

OECD THEMATIC REVIEW OF TERTIARY EDUCATION

Country Background Report for Mexico



**Ministry of Public Education
November 2006**

Preface

This Country Background Report presents the current state of the higher education system in Mexico and its evolution in the last decade. It was prepared by the office of the Undersecretary of Higher Education of the Federal Government's Secretaría de Educación Pública (SEP).

The original version of this report was written in Spanish and published by *Fondo de Cultura Económica* in 2006 and titled "La Política Educativa y la Educación Superior en México: Balance de una década 1995-2005". The book was originally translated into English by Claudia Esteve.

With this report, Mexico contributes to the project coordinated by the OECD dealing with the comparative analysis of federal policies and the evolution of the systems of higher education of several countries during the last decade (The OECD Thematic Review of Tertiary Education).

The report was produced by a team coordinated by Julio Rubio, Undersecretary of Higher Education SEP, with the participation of Jose A. Abud, Ignacio E. Arvizu, Eugenio Cetina, Francisco Demeneghi, Bulmaro Fuentes, Luis Mier y Terán, Hugo Moreno, Arturo Nava, Fernando Treviño and Armando Zapatero. The team was technically assisted by José Luis Cuevas, Efraín Juárez, Martha Riebeling, and Maria del Carmen Silva.

Even though the thematic report was elaborated by SEP, it includes opinions and points of view of different actors interested in the development of the Mexican Higher Education System.

Felicia Knaul was in charge of the management of Mexico's participation in the OECD project.

México, D. F., 2006.

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Executive Summary

(1) Higher education in the Mexican context

Mexico is a federal, democratic and representative republic constituted by 31 states and one Federal District. The latter, houses the federal powers and the nation's capital city. Mexico is a multi-cultural nation with over 103 million inhabitants of which, over 10 million belong to indigenous groups. An emerging economy, Mexico is quite developed in the industrial context and features significant increases in its sale of goods and services abroad.

As is the case of a large number of middle-income countries in Latin America, Mexico is experiencing four fast, deep, parallel and polarised transitions in the demographic, social, economic and political scenes. The complexity of this set of transitions is closely related to the disparities Mexico still shows in the living standards of its population, its economic development and the most relevant social indicators. In this sense, Mexico still faces the challenge of large gaps separating the richer population from those who earn less, as well as the differences between states, regions and rural and urban areas.

Due to the increases in the economically active population, a unique—albeit temporary—opportunity opens on the demographic front. Demographic transition will bring radical changes in the demand for a series of services the Mexican State must provide. Two trends will influence the evolution of educational services' demand during the next decades: a) the decrease in the population under 15 years old and the related increase of the working-age population—the 15-64 segment—; and b) the increase in the number of small communities disseminated across the national territory. The reduction at the base of the population pyramid has had and still has important consequences on basic and secondary education.

During the second half of the twentieth century, Mexico's considerable mortality and fertility indices began to decrease. This phenomenon caused the natural population growth rate to change from 3.5% in 1965, to 1.7% in 2000. During the past five years, the average annual growth rate reached 1%. In that context, it may be anticipated that Mexico will still be among the most populated nations in coming decades with its population probably stabilizing somewhere between 130 and 150 million towards the mid-twenty-first century. Although most of the population is young—currently over 50% is 25 years old or less—the ageing process is undeniable. In 2000, one out of every 20 Mexicans was over 65; in 2050, this ratio will reach one out of four Mexicans.

In terms of the geographical distribution, over 75% of the population lives in urban areas, with a large portion in the three largest cities. Nevertheless, growth in mid-sized cities has been intense during the past 20 years. At the same time, the distribution of part of the population in rural areas represents an enormous challenge: 75% of over 150 thousand rural communities in the country count less than 100 inhabitants.

Along with the changes experienced as a consequence of economic dynamics, Mexico is facing material social transformations. Organisation schemes, almost exclusively restricted to social groups or trade unions three decades ago, are shifting towards more diversified versions, such as the multiplicity of organisation initiatives from civil society groups. There is renewed interest in the social role of trade unions, firms and sectoral associations that leaves space for convergence beyond the protection of specific interests, suggesting new social energies in terms of defending rights and exercising public responsibilities.

An increasingly complex social structure is fostering a transformation in the identities adopted and the roles performed by the social actors in the most diverse scenarios. Three indications of this phenomenon are the emergence of a mostly young population demanding jobs and social participation; transformed women's roles, with increasing educational achievements and growing participation in the economy, as well as the revaluation of multi-culturalism.

Namely, the growing participation of women in labour markets and decision-making has been instrumental in the transformation of the household's structure and social role. Female

employment has more than doubled in the past 30 years. There are still inequities, however. In the past few years, the coverage of education has increased continuously for both genders, hence the decrease in disparities. Differences persist, however, mostly in rural areas and especially in indigenous communities, where girls are usually significantly disadvantaged with respect to boys.

In essence, economic transformation has implied changing the original development model—based on protecting domestic production mainly by means of substituting imports and strong government presence in basic service provision—to another based on market globalisation, reduced government intervention in the economy and the implementation of an export promotion strategy. Currently, Mexico's economic systems are more open and integrated towards international trade and economic practice. In this sense, it has signed a sizeable number of trade agreements with countries and regions such as North America, the European Union, Japan and several Latin American countries. In addition, Mexico belongs to the Organisation of Economic Cooperation and Development (OECD) since 1994.

Given its specific nature and the circumstances to which it relates this economic transition has undeniably stimulated modernisation, dynamism and productivity in Mexico. Since 2001, its GDP has grown at an annual average rate of 3%. Given Mexico's demographics, however, such growth has not sufficed to generate significant improvements in the country's economic and social welfare conditions. A recent World Bank report indicates a continuous decrease in the number of Mexican households living on less than two US dollars a day. Nevertheless, most of the population has not been able to access many of the benefits derived from these economic changes. Indeed, the weak expansion of the labour market has had different effects, such as Mexican worker migration abroad, mainly to the US.

Changes in the political front have also been highly relevant. During the past two decades, Mexican society has gradually built a regime featuring political parties alternating in office at different government levels, respect for democratic values, plurality in the composition and autonomy of action across public powers. Constituent participation and the creation of autonomous institutions contribute to transparent election procedures and to develop surveillance and accountability schemes in terms of public resource use.

Throughout the second half of the twentieth century, the Mexican society invested enormous efforts to build and develop its educational system. In 1950, only 1% of the population in the 19-23 cohort participated in the higher education system. The system was only capable of training bachelor's degree professionals in some traditional study programmes and in a few cities. In 2000, 45% of this age group from urban, medium to high-income families, followed higher education programmes. Conversely, only 11% of those living in poor urban areas and 3% of those living in poor rural areas had access to this level of education. Indigenous student participation was minimal, reflecting upon 20% coverage for this segment. In 2005, with a total population of 9,053,384 individuals in the 19-23 cohort, the system's coverage exceeded 26%, i.e., several percentage points above that of 2000. Nevertheless, the Mexican society keeps demanding that a larger number of its youth population have higher education in a large and diversified system, offering everything from short-period programmes to doctorate levels in the most diverse fields and with the highest quality levels possible.

Given its magnitude and relevance, complexity and depth, these transitions have become sizeable challenges in terms of designing the country's development policy. Albeit needing to invest constant efforts to combat the existing poverty levels, Mexico has achieved significant success in this sense: improvements are evident in the overall economic conditions, continuous decreases are observed in poverty levels, significant progress in social development (including education and health) and its political situation is stable. In the next 20 years the Mexican society will consist mainly of young people, old enough to participate in society and labour markets with full rights and responsibilities. This is one of the main reasons why the Mexican future looks optimistic.

Mexican society as a whole is immerse in a deep educational process that implies a substantial change in its own perception, in establishing its responsibilities and in setting guidelines to steer

its government. Mexican society is learning to perform under new social interaction and participation rules, whose content and soundness will depend, to a considerable extent, upon the level of expression that democracy's values might reach in the educational front. The National Education System will have an exceptional opportunity to act as a catalyst agent in terms of creative abilities, imagination and commitment from new generations that, in a very short time, will transform the cultural, social, political and economic scenarios in Mexico.

(2) General overview of the higher education system

The higher education system in Mexico is large, complex and heterogeneous. This is made clear in the diversity of its elements, the number and size of its institutions and the characteristics, profile and distribution of its faculty.

The system consists of 1,892 institutions with different typologies, of which, 713 are public and 1,179 private. These facilities counted 2,538,256 students during the 2004-2005 academic year, of which 1,707,434 studied at public institutions (67.3%) and 830,822 (33.7%) at private institutions. Moreover, 50.9% were women and 49.1% men. The system offers study programmes type 5B2, 5A3, 5A4, 5A and 6 (according to UNESCO's International Standard Classification of Education, ISCED). The study programmes implying full attendance are generally rigid and represent most of the student's training.

During the 2004-2005 academic year, 83,404 (3.3%) students were enrolled in 5B2 level study programmes, 2,288,259 (90.2%) in 5A4 level study programmes and 166,503 (6.5%) in postgraduate studies' programmes (6). The students showed their preference for knowledge areas such as social and administrative sciences (43.2%), engineering and technology (28.7%) and education and humanities (15.2%). Health sciences came in fourth (8.7%), while enrolments in natural and agricultural sciences were the least popular (2.1% each).

The system's institutions may be grouped into the following sub-systems: public federal institutions, public state universities, public technological institutes, public technological universities, public polytechnic universities, public inter-cultural universities, public and private teacher training institutions, public research centres, private institutions and other autonomous and non-autonomous public institutions not included in the previous sub-systems.

Overall, 27.7% of the students are between 17 and 19 years old, 62% between 20 and 24 years old and 10.3% is 25 or older. Most students (94.6%) are single and 31.8% work and study at the same time. Half of the student cohort is the first generation in their families to access higher education.

Public institutions reported 154,205 teachers during the 2004-2005 academic year, whereas private schools reported 94,577 professors. The public sub-system reported 59,409 full-time teachers (38.5%), 11,537 part-time (three quarters and half-time) (7.5%) and 83,259 hourly employed professors (54%). On the other hand, the private sub-system reported 9,609 full-time teachers (10.2%), 5,580 three-quarters and half-time (5.9%) and 79,388 (83.9%) hourly employed.

Higher education is assessed by a number of instances and entities with which the Federal Government has worked striving for their co-ordination into a nationwide assessment and accreditation system. These are: the Inter-institutional Committees for Higher Education Assessment (*Comités Interinstitucionales para la Evaluación de la Educación Superior*, CIEES); the National Centre for Higher Education Assessment (*Centro Nacional de Evaluación para la Educación Superior*, CENEVAL) and the accrediting bodies acknowledged by the Council for the Accreditation of Higher Education (*Consejo para la Acreditación de la Educación Superior*, COPAES). The National Registry of Postgraduate Programmes (*Padrón Nacional de Posgrado SEP-CONACyT*, PNP) created by the Secretariat of Education -SEP- and the National Council for Science and Technology -CONACyT- provides the schemes and procedures required to assess postgraduate study programme quality. Moreover, in order for private institutions to obtain a Recognition of Official Validation of Studies (*Reconocimiento de*

Validez Oficial de Estudios, RVOE), SEP and the state education authorities apply the General Education Law (*Ley General de Educación*).

In order to fulfil their tasks, federal public institutions receive an ordinary annual subsidy from the federal government. The subsidy allocated to public state universities is integrated by the federal and state government contributions, in different proportions according to agreements between the federation and the state in which the university is located. The subsidy for federal technological institutes is allocated by the SEP based upon a set of guidelines and criteria established by the Secretariat itself. In the instance of technological, polytechnic and intercultural universities as well as state technological institutes, the subsidy consists of contributions distributed on a 50% basis from both the federation and their states. The same financial scheme applies to state public universities created after 1997. The average annual cost per student index in the public system resulted in Mx\$45,600 for the 2004-2005 academic year.

The basic regulatory framework for higher education in Mexico, whose description appears in the Annex, consists of the Mexican Constitution (*Constitución Política de los Estados Unidos Mexicanos*), the General Education Law (*Ley General de Educación*, LGE), the Higher Education Co-ordination Law (*Ley para la Coordinación de la Educación Superior*), the Regulative Law for Article 5 of the Constitution (*Ley Reglamentaria del Artículo 5º Constitucional*), the education and higher education state laws, the Internal Regulations of the Secretariat of Education (*Reglamento Interior de la Secretaría de Educación Pública*), the organic laws of autonomous and non-autonomous public universities, SEP Agreements Ns. 93, 243, 279, 286 and 328 and the Co-ordination, Operation and Financial Assistance Agreements between the federation, the states and the institutions. Labour relationships are governed by the Federal Labour Law (*Ley Federal del Trabajo*).

The Federal Public Administration Planning Law (*Ley de Planeación de la Administración Pública Federal*) dictates that the Executive branch must design and implement a National Development Plan (*Plan Nacional de Desarrollo*, PND), as well as several sectoral programmes derived from the master plan. The sectoral programme associated with education is the National Education Plan (*Plan Nacional de Educación*, PRONAE). The Secretariat of Public Education is responsible, on the terms established by the law, for its design and application in co-ordination with the remaining sectors of the federal and state administrations as well as the institutions themselves. Its strategic objectives are the following: 1) expand the system privileging equity considerations; 2) provide good quality education responding to the needs of every Mexican and effectively contribute to the country's social and economic development; and, 3) foster educational federalism as well as the system's planning, coordination, integration, institutional and system management, and social participation.

PRONAE's three strategic objectives and the ambitious goals contained in the 2025 *Vision* of the higher education system have constituted the guiding framework of the current administration's actions in terms of defining policies and strategies, in co-ordination with state governments and institutions, in order to accomplish a set of goals in 2001-2006. This has demanded the articulation of long-term planning with more immediate objectives during the past five years.

During the past four academic years, enrolments in higher education increased by 340,554 students (a 15.55% growth). Likewise, the number of teachers increased from 208,692 to 248,782. This favourable behaviour in enrolments has been evident in every type and level of higher education (e.g. 50.6% in 5B2 level degree, 18.9% in 5A4 level degree and 18.6% in postgraduate study programmes), except for teacher training programmes (*educación normal*), which decreased by 27.7% as a result of national and state policies aimed at regulating the services offered by these institutions. Preliminary data on total enrolment for the 2005-2006 academic year estimate it at 2,613,466 students; by the 2006-2007 academic year, such figure could reach 2,700,000, bringing the total cumulative growth during the current administration to 22.9% (approximately 500,000 additional students) with regard to total enrolment in the 2000-2001 academic year.

The fostering of continuous improvement and assurance of quality in the public subsystem has been done by means of participatory strategic planning exercises in the system's institutions.

Since the beginning, the planning process was conceived as a dynamic exercise which should evolve along with the learning of all actors and the results obtained by universities. This scheme has taken the basic methodological principles of strategic planning, adapting them to the organizational culture of institutions in order to establish appropriate conditions to define policies, objectives and strategies. This useful approach would allow to reach better levels of development and consolidation in the framework of a desirable future situation (*vision*), starting from the objective definition of the strengths that should be preserved and the main problems that should be attended.

The policies implemented throughout the past decade have fostered increases in the number of full-time and part-time faculty participating in the overall system, as well as improvements in their academic profiles. The total system's faculty increased from 134,357 (30.9% with postgraduate studies, of which 4.8% had doctorates) in the 1994-1995 academic year to 248,782 (42% with postgraduate studies, of which 8.3% with doctorate degrees) for the 2004-2005 academic year. Likewise, full time professors increased from 38,398 to 68,923 (44% with postgraduate studies and 10.2% with doctorates to 61.4% with postgraduate studies and 19% with doctorates, respectively).

Federal and state policies have widely promoted decentralizing and diversifying the supply and profiles of the higher education institutions that shape the system. Nevertheless, several internal tensions have been present in the higher education system, owing to its large size and complexity. Some of these tensions are generated by the difficulties inherent to the effective coordination and implementation of federal, state and institutional-level policies, and others as a response to the gap between such policies and the customs, interests and rules established by different actors in the system. In addition, society's demands for quality and relevant education, as well as the need to foster external accreditation and assessment of study programmes in the context of federal policies have contributed to increase such tensions. Other tensions may also result from an unconcluded federalization process.

Undoubtedly, higher education has been a social mobility vehicle in Mexico. The public policies implemented by the federal and state governments in recent decades have contributed to build a complex, decentralized and diverse higher education system. Policy success is evident in the continuous increase in coverage rates, in the diversification and de-concentration of educational options, in the growth in number and diversity of the communities where there is increasing supply of graduates from every higher level, in the noticeable rise in women's participation in the enrolment and graduate structure, in the improvement of professor profiles and the development of academic bodies and of their lines of generation and innovative application of knowledge, in the expansion and updating of public institution infrastructure for professors and students to perform academic tasks, in a higher level of social participation in decision making, in the development of management, planning, co-ordination and assessment schemes and in the growing participation of state governments in defining national policies and their application, among many other aspects.

In addition, the policies encouraged by the federal government in co-ordination with the state governments and the institutions have been conducive to the expansion of opportunities for young individuals who had previously no access to higher education, as well as the establishment of collaboration, academic exchange and student mobility networks and consortia across both domestic and international institutions contributing to transform the practically closed system of 1994 into a more open one.

These policies have also encouraged setting effective planning mechanisms and continuous improvement in quality at most public institutions, as well as a new institutional culture promoting adequate outcomes; increased participation from institutions in the external assessment and accreditation processes of education programs, strategic management process certification by international ISO standards and transparency and accountability; updating and flexibilisation of programs; incorporation of approaches centred on student learning and individualized or group student attention schemes; improving governance levels in public institutions; and a significant reduction in pension liabilities of public state universities, which

put at risk their short and medium term financial viability, by means of adjusting their pension and retirement systems, among other aspects.

(3) The higher education system and the labour market

The main feature of the Mexican labour market is the co-existence of formality and informality. In general, informal jobs are performed by poorer individuals with, in most cases, lower educational levels, or by those with higher learning achievements but who, for lack of employment, are compelled to resort to this sector. Generally, the national unemployment rate is low, at 3.5% of the Economically Active Population (EAP) for the first quarter of 2006.

Between 1990 and 2000, the rise in the number of occupied individuals with bachelor's degrees or postgraduate studies exceeded the average employment rate figure, thus increasing their share in the distribution of employment according to schooling levels. The rise in the number of occupied women exceeded that of men. Mexico's net professional supply for this period amounted to 1.9 million individuals, while the net aggregate demand was 1.8 million. This means that the Mexican professional market was able to absorb most of the graduates from the higher education system. Regarding occupational quality, 55% of graduates succeeded in finding highly specialised jobs whereas over 50% of the employed population had followed higher education studies. The remaining 45% were employed in less specialised occupations, where between 10 and 49.9% of the employees had followed professional-level studies or in occupations that did not require professional-level studies, which may be performed by individuals with lower educational levels, leading to underemployment situations. Of the total number of professionals employed in 2005, the 20 to 34 year olds represented 42.2%, while the 45 and over cohort reached 27.3%.

The national professional net average monthly income (excluding benefits) in July 2004-July 2005 amounted to Mx\$8,998. Currently, over two-thirds of the professional population are salaried employees.

The insufficient adjustment in the relationship between higher education and the labour market in the 1990-2000 period was evident in: the unemployment and underemployment levels among university graduates; increasing transition times from education to employment; reductions in wage differentials across professionals and individuals with lower educational levels; concentration of 45% of professionals in only five study programmes (Accounting and Finances, Administration, Law, Preschool and Elementary School Teacher Training and Mechanical, Industrial, Textile and Lumber Technology Engineering); and the insufficient correspondence between the study programmes offered by higher education institutions and productive sector requirements.

Considering this situation, the current administration, through PRONAE, confirmed that the system's expansion should be a means to contribute to economic and social development and, specifically, to respond to labour markets' needs. With this purpose, the Federal Government has taken the following measures: 1) promoting coverage expansion policies considering labour market conditions, in co-ordination with the state governments; 2) giving priority endorsement to study programmes for which there is proven demand of professionals; 3) contributing in labour market research aimed at decision making at every planning level; and 4) fostering that public institutions review and update, in the context of their planning exercises, their educational options in order to ensure their relevance.

Throughout the past few years, national and state policies have discouraged growth in enrolments or the opening of study programmes in existing public institutions, for which there is excess of professionals in the market. This has generated regional tensions in the higher education system, mainly caused by the demands from youths wishing to pursue these programmes. Such demand is covered, in a good number of instances, by private institutions, causing them to increase and focus their education options in these programmes.

The miss adjustment observed in the relationship between higher education and the employment system is also a consequence of factors influencing career choices among young people, such as

the inclination they believe they possess for a certain professional activity, employment opportunities, family influence and the information provided by the institutions. Many young persons still choose to study in programmes for which there is excess graduate supply. In order to improve co-ordination levels between the higher education system and the labour market, the Federal Government has implemented a public information service through the Internet. Such service provides information on the behaviour, dynamics, trends and features of occupation and employment through the Mexican Labour Observatory (*Observatorio Laboral Mexicano*, OLM) website, which is updated regularly. The OLM is a source of relevant information for students and their families, as it is for the institutions in their policy-making activities, in assessing the relevance of their education options as well as to design and update their curricula.

In this context, the OLM is a strategic means for national educational policies to contribute to improve the relevance of the relationship between the education options offered by higher education institutions and the labour market, in the context of the National Council of Education Authorities (*Consejo Nacional de Autoridades Educativas*, CONAEDU) and the State Commissions for Higher Education Planning (*Comisiones Estatales para la Planeación de la Educación Superior*, COEPES).

In addition, higher education institutions have increasingly carried out surveys researching graduate students' data as input in their design, review and updating plans and programmes and their relationship with the labour markets. The information derived from these surveys is also used as input for defining federal and state policies.

The relationship between higher education institutions and the productive sector adopts different shapes, among which student internships in the last stages of training, firm incubator development, support activities to strengthen strategic sectors, outreach activities with alumni associations and regular updating of study programmes in order to adapt them to the demand in the regions where institutions are located.

Nevertheless, entrepreneurs continuously indicate the need to improve the relationship between study programmes and productive sector requirements. They ask for professional training to correspond to firm requirements, requesting increased participation levels in the design of upper technical education curricula.

With this purpose, federal and state policies have fostered the incorporation of entrepreneurs into the governing bodies, commissions or boards of technological universities, technological institutes and polytechnic universities for the past decade. In addition, public autonomous universities have been encouraged to establish structures and programmes aimed at promoting their relationship with the productive sector.

Overall, the higher education system currently enjoys areas of opportunity to balance the relationship between graduate supply and the labour market by updating existing study programmes and defining new ones arising from identifying and comparing professional and work-related abilities required in international markets.

(4) The regional role of higher education

Throughout the past decades, educational policies—in the context of the Higher Education Co-ordination Law (*Ley para la Coordinación de la Educación Superior*)— have consistently centred on regional and local development. Evidence of this are the purposes of a number of PRONAE's policies: a) to encourage decentralization in order to expand and consolidate high-quality higher education systems in each state; b) expand its coverage with geographical balance; c) foster academic capacity and competitiveness strengthening efforts across public higher education institutions; and d) motivate the creation of study programmes linking them to their regional environment. PRONAE deems that achieving these goals must be supported by state-level development plans for higher education and science and technology. State education authorities participate vigorously in defining, operating, and enriching national policies through their participation in different programmes and the CONAEDU.

The planning activities carried out by the COEPES have considered economic, social and cultural aspects as well as the guidelines established by SEP in agreement with state governments. In compliance with PRONAE policies, the surveys carried out to expand and diversify higher education supply in each state have taken the macro- and micro-regional environment and the labour market into consideration, incorporating education supply and demand analysis and upper secondary student expectations.

Since 2001, in co-ordination with state governments, SEP has endorsed the creation and operation of 84 public higher education institutions in the context of the Programme of Expansion of Educational Supply (*Programa de Ampliación de la Oferta Educativa*). This figure encompasses 24 technological universities, 27 state technological institutes, 11 public universities, 18 polytechnic universities and 4 intercultural universities. The latter, created in 2003, are located in regions with high indigenous population densities, but accessible to all kinds of students. In addition, SEP endorsed the opening of a fourth *Universidad Autónoma Metropolitana* (UAM) Academic Unit in western Mexico City. In terms of new institution creation, the Federal Government has privileged the states or regions with coverage rates below the national average.

In the past five years, with the purpose of widening and diversifying the educational supply and access, SEP has also endorsed the following: a) opening 387 study programmes in 107 public state universities and technological institutions; b) capacity expansion in 48 state public universities to increase enrolment levels in 1,673 existing study programmes; c) creating other decentralized entities of the state governments, such as the Oaxaca Regional University Network that, owing to its organisation and education model, respond more appropriately to their region's specific development needs; and d) opening 128 study programmes in 41 technological institutes.

In order to implement federal policies, in 2001-2005 SEP allocated resources to state governments aimed at strengthening the COEPES and operating the Educational Options Expansion Programme. On the other hand, public higher education institutions received extraordinary funds aimed at developing their comprehensive strengthening programmes, improving their faculties through the Faculty Enhancement Programme (*Programa de Mejoramiento del Profesorado*, PROMEP) as well as at carrying out projects addressing regional needs.

Currently, public higher education institutions have different schemes for contributing to development in their region. These schemes may exert an influence over different problem areas and, at the same time, receive extraordinary resources to supplement their subsidies.

Public universities have had a history of commitment and relationship with regional development and addressing problems in their environment. They offer a wide array of continuous education programmes and provide many services, such as assisting different actors through legal offices, dentistry and veterinary clinics, social service projects, agricultural sector and entrepreneurial development support centres and various advice and training programmes, among others.

These institutions made significant efforts during the past decade to expand, reinforce and improve the quality of their cultural extension programmes and the services they offer to their community, allowing them to relate more closely to different social sectors in terms of addressing problems in the most marginalized communities, in preserving local, state, regional and national culture and promoting scientific, artistic and aesthetic activities in benefit of their community and their environment.

Links to the productive sector are developed in these institutions with different depth and expansion levels. In most of these universities the relationship materialises through student professional internships in firms and advice and consulting services. Those with larger academic capacity also develop research projects and joint programmes, among others. In order to foster a closer and more effective relationship, most universities have established one or more of the following structures: consultative connection councils, institutional connection units,

technology-based firm incubators, entrepreneur and consulting programmes and national or regional strategic research centres. UNAM and IPN have a wide variety of programmes that contribute to the development of PyMES.

Private institutions generally contribute to regional development through training, updating and preparing professionals based on their programmes and by the social service projects their students develop. The institutions with the largest academic capacity offer one or more of the following programmes: university extension, specialized health services, firm development and advice and consulting for community development, among others.

Despite the above, state governments and local entrepreneurs and organisations have expressed their disagreement in terms of the unsatisfactory training of graduate students, the quality and relevance of the programmes offered and the insufficient connection with local needs. The latter is a problem associated also to the inadequate knowledge of higher education institution capacities to help solve the problems in their community.

Indeed, there are tensions in the system derived from regional and other higher education roles. The presence of higher education institutions with different typologies in the states contributes to mitigate such tensions, responding to very diverse needs. Nevertheless, tensions intensify when federal and state programmes and policies generate centrifugal forces weakening the contributions of academic communities to regional and local development (thus diminishing the possibilities of academic communities to contribute to development).

(5) The role of research and innovation in higher education

Public higher education institutions carry out most of the scientific, technological and humanistic research in Mexico. Unfortunately, the institutional capacity to generate and innovatively apply knowledge is distributed heterogeneously across the country.

Therefore, PRONAE acknowledges that in order to increase the capacity of public institutions for generation and innovative application of knowledge, it is essential to expand and strengthen the academic bodies at each of the Higher Education Units (*Dependencias de Educación Superior*), according to their profile and development plans. This is as important as it is to integrate and co-ordinate their intellectual capital in benefit of their study programmes as well as to continue the modernization process of their infrastructure. Moreover, PRONAE expresses the relevance of articulating these activities and training high-level personnel in the context of social development and science and technology requirements in Mexico.

In order to address these aspects, SEP and CONACyT established collaboration schemes since 2001, aimed at strengthening academic bodies, supporting basic science and reinforcing domestic postgraduate studies.

PROMEP contributes to the progressive improvement of *academic bodies*’ —encompassing the full-time faculty groups brought together by a common interest in cultivating one or several lines of generation and innovative application of knowledge— capacities to achieve higher development levels. With these programmes, the number of *consolidated academic bodies* —featuring professors with doctorate degrees, joint activities, and intense collegiate life and participation in domestic and international collaboration networks— has increased significantly in every public institution in recent years. Such increase has come about in parallel with the rise in the number of professor-researchers and researchers registered at the National System of Researchers (*Sistema Nacional de Investigadores*, SNI).

