INNOVATION IN POSTGRADUATE VETERINARY EDUCATION IN MEXICO AND THE Provision OF INFORMATION SERVICES

Judith Licea de Arenas

National Library of Mexico and Faculty of Philosophy and Letters.
National Autonomous University of Mexico
Ciudad Universitaria
Mexico, D.F.
Mexico

ABSTRACT: The need to train highly qualified human resources for Mexico's development has to consider the provision of information services especially designed for the training of high performers which will contribute to the rational production of animal protein under adverse conditions.

Introduction

Mexico's position as one of the largest and most developed Latin American countries underlines the importance of Mexico in its own right. The existing literature on Mexico is extensive and on many highly specialized subjects. However, as Mexico, the country that has been extensively studied, continues to be little understood, we attempt an insight into what constitutes the framework for information in veterinary medicine (Mexico's geography, the country's population, quality of life, the scientific research system and the veterinary education system) to aid information specialists to appreciate Mexico's achievements.

The Population

Mexico ranks 11th in the world in terms of population. The preliminary results of the 1990 census reported that Mexico had a population of 81,140,922. The population density was, according to the same source, 41.25 inhabitants per square kilometer. The country is characterized by a demographic transition distinguished by: high birth rates combined with a decline in the mortality rate and a rise in life expectancy. Between 1900 and 1950, Mexico's population virtually doubled, and it doubled again between 1950 and 1970. By the year 2000, it is expected that the population will number 113 million. Between 1960 and 1987, life expectancy rose from 57 to 69 years. The mortality rate declined from 23.2 per 1,000 inhabitants in 1940 to 7.5 in 1980.

Quality of Life

Mexico is also passing through an epidemiologic transition. The epidemiologic transition reveals a mixed picture. There is a decline in the incidence of infectious diseases, and a rapid increase in the incidence of chronic diseases and accidents. Chronic diseases and accidents are not a sign of "progress," for they are not more advanced than diarrhea. Many of the emerging ailments are a result of a defective process of industrialization that has placed more value on economic growth than on human welfare.

The Land

Mexico is located in the south of the North American continent with an area of 1,972,544 square kilometers (761,600 square miles). It shares its borders with the United States (3,200 kilometers), Guatemala (960 kilometers) and Belize (260 kilometers).

Mexico's climate is varied and more than half is dry; about one-fourth is rainy and temperate and the rest is tropically rainy. The Northwest and North regions are relatively populated areas because much of the land is arid (non-arable land) or semi-arid (irregular land yield). The Southeast region is a small area not densely populated, while the Centre-South region has the densest concentration of population.
contamination of food, protein-deficient diet, and of effective health education, seriously affect the health of the latter group. Poor people will continue to suffer the pathologies of poverty (cirrhosis, tuberculosis, amebiasis) which are largely an outcome of poverty and its environmental cognates, such as poor sanitation and hygiene, insufficient and unsafe drinking water, inadequate nutrition, and poor dietary habits. The better off segments of the population will have completed the epidemiologic transition.

Scientific Research

Why should research be done in Mexico? What sort of research should be done? Mexico needs research to reduce the gross imbalances in present standards of living, and to accelerate development. Mexico requires for its development, a strong science capability able to contribute to the solution of some of Mexico’s most urgent problems, such as malnutrition and undernutrition. A systematic and rational approach sees the key to development as lying in investment in science with an indigenous base, rather than one which relies solely on imported knowledge.

The State of Scientific Research

The pursuit of science did not grow in Mexico until the first decade of the twentieth century, and even then, it had a fragmentary, reflex, and imitative character, divorced from the productive sphere. An official document of the Mexican government summarized the period before the 1970s as one in which progress in science and technology (S&T) was the effect of revolutionary social changes. These changes were the results of the breakdown of a rigid caste structure inherited from pre-Hispanic and colonial times; massive migrations from rural to urban areas and to newly irrigated regions; the building of new universities and research centers, some of high quality; the exposure of several thousand Mexicans to foreign university training and the integration of highly qualified immigrants seeking refuge from Nazi Germany and Franco’s Spain. All of these factors have contributed considerably to the development of science and technology in Mexico’ (1).

Although its growth has accelerated since the 1970s, S&T system has revealed the following difficulties (2):

1. Mexico depends on the development of science and technology from more advanced countries. Thus its output in many cases, to purely imitative quasi-research activities in fields in which serious local research and development (R&D) was badly needed, if only because many problems arising in the context of underdevelopment are different from those facing developed societies.

2. Financial resources are not adequate when compared with those provided by industrialized and nonindustrialized countries.

