anxiety in classroom).	50.0	0.0
11	IP	To create learning situations adequate for the needs of the students (a practical and up to date teaching process, relying upon students participation).	50.0	0.0*
12	P	To organize an instructional plan for a class.	40.0	0.0
13	P	To organize an instructional plan for a course (discipline).	40.0	0.0
14	IP	To use specific teaching techniques in labs.(practical classes).	40.0	0.0

TABLE 96 Continued

RANK	PROCESS PHASE**	TEACHING SKILLS	MEAN %	SD
15	Ev	To develop special instruments to evaluate students (tests, specific tasks, observation sheets. etc).	40.0	0.0
16	P	To select instructional resources (material and equipment) necessary for the teaching process.	30.0	0.0
17	P	To use specific instruments in labs.	30.0	0.0
18	IP	To demonstrate the development of practical skills for students, in a gradual, clear and logical way, (example: teaching specific abilities related to the use of specific instruments as in surgical techniques).	30.0	0.0
19	IP	To utilize special instruments in the evaluation process.	30.0	0.0
20	Ev	To evaluate students based on previous criteria.	30.0	0.0+
21	P	To do a diagnosis of a teaching situation, (example: to obtain basic information about students, course duration, facilities, resources to make decisions and planning.	20.0	0.0
22	P	To organize an instructional plan for a unit of study.	20.0	0.0
23	IP	To develop special techniques for teaching a specific topic.	20.0	0.0
24	EV	To evaluate students in relation to specific skills, performance and behavior in a professional situation as in field experiences, internships, etc.	20.0	0.0
25	IP	To use games and simulations appropriate for the classroom.	0.0	0.0#

* High Level = 44.0 percent.

+ Medium Level = 36.0 percent.

Low Level = 20.0 percent.

** Process Phase: P = Planning Phase.

IP = Interaction Phase.

Ev = Evaluation Phase.

skills used fell in the planning phase, followed by skills related to the interaction phase and to the evaluation phase, both with the same degree of frequency. Finally, only 2 skills (8 percent) were perceived as being used by less than 30 percent of faculty. Both were related to the interaction phase of the teaching process. See Table 97.

Faculty's Perception of Research Skills Used

In the Agriculture program the mean percentage of the answers related to research skills varied from the highest of 72 to the lowest of 26 percent, with the standard deviation varying from 27.6 to 8.4. In Education, the values for the mean ranged from 60 to 4 percent and from 33.5 to 7.2 for the standard deviation. Results from the Geology Department show the mean varied from 70 percent to zero with no variation in the standard deviation. In Medicine, the mean ranged from 30 to 12 percent with a standard deviation varying from 24.4 to 8.1.

Results showed more than 70 percent of the Agriculture faculty used 3 skills or 10 percent of the total. Planning, bureaucratic, and performing - phases, skills were evenly used by this group. Thirty to 70 percent used 84 percent of the skills. In this block, 13 skills dealt with the planning phase, 8 dealt with the

TABLE 97
TEACHING SKILLS PERCEIVED USED BY PROFESSORS
IN THE MEDICINE PROGRAM

RANK	PROCESS PHASE**	TEACHING SKILLS	MEAN %	SD
01	IP	To interact positively with students (to give them attention, information, task directions, etc.)	81.9	7.9
02	IP	To create pleasant learning situations (to avoid tension, fear or anxiety in classroom).	72.7	12.6
03	P	To organize an instructional plan for a class.	72.4	10.9
04	IP	To use special instruments in classrooms (example, projectors, specific instruments for each area of study).	71.5	10.5
05	IP	To communicate with students (to listen to them before interacting).	71.4	5.4
06	IP	To create learning situations adequate for the needs of the students (a practical and up to date teaching process, relying upon students participation).	70.1	3.6*
07	P	To determine competencies (skills) necessary for students, (what students have to learn in order to in a specific discipline).	66.0	13.6
08	EV	To develop special instruments to evaluate students (tests, specific tasks, observation sheets, etc).	65.1	9.1
09	P	To select teaching procedures (methods and techniques) appropriate to the discipline you teach.	59.3	10.5
10	P	To develop instructional objectives.	56.4	18.4
11	P	To select and organize teaching content according to the objectives.	56.0	3.4
12	EV	To evaluate students based on previous criteria.	55.8	21.5
13	P	To do a diagnosis of a teaching situation, (example: to obtain basic information about students, course duration, facilities, resources to make decisions and planning.	54.9	8.9

TABLE 97 Continued

RANK	PROCESS PHASE**	TEACHING SKILLS	MEAN %	SD
14	P	To organize an instructional plan for a course (discipline).	52.3	14.1
15	EV	To utilize special instruments in evaluation process.	51.2	15.1
16	P	To organize an instructional plan for a unit of study.	50.0	7.7
17	IP	To use specific teaching techniques in classroom.	49.6	10.5
18	IP	To demonstrate the development of practical skills for students, in a gradual, clear and logical way, (example: teaching specific abilities related to the use of specific instruments as in surgical techniques).	49.2	18.4
19	IP	To use specific teaching techniques in labs. (practical classes.	48.8	18.5
20	P	To select instructional resources (material and equipment) necessary for the teaching process.	48.5	10.7
21	P	To determine the minimum requirements for students to enroll in a specific discipline.	47.5	14.4
22	IP	To develop special techniques for teaching a specific topic.	46.1	7.4
23	EV	To evaluate students in relation to specific skills, performance and behavior in a professional situation as in field experiences, internships, etc.	44.2	13.9+
24	IP	To use specific instruments in labs.	36.7	15.7
25	IP	To use games and simulations appropriate for the classroom.	4.0	8.0#

* High Level = 24.0 percent.

+ Medium Level = 68.0 percent.

Low Level = 8.0 percent,

** Process Phase: P = Planning Phase.

IP = Interaction Phase.

Ev = Evaluation Phase.

performing phase and 3 dealt with bureaucratic tasks. Only one skill was used by less than 30 percent of faculty. See Table 98.

In Education, there was no research skill which was used by more than 70 percent of faculty. Twenty-four skills (77 percent) used by a range of 30 to 60 percent of the faculty. Of these 24 skills, 16 related to the planning phase, and 8 dealt with the performance phase. In a second block, 7 skills (23 percent) used by less than 30 percent of the faculty. Those skills were related to bureaucratic tasks and the performing phase. See Table 99.

In the Geology program, 71 percent of the research skills were used by a range of 30 to 70 percent of faculty. Those skills broke down as follows: 10 relate to the planning phase: 8 dealt with the performing phase: and 4 relate to bureaucratic tasks. Another group of skills, 29 percent of the total, was used by less than 30 percent of the professors. Those skills are related to the planning phase and to the performing phase. See Table 100.

Research skills in the program of Medicine were not often used. All research skills were used by 30 percent or less of the faculty. Those skills related to the planning phase of the research process, in general, seem to have a higher mean than the skills related to the performing phase. Skills related to bureaucratic tasks were spread out among other phases without presenting any meaningful result.

TABLE 98
RESEARCH SKILLS PERCEIVED USED BY
PROFESSORS IN THE AGRICULTURE PROGRAM

RANK	PROCESS PHASE**	RESEARCH SKILLS	MEAN %	SD
01	PP	To describe the findings.	72.5	15.6
02	B	To register the research in the academic department where you work.	71.8	14.8
03	P	To review the existing literature.	70.2	15.0*
04	P	To determine the objectives of the research.	70.0	19.1
05	PP	To collect data.	70.0	24.2
06	PP	To write the final report of the study.	69.8	14.8
07	P	To define a research problem.	68.8	20.0
08	PP	To analyze the data collected.	68.6	13.5
09	P	To write a rationale for the study.	67.9	8.8
10	P	To prepare the final draft of the proposal for the research.	67.9	13.7
11	B	To register the research project in center where you are located.	66.7	12.9
12	P	To determine the hypothesis or questions to be studied.	66.3	20.0
13	P	To determine all variables and/or categories in the study.	64.4	12.2
14	B	To register the research project in the Vice-Rectory for Research and Graduate Studies .	61.3	12.0
15	P	To select instruments to be utilized (questionnaire, interview, lab or field techniques, etc.).	61.1	17.4
16	P	To prepare a budget for the research.	60.4	17.3
17	PP	To utilize instruments or statistical techniques appropriate for your area of interest.	60.1	14.2
18	P	To outline the theory and fundamental concepts for the study.	58.7	8.4
19	PP	To utilize special instruments to do research in your area of interest.	56.9	9.9

TABLE 98 Continued

RANK	PROCESS PHASE**	RESEARCH SKILLS	MEAN %	SD
20	P	To describe methodological and/or statistical procedures to choose the sample.	56.9	14.7
21	P	To describe the instrument to be utilized.	56.3	14.4
22	P	To establish the scope and limitation of the study.	55.5	9.2
23	P	To describe the data analysis procedures.	52.9	15.3
24	B	To get in touch with granting agencies to obtain funding.	52.7	17.7
25	P	To justify the selection of the statistical procedures.	51.1	12.1
26	P	To obtain cooperation of people and/or institutions in the country and overseas, for the on going research.	49.3	11.5
27	PP	To use appropriate lab' techniques for your areas of interest to achieve the proposed objectives.	48.1	24.7
28	PP	To utilize appropriate instruments or resources to collect data.	44.7	17.3
29	PP	To use special techniques for field studies, in your areas of interest, to achieve the proposed objectives.	43.3	27.7
30	P	To describe the relevant terms used in the study.	36.7	11.8+
31	PP	To develop special instruments for the studies in your specific areas of interest (creation of new types of equipment, new techniques, etc.).	26.4	17.0#

* High Level = 9.6 percent.

+ Medium Level = 87.0 percent.

Low Level = 3.2 percent.

** Process Phase: P = Planning Phase.

B = Bureaucratic Tasks.

PP = Performance Phase.

TABLE 99
RESEARCH SKILLS PERCEIVED USED BY
PROFESSORS IN THE EDUCATION PROGRAM

RANK	PROCESS PHASE*	RESEARCH SKILLS	MEAN %	SD
01	P	To write a rationale for the study.	59.7	27.1
02	P	To review the existing literature.	56.9	27.7
03	P	To define a research problem.	54.1	29.1
04	P	To outline the theory and fundamental concepts for the study.	54.1	29.1
05	P	To establish the scope and limitation of the study.	54.1	29.1
06	P	To determine the objectives of the research.	53.2	32.7
07	P	To determine the hypothesis or questions to be studied.	53.2	32.7
08	P	To determine all variables and/or categories in the study.	53.2	32.7
09	P	To select instruments to be utilized (questionnaire, interview, lab or field techniques, etc.).	53.2	32.7
10	P	To describe the instrument to be utilized.	53.2	32.7
11	P	To describe methodological and/or statistical procedures to choose the sample.	53.2	32.7
12	P	To describe the data analysis procedures.	53.2	32.7
13	PP	To analyze the data collected.	53.2	32.7
14	PP	To describe the findings.	53.2	32.7
15	P	To justify the selection of the statistical procedures.	50.4	33.5
16	PP	To write the final report of the study.	49.0	26.4
17	P	To describe the relevant terms used in the study.	46.2	26.7
18	P	To prepare the final draft of the proposal for the research.	46.2	26.7
19	PP	To use special techniques for field studies, in your areas of interest, to achieve the proposed objectives.	46.2	26.7

TABLE 99 Continued

RANK	PROCESS PHASE*	RESEARCH SKILLS	MEAN %	SD
20	PP	To collect data.	44.9	36.9
21	B	To get in touch with granting agencies to obtain funding.	42.5	28.4
22	P	To prepare a budget for the research.	40.7	29.7
23	PP	To utilize appropriate instruments or resources to collect data.	39.3	20.8
24	PP	To utilize special instruments to do research in your area of interest.	38.8	9.6+
25	PP	To utilize instruments or statistical techniques appropriate for your area of interest.	33.7	25.0
26	B	To register the research project in center where you are located.	31.0	28.1
27	B	To register the research in the academic department where you work.	26.8	21.1
28	B	To register the research project in the Vice-Rectory for Research and Graduate Studies.	26.3	15.7
29	PP	To develop special instruments for the studies in your specific areas of interest (creation of new types of equipment, new techniques, etc.)	25.9	21.0
30	PP	To obtain cooperation of people and/or institutions in the country and overseas, for the on going research.	21.7	13.9
31	PP	To use appropriate lab' techniques for your areas of interest to achieve the proposed objectives.	4.1	7.2#

+ Medium Level = 77.4 percent.

Low Level = 22.5 percent.

* Process Phase: P = Planning Phase.

B = Bureaucratic Phase.

PP = Performance Phase.

Faculty's Perception of Service Skills Used

Examining the results related to service skills in the four studied programs it was easy to see that those skills have been used to a very low degree. See Table 101.

In Agriculture, service skills were used by less than 30 percent of the faculty. The highest mean in this program was 24 and the lowest was 4 percent. Standard deviation varied from 12.3 to 7.3. See Table 102.

In Education the mean of the percentage of answers to questions about service skills varied from 43 percent to 18 percent, and the standard deviation ranged from 16.8 to 4.7. Only 2 skills were used by more than 30 percent of professors. See Table 103.

Only one service skill was used by 3 percent of the Geology professors. Two were used by 20 percent of faculty. All others were used by only 10 percent of the faculty in the program. See Table 104.