Furthermore, CONACyT’s scholarship programme —aimed at completing quality postgraduate studies— is an effort additional to PROMEP’s in terms of generating the qualified human capital needed for Mexico’s development. The total number of scholarships granted by this entity has increased from 11,934 in 2001 to 19,243 in 2005.

The Programme to Support the Basic Sciences (*Programa de Apoyo a la Ciencia Básica*) is rooted on the principle that activities of generation and innovative application of knowledge in higher education institutions must be a means to enhancing the quality of education. In this

sense, efforts have been made to increase basic science development capacities across the institutions charged with such responsibility. With that purpose, several projects generating frontier knowledge have been endorsed. These projects contribute to training new scientists and consolidating the academic bodies involved.

In order to assess the quality of postgraduate study programmes offered by institutions, SEP and CONACyT established the National Programme for the Strengthening of Postgraduate Education (*Programa para el Fortalecimiento del Posgrado Nacional*, PFPN) in 2001. Its main goals are the following: 1) recognising quality study programmes in *especialidad*, master's and doctorate degrees—regardless of their orientation or graduate profile, and from every field of knowledge—by incorporating them into the SEP-CONACyT National Registry of Postgraduate Programmes (*Padrón Nacional de Posgrado*, PNP); and 2) fostering continuous improvements of postgraduate study programmes whose quality levels are below those needed to qualify for PNP registration for them to acquire it by 2006 at the latest. In 2002-2006, 722 postgraduate study programmes received PFPN benefits.

Resulting from PFPN operation, the number of postgraduate study programmes acknowledged for their quality through their incorporation into the PNP increased significantly, from 150 in 2000 to 661 in 2006. Worth mentioning in this sense is the support granted by CONACyT through its scholarship scheme to the students who pursue their postgraduate studies in a regular and adequate fashion.

The PFPN has fostered strategic planning exercises aimed at developing postgraduate studies' offerings across institutions. Likewise, it has contributed to the geographical deconcentration of quality study programmes and encouraged increases in enrolments in such programmes. Moreover, the scheme has expanded the domestic capacity for researcher training, contributing to endow Mexico with the human capital needed for its development.

The Fiscal Incentives Programme for Research and Technological Development was designed with the purpose of encouraging research and technologic development projects (R&D) aimed at developing products, materials and production processes representing scientific or technologic progress. It is also intended to promote the relationship between the productive sector and higher education institutions.

In its fifth consecutive year of operation, the programme has demonstrated its usefulness, having achieved its objectives, as it may be inferred from the increase in the number of applications received. It is interesting to note that the applications for support have come both from large corporate groups and from PyMES. The amount of resources transferred to the programme has increased from Mx\$415 million in 2001 to Mx\$496 million in 2002 and to Mx\$500 million in 2003 (Table 5.19). In 2004, one billion pesos were invested in 1,308 projects. This figure almost trebled in 2005, three billion pesos for 2,083 projects. In almost every instance, research activities are carried out in public higher education institutions.

The rate of return of the fiscal incentives programme has had a significant positive effect, since the firms benefited with technological developments have improved their processes and revenues, thus contributing more resources to the tax authorities and to the programme's sustainability.

Scientific and technological development is also encouraged by means of CONACyT's Mixed Funds Programme. These funds have the following goals: 1) identifying strategic needs at the states leading to the establishment and consolidation of their scientific and technologic capacity from the perspective of their natural developmental mission; 2) attracting the active participation of the private sector in the mixed fund financing scheme in order to strengthen productivity; 3) increasing the connection between firms and academia, based on service provision and technological assimilation, adoption and transfer; and 4) disseminating science and technology.

There are currently 32 mixed funds, 30 at the state level and two at the municipal level (Ciudad Juárez and Puebla). To date, Mx\$ 480.1 million have been directed for their operation.

Presently, the governments of the Federal District and Oaxaca are working with CONACyT towards establishing these funds.

Federal investment in science and technology amounted to 0.41% of GDP in 2001-2005. GDP's intrinsic growth increments during this period, led to an increase in real terms, of approximately 13%. Albeit such growth, the insufficient financing aimed at science and technology in Mexico is a challenge to overcome. In fact, investments in terms of GDP should increase in order to generate optimal development levels. Such goal will therefore require more involvement—compared to the currently limited participation—from the public and the private sectors. To date, this needed increase in public investment has not materialized, since, among other reasons, no consensus has been reached in Congress in terms of a set of structural reforms—such as the fiscal reform—that are essential to this purpose.

In the past five years, federal policies and the co-ordinated efforts applied by SEP and CONACyT in terms of strengthening Mexico's research, technological development and innovation capacity have fostered significant progress in the goals of consolidating academic bodies in public universities and technological institutes, as well as in their participation in domestic and international networks. Likewise, these efforts have contributed to the progress in terms of the geographic deconcentration of high quality postgraduate study programmes, especially doctorate degrees and reinforcing the institutional capacity for generation and innovative application of knowledge, in order to make adequate contributions with increasing quality levels to national development, among other aspects.

(6) Equity

Throughout the past five years, the higher education system grew over 80-fold, while the population quadrupled. This reflects a considerable effort from society and governments alike for a larger number of young Mexicans to access higher education.

However, the noticeable expansion of the higher education system as well as the quick-paced growth in enrolments have not translated yet into adequate benefits for lower income population segments. Therefore, the benefits from public investment are not yet equitable for the 19 to 23 year old cohort, a segment that is usually linked to higher education. In fact, the participation of members from lower income households in higher education is significantly below the share such families represent in Mexico's population, evidencing the regressive features of public investment despite the policies and strategies put in place during the past two decades with the purpose of reverting such situation.

The pursuit of equity in accomplishing an educational project to satisfy Mexico's needs and aspirations, compels governments to promote the expansion and diversification of educational opportunities, especially high quality ones, and for students to conclude their studies in a timely fashion. Of the 84 public institutions created in the past five years, 40 are located in poor areas, allowing youths from these regions to expand their opportunities to access higher education programmes.

Education with equity is an effective means to reduce social imbalances, which demands designing policies and operating schemes to compensate for the adverse socio-economic conditions capable young students must face. Through SEP, the Federal Government launched the National Programme of Scholarships for Higher Education (*Programa Nacional de Becas para la Educación*, PRONABES) in 2001, in co-ordination with state governments and public higher education institutions. This programme intends to expand access opportunities to public higher education for a larger number of youths facing adverse economic conditions.

The state governments, supported by the COEPES, have given special priority to scholarships for students in study programmes relevant for the region's economic and social development. This has led the percentage share of students with scholarships in different fields of knowledge to be different from the corresponding share in total enrolment in higher education.

PRONABES' scholarships consist of a monthly support, determined according to the level (in terms of study programme years) in which the student is enrolled. Such assistance equals Mx\$750 for the first year, Mx\$830 for the second, Mx\$920 for the third and Mx\$1,000 per month for the fourth and fifth years, if applicable. In contrast with other programmes, PRONABES' scholarships are paid throughout the twelve months of the year, in order to encourage student permanence in his study programme. The scholarship is used by the students for their support, tuition and enrolment fees, transportation, materials and, in some cases, to contribute to their family expenses.

PRONABES has granted scholarships to students from the first to the fifth year of their study programmes, privileging new entrants. The number of scholarships granted has grown each year in every public subsystem. From a start, more women than men have received PRONABES' scholarships. This figure has increased every year, partly due to a better academic performance from women.

In addition, 65% of students currently enjoying a PRONABES scholarship belong to families with incomes up to two monthly minimum wages, and 35% over two and up to four. The Programme has facilitated access to public higher education to indigenous students and those living in marginalised rural and urban areas. During the 2005-2006 academic year, 45% of fellowship holders lived in rural and marginalised urban areas and 5% in indigenous areas. In states such as Chiapas, Guerrero and Oaxaca, indigenous students holding scholarships represented 5%, 7%, and 18% of the population, respectively, increasing each year.

Regular PRONABES' assessments indicate that the programme has contributed to reduce student dropout rates—especially during the first year—, to improve student performance and increase their permanence and timely completion of studies. Renewed scholarship levels reach, on average, 70%.

Complementing PRONABES, the Federal Government has implemented other scholarship programmes for higher education. Worth mentioning among them are the transportation and academic excellence scholarships granted by SEP to 5B2 or 5A4 level degree students from public institutions, in addition to the scholarships granted to students from 7th or 8th semester enrolled in public teacher training programmes (*escuelas normales*) to carry out intensive practices and comply with their social service requirement, and the CONACyT scholarships, for postgraduate studies in quality programmes in Mexico or abroad.

Generally, public institutions grant different types of support to low income students for them to have access to and remain in their study programmes. Some of them offer economic assistance in the form of a variable scholarship, according to the students' socio-economic situation; others still, dispense the students from paying tuition and enrolment fees as long as they maintain a level of academic performance according to institutional rules.

Additionally, the General Education Law (*Ley General de Educación*) indicates that private institutions with RVOE'd study programmes or incorporated before a public institution must grant scholarships to students that comply with the required academic skills and merits but lack the financial means to study there. The number of scholarships granted must be equivalent to, at least, 5% of their total enrolment.

Certain states operate educational credit schemes for students in higher education study programmes. Since this is an equity-promoting type of financing, the Federal Government and the World Bank have designed the Higher Education Student Aid Programme (*Programa de Asistencia a Estudiantes de Educación Superior*, PAEES). The programme consists of five elements: 1) supporting PRONABES as its main goal; 2) designing and implementing a student loan system in states wishing to establish one; 3) assisting, in association with the *Oportunidades* scheme, upper secondary disadvantaged students (poor and indigenous) capable of concluding higher education study programmes; 4) carrying out surveys to strengthen the national equity policy and institutional development schemes; and 5) promoting private investment in education loan programmes. The PAEES will operate in 2005-2013 through a World Bank loan for US 171 million dollars.

The magnitude of student contributions in terms of tuition and enrolment fees varies according to the public or private nature of the system. This difference may be more significant across the institutions in each sub-system. In the context of private institutions, fees may vary according to institutional prestige, costing somewhere between a monthly Mx\$500 and Mx\$10,000.

Some public institutions charge merely symbolic fees, and others charge between Mx\$500 and Mx\$2,000 a month, which accounts for 2% to 10% of their annual revenue budget. Other institutions may charge between Mx\$2,500 and Mx\$7,000 a month, accounting for over 10% to 20% of their revenue. As it is evident from the above paragraph, student contributions are not significant sources of financing at most institutions, but they generally contribute to improve the working conditions for professors and students, to supplement annual operative expenses and, on occasion, to expand their institutional scholarship programmes.

Even in this situation, the subject of student contribution to higher education financing is present in current debates. Certain opinion streams consider that all public institutions in Mexico should apply an indiscriminate gratuity regime. However, such policy would only generate larger imbalances in public investment distribution across higher education institutions.

Equity in education means access to high quality institutions and study programmes. Therefore, PRONAE considers that the adoption and reinforcement of measures aimed at improving programme and service quality is an essential element. With this purpose, the programme establishes a series of policies and lines of action. Chapter 9 describes the results achieved to date in the process of comprehensively strengthening public institutions and, in particular, of improving the programmes and services offered. Currently, in a sizeable number of institutions, most students are pursuing 5B2 or 5A4 level programmes acknowledged for their quality by external assessment and accrediting entities, which has led, during the past five years, to achieve significant progress in terms of equity.

Federal and state equity policies applied in the past decade have achieved the following: encouraging continuous quality improvement and assurance of educational processes and programmes as part of a strategic dimension of equity and generating systematic increases in female shares in higher education enrolments as well as in the graduate structure, even in fields traditionally considered as primarily male. Currently, a similar number of women and men graduate and obtain their professional certificate each year. Female participation in enrolments and in graduate population is similar to their share in the age group typically related to higher education. This is clear evidence that women are taking advantage of the opportunities presented by the system in a proportion similar to men.

(7) Financing

PRONAE establishes that, in order to continue expanding the education sector with equity the Federal Government will foster increases in the allocation of public and private resources to education.

The budgetary items aimed at financing public higher education are included in the Federation's Budget Expenditure (*Presupuesto de Egresos de la Federación*, PEF) and its counterparts in each state.

National expenditure in education, as a share of GDP, increased by 49.6% in the 1995-2005 period. In 2005 this share reached 7.3%. These figures are proof of the systematic progress towards the goal of allocating 8% of GDP to the National Education System. Also in 2005, the contribution of public expenditure to national expenses was 5.6% of GDP, and 1.7% from the private sector. Most of the public expenditure funds come from the federation, since states only contribute 1% of the total figure, an investment level below the private contribution. On the other hand, national expenditure on higher education reached 0.81% of GDP in 2005.

During that decade, federal expenditure in education increased by 63.1% in real terms and expenditure aimed at higher education by 57.2%. The latter figure relates well to the 56% increase in enrolments in the public sub-system in academic years 1994-1995 to 2004-2005.

The federal subsidy transferred to federal public institutions and decentralised state public entities, consists of three elements: the ordinary and extraordinary subsidies and the grant associated to the expansion and diversification of educational options offered. The state subsidy consists of the ordinary subsidy and the grant associated with expanding and diversifying study programme options.

The ordinary subsidy covers current expenses oriented at sustaining regular operations at public institutions. Federal shares in the ordinary subsidy for state public universities fluctuate between 47% and 88.6%. On average, the federal share for 2005 amounted to 66.5% and the average state share was 33.5%.

The ordinary subsidy received by technological universities, state technological institutes, polytechnic universities and inter-cultural universities is generated by equal contributions from the federal and state governments. This formula is the result of the Federal Government's policy aimed at encouraging investment increases from state governments in higher education. The state contribution to financing these state government decentralised public entities reinforces their commitment to regional development.

Furthermore, the extraordinary subsidy is basically intended to improve and guarantee higher education quality by means of: PROMEP; the Fund for the Modernization of Higher Education (*Fondo para la Modernización de la Educación Superior*, FOMES); the Investment Fund for State Public Universities with Evaluated and Accredited Programmes (*Fondo de Inversión para las Universidades Públicas Estatales con Evaluación de la ANUIES*, FIUPEA); the Extraordinary Support Fund for Public State Universities (*Fondo de Apoyo Extraordinario a las Universidades Públicas Estatales*, FAEUP); the University Development Support Programme (*Programa de Apoyo al Desarrollo Universitario*, PROADU); the Fund of Multiple Contributions (*Fondo de Aportaciones Múltiples*, FAM); the PFPN and the Technological Institute Quality Fund (*Fondo de Calidad de los Institutos Tecnológicos*, FOCIT).

On average, the extraordinary federal subsidy for quality improvements in state public universities, accounts for 11% of their total ordinary state and federal subsidies. Nevertheless, its share in the total subsidy figure exclusively directed at operative expenses (excluding payroll expenses) may reach up to 40%. Thus the relevance institutions assign to extraordinary financing funds and the participatory processes in terms of allocation.

In the context of the policies and guidelines established by the Federal Government in agreement with state administrations, the annual expansion and diversification needs in each state's education options are usually planned by state governments with the contribution of their corresponding COEPES. A number of resources are channelled towards expenses in equipment, operation and new academic posts. Such contributions are equally distributed between the federal and the corresponding state governments. As for federal public institutions, the resources to expand the educational options they offer and to open new positions are incorporated into their ordinary budget.

The indicator of average annual cost per student in 2005 at federal public universities amounted to Mx\$80,420, while reaching Mx\$41,280 at state public universities. For that same year, the average annual cost per student indicator at technological universities and institutes was Mx\$31,320 and Mx\$23,850 for technological institutes. Tensions tend to emerge across the higher education system owing to the evident differences between the cost per student indicator in federal and state public universities, as well as across sub-systems.

There is a growing consensus among institutions and SEP that the current allocation model for the ordinary subsidy could be improved. After a long process of building consensus and designing formulas across institutions, in 2006, SEP launched the new allocation model in addition to the federal ordinary subsidy. The resources employed for this purpose were allocated in this year's PEF. This new model will take into account public institution performance, paving the way to closing the current gaps related with the annual cost per student indicator. Moreover, the new scheme will soon become a permanent force in terms of a continuous improvement in, and quality assurance of, the study programmes and services offered by public institutions. This

undoubtedly contributes to attain equity in education. Its future application will require a scheme based on a new regulatory framework making external assessments and study programme accreditation—in addition to communicating the outcomes—a compulsory activity.

Faced with a context featuring the insufficiency of public revenues, higher education financing in the next decade will develop in a scenario of increased competition for resources. Ensuring adequate financing levels for higher education will inevitably require a fiscal reform allowing increases in, as well as schemes guaranteeing increased efficiency and effectiveness in the use of such funds, primarily geared towards principles such as equity and social benefit.

(8) System planning, governance and regulation

The Planning Law (*Ley de Planeación*) sets the bases for the executive branch to co-ordinate its planning activities with the states and foster and assure the democratic participation of different social groups in the preparation of the National Development Plan (*Plan Nacional de Desarrollo*, PND) as well as the sectoral programmes. Additionally, it establishes the framework for actions from private individuals to contribute to the accomplishment of the goals and priorities in the national plan and its programmes.

Furthermore, the Higher Education Co-ordination Law (*Ley para la Coordinación de la Educación Superior*) establishes the bases to develop and co-ordinate educational activities to address national, regional, and state needs as well as their financing by the federal, state and municipal governments. This law considers that allocation of federal resources to public higher education institutions must be subject to institutional planning, academic improvement programmes, managerial enhancement measures and a series of priorities defined in each institution's planning process.

The size and complexity of the higher education system and its constant expansion have made a co-ordinated planning exercise across its components difficult. Since their establishment in 1979 and until 1996, the COEPES worked differently in each state. Their general outcomes were rather limited. Faced with this difficulty, SEP encouraged the reactivation of these commissions in every state.

In spite of the complexities for co-ordination, the planning efforts carried out in the context of decentralizing federalism achieved, among other things, granting increased attention to a growing share of total enrolment in higher education in each Mexican region. While in 1970, 47.3% of the students enrolled in higher education were registered in institutions located away from Mexico City, in 1980 this percentage had increased to 70.2% (76.6% in 1990 and 79.5% in 2000).

The policies promoted by the Federal Government throughout the past decade, aimed at encouraging educational federalization, have led the states to play a more active role in designing the nation's educational policy, by fostering their own initiatives and giving each educational task the particular features of Mexico's different regions.

In this context, the Federal Government has worked with state governments during the past six years in a process aimed at strengthening the COEPES' competences and agendas by taking the following measures: incorporating a representative of the entity in charge of encouraging the state's economic development into its structure and designing a state-level plan for higher education and science and technological development. This has allowed endorsing initiatives to expand and diversify the educational options offered by the states and strengthening the institutions' academic competences in terms of generation and innovative application of knowledge, as well as in the context of their relationship with the problems in their surroundings. In addition, it has attracted their active participation in PRONABES' operation, contributing to the definition of areas and study programmes of interest and renowned quality required by the state's social and economic development. This had made it possible to establish priorities in terms of resource allocation. In addition, the COEPES play an advisory role with the state governments in terms of granting RVOEs to the study programmes taught in private institutions.

The National Council of Educational Authorities (*Consejo Nacional de Autoridades Educativas*, CONAEDU) was created in 2004, with the participation of the 31 state education ministers and the federal Secretary of Education, who chairs it. CONAEDU has become an effective space for policy design and consensus building contributing to develop and reinforce the National Education System, especially in terms of higher education. In addition, CONAEDU has strengthened the system's planning and assessment schemes.

In 2001-2005, SEP granted economic support to reinforce state planning schemes in several states, and create state higher education systems where needed. Currently, state governments design their higher education development plans assisted by their respective COEPES. Financial assistance requests aimed at increasing enrolments, open new study programmes and build new campuses in the existing public institutions must be submitted to the Federal Government by the state government with technical endorsement from its COEPES. The state government assumes the commitment to contribute with 50% of the operative expenses generated by the increased supply of services.

The wide array of typologies across the institutions and their legal frameworks produces a large variety of organizational and government structures within higher education institutions. Most federal and state public universities are divided into schools, faculties, institutes and centres, while others operate based on department or matrix structures. Redistributing responsibilities and assignments in benefit of local governments has resulted in more relevance for education in the development context of Mexico's regions, both for individuals and for society as a whole. On the other hand, SEP has concentrated on the essential tasks the law assigns it which, among others, focus on the responsibility of guaranteeing the national character of education, encouraging a continuous improvement and quality assurance of study programmes and proposing improved admission, permanence and graduation conditions among students.

(9) Assuring and improving the quality of higher education

The Inter-institutional Committees for Higher Education Assessment (*Comités Interinstitucionales para la Evaluación de la Educación Superior*, CIEES), the CENEVAL, the COPAES-acknowledged accrediting bodies, the PNP, the SNI, the FIMPES' Institutional Accreditation System (*Sistema de Acreditación Institucional*) and the state government and institutional self-assessment instances, are the entities in charge of evaluating and accrediting higher education in Mexico. Together, these instances and agencies have built a sizable system consisting of reference frameworks, criteria, indicators, standards, measuring tools and promotion strategies whose essential goal is to contribute to continuous improvement and assurance of quality in higher education institutions. The schemes and mechanisms in this set have been recognised by UNESCO, making Mexico one of the countries contributing to build an international database managed by this entity in charge of registering the study programmes acknowledged for their high quality.

The current federal administration firmly believes that assessment processes are an essential means to encourage quality assurance and improvement as well as to foster equity by allowing the detection of differences in study programme quality and learning levels achieved by the students. The Federal Government has thus promoted external evaluations of study programmes, and of students at the beginning, at midterm and conclusion of their studies, with the purpose of accomplishing a diagnosis of the system, the institutions and the study programmes. Furthermore, it has allocated extraordinary resources to public institutions for them to improve the quality of their study programmes in the context of their PIFIs, thereby achieving accreditation levels or ensuring quality. In a similar vein, the current administration has encouraged the CIEES, CENEVAL, PNP and COPAES consolidation, as well as the FIMPES' accreditation system. In addition, it has improved the conditions and procedures for study programmes taught by private institutions to obtain their RVOE. Finally, these measures have assisted in reinforcing the co-ordination with state governments, among other issues.

Since 1991, the CIEES have displayed intense activity levels regarding study programme assessment and institutional roles. This has been done by means of methodologies and evaluation frameworks that encompass a broad variety of categories and elements, taking international standards and criteria into account in their definition. It is worth mentioning that until 2003, committee activity concentrated in diagnostic evaluations of study programmes, and management and extension in public universities. Since 2004, however, these committees also carry out assessment activities in technological universities and federal technological institutes and in selected private institutions since 2005. From 1991 until mid 2006, the CIEES have assessed 2,910 study programmes, issuing 4,115 assessment opinions and 62,325 recommendations to improve or assure study programme quality and institutional roles.

Since 2001, at SEP's request, the CIEES prepared a programme register in which each assessed programme was classified in one of three levels: 473 in level 1 (ready to be accredited), 578 in level 2 (with potential to achieve accreditation in the medium term) and 237 in level 3 (with possibilities of accreditation in the long term). The structure of this register has changed in 2001-2006 as a result of the quality improvement processes SEP has encouraged since 2001 across public institutions by means of the formulation, updating and development of their PIFI. The number of study programmes classified into levels 1 and 2 has increased systematically during the aforementioned period, to reach 1,465 and 977, respectively by late July 2006.

In late 2000, the creation of COPAES paved the way for the creation of a system accrediting the study programmes offered by institutions. COPAES is an instance empowered and recognised by SEP to grant formal acknowledgement for a five-year period —renewable for similar terms— to organizations whose objectives are to accredit 5B2 and 5A4 level study programmes offered by both public and private institutions, after evaluating the structural, technical, operational, procedure management, impartiality and assessment framework capabilities of the accrediting organizations. Acknowledging a specialized entity guarantees its accreditation framework for study programmes is consistent with the general assessment framework established by COPAES which, in turn, is closely linked to the CIEES' assessment schemes. This allows building an assessment and accreditation system for higher education.

Since 2002, COPAES has acknowledged 23 entities which had accredited 881 study programmes by mid July 2006. Of these programmes, 620 were taught at public and 261 at private institutions. These entities regularly inform the Board with regard to the assessment activities developed and their outcomes. The Board, in turn, regularly supervises entity performance and issues recommendations, if applicable.

Student external assessments are carried out by CENEVAL, a non-governmental entity whose objective is to contribute to improve the quality of secondary and higher education by evaluating the learning achievements —by applying standard tests— at any stage of the educational process. To date, CENEVAL has designed and applied nationwide exams, among other purposes, for admission to upper secondary education (EXANI I) to higher education (EXANI II) and to postgraduate studies (EXANI III). In addition, it has designed and applied the EXIL test to assess the learning achievements of students having already covered part of a bachelor's degree course load. The EGETSU, on the other hand, assesses the level of academic knowledge and skills of graduates from 5B2 level study programmes (EGETSU) or from 5A4 degree study programmes through the General Bachelor's Degree Graduation Exam (*Examen General de Egreso de la Licenciatura*, EGEL).

In 2005, CENEVAL's EXANI II was taken by 443,580 candidates, 77% of the total number of students entering higher education that year. EXANI II is taken at 486 institutions located in every Mexican state.

Additionally, 62,212 candidates from 24 bachelor's degree study programmes took the EGEL test in 2005, amounting to 20.5% of the total number of graduates for that year. In this case, 468 institutions applied the EGEL in that year. As for technological universities, the EGETSU is currently taken by graduates from 57 institutions, which compares to only six in 2000. The number of candidates amounted to 21,274 from 30 study programmes, which implied that practically all graduates from that sub-system took the test that year.

In order to assess and acknowledge the quality of postgraduate study programmes offered by public and private institutions, CONACyT established the Excellence Postgraduate Programme Registry (*Padrón de Programas de Posgrado de Excelencia*) in 1990. This Registry incorporated, essentially, science and technology study programmes and, within these, only the postgraduate programmes at the master's degree or doctorate level aimed at training scientists and technologists. Specialty programmes and those aimed at professional practice had no place in it, however.

In order to expand the registry's coverage and incorporate more rigorous assessment criteria, SEP and CONACyT established the PNP in 2001, with the purpose of acknowledging the quality of different *especialidad*, master's degree and doctorate programmes, with different graduate profiles and knowledge areas. The register's structure has implied identifying the attributes that distinguish quality study programmes at the international level. In addition, it currently plays the role of accountability tool for higher education institutions, in terms of the public recognition for the quality of the study programmes that are part of it. Presently, the PNP has 661 study programmes registered and acknowledged for their quality. Of these, 182 are doctorate study programmes.

The SNI, created in 1984 with the purpose of encouraging the permanence of the highest-level professor-researchers in public institutions, currently constitutes the most popular means to assess the quality of academic production by career faculty, using peer commissions. The system, currently managed by CONACyT, has also contributed to the process of differentiating faculty earnings.

Since 2001, in the context of the General Education Law (*Ley General de Educación*), SEP has rigorously applied the guidelines of Agreement N.279 in terms of RVOE-granting to private institutions, in addition to strengthening the supervision schemes for the private-institution study programmes acknowledged by the Federal Government. To this date, SEP has granted the RVOE to 7,759 study programmes taught at 498 private higher education institutions in 31 Mexican states. In addition, in 2003-2006 it supervised the operation of 8,209 RVOE'd study programmes and 68,385 faculty files. As a result of such reviews, 309 institutions received sanctions and in 69 cases their RVOE was cancelled.

SEP has worked, in co-ordination with state governments, towards improving the RVOE-granting schemes and procedures, as well as study programme operation supervision. With this purpose, the Secretariat has signed co-ordination agreements with every state government in the country. Despite these efforts, society still considers there are a significant number of private institutions operating without complying with the basic quality standards.

During the past decade, higher education assessment as a means to improve and assure the quality has succeeded in overcoming several obstacles and attitudes of apathy, showing considerable progress. Public policies have offered the possibility of generalizing a culture that accepts external assessments aimed at institutional improvement and enhancement. The contribution of ANUIES has been essential in this sense.

Notwithstanding the progress achieved, there is still a long way to go, especially in terms of having accrediting bodies for every study programme offered by the system in every area of knowledge available in the higher education system; strengthening the existing ones' operation and response capacity, and their co-ordination within a national assessment and accreditation system. There is a need to make external assessments and study programme accreditation in public and private institutions mandatory. Additionally, the outcomes should be published, in order to strengthen current quality assurance schemes, thus contributing to increase transparency and accountability levels.