3. The S&T system faces a critical lack of researchers.

4. The geographic and institutional concentration of science and technology institutions is excessive.

5. The development of science and technology is highly unbalanced across sectors and disciplines.

6. There are no permanent links between the R&D effort and the educational system.

Manpower

Nowadays, we take for granted that science and its applications are mandatory for the country’s development. We also take for granted that we need a critical mass who must raise the scientific level and work towards the solution of national problems. Positive steps such as manpower training have been taken in recent years. However, the shortage of trained manpower for research constitutes one of the obstacles for Mexican science development simply because manpower development is a long-range goal. The political decision to accelerate manpower development that dates from the 1970s, was reversed in 1982 because of the shortage of hard currency, as well as other factors such as the crisis of the stabilizing development model, the growth of the external debt, the crisis of oil prices, inflation, and reduction of exports among others. Apart from considerations of quantity, the crucial characteristic of manpower is quality, although quality is difficult to achieve even under the best circumstances.

The making of a scientist, through formal postgraduate training programs, implies the development of the creativity and skills of the future researcher. Although it would be wrong to say that a professional is incapable of doing research if he or she has not obtained a given degree, such cases are the exception today. However, there are some factors, such as the irrelevance of research topics, that may seriously affect the creativity and skills of the potential researcher. Carvajal and Lomnitz (3) point out that the development of science in Mexico today is hardly conducive to the generation of relevant knowledge. Thus, strategies for scientific development based on the scientific and national relevance topics are essential.

In the 1970s, future researchers were trained abroad, but in the 1980s, when training alternatives had to be sought, national programs were strengthened. The aim of national programs has been the training
of highly qualified staff for research and teaching activities; thus original scientific work has been the main component for the evaluations that take place periodically according to objective criteria established by groups of experts. The criteria adopted for evaluation purposes are: teaching staff, including productivity in terms of number of published research papers, academic structure, enrollment, graduation rate, and infrastructure (4).

The Higher Education System

The roots of university education go back to the sixteenth century when the Royal and Pontifical University was established in 1553. The university, as well as other educational institutions, had as its objective the training of leaders for colonial society. After the 1910 Revolution, higher education institutions became community oriented, and have been evolving as popular centers of culture. There are about 250 institutions of higher education in Mexico. The total number of universities, public and private is 60.

For practical purposes, institutions of higher education are grouped into the following categories: (1) public and (2) private institutions, recognized by the Ministry of Education, a state government, or public universities.

Public universities are distinguished from other institutions of higher education, according to Ortega y Gasset's *Mission of the University* (5), by their functions of teaching, research, and diffusion of culture. Public institutions are almost entirely financed by the federal or state governments, whereas private institutions are financed by students' fees and private enterprises.

Higher education institutions in Mexico faced an increasing demand for access because of two facts: population growth and expansion of the educational system. We assume that any sustained growth brings with it the need for skilled manpower and therefore, as the population expands, the need for more graduates. As the country is beginning to come to terms with the implications of demographic change, however, the present economic model is forcing limits on the number of applicants. It is expected that by the 1990s, there will be fewer people entering the professional labor market. On the other hand, the problems that have affected the labor market for the past ten years, such as lack of jobs and low salaries, will continue. There is no doubt that universities should contribute to knowledge. Universities are, or should be, the institutions devoted to the discovery of new knowledge that may contribute to the expansion of the scientific fronts. Scientific activity in Mexican universities is young because of the importance given to the profession. Postgraduate courses seem to be the result of the expansion of education. Despite the proliferation of postgraduate programs, some institutions are already experimenting with innovative programs for developing research skills in their students. Two opposing groups, the utilitarians and the critics, have discussed the types of research that should be carried out in the country. The utilitarians suggest that research should not take into account social relevance criteria because these are abstract concepts to be used only as scientific tools. The second position argues that scientific activity should be real or nationalistic, based on an analysis of the existing national resources and problems. Both positions have solid arguments; however, universities have the freedom to select research topics.

Veterinary Education

Veterinary education first emerged in Mexico about 140 years ago. Today the veterinary education system is constituted by 38 institutions. Twelve out of the 38 institutions offer undergraduate and postgraduate veterinary education. Of the 38 institutions, 29 are affiliated with public universities and nine are private. Private schools do not offer postgraduate training.

Postgraduate veterinary education goes back to the 1950s. In the 1980s, in order to reduce centralization of veterinary education in the country's capital, schools with a solid infrastructure, serving also as regional schools, were chosen, to offer advanced degree studies based on the research policies set up by the Association of Mexican Schools of Veterinary Medicine. The policies focused on relevant problems for improving food supplies aimed to reduce undernutrition and malnutrition amongst Mexico's population, thus changing the quality of life of Mexicans.

Policies for innovative postgraduate veterinary education have stressed the importance of an autonomous decision making capacity, locally relevant research, and the creation of an indigenous science base. An autonomous decision making capacity is still far from being achieved.