Finally, service skills in the Medicine program scored very low in terms of usage. None of the skills were used by more than 30 percent of the professors. The highest mean found was 14 percent and the lowest was 5 percent. The standard deviation varied from 11.0 to 6.9. See Table 105.

Results related to service indicate that this function seems to be underdeveloped and little used by professors in the four studied programs.

TABLE 100
RESEARCH SKILLS PERCEIVED USED BY
PROFESSORS IN THE GEOLOGY PROGRAM

RANK	PROCESS PHASE*	RESEARCH SKILLS	MEAN %	SD.
01	P	To write a rationale for the study.	70.0	0.0
02	P	To prepare the final draft of the proposal for the research.	70.0	0.0
03	B	To register the research in the academic department where you work.	70.0	0.0
04	P	To select instruments to be utilizes (questionnaire, interview, lab of field techniques, etc.).	60.0	0.0
05	B	To register the research project in center where you are located.	60.0	0.0
06	B	To register the research project in the Vice-Rectory for Research and Graduate Studies.	60.0	0.0
07	B	To get in touch with granting agencies to obtain funding.	60.0	0.0
08	P	To define a research problem.	50.0	0.0
09	P	To review the existing literature.	50.0	0.0
10	P	To determine the objectives of the research.	50.0	0.0
11	PP	To use special techniques for field studies, in your areas of interest, to achieve the proposed objectives.	50.0	0.0
12	PP	To use appropriate lab 'techniques for your areas of interest to achieve the proposed objectives.	50.0	0.0
13	PP	To collect data.	50.0	0.0
14	PP	To analyze the data collected.	50.0	0.0
15	PP	To describe the findings.	50.0	0.0
16	PP	To write the final report of the study.	50.0	0.0
17	P	To establish the scope and limitation of the study.	40.0	0.0
18	P	To determine the hypothesis or questions to be studied.	40.0	0.0
19	P	To describe methodological and/or statistical procedures to choose the sample.	40.0	0.0

TABLE 100 Continued

RANK	PROCESS PHASE*	RESEARCH SKILLS	MEAN %	SD.
20	P	To prepare a budget for the research.	40.0	0.0
21	PP	To utilize appropriate instruments or resources to collect data.	40.0	0.0
22	PP	To utilize special instruments to do research in your area of interest.	40.0	0.0+
23	P	To outline the theory and fundamental concepts for the study.	30.0	0.0
24	P	To describe the instrument to be utilized.	30.0	0.0
25	P	To describe the data analysis procedures.	30.0	0.0
26	P	To describe the relevant terms used in the study.	30.0	0.0
27	PP	To obtain cooperation of people and/or institutions in the country and overseas for the on going research.	30.0	0.0
28	P	To determine all variables and/or categories in the study.	20.0	0.0
29	PP	To develop special instruments for the studies in your specific areas of interest (creation of new types of equipment, new techniques, etc.)	20.0	0.0
30	PP	To utilize instruments or statistical techniques appropriate for your area of interest.	10.0	0.0
31	P	To justify the selection of the statistical procedures.	0.0	0.0#

+ Medium Level = 70.9 percent.

Low Level = 29.0 percent.

* Process Phase: P = Planning Phase.

B = Bureaucratic Tasks.

PP = Performance Phase.

TABLE 101
RESEARCH SKILLS PERCEIVED USED BY
PROFESSORS IN THE MEDICINE PROGRAM

RANK	PROCESS PHASE*	RESEARCH SKILLS	MEAN %	SD
01	P	To define a research problem.	30.4	20.0
02	PP	To utilize special instruments to do research in your area of interest.	29.3	24.4
03	P	To review the existing literature.	28.3	17.3
04	P	To determine the objectives of the research.	28.5	19.4
05	P	To select instruments to be utilized (questionnaire, interview, lab or field techniques, etc.).	25.9	20.5
06	P	To write a rationale for the study.	25.1	17.9
07	PP	To write the final report of the study.	25.0	18.1
08	P	To determine all variables and/or categories in the study.	24.9	16.0
09	PP	To use appropriate lab' techniques for your areas of interest to achieve the proposed objectives.	24.8	26.5
10	P	To determine the hypothesis or questions to be studied.	24.6	16.0
11	B	To register the research in the academic department where you work.	24.5	14.7
12	PP	To describe the findings.	23.7	11.6
13	P	To describe methodological and/or statistical procedures to choose the sample.	23.4	16.2
14	P	To prepare the final draft of the proposal for the research.	22.8	13.1
15	B	To register the research project in center where you are located.	22.8	13.1
16	B	To register the research project in the Vice-Rectory for Research and Graduate Studies.	22.5	13.0
17	B	To describe the instrument to be utilized.	22.4	16.7
18	P	To outline the theory and fundamental concepts for the study.	21.9	15.4

TABLE 101 Continued

RANK	PROCESS PHASE*	RESEARCH SKILLS	MEAN %	SD
19	PP	To analyze the data collected.	21.4	12.2
20	PP	To collect data.	21.2	8.6
21	PP	To prepare a budget for the research.	19.6	12.3
22	PP	To establish the scope and limitation of the study.	19.1	8.9
23	P	To utilize instruments or statistical techniques appropriate for your area of interest.	18.3	9.7
24	P	To justify the selection of the statistical procedures.	17.1	8.6
25	P	To describe the data analysis procedures.	16.7	8.1
26	PP	To develop special instruments for the studies in your specific areas of interest (creation of new types of equipment, new techniques, etc.)	16.0	19.4
27	PP	To obtain cooperation of people and/or institutions in the country and overseas, for the on going research.	15.5	16.9
28	B	To utilize appropriate instruments or resources to collect data.	14.6	9.3
29	PP	To get in touch with granting agencies to obtain funding.	14.2	15.0
30	P	To describe the relevant terms used in the study.	13.7	12.4
31	PP	To use special techniques for field studies, in your areas of interest, to achieve the proposed objectives.	12.9	9.0#

Low Level = 100.0 percent.

* Process Phase: P = Planning Phase.

B = Bureaucratic Tasks.

PP = Performance Phase.

TABLE 102
SERVICE SKILLS PERCEIVED USED BY PROFESSORS
IN THE AGRICULTURE PROGRAM

RANK	SERVICE SKILLS	MEAN %	SD
01	To develop activities able to provide students with contact with the reality of communities through collection of information, transmission of knowledge, services and other activities.	23.8	12.3
02	To communicate or to apply through specific programs or activities, the theoretical and/or practical knowledge elaborated within the university to the communities that have been participating in the aforementioned programs or activities.	13.7	10.8
03	To propose activities or actions programs for communities which will provide feedback to teaching and research activities.	6.7	8.8
04	To do a survey of the community problems to determine the needs for extension programs.	5.5	9.2
05	To transform information gathered from the community action programs or activities in resources, aids or activities adequated for the improvement of the life pattern of the involved groups.	4.6	7.3
06	To observe and respect community values involved in extension programs.	3.7	9.0#

Low Level = 100.0 percent.

TABLE 103
SERVICE SKILLS PERCEIVED USED BY PROFESSORS IN
THE EDUCATION PROGRAM.

RANK	SERVICE SKILLS	MEAN %	SD
01	To develop activities able to provide students with contact with the reality of communities through collection of information, transmission of knowledge, services and other activities.	43.0	16.8
02	To do a survey of the community problems to determine the needs for extension programs.	32.4	15.3
03	To propose activities or actions programs for communities which will provide feedback to teaching and research activities.	27.7	4.7
04	To observe and respect community values involved in extension programs.	25.4	10.8
05	To transform information gathered from the community action programs or activities in resources, aids or activities adequated for the improvement of the life patern of the involved groups.	18.5	8.9
06	To communicate or to apply through specific programs or activities, the theoretical and/or practical knowledge elaborated within the university to the communities that have been participating in the aforementioned programs or activities.	18.0	13.3#

# Low Level = 100.0 percent.			

TABLE 104
SERVICE SKILLS PERCEIVED USED BY PROFESSORS IN
THE GEOLOGY PROGRAM

RANK	SERVICE SKILLS	MEAN %	SD
01	To develop activities able to provide students with contact with the reality of communities, through collection of information, transmission of knowledge, services and other activities.	30.0	0.0
02	To communicate or to apply through specific programs or activities, the theoretical and/or practical knowledge elaborated within the university to the communities that have been participating in the aforementioned programs or activities.	20.0	0.0
03	To do a survey of the community problems to determine the needs for extension programs.	20.0	0.0
04	To propose activities or actions programs for communities which will provide feedback to teaching and research activities.	10.0	0.0
05	To observe and respect community values involved in extension programs.	10.0	0.0
06	To transform information gathered from the community action programs or activities in resources, aids or activities adequated for the improvement of the life pattern of of the involved groups.	10.0	0.0#

# Low Level = 100.0 percent.			

TABLE 105
SERVICE SKILLS PERCEIVED USED BY PROFESSORS IN
THE MEDICINE PROGRAM.

RANK	SERVICE SKILLS	MEAN %	SD
01	To develop activities able to provide students with contact with the reality of communities through collection of information, transmission of knowledge, services and other activities.	13.6	11.0
02	To propose activities or actions programs for communities which will provide feedback to teaching and research activities.	10.5	11.0
03	To observe and respect community values involved in extension programs.	7.2	7.5
04	To transform information gathered from the community action programs or activities in resources, aids or activities adequated for the improvement of the life pattern of the involved groups.	6.3	7.8
05	To communicate or to apply through specific programs or activities, the theoretical and/or practical knowledge elaborated within the university to the communities that have been participating in the aforementioned programs or activities.	6.3	7.8
06	To do a survey of the community problems to determine the needs for extension programs.	5.5	6.9#

Low Level = 100.0 percent.

RESEARCH QUESTION NUMBER SEVEN
MECHANISMS AND/OR ACTIVITIES USED BY DEPARTMENT
CHAIRPERSONS TO FACILITATE THE USE OF FACULTY PROFESSIONAL
SKILLS

Data to answer question seven were collected through interviews and were examined using the technique of content analysis. Responses were categorized and the percentage of the frequency of all responses were calculated, and both frequency and percentages were quoted at the end of each statement of results.

Mechanisms Classified as Formal, Permanent, Required by Departments, Involving the Entire Faculty, and Which are Ongoing.

1. Department administrators assign professors to teach the curricula of their specialization during graduate studies: (6), (31 percent).

2. Department administrators ask faculty members to prepare their activities plans, (the Brazilian system requires that all professors write up an anticipated schedule of their plans for the term prior to its beginning) according to their abilities and interests, for presentation at a departmental meeting for discussion and further approval by the collegiate: (4) (21 percent).

3. The Department collegiate grants the faculty the opportunity to choose an area of specialization, and the tasks they will perform: (3) (16 percent).

4. Program coordinators were asked to correlate the list of curricula and the course schedules with the qualifications of professors: (2), (10 percent).

5. Departmental activities plans were presented to faculty members who were invited to choose an area to work in and tasks they would perform: (1), (5 percent).

6. With the objective of taking advantage of the diversified backgrounds, the Department collegiate allows professors leave of absence for graduate studies only in areas in which there was a lack of specialists, and also, only permits them to do so at different universities: (1), (5 percent).

7. Department administrators plan formal meetings in which professors may speak about what they have done or what they would like to do in the department: (5), (26 percent).

8. Department administrators require professors to keep an up to date file informing them of their publications: (1), (5 percent).

9. In order to help faculty become more productive, department administrators make efforts to obtain better working conditions such as better offices, labs., facilities, etc. : (3), (16 percent).

10. Department administrators are in charge of the reproducing all articles published by any professor in the department, for distribution among faculty: (1), (5 percent).

11. Department administrators foster a positive emotional environment to enable professors to express themselves freely: (3). (16 percent).

12. Department administrators give professors as much time as possible to devote to activities they enjoy: (1), (5 percent).

Mechanisms Classified as Formal, Permanent, Required by the University Administration, Involving the Entire Faculty, and Ongoing.

A formal meeting of all professors teaching the same or related curricula (i.e., "group for curricular integration") is held at least once a term to discuss common problems and solutions in order to improve teaching skills and communication among faculty: (4), (21 percent).

Mechanisms Classified as Formal, Permanent, Required by Department, Involving the Entire Faculty and Being Planned for the Future.

1. Department administrators suggested a bi-weekly seminar on a topic of common interest for the faculty: (1), (5 percent).

2. Department administrators planned to have teams of at least 2 teachers to teach all courses of 6 credits: (1), (5 percent).

3. Department administrators proposed inter-departmental activities in order to facilitate communication among professors: (1), (5 percent).

4. In order to make the qualifications of Faculty working in that department known, administrators suggested giving professors help in publishing the results of their research studies: (1), (5 percent).

5. Department administrators held meetings twice a semester to discuss professors' limitations, difficulties, and problems and to search for solutions: (1), (5 percent).

6. Department administrators suggested the formation of several different groups of professors, so that each individual would be able to find one in which he/she could meet colleagues with common interests in terms of research, teaching, resources, etc.: (2), (10 percent).

7. Departmental administrators planned to organize a "dossier" on each professor containing a register of all his/her past activities in order to be familiar with his/her specific interests in the future: (1), (5 percent).

Mechanisms Classified as Informal, Permanent, Related to Academic Life, Involving the Entire Faculty and Which are Being Planned for the Future.