(10) Internationalization and globalization of higher education

Even if Mexico's higher education globalization has a decades-long history, the formal strategy for achieving it is relatively recent. This is made evident in the recent government and institutional efforts in their policies and supplemented by globalization programmes designed by domestic and international entities such as ANUIES, the Mexican Association for International Education (*Asociación Mexicana para la Educación Internacional*, AMPEI), the British Council and the European Community's ALFA programme.

The survey carried out by AMPEI in 2002 at 43 universities reflects formal international activity in terms of student and faculty mobility, research and international co-operation academic networks. Furthermore, the results gathered from the International Co-operation Survey (*Encuesta sobre Cooperación Internacional*), distributed among a representative sample of ANUIES'-affiliated institutions in 2001-2002, suggest that 92% of their globalization activities were being handled through bilateral agreements and projects and, to a lesser extent, through multilateral schemes. In terms of fields of knowledge, most agreements took place in the Social Sciences (23%), Education (23%), Engineering (20%), Natural Sciences (15%) and Health (13%) disciplines. Out of the 3,486 professors and students registered by the survey that carried out activities in foreign institutions in 2001, 46% did so in European institutions (mainly in France, Spain, Germany, Italy, Sweden and Austria), 33% in the US and 17% in Latin America. In turn, out of the 2,953 foreign students and faculty attending the institutions surveyed, 37% came from US centres, 34% from Europe and 18% from Latin America.

With PRONAES' *Vision 2025* as ultimate goal, the current federal administration has promoted the globalization of higher education institutions by means of a set of policies and guidelines fostering the strength of their academic capacity and competitiveness. It has also established inter-institutional agreements allowing support for student mobility across study programmes from institutions with efficient mechanisms for mutual credit acknowledgement, thus promoting the study programme equivalences; endorsing projects and actions favouring co-operation, academic exchange and academic network integration both from domestic and foreign institutions; and, access to international co-operation and academic exchange funds between Mexican and foreign higher education institutions.

International scientific and technologic co-operation promoted by CONACyT has been quite dynamic. Since 2001, the number of agreements with foreign universities has increased every year. Only in 2004 nearly 25 agreements were signed with US universities in 2004, favouring over 500 Mexican students. The fields in which most international co-operation projects have developed are: physics, mathematics and earth sciences (35%); biology and chemistry (24%); engineering (17%); biotechnology and agricultural and livestock sciences (12%) and health sciences (6%).

The Repatriation Programme (*Programa de Repatriación*) for Mexican scientists working abroad has facilitated their incorporation into domestic research and higher education institutions. On the other hand, CONACyT provides the resources required to pay a year's worth of wages, benefits, incentives and research scholarships, as well as travel and moving expenses for the researcher and his/her family in order to work at the selected institution.

Higher education institutions are increasingly incorporating the international dimension into their study programmes and activities. Several have established foreign units, such as the *Universidad Nacional Autónoma de México*, the *Universidad Autónoma del Estado de Hidalgo*, the *Universidad de Guanajuato*, and the *Instituto Tecnológico y de Estudios Superiores de Monterrey*. It should be noted, however, that most of these institutions have neither developed clearly stated strategies for this purpose, nor long-term objectives and goals within the framework of an institutional policy towards globalization.

In terms of strengthening co-operation, research and training efforts in higher education, the Programme for Student Mobility in North America (*Programa de Movilidad Estudiantil en América del Norte*, PROMESAN) is a meritorious example. The scheme emerged as part of an

initiative from the Canadian, US and Mexican governments. It finances co-operation projects under the form of consortia constituted by at least three higher education institutions from each country. Since 1995, eight calls to submissions have been issued resulting in financing the constitution of 78 consortia with 512 institutions from these three countries. The consortia projects have involved 1,157 students in the following areas: Agricultural and Livestock Sciences, Health Sciences, Natural and Exact Sciences, Social and Administrative Sciences, Education and Humanities and Engineering and Technology.

The Student Mobility Programme with France, financed by SEP and the French Government was formalised in 2001. Its main purpose is to foster student mobility towards French institutions and incorporating youths from public state and technological universities—and recently, from technological institutes—registered in engineering and technological study programmes acknowledged for their quality by assessment and accreditation agencies. The programme has assisted 230 students in the course of four calls to submissions.

The general goal of the student and faculty mobility group currently operating in the Asia-Pacific region—University Mobility in Asia and the Pacific (UMAP)—consists in creating a six-university consortium within the Asia-Pacific region to develop and strengthen communication, learning and teaching abilities in students and academic staff in their use of ICTs, by means of academic exchanges.

Further progress in this field came about with the agreement to create the Common Higher Education Area of the Latin America, the Caribbean and the European Union (ALCUE). Mexico is aware that ALCUE plays a strategic role in strengthening the globalization of higher education institutions, reinforcing bilateral and multi-lateral relations across states and contributing to the process of continuous quality improvement of the domestic higher education system. In order to contribute to build a common area, Mexico participates in the Tuning Latin America Project, which takes into account a similar experience developed by the *Tuning Educational Structures in Europe* project. Currently, 18 countries from Latin America and The Caribbean contribute to build the ALCUE space through their respective education ministries or similar instances with participation from 182 higher education institutions. Curriculum changes are expected to generate a higher degree of comparativeness, which will contribute to student mobility and acknowledgement of credits and study programmes followed, thus achieving the goals set forth in the context of ALCUE's common space.

Mexico also participates in building the Ibero-American Knowledge Space (*Espacio Iberoamericano del Conocimiento*, EIC), a regional-integration area featuring interaction and cooperation across institutions, with the purpose of generating, disseminating and communicating knowledge with positive impact in a continuous improvement of the quality and relevance of higher education, scientific research and innovation aimed at the region's sustainable development.

The process of globalisation of Mexican higher education is currently on a promising path in terms of achieving challenging goals. In order to succeed, academic capabilities and competitiveness from the institutions that make the higher education system should continue to be strengthened, incorporating them into the international dimension in their programmes and activities, in the context of an explicit institutional policy aimed at globalisation; advance in the potential for flexibility and comparison across programmes and credit acknowledgement, expand student and professor mobility programme coverage, create additional co-operation and academic exchange networks across institutions and their academic bodies and strengthen the international dimension in national, state and institutional policies, among other aspects.

The current system capacity is a platform that allows building new steps in the globalization process of Mexican higher education and its institutions. Success will only materialise by assigning the highest priority to continuous improvement and quality assurance in years to come.

(11) Conclusions

Since the eighties, a very relevant strong feature of Mexican higher education policy is the continuity of its main goals in terms of coverage, diversification, decentralizing federalism, equity, quality, relevance, administration, planning, assessment and co-ordination, which are evident in the sectoral development programmes.

With one under-secretariat in charge of higher education, SEP's new organic structure—in effect since 2005—provides more certainty in terms of the design and coherent implementation of national policies in this regard, allowing for a more homogeneous strengthening of the public institutions that constitute the different subsystems; better regulation of the private subsystem, in co-ordination with state governments; and higher effective incidence in building a national higher education system (a common space) as well similar systems in every state.

Strengthening the scope and effectiveness of educational policy, requires:

- Assuring that its formulation, scope and priorities are the outcome of an efficient and effective consultation, planning, co-ordination and consensus-building process, especially with regard to the relevance and necessary elimination of the regressive features of public investment in higher education.
- Increasing the ability to acknowledge the growing complexity of the system's operation as well as the multiple typology of the institutions that compose it, with the purpose of buffering and balancing tensions, complying with the system's objectives and foster more effective contributions from institutions in terms of achieving national goals.
- Expanding particular objectives in order to promote an effective articulation of the higher education system with the previous features of the National Education System.
- Expanding and intensifying its international dimension.

Enhancing the impact of national education policies requires guaranteeing that higher education's funding schemes be coherently articulated with national and state policy objectives in order to achieve national and state goals.

Better and more efficient co-ordination across SEP instances—and among instances themselves—and other government agencies, including the state ones, as well as with the institutions, is indeed necessary in order to facilitate their implementation and operation.

Federal and state-level policies have contributed to build a complex and diverse higher education system that has significantly grown and developed during the past decade. Policy success is evident in the continuous improvement of the system's indicators. Nevertheless, if Mexico is to respond in a more timely fashion and with increasing levels of quality to the demands of the knowledge society, globalisation, social and economic development and the sizeable transformations the nation is experiencing, national and state policies should continue facing the challenges of higher education development in Mexico—in an environment of increased democratic participation—fostering its expansion and consolidation with equity. With that purpose, the federal education programme for the coming years will have to consider policies that contribute to:

- Continue the system's growth and coverage with equity. The system's future expansion should not put at risk the progress in terms of quality achieved in the last decade.
- Accelerate the pace of percentage increases in participation from students enrolled in ISCED 5B2 and 6 level study programmes, as well as in enrolment levels in basic and natural sciences, humanities and arts in terms of the overall enrolment in the higher education system.
- Ensure that public institutions make efficient use of their physical capacity by means of adequate activity scheduling and that they continue increasing their efficiency for them to better respond to the growing demand for higher education.
- Encourage recently created public institutions to expand their infrastructure according to their development plans, for them to achieve their highest absorption potential in the expected time frame.

- Make certain that the process of institutional profile diversification and the attributes of the educational options continue responding in a relevant fashion to the needs and demands of social and economic development.
- Continue developing the inter-cultural university subsystem ensuring they are accessible to all types of students, the adequate performance of its educational model and its continuous improvement and quality assurance schemes.
- Strengthen, expand and diversify technological higher education across states, ensuring their quality, their relevance and their integration into state systems.
- Continue expanding and diversifying access and permanence opportunities in good-quality higher education for disadvantaged youths. In order to achieve this, PRONABES' coverage should be expanded, at the same time guaranteeing its financial sustainability. In addition, the PAEES must be strengthened together with the development and consolidation of student credit systems across every Mexican state.
- Reduce disparities between higher education and the labour market. To achieve this goal, the institutions should continue improving the relevance of their educational options and the activities they offer and PRONABES' coverage should be expanded. Likewise, it is also necessary to strengthen the Mexican Labour Observatory as well as the public information schemes on behaviours, dynamics, trends and domestic and international features in terms of employment and occupation.
- Create the Distance Education University (*Universidad de Educación a Distancia*) with the purpose of expanding access opportunities to higher education, respond to diverse training needs and contribute to globalise Mexican higher education, thus taking advantage of the experience and capabilities of the institutions encompassed in each subsystem in addition to the networks created to support and operate the university.
- Continue encouraging the following across institutions:
 - Training professionals with the required background in fields such as language mastery; analytical, instrument and technological ability development and a reasonable knowledge of general culture in order to compete efficiently in international labour markets.
 - Academic bodies' development and consolidation.
 - Limiting hiring of full-time faculty members only to those holding postgraduate degrees, preferably doctorate.
 - Rooting the concept of desirable faculty profile, especially in institutions type III, IV, V and VI.
 - Improving institutional schemes and programmes to develop the academic careers of their faculty.
 - Assessing the relevance of their educational options and their adjustment, if applicable.
 - Flexibilising their study programmes and incorporating new technologies and approaches focused on student learning into the educational process.
 - Establishing more flexible training models and expanding continuous education supply in the field of teaching training and competence and ability updating across working professionals, as well as adult educational needs.
 - Continuous improvement in student admission schemes, guaranteeing equity.
 - Applying standardized testing throughout the course of the studies and upon conclusion, using outcomes as input in planning and continuous quality improvement processes in their programmes.
 - Strengthening individual and group attention schemes for students and regularly assessing their performance.
 - A better knowledge of the students they serve in order to ensure, among other things, the relevance of compensating or remedial and individual or group-tutoring programmes that contribute to their adequate performance and timely graduation.
 - Continuously improve completion rates across study programmes.
 - Incorporating the international dimension into the study programmes and the managerial schemes.
 - Increasing social participation in their consultative and government boards.

- Building, establishing and consolidating management systems for continuous improvement and quality assurance, co-operation, transparency and accountability.
- Reinforcing linking capabilities with the productive sector and its contributions to innovation.
- Strengthen PROMEP's support lines, especially for technological institutes and teacher education institutions, thus intensifying the process of faculty profile improvement.
- Establish programmes and schemes making adequate contributions to full time faculty permanence in technological universities and state technological institutes as well as to renew the academic staff of federal institutions.
- Continue promoting the creation of national and state higher education systems, featuring the institutions' complementary and comparable quality educational supply, networks of academic collaboration and exchange across academic bodies and institutions, student mobility and credit transference. Achieving this will require:
 - Intensifying the incorporation into the higher education system of institutions aimed at training primary education professionals.
 - Intensifying the current process of comprehensive public institution strengthening, increasing their participatory institutional and strategic planning abilities which contribute to root assurance and continuous quality improvement of staff, study programmes—considering their different levels and types—, co-operation programmes and academic and managerial performance, thus increasing their possibilities for advanced GAK, globalization and the timeliness and quality of their contributions to innovation and regional development.
 - Consolidating CONAEDU's performance, strengthening their higher education planning and co-ordination mechanisms. Creating a Consultative Council (*Consejo Consultivo*) contributing to CONAEDU's decision making would contribute to achieve this goal.
 - Continue strengthening the COEPES in the context of decentralizing federalism, ensuring their regular operation, leadership in their management and the active participation of the heads of public and private higher education institutions, other state government instances related with decision making in higher education and from representatives from the social and productive sectors in each state.
 - Continue building a national assessment and accreditation system for higher education; foster consolidation efforts across their agencies, which will have to feature high competitiveness, transparency and technical autonomy levels, and the dissemination of their assessment judgements.
 - Continue strengthening assessment frameworks and co-ordination across the federal and state governments in order to grant RVOEs to programmes taught by private institutions and set the bases for their periodic renewal based on their programme accreditation by COPAES-acknowledged accrediting bodies.
 - Making external assessment and accreditation compulsory for study programmes supplied by public and private institutions and publicize the outcomes of these assessments in order to strengthen the current quality assurance schemes.
 - Establishing a new regulatory framework covering issues related to planning, assessment, accreditation, co-ordination and financing in the context of decentralising federalism and a comprehensive information system which, through new technologies, might be able to monitor the main system indicators, assessing its status, evolution and trends. This new framework should incorporate and establish the duties of both CONAEDU and the COEPES in terms of planning and a scheme for its co-ordination; the national assessment and accreditation system, supported upon co-ordination among the CIEES, CENEVAL and the COPAES-acknowledged accrediting bodies; make external assessment and accreditation compulsory for educational programmes; an explicit scheme for federal and state contributions to public institution subsidies and an allocation model privileging equity that includes, taking the institutions'

typology into consideration, variables related to institutional performance and their contribution to the achievement of national and state strategic goals and objectives.

- Improving articulation of extraordinary financing, for assurance and continuous quality improvement of 5B2, 5A4, 5A and 6 level study programmes supplied by the institutions.
- Increase Mexico's scientific, technologic and innovation capabilities through researcher training in quality doctorate programmes.
- Increase federal and state investments in higher education and science and technology; strengthen the current schemes and develop new incentive programmes to foster increasing private financing for science and technology and a closer relationship between the productive sector and higher education institutions.
- Intensify the actions fostering a more equitable distribution of public investment in higher education.
- Increase the monthly earnings of the academic and management staff from public higher education institutions.
- Continue fostering further adjustments to the pension and retirement systems of autonomous public state universities that have not done so and that increasingly risk their short-term financial viability. Keep reinforcing the financing funds of the reformed retirement and pension systems at 26 universities.
- Maintain Mexico's active participation in the process of building and consolidating the common higher education space ALCUE and the Ibero-American Knowledge Space, as well as in generating international schemes aimed at acknowledging the assessment and accreditation domestic systems in addition to evaluating and disseminating the quality of cross-border higher education.

1. Facing the current challenges and achieving the ambitious goals contained in PRONAE's *Vision 2025*, requires consolidating the implementation of higher education policies which, given their recent impact and the expectations for it in the short term, are generating relevant outcomes in terms of continuous improvement and ensuring of educational quality, in addition to keeping those policies that, albeit in their implementation stages, their impact will only be tangible in the medium and long-term.

The preceding chapters provided a detailed description of the current state the higher education system in Mexico is in, as well as the progress achieved during the past decade as a result of national and state public policies. It has also called the reader's attention to the challenges faced by the system and its institutions.

A very relevant strong feature of Mexican higher education policy since the eighties has been the continuity of its goals in terms of coverage, diversification, decentralizing federalism, equity, quality, relevance, administration, planning, assessment and coordination, which are evident in the sectoral development programmes.

With one under-secretariat in charge of higher education, SEP's new organic structure—in effect since 2005—provides more certainty in terms of the design and coherent implementation of national policies in this regard, allowing for a more homogeneous strengthening of the public institutions that constitute the different sub-systems; better regulation of each sub-system—in co-ordination with state governments—; developing the private education sub-system and higher effective incidence levels in the task of building a national higher education system (a common space) as well similar systems in every state.

Strengthening the scope and effectiveness of educational policy, requires:

- Assuring that its formulation, scope and priorities are the outcome of an efficient and effective consultation, planning, co-ordination and consensus-building process, especially with regard to the relevance and necessary elimination of the regressive features of public investment in higher education.
- Increasing the ability to acknowledge the growing complexity of the system's operation as well as the typology of the institutions that compose it, with the purpose of buffering

and balancing tensions, complying with the system's objectives and fostering more effective contributions from institutions in terms of achieving national goals.

- Expanding particular objectives in order to promote an effective articulation of the higher education system with the previous features of the National Education System.
- Expanding and intensifying their international dimensions.

Enhancing the impact of national education policies requires guaranteeing the coherent articulation of higher education's funding schemes in terms of the national and state policy objectives, with the purpose of achieving national and state-level goals.

It is indeed necessary to establish better and more efficient co-ordination mechanisms across SEP instances—and among instances themselves—and other government agencies—including state agencies—as well as with the institutions, in order to facilitate their implementation and operation.

Federal and state-level policy has contributed to build a complex and diverse higher education system that has significantly grown and developed during the past decade. The continuous improvement in the system's indicators is an evidence of policy success. Nevertheless, if Mexico is to respond in a more timely fashion and with increasing levels of quality to the demands of the knowledge society, globalisation, social and economic development and the sizeable transformations the nation is experiencing, national and state policies should continue facing the challenges of higher education development in Mexico—in an environment of increased democratic participation—fostering its expansion and consolidation. With that purpose, the sectoral programme for the coming years will have to consider policies that contribute to:

- Maintain the system's growth and coverage with equity since the system's future expansion must not risk the progress achieved during the past years in terms of quality.
- Accelerate the pace of percentage increases in participation from students enrolled in ISCED 5B2 and 6 study programmes, as well as in enrolment levels in basic and natural sciences, humanities and arts in terms of the overall enrolment in the higher education system.
- Ensure that public institutions make efficient use of their physical capacity by means of adequate activity scheduling and that they continue increasing their efficiency for them to better respond to the growing demand for higher education.
- Encourage infrastructure expansion across recently created public institutions according to their development plans, for them to achieve their highest absorption potential in the expected time frame.
- Make certain that the process of institutional profile diversification and educational options' attributes continue responding to the needs and demands of social and economic development in a relevant fashion.
- Continue developing the inter-cultural university sub-system, ensuring its accessibility to all types of students, the adequate performance of its educational model and its continuous improvement schemes and their quality.
- Strengthen, expand and diversify technologic higher education across states, ensuring its quality, relevance and integration into state systems.
- Continue expanding and diversifying access and permanence opportunities in good-quality higher education for disadvantaged youths. PRONABES' coverage should be expanded in order to achieve this, guaranteeing its financial sustainability at the same time. In addition, the PAEES must be strengthened together with consolidating the student credit systems across every Mexican state.
- Decrease the lack of adjustment between higher education and the labour market. To achieve this goal, the institutions should continue improving the relevance of their educational options and the activities they offer; PRONABES' coverage should be expanded. Likewise, it is also necessary to strengthen the Labour Observatory as well as the public information schemes on behaviours, dynamics, trends and domestic and international features in terms of employment and occupation.

- Create the Distance Education University (*Universidad de Educación a Distancia*) with the purpose of expanding access opportunities to higher education, respond to diverse training needs and contribute to globalize Mexican higher education, thus taking advantage of the experience and capabilities of the institutions encompassed in each sub-system in addition to the networks created to support and operate the university.
- Continue encouraging:
 - Training professionals with the required background in fields such as language command, analytical, instrument and technological ability development and a reasonable knowledge of general culture in order to compete efficiently in international labour markets.
 - Academic body development and consolidation
 - Limiting full-time faculty member hiring only to those with postgraduate studies—preferably doctorate.
 - Establishing the concept of desirable faculty profile, especially in institutions type III, IV, V and VI.
 - Improving institutional schemes and programmes to develop the academic careers of their faculty.
 - Assessing the relevance of their educational options and their adjustment, if applicable.
 - Flexibilising their study programmes and incorporate new technologies and approaches focused on student learning into the educational process.
 - Establishing more flexible training models and expanding continuous education offerings in the field of teacher training and competence and ability updating across working professionals, as well as adult educational needs.
 - Continuous improvement in student admission schemes, guaranteeing equity.
 - Applying standardized testing throughout the course of the studies and when concluding them, with the outcomes used as input in planning and continuous quality improvement processes in their study programmes.
 - Strengthening individual and group attention schemes for students and regularly assessing their performance.
 - Knowledge of the students they serve in order to ensure, among other things, the relevance of compensating or remedial and individual or group tutoring programmes that contribute to their adequate performance and timely graduation.
 - Continuous improvements in completion rates across study programmes.
 - Incorporating the international dimension into the study programmes and the managerial schemes.
 - Increasing social participation in their consultative and government entities.
 - Building, rooting and consolidating management systems for continuous improvement and quality assurance, co-operation, transparency and accountability.
 - Strengthening co-operation capabilities with the productive sector and its contributions to innovation.
- Strengthen PROMEP's support lines, especially for technological institutes and the centres for basic education faculty training, thus intensifying the process of faculty profile improvement.
- Establish study programmes and schemes with adequate contributions to full-time faculty permanence in technological universities and state technological institutes, as well as to renewing the academic staff of federal institutions.
- Continue promoting the creation of national and state higher education systems, featuring complementary and comparable quality educational offerings from the institutions, networks of academic collaboration and exchange across academic bodies and institutions, student mobility and credit transference. Achieving this will require:
 - Intensifying the incorporation of institutions aimed at training basic education professionals into the higher education system.
 - Intensifying the current process of comprehensive public institution strengthening, increasing their participatory institutional and strategic planning

abilities which contribute to foster the establishment of continuous improvement schemes and ensure the quality of their faculty, their study programmes—considering their different levels and types—, their co-operation programmes and their academic and managerial performance. This is expected to increase their possibilities for advanced generation and application of knowledge, globalization and the timeliness and quality of their contributions to innovation and regional development.

- Consolidation of CONAEDU's performance, strengthening their higher education planning and co-ordination mechanisms. Creating a Consultative Council (*Consejo Consultivo*) contributing to CONAEDU's decision making might contribute to achieve this goal.
- Continuing strengthening of COEPES in the context of decentralizing federalism, ensuring their regular operation, leadership in their management and the active participation of the heads of public and private higher education institutions, other state government instances related with decision making in higher education and from representatives from the social and productive sectors in the state.
- Continuing the configuration of the National Assessment and Accreditation System (Sistema Nacional de Evaluación y Acreditación) for higher education; fostering consolidation efforts across their agencies, which will have to feature high competitiveness, transparency and technical autonomy levels, and the dissemination of their assessment opinions.
- Continue strengthening assessment frameworks and co-ordination across the federal and state governments in order to grant RVOEs to study programmes taught by private institutions and set the bases for their periodic renewal based on their study programme accreditation by COPAES-acknowledged entities.
- Making external assessment and accreditation compulsory for study programmes offered by public and private institutions and disseminating the outcomes of these assessments in order to strengthen the current quality assurance schemes.
- Establishing a new regulatory framework covering issues related with planning, assessment, accreditation, co-ordination and financing in the context of decentralising federalism and a comprehensive information system which, through new technologies, might be able to monitor the main system indicators, assessing its status, evolution and trends. This new framework should incorporate and establish the duties of both CONAEDU and the COEPES in terms of planning and generating a co-ordination scheme; the national assessment and accreditation system, supported upon co-ordination among the CIEES, CENEVAL and the COPAES-acknowledged accrediting entities; make external assessment and accreditation compulsory for study programmes; an explicit scheme for federal and state contributions to public institution subsidies and an allocation model privileging equity that includes, taking the institutions' typology into consideration, variables related to institutional performance and their contribution to the achievement of national and state strategic goals and objectives.
- Improving the articulation of extraordinary financing, continuous improvement and quality assurance study programmes for bachelor's degrees and postgraduate studies offered by the institutions.
- Expand Mexico's scientific, technologic and innovation capabilities through researcher training in quality doctorate study programmes.
- Increase federal and state investments in higher education and science and technology; strengthen the current schemes and develop new incentive programmes to foster increasing private financing for science and technology and a closer relationship between the productive sector and higher education institutions.
- Intensify the actions fostering a more equal distribution of public investment in higher education.
- Raise monthly earnings of the academic and management staff from public higher education institutions.

- Continue fostering further adjustments to the pension and retirement systems of autonomous public state universities that have not done so and that increasingly risk their short-term financial viability. Keep reinforcing the financing funds of the reformed retirement and pension systems at 26 universities.
- Maintain Mexico's active participation in the creation of the common higher education space ALCUE and the Ibero-American Knowledge Space (Espacio Iberoamericano del Conocimiento), as well as in generating international schemes aimed at acknowledging the national assessment and accreditation system in addition to evaluating and disseminating the quality of cross-border higher education.

Facing the current challenges and achieving the ambitious goals contained in PRONAE's Vision 2025, requires consolidation in the task of implementing higher education policies which, given their recent impact and expectations in the short term, are generating relevant outcomes in terms of continuous improvement and ensuring of educational quality, in addition to keeping those policies whose impact will only be tangible in the medium and long-term, although currently in their implementation stages.

Chapter 1: Higher education in the Mexican context

1.1 Introduction. 1.2 Population trends and cultural diversity. 1.3 Economic, social and cultural aspects. 1.4 Political system and organisation. 1.5 The labour market.

1.1 Introduction

2. The country is an enormously varied palette in the geographical, cultural and environmental sense, boasting a large canvas of climates and regions. Given the size of its territory, it is the fourteenth country in terms of extension. Its high-plain region, consisting of valleys and mountains, is formed by the Sierra Madre Oriental, Sierra Madre Occidental and the Neo-volcanic Axis. Its high altitude valleys and basins are surrounded by two outlets, one towards the Atlantic Ocean and another towards the Pacific. Both outlets boast warm and tempered lands, which extend through 11,000 kilometres of coasts. Mexico has a biological diversity that evidences itself through thousands of vegetable and animal species, one of its main riches.

3. Understanding these complicated and diverse geographical features contributes to a better comprehension of the political, economic, population and cultural processes of its history.

4. The Mexican society has made enormous efforts to build and develop its educational system. During the second half of the twentieth century, the system grew at a quick pace, going from less than a million students to increasing its capacity to incorporate over 30 million. During the first years of the twenty-first century, these efforts have gained intensity.

5. In 1950, only 1% of the young people in the 19-23-age cohort were part of the higher education system. Basically, the system was only capable of training for bachelor's degrees (*licenciatura*, 5A4) in some traditional programmes taught by institutions concentrated in a few cities. Currently, the system's coverage is 26.2%,¹ i.e., several percentage points above the figure for 2000 (20%). Society still demands that a larger number of youths follow higher studies in the context of a broad and diversified system, running the gamut of programmes, from short ones to doctorates in the most varied fields and with the highest quality.

6. The population's educational profile is still improving. According to the information provided by the II Population and Housing Count 2005 (*II Conteo de Población y Vivienda*),² during the previous five years the uneducated population 15 years of age or older decreased to 8.4% from 10.2%; the population segment that completed the higher education level went from 10.9% to 13.6%.

7. As is the case of a large number of medium income countries in Latin America, Mexico is experiencing four fast, deep, parallel and polarised transitions: demographic, social, economic and political. These four transitions determine Mexico's opportunities to move towards a comprehensive sort of development featured by equity and sustainability. Hence, they define the launching platform to continue building the country Mexicans wish for. In addition, they determine the limitations Mexican population must overcome in order to satisfy their more urgent needs, especially those related with educational development.

8. The complexity of this set of transitions is closely related to the disparities Mexico still has in the living standards of its population, its economic development and the most relevant social indicators. In this sense, Mexico still faces the challenge of large gaps separating the richer population from those who earn less, as well as the differences between states, regions and rural and urban areas.