Given Mexico's geographic condition, it is crucially important to have a variety of options in order to achieve alignment between science activity through education and needs and development objectives of the country.
Information Services

Scientific information is being generated at a great speed. Hence, there is a variety of limitations when trying to obtain and use it. Mexico has had to find solutions to these problems by developing mechanisms to make it possible to identify the users and information needs, as well as the procedures and systems which must be established so as to select, store, and disseminate this information efficiently. Undoubtedly, if professionals involved in teaching, research, or planning have access to the right sort of information and use it at the appropriate time, they will be able to work more efficiently.

In higher education institutions, information should play an important role since it is an important component of the teaching and research processes that are carried out in these institutions. Even if the importance of information were taken for granted, we still would have to establish the strategies needed to achieve the goals imposed by veterinary education in Mexico. Nevertheless, because of the different levels of development and financing, plus the particular characteristics of each institution, it was impossible to come up with a single model which could be applied to all institutions. What proposals could be made to obtain the desired results, and which is the most appropriate method for coping with the information flow?

Our starting point was to determine our environment, and consequently, its boundaries as well.

After surveying the libraries of the institutions which offer postgraduate studies in veterinary medicine, we came to the conclusion that a school which offers postgraduate studies does not necessarily require a large library. We felt it better to have a core collection of journals and a well selected reprint collection, because each school has a clearly defined line of research. Keeping these arguments in mind, new library policies were suggested. These policies were based on a criterion of selectivity in accordance with the quality of information and its potential use by staff and students, all of which ensures a high degree of continuity and development in accordance with innovative educational models. Efforts were centered around setting up information services which are based on selectivity and careful expenditures because there were no well-equipped and well-financed libraries.

In a country where there is no library tradition nor abundance of resources, the starting point for operative strategies for libraries, faced with setting up postgraduate studies program, should not be the problems such as insufficient and untrained library staff, poor collections, inappropriate facilities, and consequently, inadequate information services. We identified that these deficiencies were caused by the following:
—Financial resources channelled towards the acquisition of scientific information had not been sufficient, and did not increase at the same rate the new literature did.
—The amount of new literature made selection and acquisition processes more difficult.
—The acquisition of documents produced at local, regional, or national levels, was practically impossible due to lack of bibliographic control and availability.
—Automated, as well as telecommunication systems, were often inefficient because of lack of library infrastructure.
—Library personnel was scarce, and resulted in hiring people with no library training.

Undoubtedly, information has not received the full attention it deserves. Besides, the rising costs of equipment and manufactured goods, plus the patronizing attitude of the state have contributed towards this situation. Due to the country’s economic adjustments, the acquisition of information has been limited because cut-backs have reduced the amount of money granted to universities, and consequently, to library budgets.

The concept of core collections for libraries was made according to the following criteria: user studies, experts consensus, citation analysis based on citation indexes, citing behavior, citing patterns, as well as other relevant characteristics of scientific papers.

When asked whether the implementation of a strategy aimed at pointing out inexpensive and practical information policies might not have unexpected or undesirable consequences, the answer was that the purpose of selectivity, from an intellectual perspective, was to identify and strengthen high quality research. The criteria mentioned above which served as quality filter to isolate significant contributions from trivial ones, cannot by any means be considered as a sign of elitism, or scientific colonialism; for when we related this aim to the scientific method and the norms which govern scientific behavior, we found that selectivity is complementary rather than competitive.

As we have already mentioned, large libraries are not necessarily the best, for they do not guarantee 100% user satisfaction. Libraries which are based on
a criterion of selectivity have managed to solve the problems of bibliographic inflation, and they have also provided their users with the information centered on their own research topic without spending an unreasonable amount of money.

The following stages were suggested:
1. Replanning existing libraries, basing this activity on the criterion of selectivity which will, in turn, result in core collections closely related to the institution’s research lines;
2. Employing personnel with library training (at least one per library);
3. Implementation of user education programs;
4. Establishment of co-operative programs among institutions carrying out similar research projects.

When libraries based on a criterion of selectivity were created, a seminar on user education was organized so that students would become familiar with information more efficiently. The aim of the seminar was to develop their skills in submitting an end product of their research project. In this way, postgraduate students had to associate the information cycle with their daily activities. The topics discussed in the seminar were:
3. Information cycle: authors, publishers, analysts, information units.
4. The scientific paper.
6. The journal article. Scientific journals. Mexican scientific journals.
7. Information sources.
11. The research proposal.
12. The scientific discourse.
13. Guidelines for the submission of scientific papers.

We were aware that much knowledge has to be imported in Mexico because of a weak indigenous research capability. Nevertheless, innovative veterinary education has emphasized the need for a connection between research and society’s needs, since research determined by external agencies or agendas are set outside the country and have little to do with its development requirements. Therefore a project of this nature was possible because of institutional and individual collaboration. We did not have a choice because Mexico, its higher education institutions, and its libraries are of a complex nature.

References