Department administrators suggested holding informal academic meeting to discuss topics of interest to the faculty and to improve communication among them: (3), (16 percent).

Mechanisms Classified as Informal, Temporary, Related to Academic Life, Involving Small Groups and Which are Ongoing.

1. Department administrators held personal conversations with faculty members in order to determine what each professor would and/or could do in the department: (2), (12 percent).

2. Department administrators invited professors to hold brief small-group seminars, and other activities in order to keep the rest of the faculty up to date on their activities: (2), (12 percent).

3. Department administrators held informal meetings during which professors were given the opportunity to report on their activities, and tell what they would like to do: (5), (26 percent).

4. Department administrators planned a series of discussions and debates on different topics such as possible areas of interest suggested to the faculty for further study, ways to improve teaching, etc. : (2), (10 percent).

Mechanisms Classified as Informal, Permanent, Related to Social Life, Involving the Entire Faculty and Which Are Being Planned for the Future.

Department administrators suggested holding social gatherings to commemorate important events such as Christmas, Independence Day, people's birthdays, etc., with the objective of improving communication and working relationships among the faculty: (6), (31 percent).

It was found that 26 different mechanisms and/or activities have been used or are being planned for use in the future by department managers. Seventy-seven percent of those mechanisms were classified as formal and 24 percent were informal; 73 percent were required by departments and 4 percent by the university administration; 85 percent were considered permanent, and 15 percent were temporary; 85 percent were classified as involving the whole group of faculty, and 15 percent involving small groups; 19 percent were related to the academic life, and 4 percent related to social life. In terms of time perspective, 35 percent were planned for use in the future and 65 percent were already in use.

According to the answers obtained the mechanism most frequently used were used by only 31 percent of the 19 subjects who answered the question.

It is important to notice that only 4 percent of the respondents mentioned mechanisms required by the

university administration as being used in their departments.

Among all such mechanisms and/or activities, the predominant ones were those classified as formal, permanent and required by departments, involving the entire faculty and which are already in use.

SUMMARY

Data were collected through a questionnaire and an interview. About 97 percent of the total sample returned the questionnaire. Of 20 subjects, 19 answered the interview. Results related to each question were presented. Descriptive statistics (percentage, mean and standard deviation) served as bases for the analysis, interpretation and discussion of the collected data.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

INTRODUCTION

The purpose of this chapter is to summarize the research problem, methodology and procedures, and results of this study. It also presents general conclusions, some recommendations based on the findings, and implications for further research.

SUMMARY OF THE STUDY

This research dealt with the training processes of human resources (faculty members) in the Federal University of Ceara. The rationale for study was based on the UFC's need for information about the current status of human resources development. The purpose of this research was to make a contribution to the establishment of policies that will aid the UFC to a more effective development process for the faculty. One general and seven specific questions guided the study.

Chapter I contained a general view of the Brazilian Educational System, and presented a discussion of the problem, the purpose, needs, and limitations of the study. It also provided a list of basic assumptions, enumerated

the research questions and, finally listed a set of definitions of terms used in the study.

The background for this research was presented through a review of the related literature (Chapter II) which covered eleven broad areas. It started with an analysis of the development plans of the State of Ceara, followed by a brief summary of the history of the university system in Brazil, and general information about the UFC. The presence of change and innovation in society and consequently in education was emphasized. The importance of the development of human resources for both society and education was shown. The necessity for competent professionals, new leadership and incentives for excellence as means of improvement in the process of faculty development were discussed. The review of literature concluded that the development of human resources is a key factor in education and society.

Chapter III was concerned with the methodology and procedures of the study. It presented the research questions to be answered, and the research design; it described the research population, which consisted of the faculty members, chairpersons and program coordinators of four undergraduate programs at the UFC; and also described the sampling procedures. This chapter also explained the selection and organization of the instruments used (a questionnaire and an interview), and described how data were collected and how the statistical analysis of data

was done. Finally, it presented the rules that governed for the interpretation of the raw data.

Chapter IV was concerned with the analysis and discussion of the results. Data were analyzed based on tables containing percentages and, when necessary, the statistical means and standard deviations obtained from the raw data generated by the questions being studied.

In addition to the above summary, this chapter presents a series of conclusions and several recommendations, and it ends with implications for further research.

SUMMARY OF THE RESULTS

1. The demographic and professional characteristics of the faculty of the Agriculture, Education, Geology, and Medicine programs varied enough to guarantee a distinct profile of each of those groups.

2. In all four studied programs the number of courses which had professors available to teach them outnumbered the ones which need additional faculty members. However, there is a need for additional professors for 32 percent of the Agriculture courses, 11 percent of the Education courses, 43 percent of the Geology courses, and 24 percent of the Medicine classes.

3. Three-fourths of the courses of the four studied programs had professors who considered themselves

competent to teach them.

4. The level of mastery of teaching, research and services skills varied a great deal in all the four studied programs. Teaching and research skills were scored higher, which led to the interpretation that professors considered themselves more competent in those activities than in service.

5. The most common way of acquiring teaching, research and service skills was through professional practice for the faculty in the studied programs.

6. The levels of use of teaching, research and service skills varied among the Agriculture, Education, Geology, and Medicine professors. Teaching and research skills were used more than service skills.

7. Departments used different mechanisms to help faculty to use their professional skills in their departmental duties. The number of mechanisms used in each department was generally small (not more than six for each department).

CONCLUSIONS

Based on the results from the four programs studied, this researcher concluded that:

1. The available labor force varied among those programs.

Statistical results show that the Geology program had the faculty with the longest terms of service remaining, followed by Education. Agriculture, and Medicine had more professors retiring in the short and medium terms.

2. The composition of the faculty group in terms of origin was heterogeneous.

Most of the professors in the faculty groups studied were Brazilians. There were, however, some professors who were born in other countries, and among those, there were some who had already become naturalized Brazilians. The Brazilians came from fifteen different states. The most heterogeneous group was from Geology followed by Education. The most homogeneous group was found in Agriculture.

3. The composition of faculty groups in terms of Professional levels was heterogeneous.

The four groups studied were heterogeneous in terms of professional levels, in the sense that they all had professors in all existing categories. There was, however, a higher percentage of assistant and associate professors

in two of the four programs, which seems to be a positive factor in maintaining faculty competition for promotions.

4. The majority of faculty working in the four programs studied had a high level of involvement with the institution.

It was clear that the group which had the least involvement was the one from the School of Medicine. In total, about three-fourths of all faculty spent 40 hours per week working at the institution. This fact guaranteed the possibility of good involvement with the activities conducted there.

5. The profile of formal education varied among the four programs studied.

The formal education, at the BA or BS level, of professors in all four programs filled the minimum requirement of the Brazilian Law which is that 100 percent of the faculty must hold a BA or BS degree.

In the Agriculture program the most homogeneous groups of professors were found in the Departments of Agricultural Engineering, Plant, and Soil Sciences. The greatest variety of fields of study and institutions attended were found among professors in the Departments of Food Sciences and Agricultural Engineering.

The faculty from the program of Education is heterogeneous in their fields of study and areas of specialization, as well as in the years of completion of

their degrees. However, in terms of the institutions they earned their degrees, mainly in two universities in the same city and state, so, they were more homogeneous.

The faculty working in Geology has a highly homogeneous professional background, with a relative variety in relation to the places where its members had studied, as well as to the year they completed their degrees.

Faculty from the Medical School have proportionately high levels of homogeneity in specialities. They also have a high concentration (77 percent) of members who studied at the Federal University of Ceara, but they show a large variation in the year of completion of their undergraduate studies.

The MA or MS level of attainment could be considered good (more than 50 percent) in the programs of Agriculture, Education and Geology, and poor (less than 20 percent) of Medicine. At the doctoral level, the highest attainment was from Agriculture with more than 40 percent, followed by Education with 30 percent. All other programs had fewer professors with doctoral degrees.

6. The fields of study and/or areas of specialization of professors were diversified, in all levels of formal education, in the four programs studied.

At the undergraduate level, fields of study were less diversified in each program than the areas of

specialization at the graduate levels (Master's and doctoral programs). In all programs there were at least three different fields of study at the undergraduate level. Geology was the least diversified, with only three fields, while Education was the most varied with nine.

The areas of specialization at the graduate levels were also different. The programs with the most diversified areas were Agriculture and Medicine, with eighteen different specializations for each, while the least diversified program was Geology with only four areas of specialization.

7. Professors had pursued formal education at a large number of national and foreign universities.

The faculty members working in the Agriculture, Education, Geology, and Medicine programs obtained their undergraduate degrees at 21 institutions of higher education in four countries. The same group of professionals did their graduate studies at 60 universities in twelve countries. This fact guaranteed a diverse range of backgrounds among the faculty in terms of graduate programs completed. Considering that there is a recommendation from the higher administration of the university to avoid endogeny among faculties in the same department, this result shows that these four programs have met that recommendation.

8. There is a need for developing upgrading/updating activities for faculty working in the four programs.

Since the formal education of this group of faculty, at the undergraduate level, was obtained after 1934, and considering that not all of its members had pursued graduate studies, further research seems necessary to ascertain which groups of professors need which types of activities to improve faculty performance.

9. The variations in the number of credits earned did not necessarily reflect the quality of the education acquired.

While there was a great variation in number of credits earned in the graduate programs pursued by sampled subjects, there was not enough evidence based on that data to draw conclusions about the quality of those programs. However, one conclusion was clear: in terms of number of credits earned, some Masters' programs were as long as some doctoral programs. This fact had a clear implication in terms of time and money involved in those studies, at both the Master's and doctoral levels.

10. The number of courses which had enough professors to teach them was greater than the number of courses needing professors.

In three of the four studied programs (Agriculture, Education, and Medicine), it was found that there was sufficient number of professors to teach two-thirds of the courses in each curriculum. In other words, one-third of

those curricula lacks sufficient faculty members to meet the demand for sections of those courses. However, in the program of Geology the proportion of supply and lack in relation to the demand was nearly one to one.

11. Professors perceived themselves to be more competent than incompetent for teaching courses.

Statistical results support the statement above. In fact, professors perceived themselves to be more competent than incompetent for teaching courses in all levels presented. Correlating with conclusion number ten it was easy to see that the conclusions are mutually supportive.

12. The levels of mastery of teaching, research and service skills varied in all four programs.

In Agriculture, Education, and Medicine, teaching skills were mastered on a higher level than they were in research and service. In Geology, however, professors mastered research skills on a higher level than teaching and service skills.

Regarding teaching and research, skills were considered to be mastered more frequently at the high and medium level.

Service skills in the programs of Agriculture, Geology, and Medicine were learned by a very low percentage of faculty (low level). In Education, results show that a larger percentage of professors had mastered those skills (high and medium levels).

13. Professional Practice was the most frequently used methods of developing teaching, research and service skills by faculty working in the studied programs.

In all programs included in this study teaching and service skills were acquired most frequently through Professional Practice. This was also true of the research skills acquired by professors in the Agriculture, Geology and Medical programs. Only in Education did the faculty acquire research skills through Graduate Studies. This fact, however, does not invalidate the conclusion.

14. The level of usage of teaching, research and service skills varied in all studied programs.

Statistical results show that skills related to teaching and research were used mostly at the medium level by faculty in Agriculture and Medicine, and on the highest level by faculty in Education and Geology.

Teaching skills were most often utilized by faculty in the program of Education and were used least often by professors in the Geology program. Professors in the Agriculture program utilized research skills the most. In Medicine, professors used them at the lowest level found.

Skills related to the planning phase of research were used most in Education and Medicine. In Agriculture and Geology, scores were evenly distributed in relation to the three phases of the process.

Service skills were used in the lowest level. Geology was the program that presented the highest usage scores and Medicine had the lowest.

15. The data analyzed showed that there were several mechanisms and/or activities being used or planned for the future. None of those mechanisms/activities have been used by all respondents. Some were mentioned by only one respondent.

RECOMMENDATIONS

The researcher made the following recommendations regarding the implications of this study.

1. University administrators may be prepared to assess the necessity of substitution for professors in different programs.

There are three professors in the Agriculture program and nine in Medicine who are about to retire. It is not known if there is a real necessity for replacing them or if it would be better for the program to hire new professionals with new specialties who would be able to teach new courses and to develop new research projects. Only a particular study on this specific topic, will be able to give the answer. So, university administrators may assess the fact.

2. University administrators may create a system of incentives to keep faculty involved and interested in the development and improvement of the university.

As it was seen in Chapter II, the UFC in particular, and the whole federal system of universities in general, in Brazil, do not have a system of reward for excellence. Promotions are mainly based on the period of time professors stay in one class or level. The data in question one show the different levels of the professional career and the different contractual systems of the university. Nothing has been mentionned about rewards or incentives. It is important to maintain the system of categories or job levels, in order to guarantee opportunities for promotions and to keep professors interested in advancing their careers. However, this is not enough. There is a need for a reward system, which would include, awards, fellowships , grants for research or special projects, sabbatical years for faculty, "intellectual contexts", a subsystem of job evaluation, incentives for production (publications, number of classes and students taught, number of advisees, etc), and groups or associations for the development of different areas of studies, of different activities, and of the academic life at the university.

3. University administrators may work to keep as many of the faculty as possible more involved with the institution, in order to obtain a higher level of quality in their performances.