¹ This value is calculated taking the total enrolment in university level technician (5B2) and bachelor's degree (5A4) for the 2004-2005 academic year (2,371,753) and the population in the 19-23 year old cohort (9,059,384 individuals) recently reported in the II Population and Housing Count, 2005.

² Instituto Nacional de Estadística, Geografía e Informática (INEGI).

1.2 Population trends and cultural diversity

9. During the second half of the twentieth century, Mexico's considerable mortality and fertility indices began to decrease. This phenomenon caused the natural population growth rate to change from 3.5% in 1965, to 1.7% in 2000. During the past five years, the average annual growth rate reached 1%. In that context, it may be anticipated that, in future decades, Mexico will still be among the most populated nations worldwide, and that the size of its population will probably stabilize somewhere between 130 and 150 million towards the mid-twenty-first century.

10. In 2005, the population already surpassed the 103 million mark, according to the II Population and Housing Count; of that, 51.3% are women and 48.7% are men. The population for the 19-23 year old cohort reached 9,059,384 individuals.

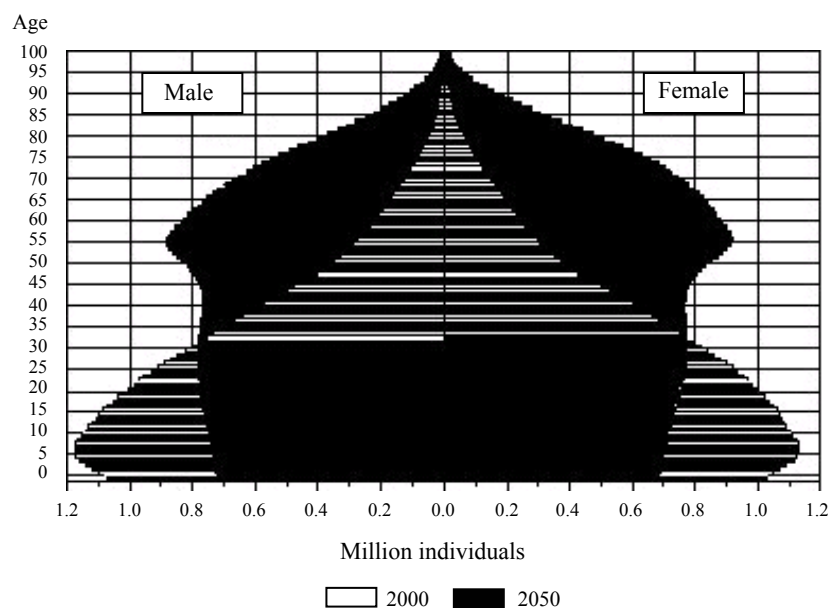
11. Mexico is a multi-cultural nation where women and men from different ethnic groups coexist. The National Indigenous Populations Institute (*Instituto Nacional Indigenista*, INI) estimates that there are over 10 million indigenous persons in the country. Most of them live in 24 states and, altogether, speak over 80 languages and several dialects. The INI has divided the indigenous population into 62 ethnic groups, representing different traditions and worldviews and conceptions. The very presence of these indigenous communities constitutes a clear expression of the existing cultural diversity. Nevertheless, due to adverse geographical conditions to a sizeable extent, and to decades of exclusion as well, most of them register very unfavourable living standards and are immersed in a situation of social and economic underdevelopment that marginalizes them from progress in a national context. According to data from the XII General Census of Population and Housing, 2000 (*XII Censo General de Población y Vivienda, 2000*), 85% of the 805 municipalities mostly inhabited by indigenous populations were highly marginalised.³

12. Mexico is experiencing an accelerated and deep demographic transition that has, and will have, implications in every aspect of its development. Although the bulk of the population is young—currently over 50% of the population is 25 years old or younger—the ageing process is undeniable. In 2000, one out of every 20 Mexicans was over 65 years old. In 2050, this relationship will be one in four (Chart 1.1). Mexico's demographic transition will bring along dramatic changes in the nature of the demand for a series of services the Mexican State must provide.

13. Two trends will influence the evolution of the demand for educational services during the next decades: a) the decrease of the population under 15 years old and the related increase of the working-age population, the 15-64 segment; and b) the increase in the number of small communities, disseminated across the national territory.

³ The degree of marginality is calculated based on indicators such as the population's overcrowding level, the mortality rate and per capita income among others.

Chart 1.1 Population pyramids, 2000 and 2050



Source: *Consejo Nacional de Población*, estimates.

14. The decrease at the base of the population pyramid has had, and still has, important consequences on basic and secondary education. In terms of the potential demand for basic education, the number of children between 6 and 11 years old has been decreasing since 1999, a trend that will mean a nearly 10% fall in enrolments by 2010. On the other hand, the performance of the secondary education-age cohort—12 to 14 years old—is beginning to stabilize, and its size will foreseeably decrease in the short term. The 15 to 24 year old group is among the largest, thus the significant increase in the demand for upper secondary and higher studies. It should be kept in mind that the possibility of increasing enrolment in higher education is closely linked to a significant improvement in completion rates of the preceding levels.

15. The expected increase in the working age, 15-64 year old population segment is an opportunity that must be taken into account. This age cohort totalled 24 million individuals in 1970, 58 million in 2000 and is expected to keep growing to reach 75 million in 2010 and 87 million in 2030. Such growth, together with a decrease in the economically dependent population is a development opportunity for the coming twenty years.

16. In addition to the changes in age cohort structure, the changes in the settlement pattern across the Mexican territory are generating a change in community distribution and modifying the social, economic and cultural features of the groups demanding education services. The territorial consequences of such dynamics make themselves evident in two closely related outcomes: urban growth and environmental impact.

17. In terms of the geographical distribution of the population, over 75% lives in urban areas, and a large portion lives in the main three cities: Mexico City, Guadalajara and Monterrey. Growth in mid-sized cities has been nevertheless intense during the past 20 years. At the same time, the distribution of part of the population in rural areas presents an enormous challenge, mostly in terms of the provision of every sort of service. In this sense, Mexico's rural areas are highly dispersed: 75% of a total of over 150 thousand local communities has less than 100 inhabitants. Such dispersion is associated to poverty, which, in turn, is linked to geographical conditions that prevent service provision and any other channel fostering community development.

1.3 Economic, social and cultural aspects

18. Mexico is an emerging economy featuring a considerable level of industrial development combined with significant increases in its sale of goods and services abroad. During the second half of the twentieth century, Mexico adopted an economic growth model based on government action (protecting domestic productive sectors and providing key goods and services) by applying an import substitution strategy.⁴ Combined with international circumstances, this model allowed the Mexican economy to keep its Gross Domestic Product (GDP) growing at a sustained pace of 6%, annually, during over two decades (1950-1975), along with price stability and relatively low annual inflation levels (of around 5%). Economic growth came with dynamic demographics: the population nearly doubled and, with that, the youth cohort increased significantly.

19. Also, between the fifties and the nineties, the sectoral labour structure experienced a radical transformation, simultaneously with the industrialization and the urbanization processes. Until the mid-twentieth century, 58.4% of the population worked in agriculture. By the 90s, it came down to 22.6%. Conversely, the share of the manufacturing and services sector in the sectoral structure of labour increased significantly: from 16% and 26%, respectively in 1950 to 28% and 49% in 1990.

20. Towards the mid-eighties, in the aftermath of the severe financial crises of 1976 and 1982, Mexico embarked in an economic transition process. In essence, this transition implied changing the original development model, based on government action, to another based on market globalization, reduced government intervention in the economy and the implementation of an export promotion strategy.

21. With the change in economic models, Mexico, as other countries, has strived to participate in the economic globalization processes and has experienced noticeable growth levels in its exports sector. In the past five years (2001-2005), exports reached an annual growth rate of 12.3%, keeping its leading position as exporting country in Latin America.⁵ Although it is true that 90% of trade is carried out with the US, in 2005, there were increases in trade with Latin America, Europe and Asia. Exports in general were considerably dynamic in 2005, growing at a rate of 13.7% with regard to 2004.⁶ Due to the size of its economy, Mexico reached that year the tenth place worldwide.

22. As in other countries, the economic transition in Mexico has been determined by four main lines of the economic globalization process: the worldwide information and communication networks, the globalisation of financial systems, the international specialising of manufacturing and the creation of global patterns in lifestyles, learning, working, recreation and relationships.

23. Given its specific nature and the circumstances to which it relates, economic transition has undeniably stimulated modernisation, dynamism and productivity. Unfortunately, there is no concealing the fact that most individuals have been unable to adapt to the pace of transformation and its benefits.

24. Notwithstanding the recurring economic crises experienced during the past decade, Mexico has seen continuous progress in aspects related to economic growth, health, education and poverty alleviation. Since 2001, its GDP has grown at an annual average rate of 3%. Given Mexico's demographics, however, such growth has not sufficed to generate significant improvements in the country's economic and social welfare conditions. Indeed, the economic growth gap of the past decade has impacted labour markets, an element that causes, among other phenomena, Mexican worker migration abroad, mainly to the US.

⁴ Samaniego, Norma, et al., *Los principales desafíos que enfrenta el mercado de trabajo en México en los inicios del Siglo XXI*, OIT, Mexico, 2000.

⁵ World Trade Organization. (www.wto.org).

⁶ Bancomext, *Intercambio comercial total por regiones; Comercio exterior de México*. (www.bancomext.com.mx).

25. Along with the changes experienced as the outcome of the economic dynamics, Mexico is facing material social transformations. Organisation schemes, that three decades ago were almost exclusively restricted to social groups or trade unions, are shifting towards more diversified versions, such as the multiplicity of organisation initiatives from civil society groups. There is renewed interest in the social role of trade unions, firms and sectoral associations that leaves space for convergence beyond the protection of specific interests, suggesting new social energies in terms of defending rights and exercising public responsibilities.

26. The increasing complexity of the social structure is fostering a transformation in the identities adopted and the roles performed by the social actors in the most diverse scenarios. Evidence of this phenomenon is clear in the transformation of women's role in society, the emergence of a mainly young population demanding jobs and social participation and the revaluation of multi-culturalism, which has had clear consequences in the field of education in Mexico.

27. The increasing participation of women in labour markets and decision-making has been instrumental in the transformation of the household's structure and social role. Female employment has more than doubled in the past 30 years. There are still inequities, however. In the past few years, the coverage of education has increased continuously for both genders, hence the decrease in disparities. There are still differences, mostly in rural areas and especially in indigenous communities, where girls are usually significantly disadvantaged with respect to boys.

28. In the following two decades, Mexican society will consist mainly of young people, old enough to participate in society and labour markets with full rights and responsibilities. This is one of the most important reasons why the Mexican future looks optimistic. The education sector will have an exceptional opportunity to act as catalyst of creative abilities, imagination and commitment of new generations that will transform, in a very short time, the cultural, social, political and economic scenarios in Mexico.

29. Albeit Mexico's significant achievements in terms of social development (including education and health), constant effort is still needed to fight the current poverty levels. A recent World Bank⁷ report indicates a continuous decrease in the number of Mexican households living with less than two US dollars a day. This decrease (from over 25 to nearly 15 between 1998 and 2005) obeys to a combination of elements, such as the macroeconomic stability enjoyed by Mexico and the operation of several social impact programmes currently applied by the federal government. Most relevant among these schemes is *Oportunidades* (Opportunities, formerly *PROGRESA*), a comprehensive programme that includes education, health care access and nutrition and income generation components.

30. The decrease in poverty levels and the State's achievements in the social sphere have been considerable and acknowledged by first-rate international institutions. However, the share of the population and the number of individuals living in poverty is still high. According to the *Comité Técnico para la Medición de la Pobreza en México* (Technical Committee for the Measurement of Poverty in Mexico) the figures for 2004—measured according to three definitions of poverty—were the following: from the total figure of poor population, 13.7% suffered from nutrition poverty, 19.8% from poverty measured in terms of skill development and 39.6% in terms of capital.⁸

⁷ World Bank, *Generación de Ingreso y Protección Social para los pobres*. Two Volumes, The World Bank, Mexico, 2005.

⁸ Following the technical committee for poverty measurement in Mexico, the Social Development Secretariat of the federal government defined three reference guidelines for grouping the population by poverty level: a) *Alimentary Poverty Threshold*: households whose income is below the one considered as necessary to cover nourishment needs, equivalent to 15.4 and 20.9 daily Mexican pesos per person (year 2000) in rural and urban areas, respectively; b) *Ability Development Threshold*: households whose per capita income was below that considered as necessary to cover nourishment needs, in addition of the income required to cover education and health expenses, equivalent to 18.9 and 24.7 daily Mexican pesos (year 2000) per person in rural and urban areas, respectively; and c) *Capital Development Threshold*: households where per capita income is below the level required to cover nourishment and basic consumption needs (such as health, education, attire, footwear, housing and public transportation. Such income was equivalent to 28.1 and 41.8 2000 daily Mexican pesos (year 2000) per person in rural and urban areas, respectively.

31. Going forward, Mexico faces the challenge of maintaining macroeconomic stability and fostering current sustainable growth levels as well as of guaranteeing competitiveness with the purpose of securing resources to confront social and economic disparities. In addition, the nation must continue its effort to reduce the current poverty, marginality, and exclusion levels and the lack of access to services suffered by a considerable share of the population.

32. Mexico has stopped conceiving itself as culturally homogeneous, hence the consensus on the need for Mexicans to share certain basic values, behaviours and communication codes. Education may contribute with valuable insights in terms of consolidating a common ground for the different segments of Mexican society that, respecting each sector's cultural specificities and based on them, will form a renewed national identity that will allow its population to face the challenges that will arise during the twenty-first century.

1.4 Political system and organisation

33. Mexico is a federal, democratic and representative republic formed by 31 states and a Federal District. The law grants the latter powers and limitations that are different from the rest of the states. In addition, the Federal District houses the federal and local (Mexico City) powers.

34. The Mexican political system is based on the division of powers into three branches: executive, legislative and judicial, whose roles have consolidated during the past decade. This division of powers is the best equaliser in terms of enriching Mexico's democratic life. The chief of the executive power is the President, elected by universal, free and secret vote every six years.

35. The Congress, that endorses the federal pact, is formed by the chamber of deputies (the lower house in parliamentary terms) and the Senate. Deputies are elected every three years and senators every six. Currently, the election process is carried out transparently, co-ordinately and supervised at each stage by the *Instituto Federal Electoral* (the Federal Electoral Institute, IFE). Any controversies in this matter are solved by the *Tribunal Electoral del Poder Judicial de la Federación* (Federal Electoral Court, TEPJF), which is part of the judicial branch. Mexico's Constitution does not allow re-election in any of its appointments decided by voting.⁹

36. The Congress is a plural institution performing a significant role in the democratic transition the country is experiencing. Currently, there is no absolute majority from any party in the House of Deputies or the Senate.

37. Mexican citizens elect local authorities in a fashion similar to federal processes. It should be mentioned that the states enjoy quite a broad margin in terms of passing laws, allocating and directing public expenditure and operating sectoral development and social programmes.

38. The federal judicial power is exercised by the *Suprema Corte de Justicia de la Nación* (Supreme Court) the ultimate entity in terms of justice. In the states, such powers are held by the corresponding Justice Courts (*Tribunales Superiores de Justicia*).

39. The Mexican political system has traditionally been presidential, concentrating, for a long time, most decisions in the executive power. Since the 90s, the system has pursued an effective decentralized federalism of responsibilities in every aspect.

40. Mexico has a multi-party system. Citizens may opt among several possibilities that come from, at least, six political stances or parties, represented at both federal and state congresses. Notwithstanding this political diversity, most voting intentions concentrate in three main parties: the *Partido Acción Nacional* (National Action Party, PAN), the *Partido de la Revolución Democrática* (Democratic Revolution Party, PRD) and the *Partido Revolucionario*

⁹ The Mexican Constitution prevents deputies, senators and other representatives of the people to be re-elected for consecutive terms.

Institucional (Institutional Revolutionary Party, PRI). In the presidential election that took place on July 2, 2000, the coalition formed by the PAN and the *Partido Verde Ecologista* (Green Ecologist Party) obtained the majority of votes. This outcome, favouring an opposition candidate, accelerated the political transition. Such transition has consisted of a long and peculiar democratisation process that is contributing to surmount a hegemonic political regime that lasted over 70 years.

41. During the past two decades the Mexican society has constructed a regime based on alternating their choice of candidates to perform public office in different levels of government, the respect for skills, the plural composition and the autonomous acting of public powers, the development of accountability mechanisms in terms of monitoring the public resources and the transparency and independent monitoring of elections.

42. This transition has brought about a change in Mexico's political map, which shows a broad diversity of social forces and party ideologies at the federal, state and municipal levels. Mexico's political rearrangement is acting as a decisive element in new ways of negotiating, of reaching consensus and accepting shared responsibilities, in order to identify and foster the highest priority agendas to be accomplished by the public sphere, but, most of all, it is contributing to establish new forms of relating between the government and the civil society.

43. It may be stated that society, as a whole, is immerse in a deep educational process that implies a substantial change in its own perception, in establishing its responsibilities and in setting guidelines to steer its government. Society is learning to perform under new rules for social interaction and participation, whose content and soundness will depend, in good measure, upon the level of expression that democracy's values might reach in the educational front. The contribution of Mexico's educational system is instrumental for consolidating Mexican democracy.

44. Currently, Mexico's political and economic systems are more open and integrated towards international trade and economic practice. In this sense, it has signed a large number of trade agreements such as with North America, the European Union, Japan and several Latin American countries. In addition, since 1994, Mexico is a member of the Organisation for Economic Co-operation and Development (OECD), which brings together the countries with the most advantageous economic conditions.

45. In terms of budget, the relationship between the states and the federal government is ruled by the Constitution and a series of laws and regulations defining the responsibilities and obligations of each party. The resources allocated to the states in the Federation's Budget Expenditures (*Presupuesto de Egresos de la Federación, PEF*) are earmarked to the programmes and actions that are most convenient for each state's development. The Federal Congress, the Secretariat of Public Administration (*Secretaría de la Función Pública*), the Secretariat of Finance and Public Credit (*Secretaría de Hacienda y Crédito Público, SHCP*) and the local congresses are responsible for auditing and making the states accountable for the way they exercise the resources they receive. From January to November 2005, the federation transferred the states Mx\$556.545 billion in federal revenue transfers (*participaciones*), devolved responsibilities' expenses and agreements. This figure represented 55.3% of the total amount of transferable federal revenues (*Recaudación Federal Participable*).¹⁰ Since the nineties, the decentralisation process has led the states to exercise broad responsibilities in terms of service provision.

¹⁰ *Informe de Participaciones 2005*, Secretaría de Hacienda y Crédito Público.

1.5 The labour market

46. The main feature of the Mexican labour market is the co-existence of formality and informality.¹¹ In general, poorer individuals that, in most cases, are not very educated, or by those more educated but who, for lack of employment, are compelled to resort to this sector perform informal jobs.

47. Recently, the Mexican National Institute of Statistics, Geography and Informatics (*Instituto Nacional de Estadística, Geografía e Informática*, INEGI) published the results of its labour survey (*Encuesta Nacional de Ocupación y Empleo*, ENOE)¹² for the first quarter of 2006. During this period, the Economically Active Population (EAP) totalled 43.9 million individuals¹³, of which 42.4 million (96.5%) were occupied. It is worth mentioning that, in every community in the country, regardless of size, there were annual increases in its employed population. During the aforementioned quarter, the national unemployment rate was 3.5% of the EAP (a million and a half persons), lower than the figure registered for the first quarter of 2005 (3.9%). The number of unemployed persons in rural areas was 175,000, whereas in urban areas, it was 161,000 in the less urbanized areas, 207 thousand in the medium areas and one million in the most urbanized zones.

48. With regard to the economic sector that occupied the most individuals, the primary sector concentrated 14.4% (six million persons); 25.6% (11 million) in the secondary sector; and 59.2% (25 million) in the higher or services sector, which is the main labour destination for professionals. The remaining 0.8% did not specify their economic activity. In 2005, 6.3, 10.6 and 24 million individuals, respectively, worked in the above sectors.

49. During this quarter, some persons worked a few hours, while others did so more intensely. According to the survey, 2.5 million individuals worked less than 15 hours a week, while 12.3 million worked over 48 hours a week. On average, the employed population worked 43-hour weeks. With regard to the size of the economic unit where employed individuals worked, it was found that considering only the non-agricultural environment, 48.5% worked in micro-businesses, 17.7% at small businesses, 12.2% in mid-sized establishments, 10.2% in large and 11.4% worked in other types of economic units. Between the first quarter of 2005 and the same period in 2006, among the economic units that increased their staff most were micro-businesses, with 513 thousand workers (3.1%), medium- and small-sized firms increased their staff by 6.6% and 3.6%, respectively (267 and 218 thousand workers), while the larger companies reduced their number of employees by 64 thousand (-1.7%).

50. Statewise, Distrito Federal and Estado de México are the largest labour markets, accounting for nearly a fourth of the total employment in the country. Jalisco, Veracruz and Puebla come behind. On the other end, the smallest labour markets are Baja California Sur, Colima, Campeche, Aguascalientes and Nayarit.

51. During the first quarter of 2006, the underemployed population accounted for 6% of the EAP and 6.2% of the employed population (one million employees less than those reported on the first quarter of 2005). These percentages are higher among men than among women. The services sector concentrated 53.9% of the underemployed population; the secondary sector, 25.7% and the primary sector 19.8%. The employed population in the informal sector reached 11.8 million individuals, which represents 27.8% of the employed population, an increase of 254 thousand persons with regard to the same quarter of the previous year.

52. A significant change in the Mexican labour market has to do with female participation. Several examples illustrate this new reality: while in 1960 approximately 15% of the Mexican

¹¹ In the informal sector, workers are not registered in the social security systems. Therefore, they do not have benefits such as retirement or pensions.

¹² INEGI, *Encuesta Nacional de Ocupación y Empleo*, May 2006.

¹³ Individuals 14 or older that performed an economic activity or actively pursued doing so during the reference period, as long as the individual was willing to work immediately during the reference week.

women had a paid job, by 2000 the figure reached 39%. In fact, the rise between the seventies and the nineties is among the highest in Latin America and the Caribbean region.¹⁴

53. In this same sense, women's development in Mexican society has been noticeable in recent years. There has been a significant rise in the number of families with a woman at the head. In parallel, they have increased their education levels considerably. In 2000, the share of women with any level of higher education was almost 10%, estimating that such figure will keep increasing in the coming years. Another evidence of this phenomenon is that, currently, many professions traditionally dominated by men have experienced drastic changes.

54. As it has been said, Mexico is a country experiencing deep and complex transitions. Given its magnitude and relevance, these transitions have become complex challenges in terms of designing the country's development policy. Although poverty levels have continuously decreased and the economy has generally improved, Mexico is still a very heterogeneous nation with wide imbalances: over 18 million individuals live in poverty; the population over 14 years old that has not yet concluded secondary education exceeds 23%, basic education and health services are not yet universal and—withstanding the political and social stability—social injustice still generates considerable tension. All of the above configures the context within which the education system operates, facing the challenge of playing a strategic role in the process of building a more educated and fair society with increased abilities to confront the global risks that have an impact on their development. The system must offer individuals an education aimed at their comprehensive development, building and consolidating basic intellectual abilities, developing learning skills and providing students with flexible guidelines to incorporate to and remain in the labour market.

55. If education levels as well as labour productivity are increased among the population, the dynamism thus generated might foster a rise in per capita GDP growth. This is potentially associated with taking advantage of the "demographic bonus". The reduction in the demographic pyramid's base expected in the near future will lead temporarily an increasing share of the population to enter economic activity. If this population is educated for labour and productivity within the formal sector, the impulse could be enormous and determining for the economic take-off required. Otherwise, if the "demographic bonus" is not appropriately taken advantage of, the current opportunity for development might only widen the social gap.

¹⁴ Valdés, Teresa y Enrique Gomariz (Coords), *Mujeres Latinoamericanas en cifras, Caso México*, FLACSO-México/Instituto de la Mujer de España, México, Santiago de Chile, 1995.

Chapter 2: General overview of the higher education system

2.1 Introduction. 2.2 Institutions. 2.3 Institutions' typology. 2.4 Enrolment. 2.5 Student's profile. 2.6 Acquisition of degrees and certificates. 2.7 Graduates. 2.8 Professors. 2.9 Regulatory framework. 2.10 Agencies empowered for policy implementation. 2.11 Agencies responsible for financing. 2.12 Assessment agencies. 2.13 Tensions in the higher education system. 2.14 The National Education Programme 2001-2006: strategic objectives and national goals. 2.15 System's evolution between 1994-1995 and 2004-2005 academic years.

2.1 Introduction

56. The components of Mexico's higher education system are considerably diverse, large, complex and heterogeneous. This is evidenced, among other things, by the size and particular features of the institutions that constitute it and the profile and characteristics of its teaching staff.

57. The system consists of 1,892 institutions¹⁵ with different typological profiles that, altogether, constitute part of the national education system. Of these, 713 are public institutions and 1,179 private, with different typologies. These higher education institutions counted 2,538,256 students during the 2004-2005 academic year, of which 1,707,434 studied at public institutions (67.3%) and 830,822 (32.7%) at private institutions. Based on the International Standard Classification of Education (ISCED 97) from the United Nations Educational, Scientific and Cultural Organisation (UNESCO), the system offers: 5B2, 5A3, 5A4, 5A and 6 degree levels. Some institutions also offer 3A level study programmes.

58. Higher education institutions may be classified into subsystems, as described below.

2.2 Institutions

2.2.1 The federal public institution subsystem

59. This subsystem is constituted by the *Universidad Nacional Autónoma de México* (UNAM), the *Universidad Autónoma Metropolitana* (UAM), the *Universidad Pedagógica Nacional* (UPN) and the *Instituto Politécnico Nacional* (IPN). UPN and IPN are decentralised agencies¹⁶ of the federal Secretariat of Education (*Secretaría de Educación Pública*, SEP). During the 2004-2005 academic year, this group of institutions received 307,788 students in ISCED 5A4, 5A and 6 study programmes under different formats, which represented 12.1% of the total higher education system enrolment.

60. In addition to their teaching activities, the institutions¹⁷ that constitute this subsystem develop a wide array of programmes and research projects aimed at generating and innovatively applying knowledge (GAK), as well as to expanding and promoting culture. UNAM and IPN also offer 3A level study programmes.

61. The UNAM's subsystem of scientific research is currently constituted by 18 institutes and 10 centres located in 13 federative entities: Baja California, Campeche, Distrito Federal, Hidalgo, Jalisco, Michoacán, Morelos, Puebla, Querétaro, Quintana Roo, Sinaloa, Sonora and Veracruz.¹⁸

62. The IPN has 15 research centres in nine federative entities: Baja California, Baja California Sur, Distrito Federal, Durango, Michoacán, Morelos, Oaxaca, Sinaloa and Tamaulipas.¹⁹

¹⁵ Taking only central units into account. Including deconcentrated units the number increases to 1,976. The 1,892 institutions include 433 teaching schools (escuelas normales), of which 249 are public and 184 private.

¹⁶ Deconcentrated agencies are part of managerial centralisation, whose powers are exercised regionally, away from the geographical locus where central power resides.

¹⁷ Higher education enrolment in UNAM was 173,838 students in 2004-2005; IPN's was 81,347; UAM's was 43,630 and UPN's 8,973.