Earlier, in Chapter II, it was said that buildings, facilities, hardware and software were not the only basic needs for the university to achieve its goals. The university should rely primarily upon human resources. But, it has to be considered that qualified professionals cannot operate in an empty physical environment. Appropriate working conditions will attract more full time professors in different departments. An adequate physical environment requires better offices and more and better facilities, a competent support staff (secretaries), and a better system of communication (by mail, by telephone) among professors, among professors and employees, and among professors and administrators, both on and off campus.

4. University administrators may encourage and give priority to faculty who wish to be involved in any program or project that would permit professional growth.

It was seen that the number of faculty with doctoral degrees is still very low or nonexistent in some departments. It is believed that a doctoral program is a means of developing individual potential to perform at a higher level of knowledge and skill. However, besides doctoral programs, many different types of activities, projects or program can contribute to the professional

growth of the faculty at the UFC. The needs for professional qualification differ from one area to another. While doctoral degrees were important and common to the Agriculture and Education programs faculty, they are not to the Medicine program faculty, where most of the professors' professional qualification were obtained through internships and special studies courses (especializacão and/or aperfeiçoamento). So, it is important, to give special attention to each program, individually, to determine its needs and to give priority to those faculty members who are interested in self-qualification.

Above all, university administrators may consider that human resources development is more a qualitative process than a quantitative effort, and, it is a continuing process. The modern approach however, is cost-benefit oriented, and this aspect may be considered by those in charge of the process.

5. University administrators may consider which institutions and locales offer the best programs to enable the UFC professors to upgrade their qualifications.

It has been part of the UFC's tradition to avoid training of a big group of professors in the same place and institution, in order to prevent endogeny. By the same token, to permit professors to go to the other states or countries has been seen as a way to avoid xenophobia. Both phenomena are considered bias factors in communication.

There are advantages and disadvantages of having people studying in different institutions in and out of the country. Some advantages are to increase opportunities for communication with other higher education institutions, to enrich the education of new scholars, and to avoid conflicts among faculty in the same department. On the other hand, it is important to consider that conflicts and incongruencies within groups can be a positive factor for the group growth, even though they have been considered negative factors. Conflicts and incongruencies can help the group growth if they are faced, respected, and discussed creatively. They may not be necessarily solve but, it is fundamental to consider them as a fact in the dynamic of a group. To approach incongruencies and conflicts is a way of helping to develop social and professional relationships within a group.

More reflection is needed in relation to this process. The specific situation of Ceara, especially its agricultural (semi-arid tropical region), medical (tropical diseases carried by the population), and geological (several different types of minerals) needs -- have to be taken into account when determining the best centers for training and which types of programs (if graduate studies, short courses, in service training, etc) best fit the needs of the UFC in qualifying its professors in different programs.

6. University administrators may consider offering opportunities for some form of continuing education for its faculty.

Examination of all the tables which indicate the year of completion of studies at undergraduate and graduate levels for the faculty at the UFC, it is easy to see that there is a considerable group of faculty who have graduated for more than five years ago (some of them for more than twenty years ago) and who have not pursued any further studies. In order to help those professors to keep their skills, knowledge, abilities, etc., up-to-date, and also to help them to keep in touch with professors from the same areas of specialization, who have been doing further and more up-to-date studies, it is advisable to offer activities such as seminars, workshops, short courses, conferences, and upgrading activities related to teaching methodology for higher education.

On the other hand, it is important to consider that some of those professors have been working in a specific field or area in which they may have developed new knowledge or technology that may be meaningful for solutions to local problems. In this case, seminars, conferences, meeting, etc., should be carried on with the objective of giving those professors the opportunity to share their knowledge, expertise, the results of local studies, etc. This should be a way of reaching "the universal [knowledge] through or by means of the regional [studies]."

7. University administrators may consider the personal preferences of those professors already working in the departments and the incoming faculty members, for teaching a specific discipline.

The assumption behind this recommendation is that if a person does what he/she likes, he/she will do and feel better.

8. University administrators may consider the creation of a dossier to register all production and professional activities of all faculty members in the UFC.

This dossier may be organized and kept by the CCRH, and should be maintained up-to-date. It is advisable to keep data on a computer file. These data would be used by the university when it will be necessary to have to have information for providing different forms of incentives to faculty members.

9. University administrators and professional in charge of upgrading activities for professors may consider the results of this study in terms of the skills mastered and used in teaching, research and services, in the university.

In planning activities to help faculty members to upgrade their qualifications in areas of teaching, research and service, professionals in charge of those activities or projects may consider the results of this study as a basis for the development of further educational activities. It is hoped that these results will be useful in determining which skills should be

developed, through the new activities being planned. Being more specific, if one knows which skills are basic to teach, to do research, and offer services, and further, if one knows which of those skills are and are not developed among a specific group of faculty, it will be easier to determine which skills should be developed among those faculties.

10. University administrators may consider all the findings of this study in order to establish policies to result in more effective faculty development.

In addition to these findings, administrators should consider the financial, material, environmental, and organizational requirements and resources of the university as a whole, in order to establish policies that will produce effective faculty development.

IMPLICATIONS FOR FURTHER RESEARCH

To establish an effective policy for developing human resources (especially faculty members) the UFC should conduct indepth studies on other topics and should examine other factors, such as:

1. The University as an organization: the goals, objectives and philosophy of the institution; the administrative organization and the leadership style; the new demands of the Brazilian society; an awareness of the

regional needs and the job market; types of new services needed; a new system for feedback and evaluation for the university operations; resistance to and flexibility for change and innovation.

2. Faculty environment and behavior: humane and positive psychological working conditions; job satisfaction; the use of faculty time within the university; relationships between different groups, and between levels of administration; problems and needs of faculty; faculty professional production, such as: publications, conferences, seminars, etc.

3. Students: characteristics, problems and needs; goals and objectives; attitudes toward change and abilities to respond to the demands of society.

4. Curriculum: organization, sequency, teaching frequency of each course belonging to each studied program, up-to-dating of the courses in each curriculum of the university programs.

5. Training Needs: An in-depth study of all previous training of the UFC faculty at the graduate level may be conducted in order to facilitate the improvement of the human resources development process and yield better revenues. This special evaluation may also determine if the graduate studies pursued by faculty were appropriated, and which individual contributions trained faculty have given to the improvement of the institution. From this suggested evaluation, studies of new and more efficient

faculty development programs could be conceptualized.

6. Department Dynamics: The UFC administrators may undertake further studies on the mechanisms/activities used in departments to help professors to make use of their professional skills. It is important to determine which mechanisms/activities were the most effective to this end, and also to provide an incentive to department managers to use those mechanisms on a larger scale in all the departments of the university.

Many others topics could be studied. This should be considered a pioneer study for further research in this area. The UFC should use its special division of institutional research to conduct new studies and should encompass all programs (undergraduate and graduate) within the university.

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APPENDIX A

APPENDIX A

LIST OF USED ABBREVIATIONS AND/OR ACRONYMS OF CENTERS,
SCHOOLS, AND DEPARTMENTS INCLUDED IN THIS STUDYABBREVIATIONS
Centers/Schools

FULL NAMES

CAS	Center of Agriculture Sciences
CS	Center of Sciences
CHS	Center of Health Sciences
FACED	School of Education

Departments

AGRI.ECO.	Agricultural Economics
AGRI.ENG.	Agricultural Engineering
ANIM.SCS.	Animal Sciences
FOOD.SCS.	Food Sciences
PLAN.SCS.	Plant Sciences
SOIL.SCS.	Soil Sciences
FOUN.EDU.	Foundations of Education
SPEC.STU.EDU.	Specialized Studies in Education
TEAC.THE.PRA.	Teaching Theory and Practice
GEOL.	Geology
CLIN.MED.	Clinical Medicine
COMM.HEALTH	Community Health
MORPH.	Morphology
PATH.LEG.MED.	Pathology and Legal Medicine
PHYS.PHAR.	Physiology and Pharmacology
SURG.	Surgery.

APPENDIX B

APPENDIX B

LIST OF USED ABBREVIATIONS AND/OR ACRONYMS OF INSTITUTIONS
WHERE PROFESSORS HAVE STUDIED

This list is organized in alphabetical order and includes all higher education institutions related to this study.

ABBREVIATIONS/ ACRONYMS	FULL NAME
CSU (SP-B)	Campinas State University (Sao Paulo - Brazil)
CUPe.-SPS & L (Pe.-B) ..	Catholique University of Pernambuco - School of Philosophy, Sciences and Languages (Pernambuco - Brazil)
CSU (Ce.B)	Ceara' State University (Ceara'-Brazil)
CSU-FAFICE (Ce.B)	Ceara' State University - School of Education (Ceara'- Brazil)
CSU-SVM (Ce.B)	Ceara' State University - School Veterinary Medicine (Ceara' - Brazil)
CTSRA (F)	Center Tours Station de Recher - ches Avicoles(France).
CUL (L-P)	Classic University of Lisbon Portugal)
CICM (Q-C)	College Immacule' Conception- Montreal (Quebec - Canada)
CSU (C-USA)	Colorado State University (Colorado - USA)
CSMG (C-USA)	Colorado School of Mine - Golden (Colorado - USA)

CUI (NY - USA)	Cornell University - Ithaca (New York - USA).
FUBa (Ba.-B)	Federal University of Bahia (Bahia - Brazil)
FUMG (MG-B)	Federal University of Minas Gerais (Minas Gerais - Brazil)
FUPb (Pb-B)	Federal University of Paraiba (Paraiba - Brazil)
FUPr (Pr-B)	Federal University of Parana' (Parana'- Brazil)
FURJ (RJ-B)	Federal University of Rio de Janeiro (Rio de Janeiro - Brazil)
FUPe (Pe.-B)	Federal University of Pernambuco (Pernambuco - Brazil)
FURGS (RGS-B)	Federal University of Rio Grande do Sul (Rio Grande do Sul - Brazil)
FURGS-IHR (RGS-B)	Federal University of Rio Grande do Sul - Institute of Hydraulic Research (RGS - Brazil)
FUSM (RGS-B)	Federal University of Santa Maria (Rio Grande do Sul - Brazil)
FUV (MG-B)	Federal University of Vicosa (Minas Gerais - Brazil)
FUV-SVM (MG-B)	Federal University of Vicosa - School of Veterinary Medicine (Minas Gerais - Brazil)
FSU (F-USA)	Florida State University (Florida USA)
FSM (RJ-B)	Fluminense School of Medicine (Rio de Janeiro - Brazil)
FUB (WG)	Frein Universitat Berlin (West Germany)
ISUN (I-USA)	Illinois State University-Normal (Illinois - USA)

ICP (P-F)	Institute Catholique de Paris (Paris - France)
ISR (SP-B)	Institute for Spacial Research (Sao Paulo - Brazil)
IST (SP-B)	Ipiranga School of Theology (Sao Paulo - Brazil)
MSUS (M-USA)	Mississippi State University - Starkville (Mississippi-USA)
NSA (M)	National School of Agriculture (Mexico)
OSUC (O-USA)	Ohio State University-Columbus (Ohio - USA)
OSUC (O-USA)	Oregon State University-Corvallis (Oregon - USA)
PSM (SP-B)	Paulista School of Medicine (Sao Paulo - Brazil)
PUC (RJ-B)	Pontifical Catholique University (Rio de Janeiro - Brazil)
SDSC (C-USA)	San Diego State College (Califor- nia - USA)
SUU (RJ-B).....	Santa Ursula University (Rio de Janeiro - Brazil)
SMSRJ (RJ-B)	School of Medical Sciences of Rio de Janeiro (Rio de Janeiro - Brazil)
SM&S (RJ-B).....	School of Medicine and Surgery (Rio de Janeiro - Brazil)
STSP (SP-B)	School of Theology of Sao Paulo (Sao Paulo - Brazil)
TMI (A-B)	Tropical Medicine Institute (Anvers - Belgique)
TU (L-USA)	Tulane University (Louisiana - USA)
UAF (A-USA)	University of Arkansas - Fayetteville (Arkansas - USA)

UAT (A-USA)	University of Arizona - Tucson (Arizona - USA)
UC (SP-B)	University of Campinas (Sao - Paulo - Brazil)
UCD (C-USA)	University of California - Davis (California - USA)
UC (C)	University of Chile (Chile)
UFC (C-B)	Federal University of Ceara' (Ceara' - Brazil)
UFC-CAS (C-B)	Federal University of Ceara' - Center of Agriculture Sciences (Ceara - Brazil)
UFC-CHS (C-B)	Federal University of Ceara' - Center of Health Sciences (Ceara Brazil)
UFC-CS (C-B)	Federal University of Ceara' - Center of Sciences (Ceara' - Brazil)
UFC-CT (C-B)	Federal University of Ceara' - Center of Technology (Ceara' - Brazil)
UFC-FACED (C-B)	Federal University of Ceara' - School of Education (Ceara' - Brazil)
UFC-SEBAC (C-B)	Federal University of Ceara' - School of Economics, Business Administration, and Accounting (Ceara-Brazil)
UNIFOR (C-B)	University of Fortaleza (Ceara' - Brazil)
UFR (T-F)	Universite' Francois Rabelais (Tours - France)
UG (RJ-B)	University of Guanabara (Rio de Janeiro - Brazil)
UMI (M-F)	Universite' de Montpellier I (Montpellier - France)

UO (E)	University of Oxford (England)
UPX (P-F)	Universite' de Paris X (Paris (France))
UPXN (P-F)	Universite' de Paris X - Nanterre (Paris - France)
UPXI-CD'O (P-F).....	Universite' de Paris XI - Center D'Orsay (Paris - France)
UPXIII (P-F)	Universite' de Paris XIII (Paris France)
UPMC (P-F)	Universite' Pierre & Marie Curie (Paris - France)
UPP (P-USA)	University of Pennsylvania - Philadelphia (Pennsylvania-USA)
UP (P-USA)	University of Pittsburg (Pennsylvania - USA)
UPM (S)	Universidad Politecnica de Madrid (Spain)
ULR (M-U)	Universidad de la Republica (Montevideo - Uruguay)
USP (SP-B)	University of Sao Paulo (Sao Paulo - Brazil)
USP-ESALQ (SP-B)	University of Sao Paulo - Luiz de Queiroz School of Agriculture (Sao Paulo - Brazil)
USP-SMRP (SP-B)	University of Sao Paulo - School of Medicine of Ribeirao Preto (Sao Paulo - Brazil)
UTA (T-USA)	University of Texas - Austin (Texas - USA)
USIUSD (C-USA).....	United States International University - San Diego (Califor- nia - USA)
UUL (U-USA)	University of Utah - Logan (Utah USA)
UWM (W-USA)	University of Wisconsin - Madison (Wisconsin - USA)

UWM (W-USA)	University of Wisconsin - Milwaukee (Wisconsin - USA)
VSM (RJ-B)	Vassouras School of Medicine (Rio de Janeiro - Brazil)
WPAU (P)	West Pakistan Agriculture University (Pakistan)

APPENDIX C

QUESTIONÁRIO

PARTE 01:

OBJETIVO: Caracterizar os recursos humanos docentes que trabalham nos programas de graduação, considerados prioritários para a U.F.C.

Queira preencher o que se pede a seguir:

I - DADOS PESSOAIS

01. Nome - _____
02. Data de nascimento - _____
03. Naturalidade - _____
04. Nacionalidade - _____
05. Ano de Admissão na U.F.C. - _____
06. Vínculo Empregatício - _____
07. Regime de Trabalho - _____
08. Categoria Funcional - _____
09. Centro - _____
10. Departamento - _____
11. Atuação Funcional fora da U.F.C.:
 . Em desempenho: _____

II - TITULAÇÃO ACADÊMICA

01. Graduação:

- a) Denominação do Curso: _____

- b) Instituição e local em que realizou: _____

- c) Ano de Conclusão: _____

02. Aperfeiçoamento e/ou Especialização:

A seguir você vai encontrar espaço para registro de até 3 cursos neste nível. Se você tiver mais do que 3, queira indicar os demais no verso da folha.

Atenção área médica. No final desta parte do questionário há espaço para registro da Residência Médica, entretanto se você considera Residência Médica como Especialização e/ou Aperfeiçoamento, queira registrá-la, nesta seção do questionário.

- 2.1.a) Denominação do Curso: _____

- b) Instituição e local em que realizou: _____

- c) Período de Realização: _____

- d) Duração (Tempo e/ou Créditos): _____

- e) Área Específica do Trabalho Elaborado (Monografia): _____

- 2.2. a) Denominação do Curso: _____

- b) Instituição e local em que realizou: _____

- c) Período de Realização: _____

- d) Duração (Tempo e/ou Créditos): _____

- e) Área Específica do Trabalho Elaborado (Monografia): _____

- 2.3. a) Denominação do Curso: _____

- b) Instituição e local em que realizou: _____

- c) Período de Realização: _____

- d) Duração (Tempo e/ou Créditos): _____

- e) Área Específica do Trabalho Elaborado (Monografia): _____

03. Mestrado:
- a) Denominação do Curso: _____

- b) Instituição e local em que realizou: _____

- c) Período de Realização: _____

- d) Duração (Carga horária e/ou Créditos): _____

- e) Área de Concentração: _____

- f) Área Específica do Trabalho Elaborado (Monografia, Tese ou Dissertação): _____

04. Doutorado:

- a) Denominação do Curso: _____

- b) Instituição e local em que realizou: _____

- c) Período de Realização: _____

- d) Duração (Carga horária e/ou Créditos): _____

- e) Área de Concentração: _____

- f) Área Específica de Trabalho Elaborado (Monografia, Tese ou Dissertação): _____

05. Livre Docência:

- a) Instituição e local em que realizou: _____

- b) Período de Realização: _____

- c) Área Específica do Trabalho Defendido: _____

- d) Área Específica de Estudo: _____

ATENÇÃO: ESPECÍFICO PARA A ÁREA DE SAÚDE:

06. Residência Médica:

- a) Instituição e local em que realizou: _____

- b) Período de Realização: _____

- c) Duração (Carga horária e/ou Créditos): _____

- d) Área Específica de Trabalho Elaborado (se algum): _____

- e) Estudos e Especialização na Área de: _____

PARTE 02:

OBJETIVO: Determinar as demandas do currículo (necessidades do currículo) de curso de _____ em termos de pessoal docente qualificado.

USANDO o quadro constante nas folhas seguintes, queira fazer o que se pede:

01. Indicar marcando com um X, as disciplinas ensinadas nos 4 últimos semestres;
02. Indicar marcando com um X, como você se sente em relação a cada uma das disciplinas do curso de _____. Tome por base o seguinte critério:
 - a) Disciplinas que você tem formação especial e/ou preferência pessoal para ensinar;
 - b) Disciplinas que você tem competência para ensinar, mas necessita de tempo específico para uma melhor preparação prévia;
 - c) Disciplinas que você só ensinaria em caso extremo de emergência em seu departamento, dependendo inclusive de tempo para preparação prévia.

- Observações:
01. Você pode escolher mais de uma disciplina como preferência pessoal para ensinar, mais de uma para a qual necessita de preparação prévia para lecionar, e mais de uma que você poderia ensinar em casos de emergência em seu departamento. A escolha é sua.
 02. As disciplinas que você não marcar em nenhuma das opções apresentadas, serão tidas como as que você não ensinaria em hipótese alguma.
 03. Você pode assinalar qualquer uma das disciplinas que constam no currículo, em qualquer alternativa, mesmo que você nunca a tenha ensinado.
 04. Você pode indicar ainda uma ou mais disciplinas que gostaria de ensinar, desde que as referidas disciplinas não constem na lista apresentada.
 05. Finalmente, se você tiver qualquer dúvida, pode registrá-la no questionário na parte específica para que possamos respondê-la devidamente em contato posterior.

CURRÍCULO DO CURSO DE AGRONOMIA	DISCIPLINAS ENSINADAS NOS SEMESTRES				Preferência Pessoal	Preparação Prévia	Caso de Emergência
	1982.1	1982.2	1983.1	1983.2			
. Biologia Geral I							
. Física Geral I							
. Cálculo Diferencial e Integral I							
. Química Geral							
. Introdução à Estatística							
. Física Geral II							
. Cálculo Diferencial e Integral II							
. Química Orgânica I							
. Sociologia Geral							
. Zoologia Geral							
. Morfologia Vegetal							
. Introdução à Bioquímica							
. Física Geral III							
. Geometria Analítica							
. Solos I							
. Introdução à Zootecnia							
. Sistemática Vegetal							
. Fisiologia Vegetal							
. Topografia							
. Meteorologia e Climatologia Agrícola							
. Máquinas Agrícolas I							
. Experimentação Agrícola							
. Agricultura I							
. Zootecnia Geral							
. Álgebra Linear							

CURRÍCULO DO CURSO DE AGRONOMIA	DISCIPLINAS ENSINADAS NOS SEMESTRES				Preferência Pessoal	Preparação Prova	Caso de Emergência
	1982.1	1982.2	1983.1	1983.2			
• Química Analítica Aplicada _____							
• Construções Rurais _____							
• Máquinas Agrícolas II _____							
• Solos II _____							
• Microbiologia Agrícola _____							
• Entomologia e Parasitologia Agrícola I _____							
• Apreciação II _____							
• Hidráulica Agrícola I _____							
• Solos III _____							
• Fitopatologia _____							
• Entomologia e Parasitologia Agrícola II _____							
• Apreciação III _____							
• Criação de não Ruminantes I: Avicultura e cunicultura _____							
• Economia Rural I _____							
• Hidráulica Agrícola II _____							
• Princípios de melhoramentos Genéticos das plantas cultivadas _____							
• Horticultura I _____							
• Ovinocultura e Caprinocultura _____							
• Criação de não Ruminantes II: Suínos e equinos _____							
• Bovinocultura _____							
• Economia Rural II _____							
• Horticultura II _____							

CURRÍCULO DO CURSO DE PEDAGOGIA	DISCIPLINAS INDICADAS NOS SEMESTRES				Preferência Pessoal	Preparação Prévia	Caso de Emergência
	1982.1	1982.2	1983.1	1983.2			
• Introdução à Educação _____							
• História da Educação _____							
• Evolução da Educação no Brasil _____							
• Psicologia da Aprendizagem _____							
• Sociologia da Educação _____							
• Didática III _____							
• Estatística Aplicada à Educação _____							
• Estrutura e Funcionamento do Ensino do 1º Grau _____							
• Filosofia da Educação _____							
• Currículos e Programas _____							
• Metodologia do Ensino do 1º Grau I _____							
• Estrutura e Funcionamento do Ensino do 2º Grau _____							
• Psicologia da Educação _____							
• Estágio de Prática de Ensino na Escola do 1º Grau _____							
• Estágio de Prática de Ensino na Escola de 2º Grau _____							
• Didática IV _____							
• Princípios e Métodos de Pesquisas Educacionais _____							
• Princípios e Métodos de Administração Escolar _____							
• Administração Escolar na Escola de 1º Grau _____							
• Administração Escolar na Escola de 2º Grau _____							
• Estágio de Administração Escolar de 1º e 2º Graus _____							

CURRÍCULO DO CURSO DE GEOLÓGICA	DISCIPLINAS ENSINADAS NOS SEMESTRES				Preferência Pessoal	Preparação Prévia	Caso de Emergência
	1982.1	1982.2	1983.1	1983.2			
• Cálculo Diferencial e Integral I _____							
• Física Geral I _____							
• Química Geral _____							
• Geologia Geral _____							
• Cálculo Diferencial e Integral II _____							
• Introdução à Ciência da Computação _____							
• Física Geral II _____							
• Prática de Geologia Geral _____							
• Biologia Geral I _____							
• Cálculo Diferencial e Integral III _____							
• Introdução à Estatística _____							
• Física Geral _____							
• Geomorfologia _____							
• Cristalografia _____							
• Álgebra Linear I _____							
• Geometria Analítica _____							
• Cálculo Numérico _____							
• Química Orgânica I _____							
• Química Inorgânica I _____							
• Desenho Geológico _____							
• Mineralogia I _____							
• Físico-Química I _____							
• Química Analítica Mineralógica _____							
• Mineralogia II _____							
• Geometria Descritiva I _____							

CURRÍCULO DO CURSO DE GEOLOGIA	DISCIPLINAS ENSINADAS NOS SEMESTRES				Preferência Pessoal	Preparação Prévia	Caso de Emergência
	1982.1	1982.2	1983.1	1983.2			
. Topografia _____							
. Paleontologia _____							
. Geologia Estrutural _____							
. Sedimentologia _____							
. Petrografia Ignea _____							
. Geofísica _____							
. Geoquímica _____							
. Petrografia Metamórfica _____							
. Estratigrafia _____							
. Geologia Econômica _____							
. Geologia Histórica _____							
. Fotogeologia _____							
. Hidrogeologia _____							
. Prospeção: indique o aspecto específico da área _____							

. Geotécnica _____							
. Geologia de Campo _____							
. Geologia do Brasil _____							
. Recursos Energéticos _____							
. Cartografia I _____							
. Pedologia Geral _____							
. Planejamento em Geociências _____							
. Micropaleontologia _____							
. Geologia Marinha _____							

CURRÍCULO DO CURSO DE GEOLOGIA	DISCIPLINAS ENSINADAS NOS SEMESTRES				Preferência Pessoal	Preparação Prévia	Caso de Emergência
	1982.1	1982.2	1983.1	1983.2			
• Economia Mineral _____							
• Mecânica das Rochas _____							
• Lavra a Céu Aberto _____							
• Lavra de Minas _____							
• Gênese de jazidas _____							
• Geotectônica _____							
• Recursos Minerais do Brasil _____							
• Fotogrametria _____							
• Geocronologia _____							
• Outras, queira indicar por favor: _____							

CURRÍCULO DO CURSO DE MEDICINA	DISCIPLINAS ENSINADAS NOS SEMESTRES				Preferência Pessoal	Preparação Prévia	Caso de Emergência
	1982.1	1982.2	1983.1	1983.2			
• Histologia e Embriologia Humana _____							
• Anatomia Humana I _____							
• Fund. de Físio. G.F. e Biof. Humanas _____							
• Psicologia Médica _____							
• Estatística Vital e Demográfica _____							
• Anatomia Humana II _____							
• Farmacologia Geral _____							
• Fisiologia Humana III _____							
• Patologia Geral I _____							
• Imunologia Médica I _____							
• Microbiologia Médica _____							
• Parasitologia Médica _____							
• Medicina Social _____							
• Cirurgia Médica _____							
• Introdução ao Exame Clínico _____							
• Fundamentos de Radiologia _____							
• Bases da Técnica Cirúrgica e da Anestesia _____							
• Farmacologia Médica _____							
• Clínica Médica: indique a especialidade							
I _____							
II _____							
III _____							
• Anatomio-Físio-Patologia _____							
• Psiquiatria _____							
• Oftalmologia _____							

CURRÍCULO DO CURSO DE MEDICINA	DISCIPLINAS ENSINADAS NOS SEMESTRES				Preferência Passal	Preparação Prévia	Caso de Emergência
	1982.1	1982.2	1983.1	1983.2			
• Clínica Cirúrgica: indique a especialidade							
I _____							
II _____							
III _____							
• Trauma - Ortopedia _____							
• Dermatologia _____							
• Medicina Legal e Dentologia _____							
• Ginecobrechística _____							
• Pediatria _____							
• Neurologia _____							
• Clínica de Doenças Infecciosas _____							
• Urologia _____							
• Otorrinolaringologia _____							
• Medicina Interna _____							
• Reumatologia _____							
• Clínica Gastroenterológica _____							
• Clínica Hematológica _____							
• Clínica Endocrinológica _____							
• Radiologia Clínica _____							
• Bacteriologia Médica _____							
• Imunopatologia Humana _____							
• Puericultura _____							
• Citologia Clínica _____							
• Proctologia _____							

QUESTIONÁRIO

PARTE 03:

OBJETIVO: Determinar que competências básicas profissionais foram adquiridas pelos docentes dos programas de produção em estudo, como foram adquiridas e quais as que estão sendo utilizadas em suas atividades profissionais na UFC.