¹⁸ V. www.unam.mx

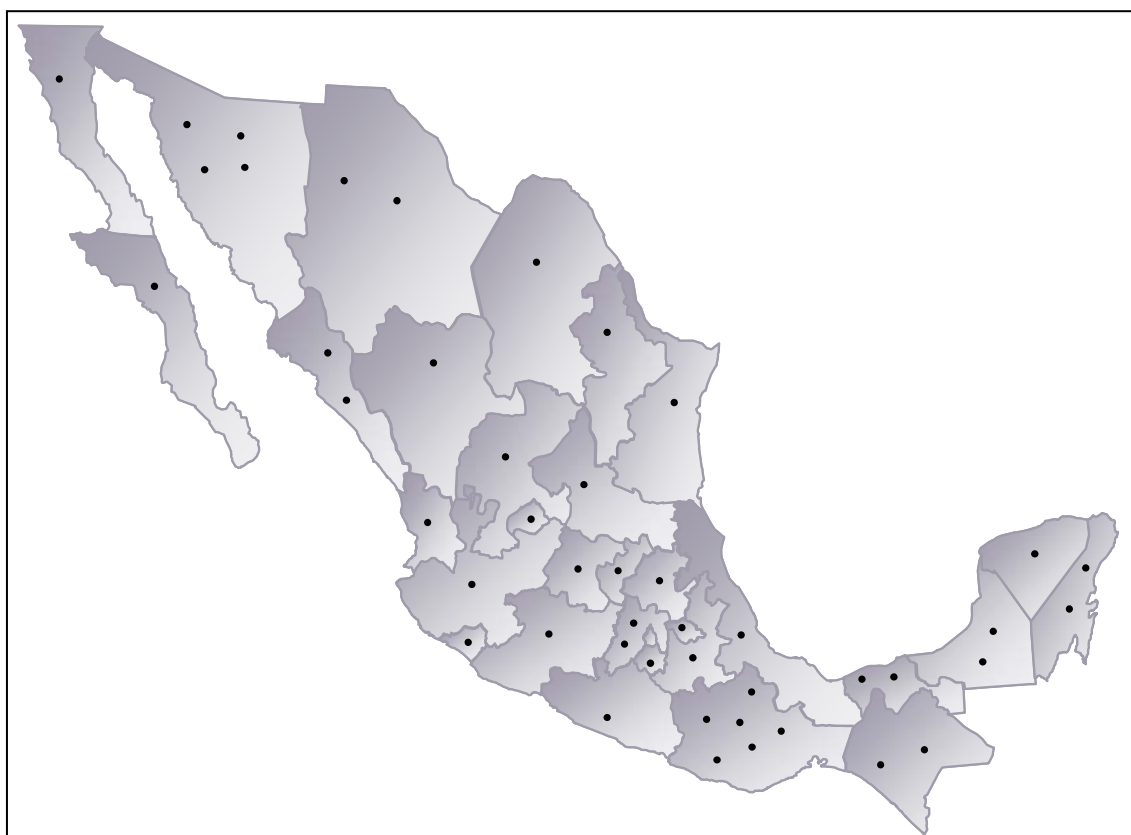
¹⁹ V. www.ipn.mx

2.2.2 The state public university subsystem

63. This subsystem consists of 46 institutions, their central units only included, distributed across Mexico's 31 states (Chart 2.1). Of the former, 74% are autonomous universities and 50% also offer 3A level programmes. These institutions are decentralised agencies²⁰ of the state governments that, in addition to their teaching activities, develop programmes and projects aimed at GAK, as well as expanding and promoting culture. During the 2004-2005 academic year, this subsystem counted 785,917 students enrolled in 5B2, 5A4, 5A and 6 level study programmes under different formats, accounting for 31% of the total system enrolment.

64. Depending on their number of higher education students, institutions in this subsystem may be classified into five groups. Thus, 12 admitted up to 5,000 students; 6 between 5,001 and 10,000; 14 between 10,001 and 20,000 students; 9 between 20,001 and 40,000; and 5 between 40,001 and 80,000 students.

Chart 2.1 Location of state public universities



²⁰ Decentralisation is a legal figure of the public administration organization through the creation of public entities with their own legal personality and patrimony, and responsible for a specific public interest activity.

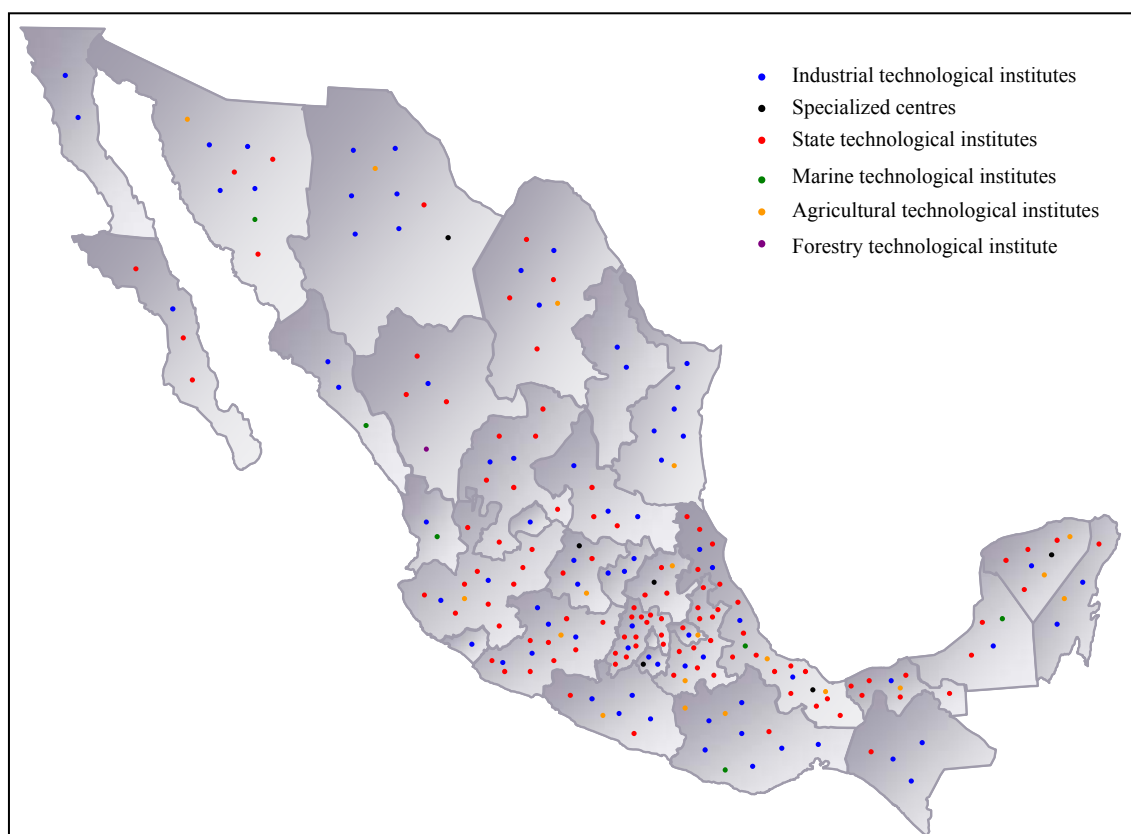
2.2.3 The public technological institute subsystem

65. This subsystem consists of 211 federal and state institutes and six specialized federal centres. Of these, 104 are federal institutions, present in all 31 Mexican states, and 107 are state technological institutes,²¹ located in 22 states (Chart 2.2). In terms of their orientation, 184 are industrial technological institutes, 20 are agricultural, six dedicated to the sea and one to forestry. The six specialised centres are the *Centro Nacional en Investigación y Desarrollo Tecnológico* (CENIDET), the *Centro Interdisciplinario de Investigación y Docencia en Educación Técnica* (CHIDET) and the four remaining institutions are the *Centros Regionales de Optimización y Desarrollo de Equipo*. The federal technological institutes and the research centres perform teaching activities and programmes and projects aimed at GAK, as well as to expanding and promoting culture. Forty-four institutes in this subsystem offer graduate programmes. On the other hand, the state technological institutes perform mostly teaching activities. This subsystem received 325,081 students²² (12.8% of total enrolment) for the 2004-2005 academic year in 5A3, 5A4, 5A and 6 level study programmes.

66. In terms of their enrolment numbers, federal technological institutes may be classified into four groups: 36 admit up to 1,000 students; 26 between 1,001 and 2,000 students; 15 between 2,001 and 3,000 students and 33 over 3,000 students.

67. State technological institutes may be classified into four groups: 74 admit up to 1,000 students; 27 between 1,001 and 2,000 students; five between 2,001 and 3,000 students and one over 3,000 students.

Chart 2.2 Location of technological institutes



²¹ Decentralised agencies of state governments. These institutions have been designed to assist between 3,000 and 5,000 students.

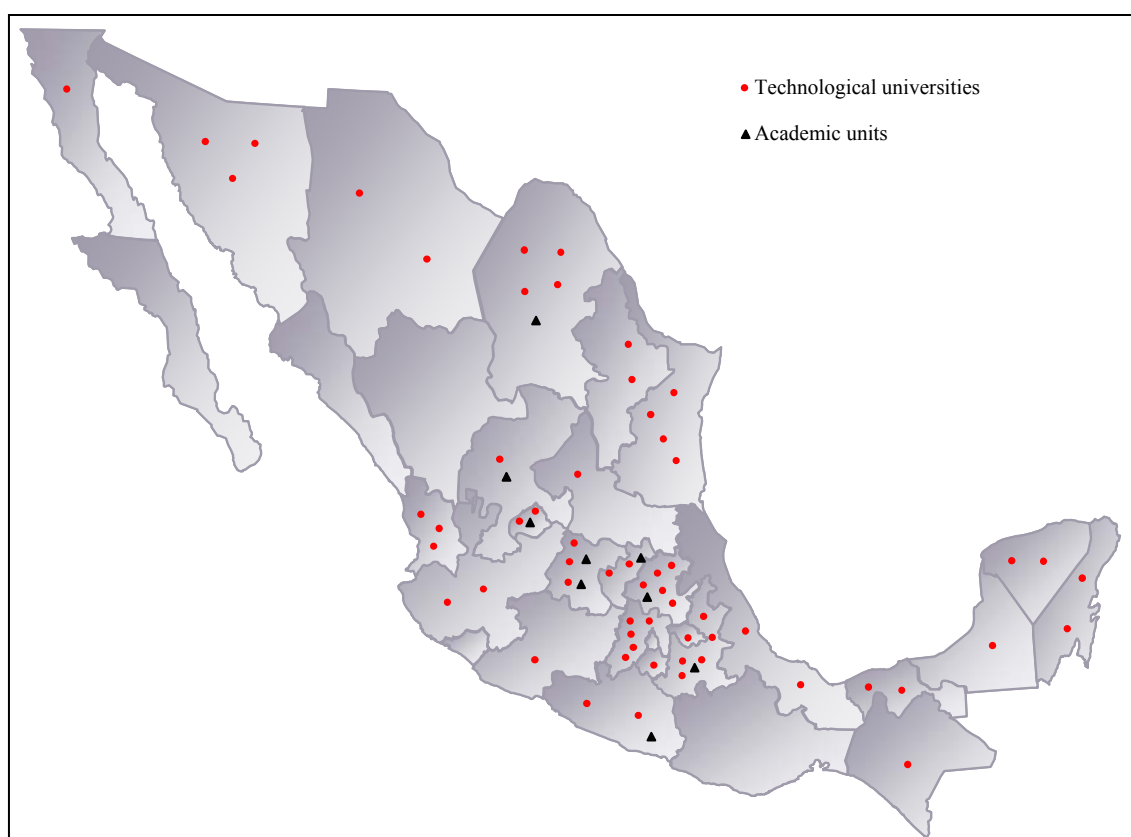
²² From this figure, 238,750 students attended programmes taught at federal technological institutes and 86,331 state technological institutes.

2.2.4 The public technological university subsystem

68. This subsystem consists of 60 institutions located in 26 states (Chart 2.3). Of these, nine have academic extension units offering a limited number of educational programmes, in regions where there were no higher education offerings. They operate under the responsibility of the technological university with the approval of its Managing Board. These universities have been designed to take between 2,000 and 4,000 students each, teaching exclusively two-year study programmes (5B2) leading to the certificate of university level technician. With the purpose of easing the students' way into the labour market once they have concluded their studies, the academic programmes are based on a 70% practical and 30% theoretical curriculum. These institutions are decentralised agencies of the state governments that, in addition to their teaching activities, carry out programmes and projects aimed at GAK, as well as to expanding and promoting technological services. This subsystem received 62,726 students (2.5% of the total higher enrolment figure) for the 2004-2005 academic year.

69. In terms of their enrolment, these institutions may be classified into three groups: 32 admit up to 1,000 students; 21 between 1,001 and 2,000 students and seven between 2,001 and 3,000 students.

Chart 2.3 Location of technological universities



2.2.5 The public polytechnic university subsystem

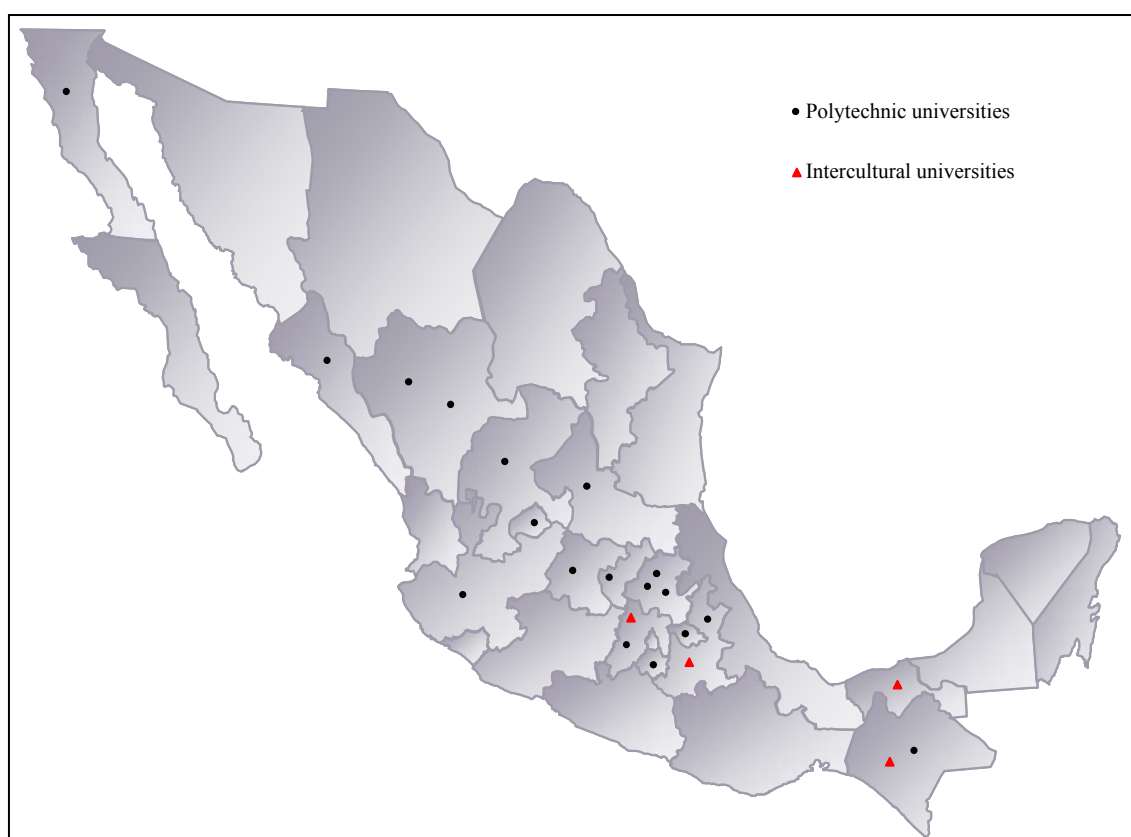
70. This system consists of 18 recently created universities located in 12 states (Chart 2.4). All of them are decentralised state government agencies and have been designed to take a maximum of 5,000 students each. This new institutional profile was incorporated into the higher education system in 2002, as a response to an initiative of the federal government, with the purpose of expanding access opportunities to public higher education and reinforcing the relevance of educational offerings in the regions where these institutions are located. The current curriculum corresponds to a bachelor's degree level (5A4) and there are plans for offering 5A-level postgraduate studies. The current study programmes have been designed

based upon professional skills and on a learning-centred approach. Among this subsystem's policies, full-time teachers must have, at least, a master's degree. On the other hand, part-time teachers must have a master's degree (5A) or, if applicable, a bachelor's degree (5A4) and ample experience in the productive sector. Regardless of its recent creation, these institutions already carry out activities related to GAK and technological service provision. Altogether, these institutions received 5,190 students during the 2004-2005 academic year.

2.2.6 The intercultural public university subsystem

71. This subsystem was the outcome of an initiative from the current federal government, and consists of four institutions located in the states of Chiapas, Mexico, Puebla and Tabasco (Chart 2.4). Located in regions with high densities of indigenous population—albeit open to students of any origin (in fact, 20% of the enrolment is composed of *mestizos*)—, these universities are decentralised agencies of the state governments and have been conceived to take between 2,000 and 3,000 students. Under a cross-cultural concept, these institutions offer innovative higher education options aimed mainly at satisfying the needs and intensifying the development potential of the regions they serve. Knowledge generation activities focus on indigenous language and cultures, as well as on sustainable regional development. In order to improve their performance, full-time teachers at these institutions must have, preferably, a master's degree. This subsystem received 1,281 students during the 2004-2005 academic year.

Chart 2.4 Location of polytechnic and intercultural universities



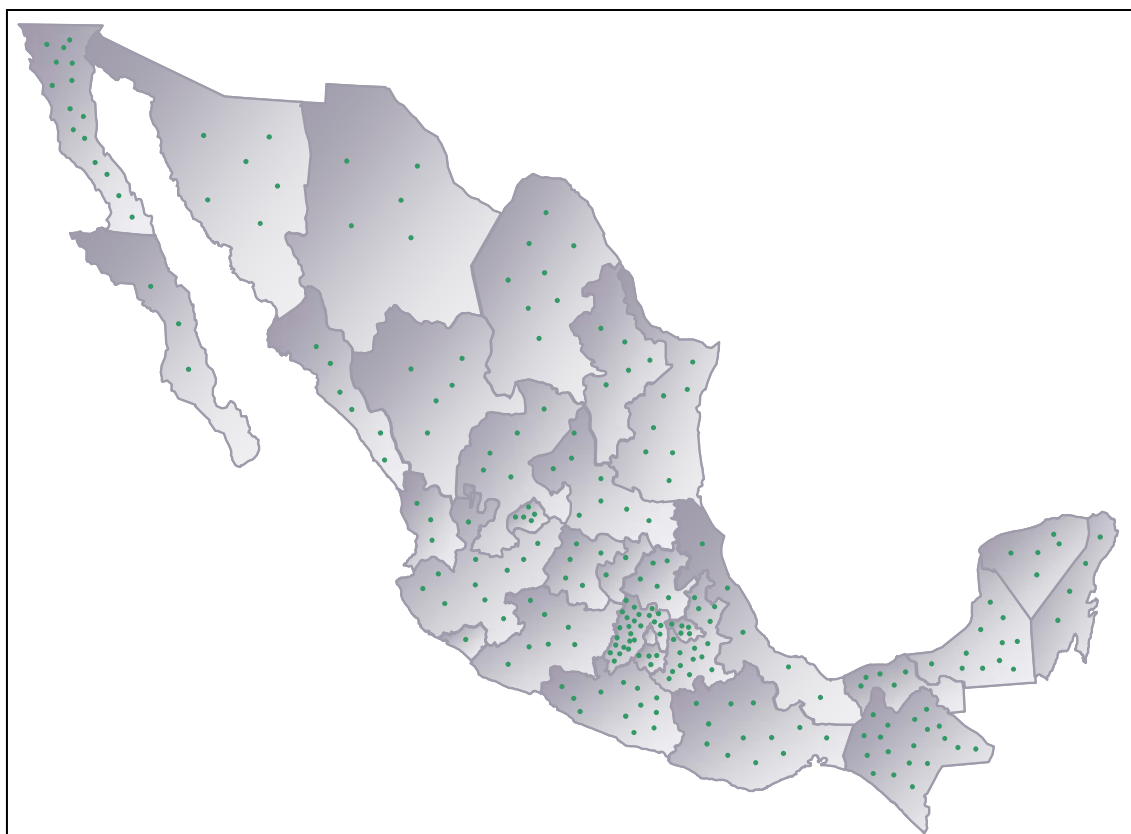
2.2.7 The subsystem of teacher education institutions

72. This subsystem consists of 433 teacher education institutions (*escuelas normales*), distributed all over the country (Chart 2.5), of which 249 are public and 184 private. Public teacher institutions are de-concentrated agencies of SEP or the state governments. This subsystem offers 5A4 level programmes in preschool, elementary, intercultural bilingual education, lower secondary education, and special education, physical and artistic education. In each instance, the curriculum is designed and updated by SEP. The higher-level teacher

education institutions (*escuelas normales superiores*) also offer graduate programmes (5A and 6 levels). During the 2004-2005 academic year, this subsystem received 146,308 students²³ — 92,041 in public schools (62.9%) and 54,267 (37.1%) in private institutions— amounting to 5.8% of the total enrolment in the system.

73. Based upon the enrolment levels, teacher education institutions may be classified into five groups: 98 take up to 100 students; 259 between 100 and 500 students; 58 between 501 and 1,000 students; 16 between 1,001 and 2,000 students; and 2 over 2,000 students.

Chart 2.5 Location of teacher education institutions



²³ 36% of the students were enrolled in the bachelor's degree study programme in secondary education teaching, 29% in elementary school, 21% in preschool, 7% in physical education, 6% in special education and 1% in bilingual intercultural elementary school, artistic education, initial and graduate studies.

Chart 2.6 Location of the units of *Universidad Pedagógica Nacional*



2.2.8 The private institution subsystem

74. This subsystem consists of 995 institutions²⁴ located in every Mexican state. Depending on their official denomination, they are classified into universities, institutes, centres and schools. In most of these institutions teaching is the primary activity. However, the most consolidated also carry out activities aimed at GAK, as well as to expanding and promoting culture. This subsystem received 776,555 students in the 2004-2005 school year, which represents 30.6% of the total enrolment figure.²⁵ With regard to the magnitude of its enrolment numbers, the institutions may be classified into four groups: 741 taking up to 500 students; 116 between 501 and 1,000 students; 67 between 1,001 and 2,000 students and 71 over 2,000 students during the aforementioned school year.

75. The Mexican Constitution indicates that individuals may teach any form and modality of education. Private institutions are not constrained to state their for-profit or non-profit status before the education authorities when applying for the Recognition of Official Validation of Studies (*Reconocimiento de Validez Oficial de Estudios*, RVOE) for any study programme they may offer, which once obtained becomes a part of the National Education System and whose graduates can thus get their professional license. In fact, some private institutions declare themselves as for-profit establishments and may even trade at the Mexican Stock Exchange.

2.2.9 The public research centres subsystem

76. This subsystem consists of 27 institutions that, in addition to generation or innovative application of knowledge in different areas, basically offer 5A and 6 level study programmes and, to a lesser extent, 5A4 level study programmes. Co-ordination of these centres is under the responsibility of the National Council for Science and Technology (*Consejo Nacional de Ciencia y Tecnología*, CONACyT) that dictates development policies and allocates operational

²⁴ Taking only central units into account. The figure excludes private teacher education institutions which are accounted for in the subsystem of institutions aimed at training basic education professionals

²⁵ Including 54,267 students from private *escuelas normales*. Total enrolment amounts to 830,822 (32.7%).

resources. This subsystem received 2,801 students²⁶ (0.1% of the total enrolment figure) during the 2004-2005 school year.

2.2.10 Other public institutions

77. There are other 94 public higher education institutions, autonomous and non autonomous, not included in the previous subsystems. These establishments are sectorised into federal secretariats or decentralised agencies of state governments (universities, schools, research centres, music schools, artistic education centres, etc.). Worth mentioning among them is the *Universidad Agraria Autónoma Antonio Narro*, the *Universidad Autónoma Chapingo*, the *Universidad Interactiva y a Distancia del estado de Guanajuato*, the *Colegio de Postgraduados*, the *Universidad del Ejército y la Fuerza Aérea*, the *Universidad Pedagógica Nacional* units in different states,²⁷ *El Colegio de México*, the *Escuela Nacional de Antropología e Historia*, the *Escuela Nacional de Biblioteconomía y Archivonomía*, and the *Centro de Investigación y Estudios Avanzados del Instituto Politécnico Nacional*. The latter is a deconcentrated agency of SEP offering only graduate study programmes (5A and 6) that carries out GAK activities in a series of natural, exact and social sciences fields. This subsystem received 124,609 students in the 2004-2005 academic year, which represents 4.9% of the total enrolment figure.

Table 2.1 Distribution of total enrolment in higher education

Subsystem		Institutions	Enrolment
Federal public institutions		4	307,788
State public universities		46	785,917
Public technological institutes		211	325,081
Public technological universities		60	62,726
Public polytechnic universities		18	5,190
Public intercultural universities		4	1,281
Elementary and lower secondary education teacher education institutions	public	249	92,041
	private	184	54,267
Private institutions		995	776,555
Public research centres		27	2,801
Other public institutions		94	124,609
Total		1,892	2,538,256

Source: SEP. *Formato 911, ciclo escolar 2004-2005*.

2.3 Institutions' typology

78. Institutions may also be classified in terms of the nature of their educational options and the activities carried out by them. In this sense, it is advisable to employ an adaptation of the typological scheme²⁸ developed in 1999 by the National Association of Universities and Higher Education Institutions (*Asociación Nacional de Universidades e Instituciones de Educación Superior*, ANUIES) (Table 2.2).

²⁶ Of the total enrolment figure, 455 students were taking bachelor's degree courses and 2,346 graduate studies.

²⁷ The UPN state units are deconcentrated agencies of each state government, co-ordinated in academic aspects by the Ajusco unit (Mexico City) of the UPN. These units received 59,730 students during the 2004-2005 academic year.

²⁸ Fresán O. Magdalena and Taborga T. Huascar, *Tipología de las Instituciones de Educación Superior*, ANUIES, Mexico 1999.

Table 2.2 Typology of higher education institutions

Type	Description	Public	Private
I	Higher education institutions with activities such as knowledge transmission and application offering exclusively ISCED 5B2 level study programmes.	61	9
II	Higher education institutions whose primary activity consists in transmitting knowledge, offering mainly or exclusively 5A4 level study programmes.	208	636
III	Higher education institutions whose primary activity consists in transmitting knowledge, offering 5A4 and 5A level study programmes.	65	288
IV	Higher education institutions with activities related to transmission, generation and innovative application of knowledge, offering 5A4 level study programmes and postgraduate studies (mainly 5A and some 6 level study programmes).	45	17
V	Higher education institutions with activities related to transmission, generation and innovative application of knowledge, offering 5A4 and postgraduate studies (5A and 6 level study programmes).	52	23
VI	Higher education institutions with activities related to generation and innovative application of knowledge, offering almost exclusively 5A or 6 level study programmes.	33	3
	TOTAL	464	976

Note: 19 private institutions could not be classified based on this typology. Teacher education institutions are not included.

79. In terms of typology, there is a predominance of institutions offering, exclusively or primarily, 5A4 level study programmes and whose primary activity is transmission of knowledge. Generation and innovative application of knowledge is primarily carried out by public institutions and public research centres.

80. Public institutions also carry out relevant culture preservation and transmission activities. A relevant number of public universities have spaces exclusively for this activity, and some of them have professional or student dance, music and drama groups. In addition, 28 institutions carry out activities through university radio and TV stations.

2.4 Enrolment

81. Total enrolment in higher education during the 2004-2005 academic year reached 2,538,256 students,²⁹ of which 2,384,858 carried out their studies in traditional schooling programmes and the rest, 153,398 students, in open or mixed environments. Moreover, 50.9% of total enrolment was women and 49.1% men. Generally, programmes requiring physical attendance are rigid and configure, almost completely, the students' educational trajectory.

²⁹ Includes 146,308 teacher education institutions students.

82. Out of the total enrolment figure, 83,494 students (3.3%) were registered in ISCED 5B2 level study programmes, 2,288,259 in 5A4 level studies (90.2%) and 166,503 (6.5%) in 5A and 6 level study programmes.³⁰ Globally, the public subsystem received 67.3% of the total enrolment figure. Level-wise, the public subsystem received 96.2% of the total number of students from 5B2, 68% of the 5A4 level students and 56% of 5A and 6 level students.

83. Tables 2.3 and 2.4 respectively show the distribution of enrolment by knowledge area and levels.

Table 2.3 Distribution of total enrolment in higher education by knowledge area

	Enrolment (%)					
	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology
Total	2.1	8.7	2.1	43.2	15.2	28.7

Source: SEP. *Formato 911, ciclo escolar 2004-2005.*

Table 2.4 Distribution of total enrolment in higher education by ISCED level and knowledge area

	Enrolment (%)					
ISCED level	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology
5B2	1.4	6.9	0.02	37.4	1.2	53.1
5A4	2.1	8.4	2.0	43.5	15.0	29.0
Especialidad, 5A and 6	1.9	14.3	5.4	41.1	24.5	12.8

Source: SEP. *Formato 911, ciclo escolar 2004-2005.*

84. In the last decade, the total enrolment of the whole system grew 78.6%. The increase is observed in all federative entities, modalities and educational levels, except in teacher education institutions as a result of the policies for service regulations in these institutions agreed in 2001 between the federal and state governments. Participation of women in the structure of enrolment increased from 46.7% to 50.9% and consequently in the graduate structure. The annual growth rate of the private subsystem enrolment decreased from 16.5% in the academic year 2000-2001 to 2.5% in 2004-2005.