Considere competência profissional como "adequação para uma tarefa; a posse ou domínio de conhecimentos e habilidades específicos para atingir um nível aceitável de desempenho", ou ainda, a capacidade para preencher uma necessidade.

A partir da lista constante nas folhas seguintes queira indicar, marcando com um X, as competências ou habilidades que você teve oportunidade de desenvolver ao longo de sua carreira profissional. Tente indicar como as desenvolveu, classificando-as da seguinte forma:

- a) competências desenvolvidas na prática profissional através de esforço próprio ou em contato com colegas e alunos;
- b) competências desenvolvidas em cursos de pós-graduação "latu sensu". (Aperfeiçoamento e/ou Especialização);
- c) competências desenvolvidas em cursos de pós-graduação "Stricto-sensu". (Mestrado e Doutorado).

Indique também todas as competências que você está utilizando em suas atividades profissionais na UFC. (No departamento em que está lotado ou em qualquer outra atividade desenvolvida no âmbito da universidade).

- Observações:
- 01. Você pode usar mais de uma alternativa para cada competência. Ex.: fazer diagnóstico de uma situação de ensino; você pode ter aprendido na prática profissional, aperfeiçoado na pós-graduação "latu sensu" (aperfeiçoamento e/ou especialização) e estar usando na UFC.
 - 02. As competências não assinaladas em nenhuma coluna, serão consideradas como as que você não tem domínio sobre elas.
 - 03. Desde que os modelos de Ensino, Pesquisa e Extensão, aqui apresentados são bastante amplos, muitas das competências podem não estar relacionadas com sua área de atividades.
 - 04. Finalmente, você pode registrar quaisquer outras competências ou habilidades que julgar importantes, relativas aos processos de Ensino, Pesquisa e Extensão, e que não tenham sido listadas neste questionário. Use o espaço deixado no final de cada relação apresentada.

QUESTIONÁRIO

PARTE 03:

OBJETIVO: Determinar que competências básicas profissionais foram adquiridas pelos docentes dos programas de produção em estudo, como foram adquiridas e quais as que estão sendo utilizadas em suas atividades profissionais na UFC.

Considere competência profissional como "adequação para uma tarefa; a posse ou domínio de conhecimentos e habilidades específicos para atingir um nível aceitável de desempenho", ou ainda, a capacidade para preencher uma necessidade.

A partir da lista constante nas folhas seguintes queira indicar, marcando com um X, as competências ou habilidades que você teve oportunidade de desenvolver ao longo de sua carreira profissional. Tente indicar como as desenvolveu, classificando-as da seguinte forma:

- a) competências desenvolvidas na prática profissional através de esforço próprio ou em contato com colegas e alunos;
- b) competências desenvolvidas em cursos de pós-graduação "latu sensu". (Aperfeiçoamento e/ou Especialização);
- c) competências desenvolvidas em cursos de pós-graduação "Stricto-sensu". (Mestrado e Doutorado).

Indique também todas as competências que você está utilizando em suas atividades profissionais na UFC. (No departamento em que está lotado ou em qualquer outra atividade desenvolvida no âmbito da universidade).

- Observações:**
- 01. Você pode usar mais de uma alternativa para cada competência. Ex.: fazer diagnóstico de uma situação de ensino; você pode ter aprendido na prática profissional, aperfeiçoado na pós-graduação "latu sensu" (aperfeiçoamento e/ou especialização) e estar usando na UFC.
 - 02. As competências não assinaladas em nenhuma coluna, serão consideradas como as que você não tem domínio sobre elas.
 - 03. Desde que os modelos de Ensino, Pesquisa e Extensão, aqui apresentados são bastante amplos, muitas das competências podem não estar relacionadas com sua área de atividades.
 - 04. Finalmente, você pode registrar quaisquer outras competências ou habilidades que julgar importantes, relativas aos processos de Ensino, Pesquisa e Extensão, e que não tenham sido listadas neste questionário. Use o espaço deixado no final de cada relação apresentada.

COMPETÊNCIAS DESENVOLVIDAS		Prática Profissional	Pós-Graduação: Aperfeiçoamento e/ou Especialização	Pós-Graduação: Mestrado e/ou Doutorado	Sendo utilizado na UFC
PESQUISA:					
• Definir um problema de pesquisa _____					
• Elaborar uma justificativa para o estudo _____					
• Fazer a revisão da literatura existente _____					
• Indicar quais os fundamentos conceituais e teóricos do estudo _____					
• Indicar os limites do estudo (abrangência e limitações) _____					
• Determinar os objetivos da pesquisa _____					
• Determinar as hipóteses ou questões a serem estudadas _____					
• Determinar as variáveis e/ou categorias envolvidas no estudo _____					
• Selecionar os instrumentos a serem utilizados (questionários, entrevistas, técnicas de laboratórios e/ou de campo, ou outras) _____					
• Descrever os instrumentos a serem utilizados _____					
• Descrever os procedimentos, metodológicos e/ou estatísticos, para a escolha da amostra _____					
• Justificar a seleção dos procedimentos estatísticos _____					
• Descrever os termos relevantes usados no estudo (termos específicos da área ou que sejam definidos somente para efeito do estudo em foco. Ex.: o termo competência usado nesta pesquisa) _____					
• Elaborar a proposta de orçamento da pesquisa _____					
• Elaborar a proposta da pesquisa (projeto da pesquisa) _____					
• Encaminhar o projeto junto ao departamento para registro _____					
• Encaminhar o projeto junto ao Centro para registro _____					
• Realizar a coleta de dados _____					

QUESTIONNAIREPART 01 :

OBJECTIVE :

To discover the professional characteristics (profile) of the Faculty members working in each undergraduate program considered a priority for the university.

PLEASE FILL IN THE FOLLOWING :

I. PERSONAL DATA :

01. Name : _____
02. Date of Birth: _____
03. Place of Birth: _____
04. Nationality: _____
05. Contractual Status: _____
06. Number of hours worked per week : _____
07. Professional Level : _____
08. Center or School where you work: _____
09. Department to which you are affiliated: _____
- _____
10. Year of Admission to the university: _____
11. Current Activities outside of UFC: _____
- _____

II. EDUCATION:

01. Undergraduate:

- a) Field: _____
- b) Institution: _____
- c) Year completed : _____

02. Graduate Studies (Lato Sensu) "Aperfeicoamento and/or Especializacao"

Following you're going to find space to register three (3) courses at this level. If you have attended more than three of them, please indicate the other on the verse of the page .

Attention Medical Doctors :

In the final part of this questionnaire there a space to register your Medical Internship, however if you considere it an experience at the level of "Especializacao " or " Aperfeicoamento", please register it in this part of the questionnaire.

2.1a) Field: _____

b) Institution : _____

c) Year completed: _____

d) Length (Time or Credits): _____

e) Title of the final paper presented: _____

2a) Field: _____

b) Institution: _____

c) Year completed: _____

d) Length (Time or Credits): _____

e) Title of the final paper presented: _____

3a) Field: _____

b) Institution: _____

c) Year Completed: _____

d) Length (Time or Credits): _____

e) Title of the final paper presented: _____

03. Masters:

- a) Field: _____
- b) Institution: _____
- c) Year Completed: _____
- d) Length (Time or Credits) : _____
- e) Dissertation Title: _____

- f) Areas of Specialization: _____

04. Doctorate:

- a) Field: _____
- b) Institution : _____
- c) Year Completed: _____
- d) Length (Time or Credits): _____
- e) Dissertation Title: _____

- f) Areas of Specizalization: _____

05. "Livres Docencia" :

- a) Field: _____
- b) Institution: _____
- c) Year Completed: _____
- d) Areas of Specialization: _____

- e) Title of the Paper Presented: _____

ATTENTION: THIS PART IS JUST FOR MEDICAL DOCTORS .

ATTENTION: THIS PART IS JUST FOR MEDICAL DOCTORS.

06. Internship:

- a) Institution: _____
- b) Year Completed: _____
- c) Duration: _____
- d) Areas of Specialization: _____
- e) Articles, research paper published, other (if any):

QUESTIONNAIREPART 02:OBJECTIVE:

To determine the requirements of the curriculum (curriculum needs) in terms of faculty members able to teach the disciplines offered by their departments.

USING THE CURRICULUM TABLE PRESENTED AHEAD,
PLEASE DO THE FOLLOWING :

01. In the first four columns indicate the courses you have taught in the last four semesters.
02. Indicate how you feel about each discipline in the _____
_____ program, using the following criteria:
 - a) Disciplines in which you have specialized during your training and have a personal preference to teach.
 - b) Disciplines you are able to teach, but need time to prepare thoroughly.
 - c) Disciplines which you only teach in emergencies, requiring a previous period of time for preparation.

OBSERVATIONS :

01. You can chose more than one discipline to mark as your personal preference to teach, more than one, which you need previous preparation to teach and more than one you only would teach in a case of emergency in your department. The choise is yours.
02. All disciplines that you don't mark in any of the options presented, will be considered as the one that you would not teach them at all.

- 03. You can sign any discipline in the list presented, in any column, even if you had never taught it .
- 04. You may indicate one or more disciplines that you would like to teach, since they are not in the list presented. Use the space provided at the end of the list given.
- 05. Finally, if you have any question, you can register it on the questionnaire, in the specific part related to the question, then we will be able to answer it afterward.

CURRICULUM OF AGRICULTURE	DISCIPLINES TAUGHT DURING THE SEMESTERS				PERSONAL PREFERENCE	PREVIOUS PREPARATION	EMERGENCY CASES
	1982.1	1982.2	1983.1	1983.2.			
• General Biology _____							
• General Physics I _____							
• Differential & Integral Calculus I _____							
• General Chemistry _____							
• Introduction to Statistics _____							
• General Physics II _____							
• Differential & Integral Calculus II _____							
• Organic Chemistry I _____							
• General Sociology _____							
• General Zoology _____							
• Plant Morphology _____							
• Introduction to Biochemistry _____							
• General Physics III _____							
• Analytics Geometry _____							
• Soils I _____							
• Introduction to Animal Husbandry _____							
• Plant Systematic _____							
• Plant Physiology _____							
• Topography _____							
• Meteorology & Agriculture Climatology _____							
• Agricultural Machinery I _____							
• Agricultural Experimentation _____							
• Agriculture I _____							
• General Animal Husbandry _____							
• Linear Algebra _____							

CURRICULUM OF AGRICULTURE	DISCIPLINES TAUGHT DURING THE SEMESTERS				PERSONAL PREFERENCE	PREVIOUS PREPARATION	EMERGENCY CASES
	1982.1	1982.2	1983.1	1983.2			
. Applied Analytical Chemistry _____							
. Rural Construction _____							
. Agricultural Machinery II _____							
. Agricultural Microbiology _____							
. Agricultural Entomology and Parasitology _____							
. Agriculture II _____							
. Agricultural Hydraulics I _____							
. Soils II _____							
. Plant Pathology _____							
. Agricultural Entomology and Parasitology II _____							
. Agriculture III _____							
. Non-Ruminants: Poultry and Rabbit Sciences _____							
. Rural Economics I _____							
. Agricultural Hydraulics II _____							
. Principles of Genetic Breeding in Cultivated Plants _____							
. Horticulture I _____							
. Sheep and Goat Sciences _____							
. Non-Ruminants: Swine and Equine Sciences _____							
. Cattle Sciences _____							
. Rural Economics II _____							
. Horticulture II _____							

CURRICULUM OF AGRICULTURE	DISCIPLINES TAUGHT DURING THE SEMESTERS				PERSONAL PREFERENCE	PREVIOUS PREPARATION	EMERGENCY CASES
	1982.1	1982.2	1983.1	1983.2			
• Seed Technology _____							
• Technology of Agricultural Products I _____							
• Principles of Genetic Breeding in Animal _____							
• Forrage & Native Pastures Studies _____							
• General Ecology _____							
• Rural Economics III _____							
• Rural Extension _____							
• Technology of Agricultural Products II _____							
• Ecology of Animal Husbandry _____							
• Nutrition of Ruminants _____							
• Nutrition of Non-Ruminants _____							
• Elements of Agroclimatology _____							
• Drainage and Soil Salinity _____							
• Special Topics in Plant Sciences _____							
• Special Topics in Animal Husbandry _____							
• Horticulture III _____							
• Soils III _____							
• Forestry _____							
• Others, please indicate : _____							

CURRICULUM OF EDUCATION	DISCIPLINES TAUGHT DURING THE SEMESTERS				PERSONAL PREFERENCE	PREVIOUS PREPARATION	EMERGENCY CASES
	1982.1	1982.2	1983.1	1983.2			
Introduction to Education							
History of Education							
Development of Education in Brazil							
Psychology of Learning							
Sociology of Education							
General Methodology of Teaching III							
Statistics Applied to Education							
Structure & Functioning of the System of Teaching in Primary School							
Philosophy of Education							
Curricula and Programs							
Methodology of Teaching in Primary School I							
Methodology of Teaching in Primary School II							
Structure & Functioning of the System of Teaching in Secondary School							
Psychology of Education							
Field Experience in Primary School							
Field Experience in Secondary School							
Field Experience in Primary and Secondary Schools							
General Methodology of Teaching IV							
Educational Measurements							
Principles and Methods of Educational Research							

CURRICULUM OF EDUCATION	DISCIPLINES TAUGHT DURING THE SEMESTERS				PERSONAL PREFERENCE	PREVIOUS PREPARATION	EMERGENCY CASES
	1982.1	1982.2	1983.1	1983.2			
• Principle and Methods of School Administration _____							
• School Administration in Primary School _____							
• School Administration in Secondary School _____							
• Field Experience in School Administration in Primary & Secondary Schs. _____							
• Principles and Methods of School Supervision _____							
• Supervision in Primary School _____							
• Supervision in Secondary School _____							
• Field Experience in Supervision in Primary & Secondary Schools _____							
• Principles and Methods of Counseling and Guidance _____							
• Counseling and Guidance in Primary School _____							
• Field Experience in Counseling and Guidance in Primary and Secondary Schools I _____							
• Field Experience in Counseling and Guidance in Primary and Secondary Schools II _____							
• Others, please indicate :							

CURRICULUM OF GEOLOGY	DISCIPLINES TAUGHT DURING THE SEMESTERS				PERSONAL PREFERENCE	PREVIOUS PREPARATION	EMERGENCY CASES
	1982.1	1982.2	1983.1	1983.2			
. Differential & Integral Calculus I _____							
. Physics I _____							
. Chemistry _____							
. General Geology _____							
. Differential & Integral Calculus II _____							
. Introduction to Computer Sciences _____							
. Physics II _____							
. Practices of General Geology _____							
. General Biology _____							
. Differential & Integral Calculus III _____							
. Introduction to Statistics _____							
. Physics IV _____							
. Geomorphology _____							
. Crystallography _____							
. Linear Algebra I _____							
. Analytics of Geometry _____							
. Numerical Calculus _____							
. Organic Chemistry I _____							
. Inorganic Chemistry I _____							
. Geological Drawing _____							
. Mineralogy I _____							
. Physical Chemistry I _____							
. Analytical Chemistry for Mineralogy _____							
. Mineralogy II _____							
. Descriptive Geometry _____							

CURRICULUM OF GEOLOGY	DISCIPLINES TAUGHT DURING THE SEMESTERS				PERSONAL PREFERENCE	PREVIOUS PREPARATION	EMERGENCY CASES
	1982.1	1982.2	1983.1	1983.2			
• Topography _____							
• Paleontology _____							
• Structural Geology _____							
• Sedimentology _____							
• Igneous Petrography _____							
• Geophysics _____							
• Geochemistry _____							
• Metamorphic Petrography _____							
• Stratigraphy _____							
• Economical Geology _____							
• Photogeology _____							
• Hydrogeology _____							
• Geological Prospection _____							
• Geotechnics _____							
• Field Geology _____							
• Geology of Brazil _____							
• Energy Resources _____							
• Cartography I _____							
• General Pedology _____							
• Geosciences Planning _____							
• Micropaleontology _____							
• Marine Geology _____							
• Mineral Economics _____							
• Rock Mechanics _____							
• Open Pit Mining _____							

CURRICULUM OF GEOLOGY	DISCIPLINES TAUGHT DURING THE SEMESTERS				PERSONAL PREFERENCE	PREVIOUS PREPARATION	EMERGENCY CASES
	1982.1	1982.2	1983.1	1983.2			
. Mining _____							
. Genesis of Mineral Deposit _____							
. Geotectonics _____							
. Mineral Resources of Brazil _____							
. Photogrammetry _____							
. Geochronology _____							
. Historical Geology _____							
. Others, please indicate : _____							

CURRICULUM OF MEDICINE	DISCIPLINES TAUGHT DURING THE SEMESTERS				PERSONAL PREFERENCE	PREVIOUS PREPARATION	EMERGENCY CASES
	1982.1	1982.2	1983.1	1983.2			
. Histology and Human Embryology							
. Human Anatomy I							
. Fundamental of Human Physiology and Biophysics							
. Vital Statistics							
. Human Anatomy II							
. Pharmacology							
. Human Physiology III							
. Pathology							
. Medical Bacteriology							
. Medical Genetics							
. Medical Immunology							
. Medical Microbiology							
. Medical Parasitology							
. Medical Pharmacology							
. Medical Psychology							
. Social Medicine							
. Introduction to Clinical Medicine							
. Fundamental of Radiology							
. Basic Studies of Techniques of Surgery and Anesthesiology							
. Physio-Pathology Anatomy							
. Psychiatry							
. Ophthalmology							
. Traumatic-Orthopedics							
. Dermatology							

CURRICULUM OF MEDICINE	DISCIPLINES TAUGHT DURING THE SEMESTERS				PERSONAL PREFERENCE	PREVIOUS PREPARATION	EMERGENCY CASES
	1982.1	1982.2	1983.1	1983.2			
. Legal Medicine and Dentology _____							
. Obstetrics and Gynaecology _____							
. Pediatrics _____							
. Neurology _____							
. Treatment of Infectious Diseases _____							
. Urology _____							
. Otorhinolaryngology _____							
. Internal Medicine _____							
. Rheumatology _____							
. Human Immuno-Pathology _____							
. Puericulture _____							
. Proctology _____							
. Clinical Cytology _____							
. Clinical Endocrinology _____							
. Clinical Gastroenterology _____							
. Clinical Hematology _____							
. Clinical Radiology _____							
. Clinical Medicine: please indicate the specialty :							

. Clinical Surgery: please indicate the specialty :							

CURRICULUM OF MEDICINE	DISCIPLINES TAUGHT DURING THE SEMESTERS				PERSONAL PREFERENCE	PREVIOUS PREPARATION	EMERGENCY CASES
	1982.1	1982.2	1983.1.	1983.2			
. Clinical Surgery: Specialties : . Abdominal _____ . Chest _____ . Chest and Cardiovascular _____ . General _____ . Head and Neck _____ . Neuro _____ . Pediatrics _____ . Internships I & II : Specialties: . Endocrinology and Diabetes _____ . Gastroenterology _____ . General Surgery _____ . Hematology _____ . Infectious & Parasites Diseases _____ . Internal Medicine _____ . Nephrology _____ . Orthopedics and Traumatology _____ . Pediatrics _____ . Pediatrics / Neonatology _____ . Pediatrics Surgery _____ . Rheumatology _____ . Urology _____							

CURRICULUM OF MEDICINE	DISCIPLINES TAUGHT DURING THE SEMESTERS				PERSONAL PREFERENCE	PREVIOUS PREPARATION	EMERGENCY CASES
	1982.1	1982.2	1983.1	1983.2			
. Clinical Medicine: Specialities : . Angiology _____ . Cardiology _____ . Cytology _____ . Dermatology _____ . Endocrinology _____ . Gastroenterology _____ . General Clinical Medicine _____ . Hematology _____ . Internal Medicine _____ . Infectious & Parasitic Diseases _____ . Nephrology _____ . Neurology _____ . Pneumatology _____ . Radiology _____ . Rheumatology _____ . Urology _____							

CURRICULUM OF MEDICINE	DISCIPLINES TAUGHT DURING THE SEMESTERS				PERSONAL PREFERENCE	PREVIOUS PREPARATION	EMERGENCY CASES
	1982.1	1982.2	1983.1	1983.2			
. Internship I : please indicate the specialty :							
. Internship II : please indicate the specialty :							
. Others, please indicate :							

CURRICULUM OF MEDICINE	DISCIPLINES TAUGHT DURING THE SEMESTERS				PERSONAL PREFERENCE	PREVIOUS PREPARATION	EMERGENCY CASES
	1982.1	1982.2	1983.1	1983.2			
. Others: Specialties : . Complementary Methods of Diagnosis _____ . Hansenology _____ . Medical Entomology _____ . Medical Biochemistry _____ . Mouth & Facial Anatomy _____ . Micro & Plastic Surgery _____ . Neuroanatomy _____ . Neuropediatrics _____ . Neuroradiology _____ . Pathological Biogenics _____ . Public Health and Nutrition _____ . Social Hygiene _____ . Technology Applied to Health _____							

QUESTIONNAIREPART 03:OBJECTIVE :

To determine the basic professional skills acquired by professors working in the undergraduate programs which are the object of this study, how they acquired them, and which ones they are using to fulfill their duties within the university.

Consider professional competences as "adequacy for a task" or possession of necessary knowledge, skills and abilities to achieve an acceptable level of performance, in other words, the capacity to fulfill a need.

From the following list, please indicate the competences that you had opportunity to develop during your professional life (career). Try to indicate how you developed them, classifying them according to the following criteria:

- a) Competences developed through individual work and/or through professional relations with students and colleagues ;
- b) Competences developed during graduate studies "lato sensu", ("Aperfeicoamento and/or Especializacao ");
- c) Competences developed during graduate studies "stricto sensu" (Master's or Doctor levels studies).
- d) Also indicate all competences that you are utilizing in your professional activities in UFC. (In the department where you are working or in any other activity that you are undertaking within the university).

OBSERVATIONS:

01. You may use more than one alternative for each acquired

competence. Example, to do a diagnosis of a teaching situation; you may have learned it during your professional life, may have improved the ability to do it, in a graduate course -"lato sensu " - ("Aperfeicoamento and/or Especializacao"), and you may be using it at UFC.

02. All competences that are not marked in any collum, will be considered as the ones that you don't have developed at all.
03. Since the models of teaching, research and extension (services) presented here are very wide, many of the competences, may be not related to your area of activity.
04. Finally, you may register any other competences or skills that you have developed, and think is important, related to the processes of teaching, research and extension(services), and that have not been listed in this questionnaire. Use the space provided at the end of each presented list.

COMPETENCES (SKILLS) DEVELOPED	PROFESSIONAL PRACTICES	GRADUATE STUDIES "APERFEIÇAMENTO" ESPECIALIZACAO	GRADUATE STUDIES MASTER / DOCTOR	BEING USED AT UFC
<u>TEACHING:</u> - To do a diagnosis of a teaching situation, (example: to obtain basic information about students, course duration, facilities, resources to make decisions and planning). - To determine the minimum requirements for students to enroll in a specific discipline - To develop instructional objectives - To determine competences (skills) necessary for students, (what students have to learn in order to pass in a specific discipline) - To select and organize teaching content according to the objectives - To select teaching procedures (methods and techniques) appropriate to the discipline you teach - To select instructional resources (material and equipment) necessary to the teaching process - To organize an instructional plan for a class - To organize an instructional plan for a unit of study - To organize an instructional plan for a course (discipline) - To develop special techniques for teaching a specific topic - To use specific teaching techniques in classroom - To use specific teaching techniques in labs. (practical classes) - To use especial instruments in classrooms (example, projectors, specific instruments for each area of study)				

COMPETENCES (SKILLS) DEVELOPED	PROFESSIONAL PRACTICES	GRADUATE STUDIES "APERFEIÇOAMENTO" "ESPECIALIZACAO"	GRADUATE STUDIES MASTER / DOCTOR	BEING USED AT UFC
• To use specific instruments in labs. • To use Games and simulations appropriate for the classroom • To communicate with students (to listen to them before interacting) • To interact positively with students (to give them attention, information, task directions, etc.) • To create pleasant learning situations (to avoid tension, fear or anxiety in classroom). • To create learning situations aduated to the needs of the students (a practical and up to data teaching process, relied upon students participation). • To demonstrate the development of practical skills for students, in a gradual, clear and logical way, (example: teaching specific abilities related to the use of specific instruments as in surgery techniques). • To develop special instruments to evaluate students (tests, specific tasks, observation sheets, etc). • To utilize special instruments in evaluation process. • To evaluate students based on previous criteria • To evaluate students in relation to specific skills, performance and behavior in a professional situation as in field experiences, internships, etc. • Other, please indicate, if any :				