85. In the period of reference, the 5B2 level enrolment increased by a factor of 32 and that of 5A and 6 levels in 154%. In the academic year 1994-1995, 5A and 6 levels enrolment was

³⁰ Graduate studies' enrolment is distributed as follows: 19.7% in one year programme (*especialidad*), 71.7% in 5A level degrees and 8.6% in 6 level degree.

distributed 28.6% in *especialidad* programmes, 64.5% in master's and 6.9% in doctorate's. In the academic year 2004-2005, the number of students enrolled in a *especialidad* represented 19.7% of the total enrolment, master's was 71.7% and doctorate level programmes represented 8.6%. On the other side, in 1994 the enrolment of this level in Distrito Federal, Nuevo León, Jalisco, Estado de México, Puebla and Guanajuato represented 71.7% from the total. Ten years later their participation lowered to 58.7%. In particular, in the academic year 1994-1995, the enrolment of the institutions located in Distrito Federal represented 37.6% from the total, while in the academic year 2004-2005 it decreased to 27.2%. This accounts for an important geographical deconcentration process of postgraduate studies in the last decade.

2.5 Student's profile

86. Chapter 6 describes the type of students attending higher education more thoroughly. It should be noted, however, that 27.7% of this cohort is aged between 17 and 19 years old, 62% between 20 and 24 years old, and 10.3% is 25 or older. Most students (94.6%) are single and 31.8% work and study at the same time.

87. Half of the student cohort is the first generation in their families to access higher education.

2.6 Acquisition of degrees and certificates

88. In order to obtain a 5B2 or a 5A4 level degree in an institution belonging to the National Education System, candidates must have taken the number of subjects, modules or credits corresponding to the selected programme as well as worked a period of social service. Most institutions require, in addition, complying with a supplementary activity, such as a thesis, a dissertation, a report of trainee work at a firm, report of the social service provided, attest skills in one or more languages other than Spanish, a degree seminar, etcetera.

89. In order to carry out postgraduate studies, candidates must have completed a 5A4 level study programme from a higher education institution belonging to the National Education System,³¹ and, in order to obtain the degree, the student must have taken and passed the subjects, modules or credits in the curriculum and have satisfied the requirements established by the institution (thesis, academic knowledge tests, fluency in a foreign language, refereed publications, etcetera).

2.7 Graduates

90. During the 2004-2005 academic year, 371,080 students —132% more than in 1994— concluded their studies, of them 65.6% did so in public institutions and 34.4% in private schools. Gender-wise, 48.2% of the students were male and 51.8% female. In terms of levels, 21,854 students (5.9%) finished 5B2 level programmes, 296,968 (80.0%) 5A4 and 52,258 (14.1%) 5A and 6 level studies. Completion rates among those receiving degrees were 57% in 2004, which is an outstanding result compared to the rate of 38% registered in 1994.

91. The number of professionals that obtained their registration³² in 2005 was 259,593, of which, 45.6% were men and 54.4% were women. In terms of educational levels, 18,853 professionals registered their 5B2 level degree, 217,578 their 5A4 level degree, 7,168 their *especialidad* certificate, 15,010 their 5A level degree and 984 their 6 level degree.

³¹ In case of having studied abroad it is necessary to have the appropriate validation, as is established in the General Law of Education (*Ley General de Educación*).

³² At SEP's General Directorate of Professions (*Dirección General de Profesiones*).

2.8 Professors

92. Public institutions reported the employment of 154,205 professors³³ during the 2004-2005 academic year, whereas private schools reported 94,577 professors. The public subsystem reported 59,409 full-time professors (38.5%), 11,537 three quarters and half-time professors (7.5%) and 83,259 on an hourly basis professors (54%). On the other hand, the private subsystem reported 9,609 full-time professors (10.2%), 5,580 part-time (5.9%) and 79,388 (83.9%) on an hourly basis.

93. The significant differences between the full time proportions of professors hired in the public and the private subsystems are due to the nature of the educational supply from the institutions and the roles they play. For instance, most of this supply in the private subsystem focus around practical³⁴ programmes that mostly require professors hired non full time. The public subsystem is more varied in terms of the nature of its educational offers and the roles they play. This subsystem offers, in addition to practical programmes, practical programmes requiring very personalised instruction, scientific-practical, intermediate and basic programmes (Chapter 7) requiring a considerable percentage of full-time professors. The institutions bearing the typology profile IV, V and VI also perform GAK activities carried out necessarily by full-time professors.

94. Table 2.5 shows the full time professors' academic formation level within the public and private subsystems. Of them, 61.4% possesses at least a postgraduate degree and 19% has a doctorate degree. From the total number of professors with a doctorate degree (13,113), 86.5% works in public institutions.

95. Table 2.6 shows similar information as a function of the typological profile of institutions. The percentage of professors with postgraduate degrees increases progressively from type I to VI according to the kind of educational options and the functions performed by the institutions. In type I institutions it represents 33% (1% with doctoral degrees), while in type VI institutions the percentage reaches 98% (72% with doctoral degrees). The 93.3% of professors with doctoral degrees are working in institutions with typological profiles IV, V and VI.

96. It is important to point out that in the last decade, federal policies and their instruments have propitiated the increase of the total number of professors (full and partial time) of the whole system and their improvement of the academic profile, from 134,357 (30.9% postgraduates, of whom 4.8% were doctors) in the academic year 1994-1995 to 248,782 (42% of postgraduate degrees of whom 8.3% were doctors) in the academic year 2004-2005, of the full time professors from 38,398 (44% postgraduates and 10.2% were doctors) to 68,923 (61.4% postgraduates and 19% are doctors; and of professor-researchers and researchers registered in the National System of Researchers (*Sistema Nacional de Investigadores*, SNI) from 5,879 to 12,096 in the same period, which accounts for their research activities, the quality and regularity of their academic production and their contribution to the fulfillment of the institutional goals.

³³ Information is obtained from SEP's *Formato 911*.

³⁴ Practical study programmes are, among others: Law, Accounting, Administration and Design. Scientific-practical programmes are, among others: Medicine, Economics, Engineering, Sociology and basic programmes are as History, Physics and Mathematics.

Table 2.5 Academic background of full time teaching staff in public and private institutions; 2004-2005 academic year

Institution	ISCED Level				
	5B2	5A4	Especialidad, 5A and 6	6	Total
Public	981 (1.6%)	22,225 (37.4%)	36,267 (61.0%)*	11,343 (19.1%)	59,473
Private	163 (1.7%)	3,247 (34.4%)	6,040 (63.9%)*	1,770 (18.7%)	9,450

*Includes professors with doctoral degree.

Source: SEP. *Formato 911, ciclo escolar 2004-2005.*

Table 2.6 Distribution of full time teaching staff by academic background and typological profile of institutions; 2004-2005 academic year

Institution	Typology	5B2	5A4	Especialidad	5A	6	Total
Public	I	42 (1.9)	1,429 (64.7)	118 (5.3)	600 (27.1)	21 (1.0)	2,210
	II	188 (5.5)	1,911 (56.2)	174 (5.1)	1,017 (29.9)	110 (3.2)	3,400
	III	30 (0.8)	1,590 (40.2)	225 (5.7)	1,630 (41.2)	481 (12.2)	3,956
	IV	263 (4.3)	2,716 (44.2)	496 (8.1)	2,287 (37.2)	385 (6.3)	6,147
	V	458 (1.1)	14,525 (35.1)	1,599 (3.9)	16,165 (39.0)	8,674 (20.9)	41,421
	VI	0 (0)	54 (2.3)	12 (0.5)	601 (25.7)	1,672 (71.5)	2,339
Private	I	5 (11.6)	23 (53.5)	1 (2.3)	13 (30.2)	1 (2.3)	43
	II	33 (2.2)	1,186 (78.9)	65 (4.3)	192 (12.8)	27 (1.8)	1,503
	III	95 (3.7)	1,029 (40.0)	150 (5.8)	1,056 (41.0)	245 (9.5)	2,575
	IV	0 (0)	27 (8.7)	6 (1.9)	119 (38.3)	159 (51.1)	311
	V	30 (0.6)	982 (19.8)	180 (3.6)	2,472 (49.8)	1,296 (26.1)	4,960
	VI	0 (0)	0 (0)	0 (0)	16 (27.6)	42 (72.4)	58

Percentages are shown in brackets

Source: SEP. *Formato 911, ciclo escolar 2004-2005.*

2.9 Regulatory framework

97. The basic regulatory framework for higher education in Mexico, whose description appears in the Annex, consists of the Mexican Constitution (*Constitución Política de los Estados Unidos Mexicanos*), the General Education Law (*Ley General de Educación, LGE*), the Higher Education Co-ordination Law (*Ley para la Coordinación de la Educación Superior*), the Regulative Law for Article 5 of the Constitution (*Ley Reglamentaria del Artículo 5º Constitucional*), the education and higher education state laws, the Internal Regulations of the Secretariat of Education (*Reglamento Interior de la Secretaría de Educación Pública*), the organic laws of autonomous and non-autonomous public universities, SEP Agreements Ns. 93, 243, 279, 286 and 328 and the Co-ordination, Operation and Financial Assistance Agreements between the federation, the states and the institutions. Labour relationships are governed by the Federal Labour Law (*Ley Federal del Trabajo*).

2.10 Agencies empowered for policy implementation

98. The Federal Public Administration Planning Law (*Ley de Planeación de la Administración Pública Federal*) dictates that the executive branch must design and implement a National Development Plan (*Plan Nacional de Desarrollo*, PND), as well as several sectoral programmes derived from it. The sectoral programme associated to education is designed by SEP, containing strategic targets, policies, particular objectives, action guidelines and general goals during the period in question. Complying with this programme is compulsory for those who work at the federal public administration and the deconcentrated institutions of the federal government. In addition, it is the guiding framework for state governments and their decentralised agencies, as well as for the higher education autonomous public and private institutions.

99. In Mexico, the federal government, through SEP, is responsible for implementing the national education plans and policies, while the state governments are responsible for their plans and policies. In the specific case of higher education, other federal government instances participate in defining federal policies.

2.11 Agencies responsible for financing

100. Each year, through SHCP, SEP sends a proposal to the head of the executive branch containing the amounts to be invested in every form of public higher education. SHCP considers such proposal when preparing its expenditures budget project that the executive branch submits, in turn, to the Chamber of Deputies of the Mexican Congress, the body that eventually authorises the amount of resources that will be oriented towards this level. Simultaneously, state budgets reflect the agreements reached in each Congress regarding the funds that state governments will allocate to higher education (Chapter 7).

101. On the other hand, through its Under-secretariat for Higher Education (*Subsecretaría de Educación Superior*, SES), SEP calls for bids on extraordinary subsidy to improve and assure institutional quality and expand physical infrastructure and equipment (Chapter 7). Likewise, CONACyT contributes to higher education development by allocating funds oriented towards high-level human resource training and, along with SEP, improve and assure postgraduate curriculum quality offered by public and private institutions through fund bids (Chapter 5).

102. In order to fulfil their tasks, federal public institutions receive an ordinary annual subsidy from the federal government. The subsidy allocated to public state universities is integrated by the federal and state government contributions, in different proportions according to agreements between the federation and the state in which the university is located. The subsidy for federal technological institutes is allocated by SEP based upon a set of guidelines and criteria established by the Secretariat itself. In the instance of technological, polytechnic and intercultural universities as well as state technological institutes, the subsidy consists of contributions distributed on a 50% basis from both the federation and their states. The same financial scheme applies to state public universities created after 1997 (Chapter 7).

103. During the 2004-2005 academic year, the average annual cost per student³⁵ indicator for federal public universities was Mx\$80,420, while the cost at state public universities reached an average Mx\$41,280. In this subsystem, however, the annual cost per student index showed a significant variation across institutions, from an Mx\$22,090 low, to a high of Mx\$79,120 during that same year. The average annual cost per student indicator at technological universities and institutes was Mx\$31,320 and Mx\$23,850, respectively during the aforementioned academic year.

³⁵ The cost per student index is calculated dividing the total university's ordinary and extraordinary subsidy by the sum of the higher education students plus a third of upper-higher secondary students should the university offer this latter educational level. Ordinary and extraordinary subsidies may be looked up in the Higher Education Under-secretariat webpage (www.ses.sep.gob.mx).

2.12 Assessment agencies

104. Currently, higher education assessments are carried out by a group of instances and agencies whose origin and roles are extensively described in Chapter 9. Since 2001, the federal government has worked with the agencies pursuing their co-ordination into a national assessment and accreditation system (*Sistema Nacional de Evaluación y Acreditación*). These are: the Inter-institutional Committees for Higher Education Assessment (*Comités Interinstitucionales para la Evaluación de la Educación Superior*, CIEES) which, since their creation in 1991, carry out diagnostic assessments of the study programmes and institutional management and administration, and cultural diffusion roles; the National Centre for Higher Education Assessment (*Centro Nacional de Evaluación para la Educación Superior*, CENEVAL), was created in 1994 with the purpose of contributing to further the knowledge on higher education quality through the design and implementation of standard entrance and exit level tests and the Council for the Accreditation of Higher Education (*Consejo para la Acreditación de la Educación Superior*, COPAES) which was established in 2000 in order to regulate the accreditation processes for 5B2 and 5A4 level study programmes from public and private institutions, formally acknowledging the agencies meeting the requirements established by the council.³⁶

105. To date, COPAES has recognised 23 accrediting bodies for 5B2 and 5A4 level study programmes in accounting and administration, agronomy, architecture, biology, chemical sciences, communications, computer sciences and informatics, dentistry, design, economics, engineering, law, medicine, nursing, nutrition, ocean sciences, pharmaceuticals, physical activity, psychology, social sciences, tourism, and veterinary medicine and zootechnics.

106. In order to assess the quality of postgraduate programmes, the framework of reference is the SEP-CONACyT National Registry of Postgraduate Programmes (*Padrón Nacional de Posgrado*, PNP) (Chapter 5). Likewise, the framework of reference to grant the RVOE to study programmes offered by private institutions is SEP's assessment procedure scheme under Agreement N.279, as well as those established by the state governments.

107. The LGE establishes that RVOEs are granted to private institutions when they fulfill the following requirements: academic staff that credits appropriate habilitation for the development of higher education functions; adequate facilities to satisfy hygienic, security and pedagogical conditions set by the authority; and study programmes considered appropriate by the authority. It is important to mention that, based on the law; private institutions may offer study programmes without having been granted the RVOE. Nevertheless, in this case, the programmes are not incorporated into the National Educational System and their graduates can not obtain the professional license.

108. During the process of evaluation for granting RVOE to one or several study programmes offered by an institution, or to one or several programmes that could lead to the creation of an institution, the educational authority verifies that the private institution fulfills the requirements to offer the new educational service.

109. On the other hand, with the purpose of granting the administrative simplification regime to private institutions complying with the requirements established by Agreement N.279, SEP agreed with the Federation of Mexican Private Higher Education Institutions (*Federación de Instituciones Mexicanas Particulares de Educación Superior*, FIMPES), in 2000, to rely on its Institutional Accreditation System (*Sistema de Acreditación Institucional*).

110. Since its creation in 1984, SNI has been the primary tool for external assessments of academic production quality by researchers-professors from higher education institutions and investigators from research centres. Through this system, the federal government has encouraged full time and high-level academic staff to remain in public institutions (Chapter 5).

³⁶ In the Reviews of Federal Policies for Education OECD experts recommended establishing a national accreditation system for institutions and programmes.

2.13 Tensions in the higher education system

111. Federal and state policies have widely promoted decentralizing and diversifying the supply and profiles of higher education institutions that shape the system. This has contributed to minimize the tensions that, inevitably, arise across any system's elements.

112. Given this diversification, as described in the different subsystems as well as in the institutions' typologies, higher education in Mexico is based on public and private institutions; universities and technological institutes; federal and state government-decentralised study centres; autonomous and non-autonomous public universities; some institutions are basically oriented towards transmitting knowledge, others add to the latter its generation and innovative application; some are SEP' sector specific; and other federal public administration agencies.

113. Such variety allows the elimination or mitigation of tensions that would otherwise permeate the system. For instance, although every public higher education institution strives for the highest amount of public subsidy possible—from federal, state or municipal origins—it is not possible, however, for a state university to aspire to subsidies from another state. On the other hand, institutions oriented exclusively towards teaching activities do not compete for public resources aimed at GAK.

114. To a large extent, the internal tensions in the higher education system are a consequence of its considerable size and complexity. Some of these tensions are generated by the difficulties in coordinating the implementation of federal, state and institutional-level policies effectively, and others as a response to the gap between such policies and the customs, interests and rules established by different actors in the system.

115. In other cases, tensions arise as a result of expansion and quality assurance processes or from the weakened capacity of the federal and state governments to finance public institution development; from the differences, sometimes extremely significant, across the institutions' annual average cost per student indices, as well as from the application of federal and state policies regarding the extension and diversification of educational supply by means of creating new public institutions, seen by the existing ones as competitors in public fund allocation. Finally, tensions may also arise between the newer institutions with relevant—and sometimes innovative—supplies and more “traditional” ones.

116. Increasing tensions also emerge owing to the social demands for higher quality and more relevant education as well as to the encouragement to obtain external assessment and accreditation for programs in the context of federal policies and to the recent differentiation among institutions achieving official recognition from evaluation and accreditation instances and agencies due to the high quality of their programmes, which leads, in turn, to an improved social positioning and those that have not reached such level, among others.

117. Other tensions result from an unfinished federalization process. Concerning the institutions aimed at training basic education professionals, for example, albeit their being decentralized agencies of state governments, decisions are still made at the federal level on relevant aspects of their operation. State authorities are demanding more participation in the decision making process.

118. In their legitimate search for better working conditions for their members, labour unions generate financial tensions on both institutions and the system that, on certain occasions, cannot be solved with the resources available. On the other hand, labour unions frequently demand participation in processes that are the concern of the institutions only, such as academic staff admissions, promotion and permanence. It is not unusual for institutions to give in to these pressures, thereby violating constitutional regulations.

2.14 The National Education Programme 2001-2006: strategic objectives and national goals

119. The National Education Programme 2001-2006 (*Programa Nacional de Educación, PRONAE*), is the outcome of an extensive consultation process that included inputs from a large number of institutions, agencies, researchers, students, alumni and education authorities, as well as the education commissions of the legislative branch, ANUIES, FIMPES, the Education Commission of the Entrepreneurial Coordinating Council (*Comisión de Educación del Consejo Coordinador Empresarial*) and other private and public agencies. Over 8,000 proposals were sent by interested parties through different channels, or presented at the 32 forums carried out in Mexican states for that purpose. The information received either through Internet or the Mexican postal service was classified by INEGI, while its analysis was SEP's responsibility.

120. SEP validated 2,398 initiatives in 64 meetings. These proposals contributed innovative insights for the formulation of PRONAE. Many citizens and institutions were thus parties in the Programme's design.

121. PRONAE establishes that higher education is a strategic tool in terms of increasing Mexico's human and social capital, and the collective and individual intelligence of its citizens; to enrich the culture with the contributions of the humanities, the arts, the sciences and technologies; and to contribute to the improvement of competitiveness and employment required to encourage national product growth, as well as social cohesion and justice, to consolidate democracy and national identity, based on Mexico's cultural diversity in addition to improving income distribution among the population.

122. PRONAE has three strategic goals: 1) Expand the system by privileging equity; 2) Provide good quality education responding to the needs of every Mexican and effectively contribute to the country's social and economic development; and, 3) Foster educational federalism as well as the system's planning, co-ordination, integration, institutional management, and social participation.

123. The Programme also contains a *Vision* of higher education up to the year 2025:

- *Higher education must be Mexico's lever, encouraging social development, democracy, multi-cultural co-existence and sustainable development. It will provide Mexicans with the tools required for their comprehensive development and will train cultured scientists, humanists and professionals in every field of knowledge, as conveyors of the most advanced erudition and committed to the country's needs.*
- *The higher education system will be open, flexible and high quality, with domestic and international recognition. It will feature social appreciation for its alumni, adequate coverage and co-ordination with other education systems, as well as with science, technology, art and culture.*
- *Higher education institutions will be highly capable of responding to the academic needs of its students, increasingly diverse given their social and ethnic origins, and will be part of academic co-operation and exchange networks, domestic and international, that will support professor and student mobility programmes. Its institutions will be assimilated to their respective environments and be a consultation source for society and its representatives owing to their proven moral and academic authority.*
- *The higher education system will consist of 32 state systems, will be extensively supported by society and will receive over half of the population aged 19 to 23 years old with wide, flexible and diverse programmes taught at institutions with different typologies. In addition, it will provide updating opportunities to all its alumni and will offer varied types of continuous*

education options in order to satisfy the education needs of the adult population.

- *The society will be fully informed about the academic performance and resource employment of every higher education institution, based on consolidated evaluation and accreditation processes.*

124. The three strategic objectives and the ambitious goals contained in the 2025 *Vision* of the higher education system have constituted the guiding framework of the current administration's actions in terms of defining policies and strategies, in co-ordination with state governments and institutions, in order to accomplish a set of goals in 2001-2006. This has demanded the articulation of long-term planning with more immediate objectives during the past five years.

125. The first strategic objective of PRONAE has been implemented through a set of policies (chapters 4 and 6) designed to foster an equitable enrolment expansion, encouraging increased participation from young population from the most marginalised sectors, from women in each of them as well as from representatives of different cultures and languages.

126. In this sense, SEP has based its actions on the following programmes:

- National Programme of Scholarships for Higher Education (*Programa Nacional de Becas para la Educación Superior*, PRONABES) (Chapter 6).
- Programme of Expansion of Educational Supply (*Programa de Ampliación de la Oferta Educativa*) (Chapter 4).

127. PRONABES has the objective of expanding access opportunities to public higher education so that increasing numbers of youths in adverse economic situations may have access to good quality university 5B2 and 5A4 level programmes, as well as for them to conclude their studies in a timely fashion (Chapter 6). This programme was launched³⁷ by the Federal Government in collaboration with the state governments and federal and state public institutions, during the 2001-2002 academic year, under a well sounded co-ordination scheme. Currently, the programme has granted 322,197 scholarships. Over half of its beneficiaries are women. The programme has facilitated indigenous students and those living in marginalised rural and urban areas their access to public higher education.

128. The objectives of the Programme of Expansion of Educational Supply are to expand and diversify the schooling and non open options of the public higher education subsystem, thus expanding access opportunities, particularly for the poorer population. In addition, it strives to close gaps in coverage rates among states and contributes to reinforce the system's relevance. In order to operate, and in PRONAE's context, SEP established a set of policies (described in Chapter 8) —in agreement with the education authorities of the states— that have guided decision-making actions during the past five years.

129. Resulting from state government initiatives, technically endorsed by the State Commissions for Higher Education Planning (*Comisiones Estatales para la Planeación de la Educación Superior*, COEPES), in 2001-2005 the federal government advocated, through SEP, the creation and operation of 84 higher education state public institutions and the expansion and diversification of the educational options offered by existing institutions, employing the criteria and guidelines described in chapters 4 and 6. In addition, it has encouraged and supported the creation and operation of the fourth Academic Unit of UAM, in western Mexico City.

130. The creation of new higher education public institutions and the expansion and diversification of educational options in state public universities and technological universities

³⁷ PRONABES' operation and its contribution to expanding student access, permanence and timely graduation opportunities are detailed in Chapter 6. OECD experts recommended a considerable expansion of the scholarship system in the Reviews of Federal Policies for Education.

and institutes have set the groundwork to incorporate over 250,000 new locations to the public higher education subsystem in coming years, which will reinforce its development and service capabilities.

131. Consequently, total enrolment in higher education increased by 340,554 students in the past four academic years, a 15.5% growth. By the same token, the number of professors grew from 208,692 to 248,782.

132. Increases in enrolment are evident in every type and level of higher education (50.6% in 5B2, 18.9% in 5A4 and 18.6% in 5A and 6 level study programmes), except for teacher education institutions, which decreased by 27.7% as a result of federal and state policies in terms of regulating their services³⁸ (Table 2.7).

133. Preliminary data on total enrolment for the 2005-2006 academic year estimate it at over 2,613,466 students; by the 2006-2007 academic year, such figure could reach 2,700,000, bringing the total cumulative growth during the current federal administration to 22.9% (approximately 500,000 additional students) with regard to total enrolment in the 2000-2001 academic year.

134. Table 2.8 shows how the coverage rate by state has evolved from 2000-2001 to 2004-2005. The coverage increased in almost every state, significantly so in some. The decreases in the states of Nayarit and Tamaulipas are basically explained by a reduction in their *escuelas normales* enrolment numbers during this period.

135. The calculations for the coverage rate in the 2004-2005 academic year presented in Table 2.8, were carried out employing, on one hand, the 19-23 year old group cohort estimated by the National Population Council (*Consejo Nacional de Población*, CONAPO), and, on the other, the information recently published by INEGI concerning the II Population and Housing Count 2005 (*II Censo de Población y Vivienda 2005*). The population in the 19-23 year old group, according to INEGI, was 9,059,384 individuals, while CONAPO's estimate fixes the figure at 10,251,107, i.e. 1,191,723 additional individuals. This situation also appeared in 2000, when the population resulting from the XII General Population and Housing Census (*XII Censo General de Población y Vivienda*) was lower than the figure resulting from CONAPO's estimates and by an amount similar to that of 2005.

136. Employing INEGI's data, the average coverage rate for the higher education system reached 26.2% in the 2004-2005 academic year. The preliminary information available for the current academic year (2005-2006) indicates that the average rate will hover around 27%, foreseeing it will reach 28% in 2006-2007.

Table 2.7 Evolution of total enrolment in higher education by level

ISCED level	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2000-2004 increase
5A4 (<i>escuelas normales</i>)	200,931	184,100	166,873	155,548	146,308	-27.2%
5B2	55,448	63,550	69,024	76,065	83,494	50.6%
5A4	1,800,870	1,894,698	2,002,667	2,086,197	2,141,951	18.9%
Especialidad, 5A and 6	140,453	146,022	152,694	158,793	166,503	18.6%
Total	2,197,702	2,288,370	2,391,258	2,476,603	2,538,256	15.5%

Includes school and non-school enrolment.

Source: SEP. *Formato 911*.

137. Since a sizeable percentage does not have the previous training required, not all of the 9,059,384 individuals in the 19-23 cohort reported by INEGI constitute potential demand for the

³⁸ Enrolment in elementary education is decreasing as a result of the evolution in the demographic pyramid, which generates a lower demand for professors.

higher education system. Taking into account the graduation rates from primary and (lower and upper) secondary education, an approximate calculation would allow concluding that 50% of individuals belonging to this age group are potential subjects in terms of accessing higher education. Taking this situation into account, the coverage rate of the higher education system is significantly larger than that calculated in the traditional way.

Table 2.8 Higher education coverage by state

State		Coverage ^{1/} 2000-2001 Ac. Yr.	Coverage ^{1/} 2004-2005 Ac. Yr.	Coverage ^{2/} 2004-2005 Ac. Yr.
1	Aguascalientes	21.2	28.2	29.8
2	Baja California	17.7	20.6	22.9
3	Baja California Sur	22.5	28.9	29.6
4	Campeche	21.4	24.5	26.7
5	Chiapas	10.0	13.9	16.3
6	Chihuahua	19.3	23.8	27.3
7	Coahuila	24.3	28.6	30.6
8	Colima	23.9	23.8	26.5
9	Distrito Federal	40.9	46.3	48.3
10	Durango	16.5	18.8	22.3
11	México	12.0	16.2	18.3
12	Guanajuato	11.6	15.8	18.4
13	Guerrero	17.0	19.2	23.6
14	Hidalgo	14.9	21.9	25.1
15	Jalisco	19.0	20.7	24.6
16	Michoacán	12.7	17.8	22.3
17	Morelos	17.9	21.5	25.4
18	Nayarit	25.2	24.9	30.0
19	Nuevo León	27.6	31.6	32.0
20	Oaxaca	13.8	16.2	21.6
21	Puebla	20.0	24.9	28.5
22	Querétaro	17.7	21.2	23.1
23	Quintana Roo	9.4	13.6	14.3
24	San Luis Potosí	15.8	21.9	24.9
25	Sinaloa	26.2	27.7	33.4
26	Sonora	26.3	30.7	33.7
27	Tabasco	20.7	25.6	28.9
28	Tamaulipas	32.1	30.5	33.1
29	Tlaxcala	17.3	19.6	21.3
30	Veracruz	13.7	20.0	23.7
31	Yucatán	18.9	23.7	24.2
32	Zacatecas	13.5	18.7	22.0

1/ Based on population estimates by CONAPO. 2/ Based on population reported in the *II Censo Nacional de Población y Vivienda*, INEGI, 2005.