COMPETENCES (SKILLS) DEVELOPED	PROFESSIONAL PRACTICES	GRADUATE STUDIES "APERFEIÇOAMENTO" "ESPECIALIZAÇÃO"	GRADUATE STUDIES MASTER / DOCTOR	BEING USED AT UFC
RESEARCH : - To define a research problem - To write a rationale for the study - To review the existing literature - To outline the theory and fundamental concepts for the study - To establish the scope and limitation of the study - To determine the objectives of the research - To determine the hypothesis or questions to be studied - To determine all variable and/or categories in the study - To select instruments to be utilized (questionnaire, interview, lab or field techniques, etc.) - To describe the instrument to be utilized - To describe methodological and/or statistical procedures to choose the sample - To justify the selection of the statistical procedures - To describe the data analysis procedures - To describe the relevant terms used in the study - To prepare the budget for the research - To prepare the final draft of the proposal for the research				

COMPETENCES (SKILLS) DEVELOPED	PROFESSIONAL PRACTICES	GRADUATE STUDIES "APERFICAMENTO" "ESPECIALIZACAO"	GRADUATE STUDIES MASTER / DOCTOR	BEING USED AT UFG
- To register the research project in the academic department were you work - To register the research project in center where you are located - To register the research project in the Vice-Rectory for Research and Graduate Studies - To get in touch with Granting agencies to get financing - To obtain cooperation of people and/or institutions in the country and overseas, to the on going research - To develop special instruments for the studies in your specific area of interest (creation of new types of equipment, new techniques, etc.) - To utilize appropriate instruments or resources to collect data - To use special techniques for field studies, in your area of interest, to achieve the proposed objectives - To use appropriate lab' techniques for your area of interest to achieve the proposed objectives - To collect data - To utilize special instruments to do research in your area of interest - To utilize instruments or statistical techniques appropriate for your area of interest - To analyze the data collected - To describe the findings - To write the final report of the study - Other, please indicate, if any :				

COMPETENSES (SKILLS) DEVELOPED	PROFESSIONAL PRACTICES	GRADUATE STUDIES "APERFEIÇOAMENTO" ESPECIALIZACAO	GRADUATE STUDIES MASTER /DOCTOR	BEING USED AT UFC
<u>EXTENSION:</u> • To do a survey of the community problems to determine the needs for extension programs • To propose activities or actions programs for communities which are able to feedback to teaching and research activities • To observe and respect community values involved in extension programs • To transform information gathered from the communities action program or activities in resources, aids or activities adequate to the improvement of the life pattern of the involved groups. • To communicate or to apply through specific programs or activities, the theoretical and/or practical knowledge elaborated within the university to the communities that have been participating in the aforementioned programs or activities. • To develop activities able to provide students with contact with the reality of communities, through collection of information, transmission of knowledge, services and other activities. • Other, please indicate, if any :				

APPENDIX D

ROTEIRO PARA ENTREVISTA

1. Ha quanto tempo voce esta no cargo ou funcao de chefe de Departamento ou de coordenador de curso?
2. Durante o periodo em que voce esta neste cargo quantos docentes voltaram da pos-graduacao ou entraram no departamento e estao em atividade?
3. De que forma o (a) Departamento/Coordenacao toma conhecimento das habilidades/qualificacoes dos professores que estao no departamento?
4. De que forma o (a) Departamento/Coordenacao tem utilizado as habilidades/qualificacoes especificas dos professores a servico do curso de _____/
5. Como tem sido feito o processo de retorno ou de entrada no Departamento, dos professores que voltam da pos-graduacao ou comecam a trabalhar nesta unidade?
6. Que comunicacao o Departamento manteve com o professor que retorna para saber:
 - (a) A area especifica de especializacao do docente?
 - (b) Os trabalhos realizados (producao intelectual) durante a pos-graduacao pelo professor?
 - (c) Se o docente fez alguma publicacao durante o tempo que esteve fora.
 - (d) Que conhecimentos e habilidades novas foram desenvolvidas e podem ser utilizadas a servico do curso de _____?
 - (e) Quais os planos do professor para iniciar ou reiniciar suas atividades no departamento.?
 - (f) Que novidades ele pretende introduzir em seu ambito de atuacao no Departamento?
7. O (a) Departamento/Coordenacao tem algum plano para melhorar ou promover a comunicacao entre os docentes, a fim de melhor utilizar suas habilidades/qualificacoes a servico do curso de _____?
8. Que sugestoes voce apresentaria para melhor introsar os professores que voltam da pos-graduacao ou que entram no departamento, no sentido de utilizar suas habilidades a fim de proporcionar mais realizacao profissional do docente e mais aproveitamento para o curso de _____?
9. Que fatores voce considera importantes e fundamentais para melhorar as condicoes de trabalho em seu Departamento?
10. O que voce considera como fatores ou criterios importantes e fundamentais para o estabelecimento de uma politica de Recurso Humanos para a UFC?

INTERVIEW GUIDE

QUESTIONS:

1. How long have you been in this position?
2. What does the department or the coordination do to discover the skills or qualifications of the professors who work for the program of _____?
3. How has the department or the coordination of this program utilized the skills or qualifications of the faculty members to improve the department itself and the program of _____?
4. During the time you have been in this position how many professors have returned from graduate studies or have entered to work in the department?
5. How has been the process of entrance or reentry into the department of professors who return from graduate studies or begin to work in the department?
6. What process of communication exists between the department and the professor returning from graduate studies or entering to work in the department in order to find out:
 - (a) The specific areas of specialization of the faculty members?
 - (b) Which papers, if any, were done and/or published during the graduate studies or in another job?
 - (c) What specific knowledge and skills were developed and could be used to improve the activities of the undergraduate program of _____?
 - (d) What plans does the professor have to start or restart his/her activities in the department?
 - (e) What innovation does he/she intend to introduce in his/her work within the department?
7. Does the department or the coordination of the program have any plans to improve communication among the faculty members themselves and between them and the department administration in order to improve the process of utilization of their qualifications in teaching and research activities in the undergraduate program of _____?

8. What suggestions do you as a chairperson (or as a coordinator) have to integrate better the professors who return from graduate studies, or who entered to work in the department, in order to utilize more efficiently their qualifications, to give them opportunity for professional fulfillment and to have better results in the activities in the undergraduate program of _____?

9. Which factors do you consider important and fundamental to improve the working conditions for faculty members in your department?

10. Which factors or criteria do you consider important and basic to establish a policy of human resources development to the UFC?

APPENDIX E

UNIVERSIDADE FEDERAL DO CEARÁ



PRO REITORIA DE PÓS-GRADUAÇÃO
E PÓS-GRADUAÇÃO
FORTALEZA - CEARÁ - BRASIL

Ilm^o. Sr.

Prof.

Diretor do Centro de

N E S T A

Em 12.06.84

Senhor Diretor,

A Professora Terezinha de Jesus Pinheiro Maciel, da Faculdade de Educação, está realizando um estudo sobre a situação atual da capacitação de recursos humanos (docentes) na U.F.C. Este trabalho tem dupla finalidade: servirá para obtenção de dados para a Comissão de Capacitação de Recursos Humanos, desta Pró-Reitoria, que pretende desenvolver atividades no sentido de atuar de forma mais efetiva junto à Comunidade Universitária, e também servirá de base para a tese de doutoramento da referida professora.

Ao apresentar a Professora Terezinha Maciel, solicito ao prezado Diretor toda sua colaboração para o estudo em foco.

Agradecendo antecipadamente a atenção dispensada à meu pedido, firmo-me

Atenciosamente,

Prof. Afânio Aragão Craveiro
Pró-Reitor

FEDERAL UNIVERSITY OF CEARA
VICE-RECTORY FOR RESEARCH AND GRADUATE STUDIES
JUNE 12, 1984

To
Professor
Dean of the Center of

Dear Sir,

Professor Terezinha de Jesus Pinheiro Maciel of the School of Education is conducting a study about the current state of faculty professional development at the UFC. This study has two goals: it will supply the Human Resources Development Commission, a section of this Vice-Rectorry with basic information on human resources; and, as well as supply data for the doctoral dissertation of the aforementioned professor.

Introducing Prof. Terezinha Maciel to you, I also ask your cooperation for the study she is conducting.

Thank you for your attention to my request.

Sincerely,

Prof. Afranio Aragao Craveiro
Vice-Rector



Ministério da Educação e Cultura
Universidade Federal do Ceará

Centro de

DEPARTAMENTO DE

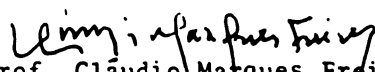
Fortaleza, 15 de junho de 1984.

Senhor Chefe,

Atendendo a um pedido do Senhor Pró-Reitor de Pesquisa e Pós-Graduação, dirijo-me a V.S^a. para apresentar a Professora Terezinha Maciel, da Faculdade de Educação, que ora realiza um estudo sobre a situação de capacitação de Recursos Humanos (Docentes) na U.F.C., e para solicitar de V.S^a. a gentileza de dispensar a atenção devida à referida professora.

Antecipadamente grato pela colaboração dispensada, firmo-me.

Atenciosamente,


Prof. Cláudio Marques Freire
Diretor

MINISTRY OF EDUCATION AND CULTURE
FEDERAL UNIVERSITY OF CEARA
CENTER OF
DEPARTMENT OF

Fortaleza, June 15, 1984

Dear Professor,

As per a request from the Vice-Rector for Research and Graduate Studies, I am introducing Professor Terezinha Maciel, from the School of Education to you. She is conducting a study about the current state faculty professional development at the UFC. Please give your attention and help to the aforementioned professor.

Thank your for your cooperation.

Sincerely.

Professor _____
Dean.

Ministério da Educação e Cultura
UNIVERSIDADE FEDERAL DO CEARÁ

Fortaleza, de maio de 1984.

Prezado Colega

Dirigimo-nos a você para solicitar sua colaboração para a pesquisa que ora estamos realizando.

Trata-se de um estudo sobre a situação do docente em alguns cursos de graduação na UFC (Agronomia, Geologia, Medicina e Pedagogia). O estudo terá dupla função, pois servirá para obter dados para a Comissão de Capacitação de Recursos Humanos, a fim de que possa ter uma atuação mais efetiva junto à Comunidade Universitária, e, também, obterá dados que servirão de base para nossa tese de doutoramento.

Os objetivos específicos estão indicados em cada parte do questionário, o que lhe ajudará a compreender as finalidades do estudo.

Como você poderá notar, parte do questionário em anexo, está preenchida, para facilitar o seu trabalho. Pedimos, portanto, que você verifique se os dados preenchidos estão corretos e que complete os que ainda estão em branco.

Ficaremos muito gratos se você devolver este questionário à chefia de seu departamento, no período de uma semana, a partir da data do recebimento.

Colocamo-nos à sua disposição para qualquer outra informação que lhe parecer necessária, através dos telefones:

Manhã : 223. 26. 34

Tarde : 244. 04. 01 .

Certos que que contaremos com sua atenção, antecipadamente agradecemos sua ajuda.

Atenciosamente ,


Terezinha J.P. Maciel
Prof. Adjunto
Faculdade de Educação

VISTO : 
Prof. Roberto Lima Sampaio
Presidente da C.C.R.H. /UFC .

Ministry of Education and Culture
Universidade Federal of Ceara

Dear Colleague,

I would like to ask you for your cooperation in a research project I am undertaking.

This research is concerned with the current situation of professors in various undergraduate programs in the UFC campus (Agriculture, Education, Geology, and Medicine). The study will have two purposes, it will be used to collect data for the Commission for Development of Human Resources in order to make its work more effective for the academic community, and also, the data obtained will be used in my doctoral dissertation.

The specific objectives are indicated in each part of the questionnaire, and should help you to understand the aims of the study.

As you will notice, part of the questionnaire has been filled in, to help you. Please check that the parts filled in are correct and complete the rest.

I would be very grateful if you could return the questionnaire in a period of one week from the date you received it.

If you need any other information I can be reached at the School of Education : Morning: Phone: 223.26.34; Afternoon: Phone: 244.04.01.

Thank you in advance for your cooperation.

Sincerely,

Terezinha J.P. Maciel
Associate Professor.

APPENDIX F

Ao Prof. _____

Departamento de _____

Centro de _____

UFC

Fortaleza, de de 1984.

Prezado Colega,

Servimo-nos da presente para lhe apresentar nossos sinceros agradecimentos por sua colaboracao em responder o questionario relativo a pesquisa: Capacitacao de Recursos Humanos (Docentes) para a UFC: Perfil, Processo, e Politica. Queremos ressaltar o quanto sua ajuda foi importante, desde que sem ela nao conseguiriamos um numero minimo para obtermos uma significacao estatistica para o estudo.

Aproveitamos para nos colocar a sua disposicao no Departamento de Teoria e Pratica do Ensino da Faculdade de Educacao, fone: 223.26.34.

Sinceramente,

Terezinha J.P. Maciel
Prof. Adjunto.

Fortaleza, _____, 1984.

To:

Professor:

Department of

Center of

Dear Colleague,

This is to express our sincere gratitude for your cooperation in answering the questionnaire related to the research project, Formation of Human Resources (Faculty Members) to UFC: Profile, Process, and Politics. We would like to emphasize that your help was important, since without it, we could not get the minimum number of data in order to reach statistical significance for the study. If you have questions, or need assistance in any way, please feel free to call us at the Teaching Theory and Practice Department, in the School of Education, phone 223.26.34.

Sincerely,

Terezinha J.P. Maciel
Associate Professor.

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