Source: SEP.

138. It was clear, in PRONAE's construction, that the major challenge faced by the national education system is its quality; the latter constitutes a *conditio sine qua non* for equity. The mere fact of creating new programmes in order to increase coverage is not a fair option for students, since quality must also be guaranteed. Quality and equity is an inseparable pair. Therefore, for the past five and a half years, SEP has deployed its every effort in the context of PRONAE's second strategic objective through a set of policies whose goal consists in promoting continuous improvement and guaranteeing academic capability and competitiveness of higher education institutions and their growing participation in programme assessment and accreditation, as well as in the certification of strategic managerial processes through international standards such as ISO 9000.

139. The fostering of continuous improvement and assurance of quality in the public subsystem has been done by means of participatory strategic planning exercises in the system's institutions. Since the beginning, the planning process was conceived as a dynamic exercise which should evolve along with the learning of all actors and the results obtained by universities. This scheme has taken the basic methodological principles of strategic planning,

adapting them to the organizational culture of institutions in order to establish appropriate conditions to define policies, objectives and strategies. This useful approach would allow to reach better levels of development and consolidation in the framework of a wishful future (*vision*), starting from the objective definition of the strengths that should be preserved and the main problems that should be attended.

140. For public universities, since 2001, these exercises have led the way to design Comprehensive Programmes for Institutional Strengthening (*Programas Integrales de Fortalecimiento Institucional*, PIFI) and their annual updates in between 2002-2006. These programmes are intended to improve and guarantee the quality of the study programmes supplied by the institutions, as well as their managerial schemes. Each of the 111 public universities, technological and polytechnic universities which formulated a PIFI, included the *Vision* 2006 therein. The PIFI contained policies, objectives, strategies and lines of action to reach the goals formulated for the 2001-2006 period. All of this for enhancing institutional performance to arrive to the desirable scenarios proposed in the institutional *Vision*.

141. In formulating these programmes it has been encouraged that universities take into account national, state and regional development needs; that the current situation be identified along with the challenges faced by every institution, to improve and assure curriculum and service quality as well as the necessary measures to overcome them; that they focus their attention on institutional problems from the perspective of the improvement of the academic staff and the reinforcement of academic bodies, of the relevance of the educational offerings and its services, and of its managerial and accountability schemes (Chapter 9). It has also been advised that institutions, for the formulation of their PIFI, consider the following:

- Quality enhancement of faculty, development of the academic bodies and of their lines of generation and innovative application of knowledge (LGAKs).
- Responding to the CIEES recommendations to improve the quality of the curricula they have assessed and, if applicable, with regard to the academic-administrative management as well as those of accrediting agencies.
- Incorporating educational approaches centred on student learning.
- Plan and programme updating and flexibilisation.
- Intensive use of ICTs in education processes.
- Improving mechanisms and processes for learning assessment.
- Individual or group student attention by means of tutoring programmes.
- Improving retention and timely certification rates.
- Incorporating students to scientific, technologic and connection activities to reinforce their training.
- Strengthening social service projects, especially community projects.
- Establishing equitable, rigorous, and transparent entry mechanisms for the enrolment of new students.
- Strengthening institutional capabilities to generate and innovatively apply knowledge and, if applicable, to perform technological studies.

142. Participatory strategic planning exercises in all 211 federal and state technological institutes and centres³⁹ paved the way to preparing the Institutional Programme for Innovation and Development (*Programa Institucional de Innovación y Desarrollo*, PIID) 2001-2006 (chapters 4 and 8). Its goals are equivalent to those of PIFI, including strategies and objectives to be accomplished in 2001-2006 to improve the quality and management of the programmes they offer.

143. In order to continue fostering improvements in teaching staff profiles and developing the academic bodies of public institutions in the context of the planning processes that have led to the preparation and updating of the institutions' PIFIs and PIIDs, SEP reinforced in 2001, the Faculty Enhancement Programme (*Programa de Mejoramiento del Profesorado*, PROMEP)

³⁹ Given their status as recently created entities, the state technological institutes in Pátzcuaro and Mulegé do not have an Institutional Programme for Innovation and Development as yet.

created in 1996, to enhance quality formation of those enrolled in public higher education, including new support lines to contribute to achieve their goals:⁴⁰ promoting and improving the training level of full-time professors, encouraging the acknowledgement of the desirable profile⁴¹ of a higher education professor and the development and consolidation of the academic bodies in public institutions as well as that of their LGAKs.

144. PROMEP (whose operative foundations and impact on the process of academic reinforcement of public institutions are described on chapters 5, 7 and 9) has granted scholarships to full time professors from public institutions for them to pursue quality postgraduate studies, to prepare or conclude their degree dissertations or different types of assistance to foster the development of the academic bodies registered at their Higher Education Units (*Dependencias de Educación Superior*, DES).

145. The requirements that the full time professor should satisfy for a scholarship to be granted are: his acceptance in a recognized good quality Mexican or overseas postgraduate programme, and a formation process in accordance with the development plan of his academic body and its LGAKs of the DES of his adscription.

146. Due to PROMEP and the policies and strategies applied by state public universities and technological institutes, large progress has been achieved in terms of improving the full time teaching staff profile, which has had significant impact on improving the quality of the programmes offered and on the reinforcement of their ability to generate or innovatively apply knowledge.

147. In the context of *escuelas normales*, planning exercises have paved the way for the Programme for the Strengthening of Teacher Education Institutions (*Programas de Fortalecimiento de las Escuelas Normales*, PDI) and their periodic updates, within the framework of the Programme for the Institutional Improvement of Public Teacher Education Institutions (*Programa de Mejoramiento Institucional de las Escuelas Normales Públicas*, PROMIN).

148. The impacts generated by these planning processes and the development of PIFIs, PIIDs and PDI in the context of improving and guaranteeing the quality of public institutions are described in Chapter 9.

149. The Federal Government has pursued the expansion, diversification, recognition and guarantee of good quality postgraduate studies and their decentralisation towards the states, through the National Programme for Strengthening Postgraduate Education (*Programa para el Fortalecimiento del Posgrado Nacional*, PFPN), designed and launched in 2001 by SEP and CONACyT (Chapter 5). This Programme consists of the PNP and the Comprehensive Programme for the Strengthening of Postgraduate Education (*Programa Integral de Fortalecimiento del Posgrado*, PIFOP). With the assistance of the latter, in the course of 2001-2005, the PFPN has encouraged improvements in the quality of the programmes offered by the institutions in order to be registered in the PNP in 2006 at the latest.

150. In all, 119 public and private institutions have received support from the PFPN, which has led, in the past five years, to a systematic increase in the number of graduate studies' programmes recognised for their high quality through their being registered in the PNP, from 150 in 2000 to 661 in mid 2006.

151. In the context of the third strategic objective of PRONAE and, in co-ordination with the state governments and the higher education institutions, SEP has fostered a set of policies and strategies in the past five years (chapters 4 and 8) aimed at improving co-ordination between the federal and the state governments, reinforcing the system's development planning and its

⁴⁰ Initially, public autonomous state universities and federal institutes of technology were considered as the target population of PROMEP. Later, the target population included the UAM, non-autonomous state universities and, more recently, technological and polytechnic universities.

⁴¹ Full time professors with master's degrees or, preferably, doctorates who achieve a satisfactory balance and performance of activities such as teaching, student tutoring, managerial-academic tasks, generation and innovative application of knowledge.

regional dimension, as well as establishing a higher quality system, featuring co-operation and exchange among the institutions that constitute it. With this purpose, SEP has promoted, among other things: program operation in co-ordination with the state governments (such as PRONABES, the Programme of Expansion of Educational Supply and RVOE granting); the establishment of networks and consortia to encourage co-operation, academic exchanges and student mobility among institutions and their academic bodies; the reinforcement of COEPES and the creation of state higher education systems.

152. The National Council of Educational Authorities (*Consejo Nacional de Autoridades Educativas*, CONAEDU) was created in 2004, with the 31 state education ministers and the federal Secretary of Education, who chairs it. Creating this council has contributed to the reinforcement of the planning, co-ordination and decision-making schemes applied by the federal and state governments with the purpose of developing the National Education System and, particularly, the higher education system.

153. The organisational restructuring⁴² at SEP is a relevant project within this strategic objective with the purpose of improving the co-ordination between federal policies and means to strengthen the development of each educational type, particularly that of higher education. The restructuring brought about an Agenda and different strategies—established by the Under-secretariat for Higher Education—to allow the coherent application of federal policies and means in the different subsystems, and Strategic Agendas (*Agendas Estratégicas*) for the technological institute subsystem and for public teacher education institutions, their objectives are to accelerate their development programmes and to incorporate them into SEP's extraordinary financing schemes that encourage a continuous improvement and the assurance of quality.

154. Recently, the federal government and the governments of the states of Guanajuato, Chiapas and Hidalgo established the legal bases and co-ordination mechanisms leading to the creation and development of a higher technological education state system in each of these states. Currently, similar systems are being created in the states of Durango, Puebla, Nayarit, Campeche and Sinaloa.

2.15 System's evolution between 1994-1995 and 2004-2005 academic years

155. Undoubtedly, higher education has been a social mobility vehicle in Mexico. The public policies implemented by the federal and state governments in recent decades have contributed to build a complex, decentralized and diverse higher education system.

156. Policy success is evident in the continuous increase in coverage rates, in the diversification and deconcentration of educational options, in the growth in number and diversity of the communities where there is increasing supply of graduates from every higher level, in the noticeable rise in women's participation in the enrolment and graduate structure, in the improvement of professor profiles and the development of academic bodies and of their LGAKs, in the expansion and updating of public institution infrastructure for professors and students to perform academic tasks, in a higher level of social participation in decision making, in the development of management, planning, co-ordination and assessment schemes and in the growing participation of state governments in defining federal policies and their application, among many other aspects.

157. In addition, the policies encouraged by the federal government in co-ordination with the state governments and the institutions have been conducive to the expansion of opportunities for young individuals who had previously no access to higher education, as well as the establishment of collaboration, academic exchange and student mobility networks and consortia

⁴² SEP's new organic structure, published in the *Diario Oficial* in January 2005, considers only one Under-secretariat for higher education responsible for defining and applying federal programmes and policies contributing to develop Mexico's higher education. This restructuring eliminated the under-secretariats for higher education and scientific research and for technological education and research. The Secretariat's restructuring was among the recommendations issued by OECD experts in their Reviews of Federal Policies for Education: revise SEP's structure, with one Under-secretariat for upper secondary education and another for higher education.

across both domestic and international institutions contributing to transform the practically closed system of 1994 into a more open one.

158. These policies have also encouraged setting effective planning mechanisms and continuous improvement in quality at most public institutions, as well as a new institutional culture promoting adequate outcomes; increased participation from institutions in the external assessment and accreditation processes of education programs, strategic management process certification by international ISO standards and transparency and accountability; updating and flexibilisation of programs; incorporation of approaches centred on student learning and individualized or group student attention schemes; improving governance levels in public institutions; and a significant reduction in pension liabilities of public state universities, which put at risk their short and medium term financial viability, by means of adjusting their pension and retirement systems, among other aspects.

159. The evolution and changes in the Mexican higher education system during the past decade are evident in:

- Increases in enrolment for the system as a whole reached 78.6%. Such increase in enrolment is evident in every state, type of education and level, except in *escuelas normales*.
- The increase in the number of institutions in the higher education system,⁴³ from 422 in 1994 (174 public and 248 private) to 1,129 in 2000 (328 public and 747 private), and 1,459 in 2005 (464 public and 995 private).
- The expansion and reinforcement of the technological higher education by means of opening 164 new public institutions (50 technological universities, 96 federal and state technological institutes and 18 polytechnic universities) which have increased and diversified access opportunities to higher education, particularly for disadvantaged groups. This has also reinforced the relevance of state-level educational supply.
- The increase in the number of students taking 5B2 level programmes⁴⁴ by a factor of 32 (from 2,572 in 1994-1995 to 83,494 in 2004-2005) and in their total share in enrolment, from 0.2% to 3.3%.
- The rise in enrolments in *escuelas normales* from 137,253 students in the 1994-1995 academic year, to 200,931 in 2000-2001. From this academic period hence, there is a systematic decrease in enrolments, down to 146,308 students in 2004-2005. This is a consequence of the regulation policies for services in teacher education institutions agreed between the federal and state governments.
- The 154% increase in postgraduate studies' enrolment⁴⁵ and of its share in total system enrolment from 4.6% to 6.6% as well as the change in its distribution by levels. In the 1994-1995 academic year, total enrolment was distributed as follows: 28.6% in *especialidad* programmes, 64.5% in master's degrees and 6.9% in doctorate programmes. During the 2004-2005 academic year, the number of students taking one year training postgraduate programmes (*especialidad*) amounted to 19.7%, while master's degrees students reached 71.7% and doctorate students' 8.6%.
- Postgraduate studies' deconcentration. In 1994, enrolment in this level in Mexico City, Nuevo León, Jalisco, Estado de México, Puebla and Guanajuato was 71.7% of the total figure. This percentage decreased to 58.7% in the 2004-2005 academic year. In this context, enrolment in 1994 at Mexico City institutions was 37.6% of the total figure. Ten years later, its share in total enrolment has decreased significantly, to 27.2%.
- The increase in the female share in the total enrolment structure went from 46.7% to 50.9% and thus in the structure of graduate students.
- The increase in the number of students in the private subsystem; a 23% share for the 1994-1995 academic year and 31.8% for 2000-2001. From there on, its participation has increased slightly, to 32.7% in the 2004-2005 academic year. This owes to a slowdown

⁴³ *Escuelas normales* are not included in the number of institutions reported.

⁴⁴ In the Reviews of Federal Policies for Education, OECD experts recommended a major development of the university level technician level.

⁴⁵ In their Reviews of Federal Policies for Education, OECD experts recommended an increase in enrolments in master's and doctorate degrees, as well as recruiting candidates among the members of the working staff.

in the annual growth rate of enrolments in this subsystem, from 16.5% in 2000-2001 to 2.5% in 2004-2005.

- A significant increase in completion rates among 5B2 and 5A4 graduates in every subsystem and the whole system, from 38% in 1994, to 42.3% in 2000 and 57% in 2004.
- Annual diversification and increase in the supply of graduate students. During the 1994-1995 academic year, 160,052 students concluded their studies (621 5B2, 145,799 5A4 and 13,632 from 5 and 6 level programmes; 120,145 from the public subsystem and 39,907 from private institutions). In 2005, 371,080 students concluded their studies, a 132% increase (21,854 5B2, 296,968 5A4 and 52,258 from 5 and 6 level programmes; 243,514 from the public subsystem and 127,566 from private schools).
- The number of professors in the system as a whole increased from 134,357 (30.9% with postgraduate degrees, of which, 4.8% had doctorates) to 248,782 (42% with postgraduate degrees, of which 8.3% with doctoral degrees). Likewise, full time professors increased from 38,398 (44% with postgraduate degrees and 10.2% with doctorates) to 68,923 (61.4% with postgraduate degrees and 19% with doctorates). The number of professor-researchers and researchers registered at SNI increased from 5,879 to 12,096.
- The significant increase in the training levels of full time professors in state public universities. Of the 18,093 full time professors registered in these institutions in 1998, only 8% had a doctorate degree (6); 32% a master's degree or *especialidad* (5A); and 60% had a bachelor's degree (5A4). By mid 2006, the number of professors had grown to 27,046, of which 73% held a postgraduate degree and, of that figure, 23% had a doctorate degree. SEP has contributed significantly to the improvement in full time professors' profiles with 9,309 positions in 1996-mid 2006 to hire full time professors, with master's degrees or, preferably with doctorates, and 5,635 scholarships for full time professors to carry out postgraduate studies in good quality programmes either domestically or abroad.
- The increase in the number of consolidated academic bodies in public universities,⁴⁶ from 34 in 2002, to 239 by mid 2006, and those in advanced phases in the development process towards consolidation, from 170 to 552 in the same period (Chapter 5).
- The creation of COPAES in 2000 to regulate curriculum accreditation processes and the current existence of 23 accrediting agencies formally acknowledged by the Council.
- The rapid increase since 2001 in the number of public institution study programmes that the CIEES have classified as level 1 in their registry (with the possibility of achieving accreditation) from 473 in early 2001 to 1,465 in mid 2006; the 5B2 and 5A4 level study programmes —that have obtained their accreditation from COPAES-acknowledged agencies— from 156 in 2002 to 881 in mid 2006; and the postgraduate studies programmes, acknowledged for their high quality, from 150 in the "Approved" category in CONACyT's Registry of Excellence for Postgraduate Study Programmes (*Padrón de Programas de Posgrado de Excelencia*) by 2000, to 661 registered in SEP-CONACyT's PNP by mid 2006, which results in system progress, equity, and educational quality.
- Currently, at least 80% of 5A4 level study programme students in the *universidades autónomas de Aguascalientes, Baja California, Ciudad Juárez, Coahuila, Hidalgo, Nuevo León, Benemérita de Puebla, México, San Luis Potosí, Juárez de Tabasco and Yucatán*, as well as the *universidades de Colima, Guadalajara, Occidente, Quintana Roo and Sonora*, are enrolled in assessable study programmes⁴⁷ acknowledged for their quality by assessment and accreditation agencies.
- In the *institutos tecnológicos de Cajeme, Poza Rica, Puebla, Estudios Superiores de Ecatepec, Celaya, El Llano-Aguascalientes, Boca del Río* and the *IPN*, as well as the *universidades tecnológicas de León, Torreón, Querétaro, la Selva-Chiapas, Huasteca Hidalguense, Valle del Mezquital, Tabasco, Norte de Guanajuato, Aguascalientes, Norte de Aguascalientes, Ciudad Juárez, Puebla, Emiliano Zapata del Estado de Morelos, Zacatecas, San Juan del Río, San Luís Potosí, Tijuana*,

⁴⁶ The number of academic bodies reported corresponds to public state universities, UAM and UPN.

⁴⁷ An assessable study programme is that which has at least one generation of graduate students.

Nayarit, Regional del Sur de Yucatán, Metropolitana de Yucatán, Sierra Hidalguense, Tula-Tepeji, Cancún, Hermosillo, Jalisco and Tlaxcala, also have an equivalent percentage of their 5A4 or 5B2 levels, respectively, in good quality assessable study programmes acknowledged by the same assessment and accreditation agencies.

- The growing institutional involvement in their education process certification schemes or their strategic managerial processes by international standards ISO 9000. To date, 71 technological institutes have certified their education processes, as well as 56 technological universities, 24 public universities and 12 private institutions for different management processes.
- A 57.2% increase in real terms in public investment in higher education, which related favourably to the 56% growth in enrolments in the public subsystem between academic years 1994-1995 and 2004-2005.

Chapter 3: The higher education system and the labour market

3.1 Introduction. 3.2 The professional labour market in 1990-2000. 3.3 The Mexican Observatory of the Labour Market. 3.4 Monitoring higher education graduates 3.5 Activities for professional formation.

3.1 Introduction

160. The federal policies that fostered higher education expansion and decentralisation during the seventies, eighties and part of the nineties were basically intended to respond to the social demand for university certificates and to increase schooling levels among the population. These efforts brought about considerable gaps in the relationship between higher education and employment, evidenced in, among other elements, graduate unemployment and underemployment, the increases in transition periods between education and employment and in decreasing wage differentials between professionals and individuals with lower education levels.

161. To face this situation, the Education Development Programme (*Programa de Desarrollo Educativo*, PDE) 1995-2000 introduced a series of policies intended to continue encouraging growth in the higher education system, striving to balance educational options with social needs and educational aspirations from students and their relationship with labour markets, with profession development, productive sector requirements, technology needs and regional progress perspectives.

162. The current administration confirmed through PRONAE (Chapter 2) that the system's expansion should be a means to effectively contribute to economic and social development and, specifically, to respond to labour market needs. With this purpose its has promoted, co-ordinately with state governments, the following policies:

- Expand coverage based on state development plans for higher education and science and technology that include supply and demand analysis, growth projections, optimal use of available capacity, labour market conditions and the need to form professionals, scientists, humanists and technologists in order to contribute to the region's sustainable development, encouraging the incorporation of segments of the population that have faced the greatest access difficulties.
- Prioritise supporting new curricula or increases in enrolment in programmes for which there is, or expected to be, higher demand.⁴⁸
- Conduct labour market research focusing on professionals contributing to decision making in the fields of national, state and institutional planning.
- Foster, in the context of the processes that generate the preparation, development and updating of the public institution's PIFIs, their educational supply review and updating in order to guarantee its relevance, taking into account the available information on the professional labour markets, the opinion of graduates, employers and, in general terms, of social and productive sectors. In addition, encourage internship programmes for professors and students in firms and of the companies' technical staff in the institutions, as well as the introduction of effective mechanisms to link institutions and entrepreneurial organisations with the purpose of satisfying firm demands and development needs in different industrial sectors; and promote the participation of society's representatives in the institutions' consulting or governing bodies, among others.

163. In the context of the public subsystem expansion, state government initiatives to create new public institutions or programmes in existing ones, must be technically endorsed by the COEPES by means of feasibility studies whose features are described in Chapter 4.

⁴⁸ The market is offered when the number of professionals in search of a job exceeds the number of actual opportunities in terms of skills. Conversely, it is demanded when the number of available jobs exceeds the number of qualified professionals in search of them.

3.2 The professional labour market in 1990-2000

164. In early 2001, SEP and ANUIES agreed to endorse a research study on the evolution of the labour market for higher education graduates in 1990-2000. This work analyses the structure, performance and workings of the labour market for this segment during the aforementioned period.⁴⁹ The conclusions were presented at CONAEDU —thus enhancing the COEPES performance in terms of expanding and diversifying the states' education supply— and at the ANUIES General Assembly, encouraging the analysis of the relevance of the education options in each of its affiliated institutions. The description of selected conclusions appears below:

- The number of employed individuals in Mexico increased from 23.2 million in 1990 (of which 8.9% had concluded professional and postgraduate studies), to 33.7 million in 2000 (11% having concluded professional and postgraduate studies) (Table 3.1).

Table 3.1 Mexico. Number of individuals employed by level of education, 1990-2000 (in thousands)

Education level	1990		2000		AAGR* (%)
	Absolute	%	Absolute	%	
No studies	2,694.2	11.6	2,229.0	6.6	-1.6
Elementary ^{1/}	10,175.2	43.9	11,927.5	35.4	1.6
Lower secondary ^{1/}	5,558.2	24.0	8,169.3	24.2	3.9
Upper secondary ^{1/}	2,077.0	9.0	5,256.9	15.6	9.7
Incomplete bachelor's degree	632.6	2.7	1,331.4	3.9	8.1
Complete bachelor's degree and postgraduate studies	2,065.3	8.9	3,748.6	11.1	6.4
Unspecified	0.0	0.0	1,067.5	3.2	0.0
Total	23,202.5	100.0	33,730.2	100.0	3.8

*Average Annual Growth Rate

^{1/} Complete and incomplete.

Source: Hernández Laos, Enrique (Co-ord.), *Mercado Laboral de Profesionistas en México*, ANUIES, Mexico, 2003.

- The average annual growth rate for professional men was 5.0%, and 8.5% for women. In 1991-2000, female participation in total employed professionals increased thus from 30.4% to 37.7%.
- During this decade, nearly all of the professionals⁵⁰ graduated from the higher education system found their services demanded. In fact, net labour supply was 1.9 million individuals, while net aggregate demand⁵¹ reached 1.8 million professionals. This means that the Mexican professional market was able to occupy most of the graduates from the higher education system, albeit the annual average growth rate in 1991-2000 being much higher (7%) than the economy's growth rate (3%).
- Regarding occupational quality, 55% of graduates succeeded in finding highly specialised jobs whereas over 50% of the employed population had followed higher education studies. The remaining 45% were employed in less specialised occupations, where between 10 and 49.9% of the employees had followed professional-level studies or in occupations that did not require professional-level studies, which may be performed by individuals with lower educational levels, leading to underemployment situations.
- The participation of working professionals in scarcely professional occupations increased from 11.5% to 15.1% during 1991-2000. Female growth rates in highly specialised or scarcely professional occupations were remarkably higher than male employment. This implies that women competed successfully with men in search of

⁴⁹ Hernández Laos, Enrique (Co-ord.), *Mercado Laboral de Profesionistas en México*, ANUIES, Mexico, 2003.

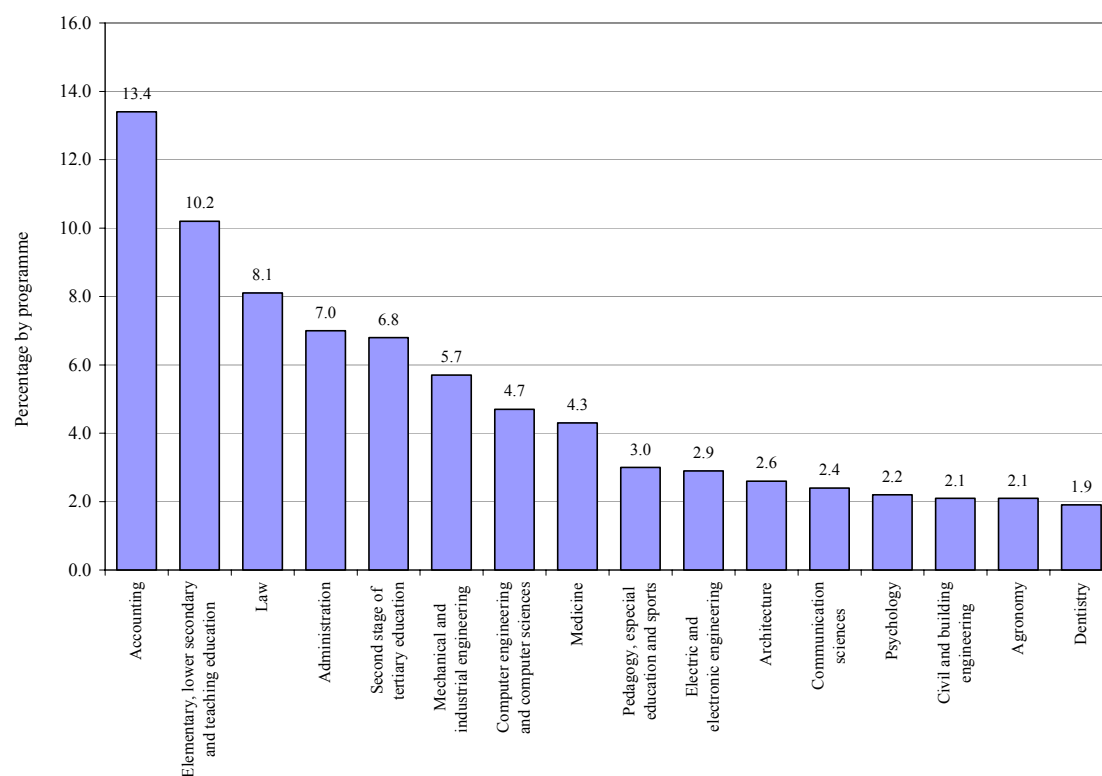
⁵⁰ Net professional supply structure results from subtracting the estimated deaths, migration and professionals opting not to enter the economic activity sphere from the total number of higher education graduates throughout the decade.

⁵¹ Net aggregate demand is formed by the ten-year increase in employed professionals according to census samples and the replacement demand for professionals deceased during that same period.

better positions in the labour market, although they also had to incorporate in significant numbers to occupations that do not require higher education.

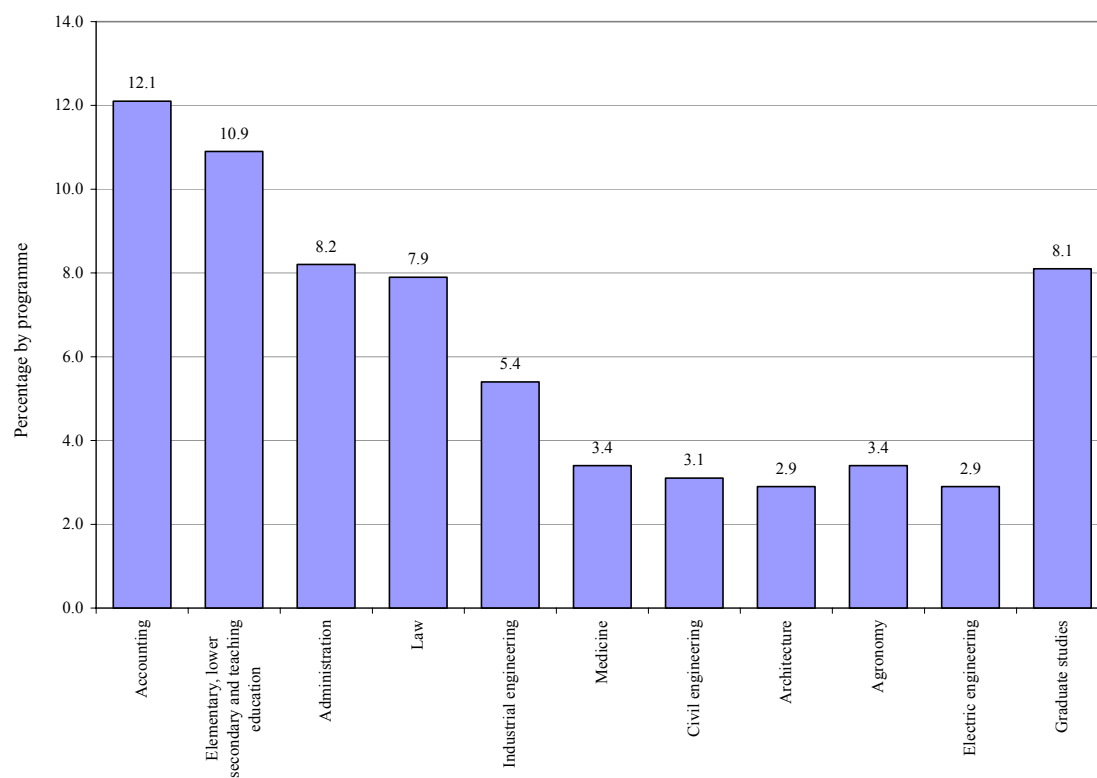
- Eighty per cent of net graduate supply in 1990-2000 came from 16 bachelor's and postgraduate degree study programmes (Chart 3.1), which was the reason for ten programmes (including postgraduate studies) to concentrate nearly two-thirds of professional employment in 2000. Chart 3.2 shows the shares for each programme.
- On the other hand, net professional demand was also highly concentrated, since 16 study programmes covered 90% of demand.
- Comparing net supply and demand numbers during the decade, along with the simultaneous employment of absolute and relative performance in each study programme in the labour market, allowed grouping professional studies into five sets, as shown in Table 3.2.

Chart 3.1 Study programmes contributing 80% of net decennial graduate supply



Source: Hernández Laos, Enrique (Co-ord.), *Mercado Laboral de Profesionistas en México*, ANUIES, Mexico, 2003.

Chart 3.2 Occupation by study programme



Source: Hernández Laos, Enrique (Co-ord.), *Mercado Laboral de Profesionistas en México*, ANUIES, Mexico, 2003.

Table 3.2 Net supply minus net demand for professionals in occupations and relevant balances

Study programme	Supply minus demand	
	Absolute number	(%)Relative*
1) Excess demand		
Ecology (environmental studies)	-17	-5.4
2) Insignificant excess supply in absolute and relative terms		
Elementary, lower secondary and teaching education	3,651	1.9
3) Insignificant excess supply in absolute terms but high in relative terms		
Plastic arts	758	35
Biomedics	393	52.7
Drama and cinematography	323	62.4
Music and dance	711	81.4
Mathematics	2,969	38.8
Food science	3,519	55.5
History	2,773	65.3
Forestry	2,513	69.2
Topographical engineering, hydraulics, geology and geodesy	2,470	65.8
Industrial design	3,816	76.3
Anthropology and archaeology	3,504	94.7
Philosophy	3,316	96.3
Biochemistry	3,066	70.9
Extractive metallurgic and energy engineering	2,993	95.4
Geography	2,319	108.3
Library and archival sciences	2,158	80.9
Theology and religion	2,092	154.9
Sciences of the sea	1,541	98.6
Aeronautic engineering and aviation	1,249	76.9
4) Excess supply in absolute and relative terms		
Biology	9,811	69.1
Literature	8,571	67.5
Physics and astronomy	6,094	152.6
Social sciences	13,632	56.2
Marketing	11,640	66.4
Chemical engineering and industrial chemical engineering	19,329	68.9
Dentistry	18,333	49.5
Graphic design	13,402	75.8
Tourism	13,185	75.8
Economics	19,980	95.4
Veterinary and zootechny	17,013	73.5
5) Marked excess supply in absolute and relative terms		
Psychology	22,518	52.1
Pedagogy, special education and sports	38,794	67.4
Electric and electronic engineering	38,278	68.3
Architecture	30,549	60.6
Communication sciences	27,851	61.0
Civil and building engineering	26,938	67.1
Agronomy	35,664	89.6
Political sciences and public administration	35,205	98.6
Chemistry in biological and health sciences	27,257	92.2
Administration	81,081	60.3
Law	55,421	35.8
Computer and system engineering	51,048	56.3
Mechanical and industrial engineering	88,030	80.7
Accounting	115,354	44.7

*(Net supply demand in *appropriate* occupations/net supply) x 100.

Source: Hernández Laos, Enrique (Co-ord.), *Mercado Laboral de Profesionistas en México*, ANUIES, Mexico 2003.

- During the decade, occupied individuals with no instruction significantly reduced their average income (-3.2% annually); the loss was less sizeable for workers with elementary school instruction (-2.8% annually). Those with secondary schooling lost 2.5% annually and 2.3% for individuals with upper secondary training, whereas the population with incomplete professional education lost 1.3% annually. The population with concluded professional education—including postgraduate studies—suffered the least reduction in average income (-0.1% annually).
- During the decade, the standardized income for workers with professional education increased substantially, compared to those of non-educated workers. Comparing standard income for those with professional skills and those with only upper secondary education (complete or incomplete) the gap resulted in nearly 65%.
- Throughout the decade there was a trend towards increased homogeneity in income among graduates from different professions, both for men and women. In fact, the difference in revenues in terms of gender tended to decrease. In 1990, average female income was 82% below men's. This difference decreased to 63% in 2000 owing to a nearly 12% real growth in average female income and the stagnation of men's income.
- In 1990, the average professional salary for highly specialised occupations was 41% higher for employees in less specialised jobs and 65% higher with regard to that of workers in scarcely professional tasks. In 2000, average income for the first group was barely 13% higher with regard to the second group and 41% higher than the third category.

165. Disaggregating the labour market by study fields and given the high degree of statistical association between net decennial supply and demand magnitudes, also by fields of study, the reference research leads to conclude that the labour market segment for professionals did indeed employ the individuals graduating from the higher education system during the decade, regardless of the field. The most specialised jobs are saturated, and the number of graduates needed in professional activities during the decade was much lower than the total figure of system graduates, given the insufficient economic growth during that period.

166. The fact that a growing number of individuals with professional training were compelled to take employments below their skills probably caused the displacement of workers with lower formal education levels. It is also possible to infer that demand is considerably flexible in terms of professional supply conditions.

3.3 The Mexican Observatory of the Labour Market

167. In 2005, through the Secretariat of Labour (*Secretaría del Trabajo y Previsión Social*), the federal government launched the Mexican Observatory of the Labour Market⁵² as an accessible, permanent and free of charge information service on the behaviour, dynamics, trends and domestic and international features of employment and occupation.

168. The main sources of information for the observatory are the National Employment Service (*Servicio Nacional de Empleo*) and the National Education System (*Sistema Educativo Nacional*) registers, especially those related to higher education enrolments and graduation and the quarterly data obtained from the National Employment and Occupation Survey (*Encuesta Nacional de Ocupación y Empleo*).

169. Among the indicators considered in terms of analysing the relationship between graduates from higher education and the labour market are: the number of individuals employed in the past ten years, by field of study; the studies concentrating the largest number of professionals; the fields of study showing the largest and the smallest annual average employee growth; the average revenue of those employed by field of knowledge, age cohorts and similar fields, as well as historical employee growth trends by field of study in the past two and five years.

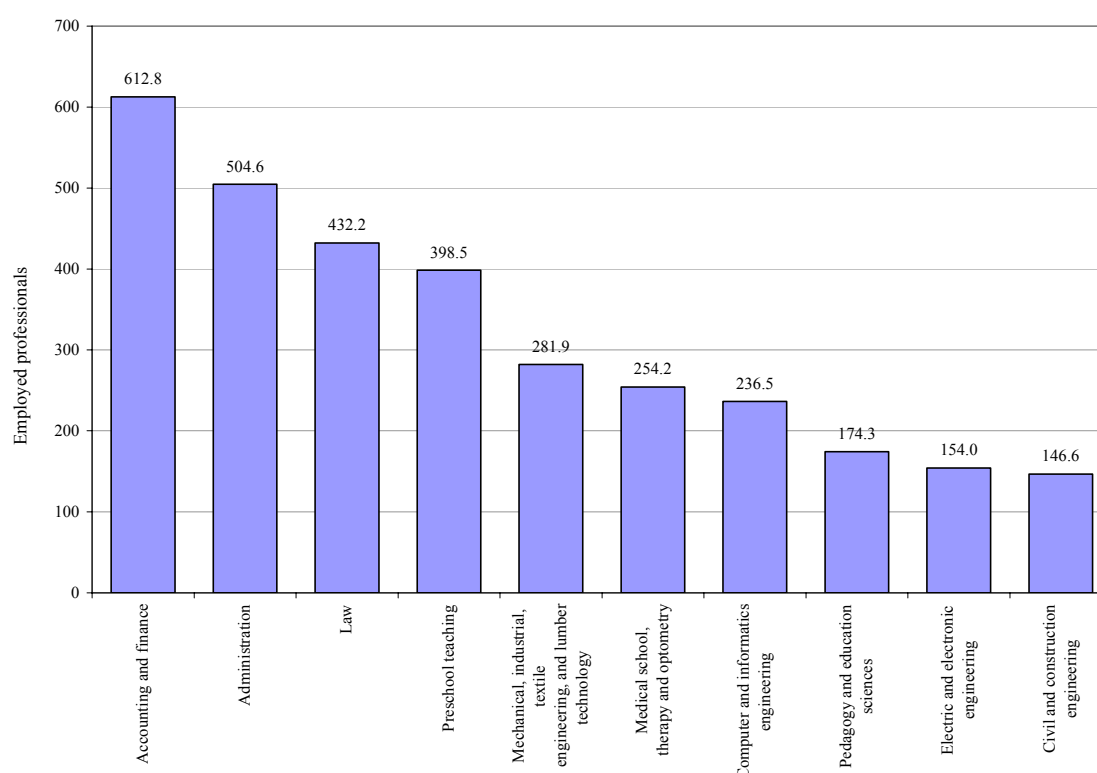
⁵² The Mexican Observatory of the Labour Market (*Observatorio Laboral Mexicano*, www.observatoriolaboral.gob.mx).

170. Between March and December 2005, the labour observatory internet site received 601,000 hits. A survey among 2,269 observatory users concluded that 45% of them were upper secondary students, 32% bachelors and 23% lower secondary students.

171. According to the labour observatory, 13% of the employed population in 2005 had higher education studies and nearly one third had followed one of three non-technological studies: a) Accounting and Finances; b) Administration; and c) Law; in spite of the extensive and diversified options presented by the higher education system in Mexico. In addition, 30% of the employed professionals performed activities that kept no relationship with their profession.

172. During the second quarter of 2005, 4.9 million professionals were employed during the second quarter of 2005. Study programmes concentrating the highest number of employed graduates were Accounting and Finances, Administration, Law, Teacher Training for Preschool and Elementary School, as well as Mechanical, Industrial, Textile and Lumber Technology Engineering. The sum of professionals trained in these five groups accounted for 45% of the total number of professionals employed in Mexico (Chart 3.3).

Chart 3.3 Study programmes with the highest number of employed professionals (in thousands)

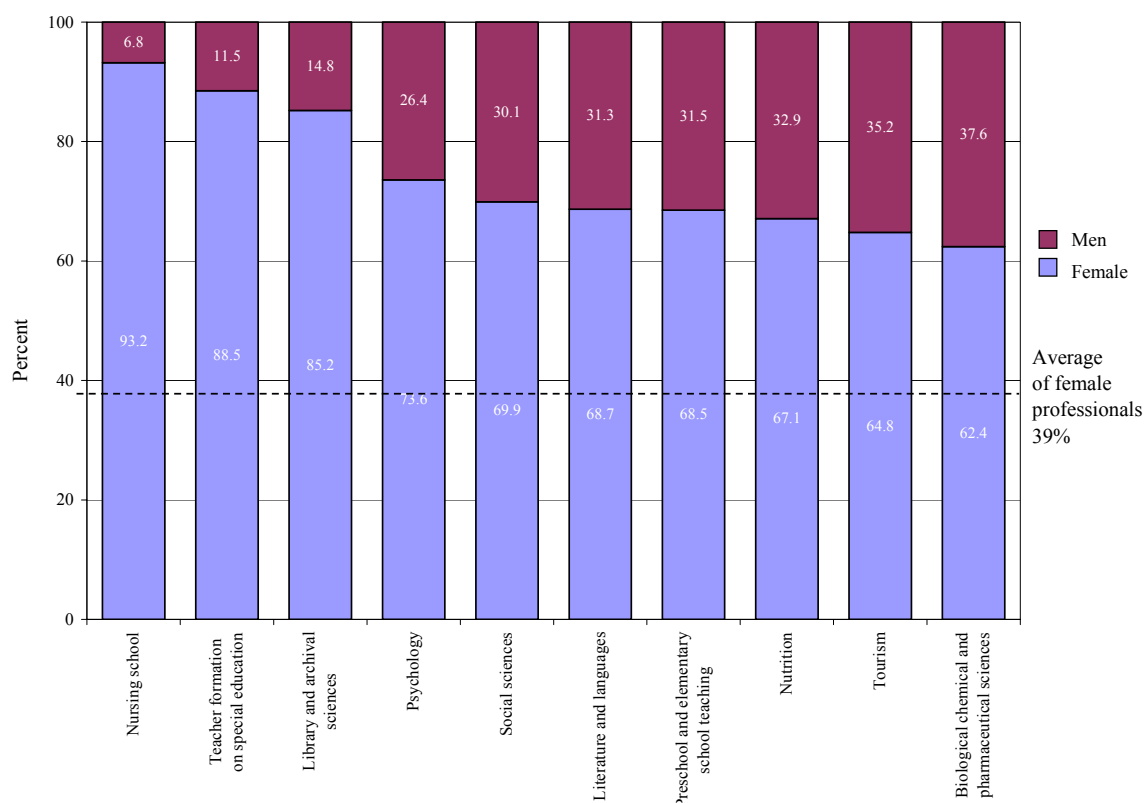


Source: Secretaría del Trabajo y Previsión Social, *Panorama Anual del Observatorio Laboral Mexicano 2004-2005*, First Edition, 2005.

173. On the other hand, most professionals (78 out of every 100 occupied) were employees, although graduates from certain activities tend to practise independently, as is the case of Dentistry (59.5%), Veterinary and Zootechnics (45.1%), Plastic Arts (41.7%) and Architecture and Urbanism (40.7%).

174. Regarding gender distribution, 39 out of each 100 employed professionals were women from five major study programmes groups (Chart 3.4): Nursing School, Teacher Training in Special Education, Archival and Library Sciences, Psychology and Social Sciences. Despite the increase of female participation in occupation in absolute terms, there are still fields where their share has shown very low growth (such as engineering, for example).

Chart 3.4 Study programmes with the highest female occupation



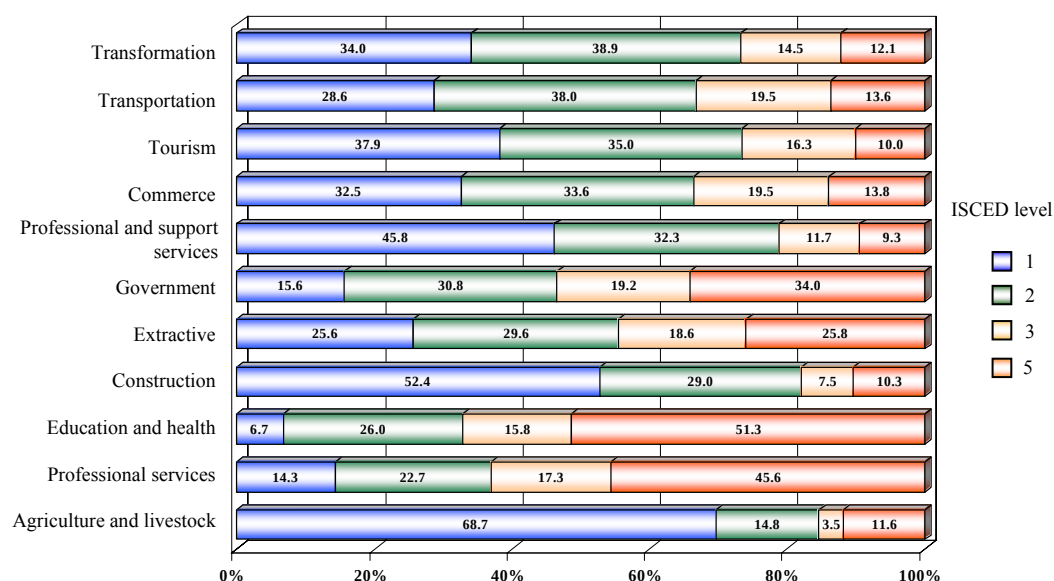
Source: Secretaría del Trabajo y Previsión Social, *Panorama Anual del Observatorio Laboral Mexicano 2004-2005*, First Edition, 2005.

175. Throughout the past few years, female and male youth participation in the labour market has increased. The 20 to 24 year old cohort represents 7.2% of employed professionals, while the 25 to 34 group accounts for 35%. This means that the employed professional group (20 -34 years old) represents 42.2% of the total number of employed professionals; the 45 year-old plus group was 27.3%.

176. The economic activity sectors with the most variation in occupation during the past five years were Tourism and Professional Services. The largest number of employed individuals worked in sectors such as Commerce (6.9 million), Transformation Industry (6.6 million) and Agricultural Development (5 million). Nevertheless, the latter has decreased significantly in terms of the number of employed individuals during the same period.

177. The sectors occupying the largest number of individuals with professional training are Education and Health (51.3%) (Chart 3.5).

Chart 3.5 Employed population level of education by economic branch



Source: Secretaría del Trabajo y Previsión Social, *Panorama Anual del Observatorio Laboral Mexicano 2004-2005*, First Edition, 2005.

178. Chart 3.6 shows that participation of higher education-trained personnel in operational positions varies from 5 to 18% among branches. Participation increases progressively, however, at the mid-management and executive positions. In absolute terms, the executive level revenues exceed those of the mid-management and this, in turn, exceeds those of operational positions. In most cases, however, the percentile difference in income levels of executive positions with regard to mid-management is lower than the difference in income between the latter and the operative jobs. The highest percentage of operative staff works in the agriculture and livestock sector, whereas the government branch shows the highest mid-management percentage, and education and health the highest executive level percentage.

Chart 3.6 Sectoral layering by employment, revenue (Mx pesos) and education levels

Schooling ISCED level	Economic activity	Position level					
		Operational		Mid-management		Executive	
5	Extractive	82.3%		16.1%		1.7%	
3			11%		56%		85%
2		\$5,814	20%	\$9,112	19%	\$12,414	13%
1			35%		16%		2%
	Agriculture and livestock		33%		9%		1%
		99.2%		0.3%		0.5%	
			11%		40%		61%
		\$2,753	3%	\$7,691	7%	\$14,124	15%
	Commerce		15%		31%		17%
			71%		22%		17%
		94.9%		2.4%		2.8%	
			11%		41%		60%
	Construction	\$3,647	21%	\$6,775	28%	\$15,469	18%
			36%		24%		16%
			33%		6%		6%
		95.5%		3.6%		0.9%	
	Government		5%		48%		83%
		\$4,752	7%	\$13,073	16%	\$20,097	5%
			31%		20%		5%
			57%		17%		6%
	Personal services	77.9%		17.0%		5.1%	
			15%		70%		66%
		\$5,713	22%	\$7,935	14%	\$12,643	11%
			41%		13%		13%
	Professional services		22%		4%		10%
		97.9%		1.1%		1.0%	
			7%		38%		54%
		\$3,366	10%	\$7,243	19%	\$10,379	19%
	Education and health		33%		26%		16%
			50%		17%		11%
		85.6%		8.0%		6.4%	
			18%		62%		78%
	Transportation	\$4,048	26%	\$8,633	22%	\$15,519	10%
			36%		13%		7%
			20%		3%		5%
		83.7%		8.0%		8.3%	
	Transformation		15%		68%		73%
		\$3,837	24%	\$8,908	13%	\$11,940	10%
			46%		16%		15%
			15%		3%		1%
	Tourism	94.6%		2.9%		2.5%	
			9%		47%		57%
		\$4,567	20%	\$8,285	22%	\$14,663	16%
			41%		25%		13%
	Tourism		31%		6%		14%
		90.2%		7.5%		2.3%	
			7%		33%		67%
		\$3,818	14%	\$7,297	20%	\$21,920	12%
	Tourism		41%		32%		10%
			37%		15%		11%
		92.8%		3.3%		3.8%	
			8%		26%		40%
	Tourism	\$3,995	17%	\$5,627	21%	\$12,006	21%
			37%		40%		20%
			38%		13%		19%

Source: Secretaría del Trabajo y Previsión Social, *Panorama Anual del Observatorio Laboral Mexicano 2004-2005*, First Edition, 2005.

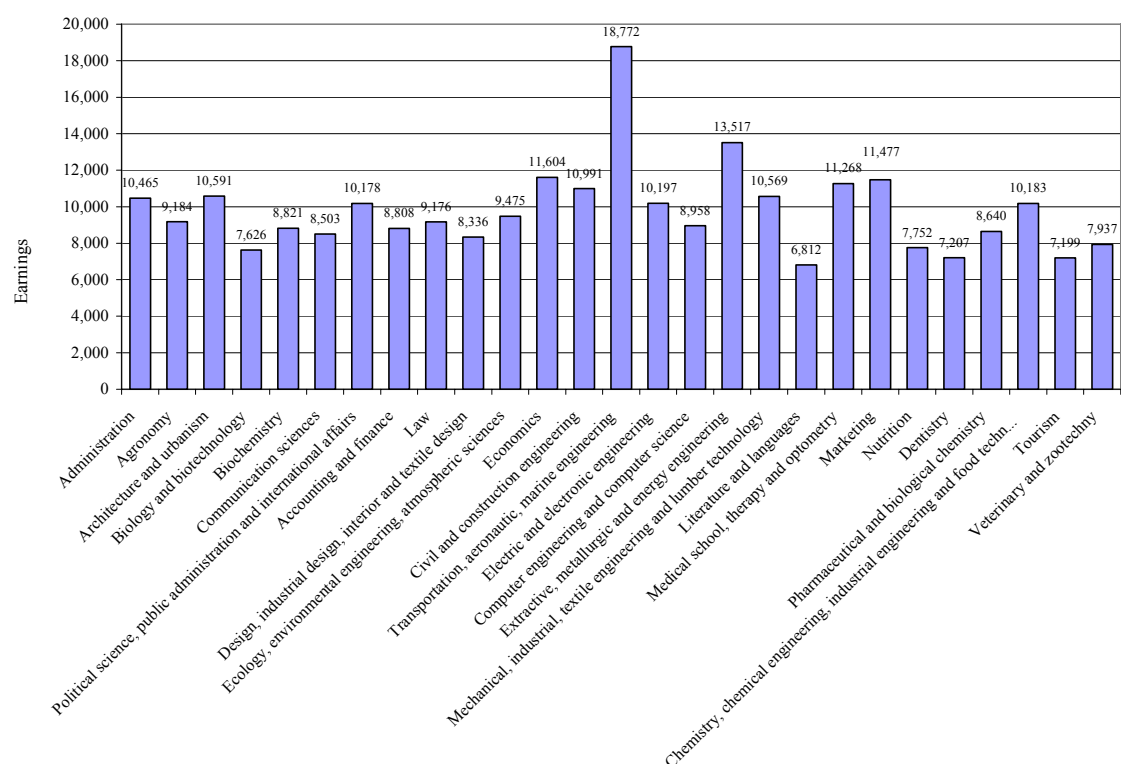
179. Both position and average income are closely related to schooling levels. The government and personal services sectors have the highest percentage of workers in operative positions and higher education training, thus enjoying better income for this level. In contrast, agriculture and livestock and construction are the sectors with the highest percentage of employees with elementary school training.

180. The highest percentages of individuals employed in mid-management positions with higher education training are in the extractive and the construction sectors. Half the executive employees in tourism and agriculture and livestock have higher education training.

181. The highest income for executive employees is paid in the transformation and construction industries. In the latter, 83% of the executive-level employees have higher education training.

182. The national average monthly income for professional-level employees in June 2004-June 2005 reached Mx\$8,998 (6.2 times the monthly minimum wage for Mexico City). Professionals whose monthly income levels exceeded this amount (Mx\$18,772) were trained in fields such as transportation, aeronautic and marine engineering; those with extractive, metallurgic and energy engineering degrees earned an average Mx\$13,517, while those with degrees in economics earned Mx\$11,604. Those with the lowest income studied musical education, dance and singing (Mx\$5,236), library and archival sciences (Mx\$4,964) and theology and religion (Mx\$4,195) (Chart 3.7).

Chart 3.7 Professional average monthly income

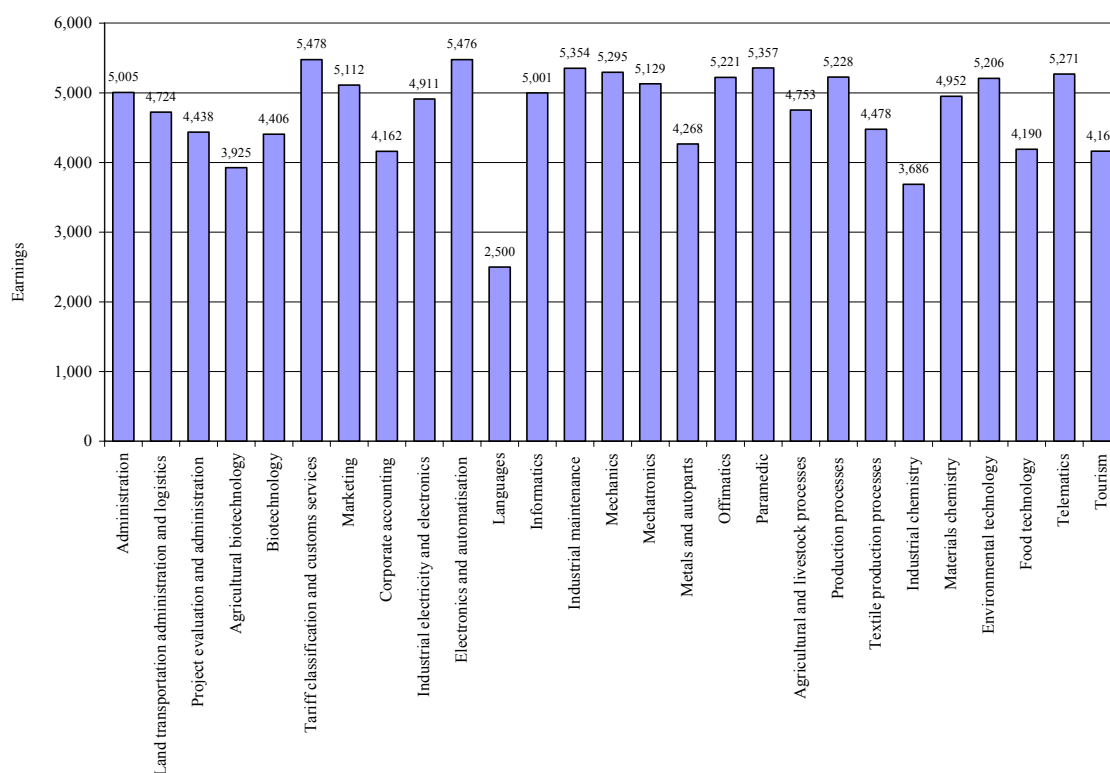


Monthly income in Mx pesos.

Source: Secretaría del Trabajo y Previsión Social, *Panorama Anual del Observatorio Laboral Mexicano 2004-2005*, First Edition, 2005. July 2004-June 2005.

183. Moreover, graduates from technological universities with the university level technician degree averaged Mx\$4,371 in monthly income. Among the highest paid professionals are those who trained in electronics and automation, industrial maintenance, paramedic, production processes, environmental technology and telematics (Chart 3.8). Graduates from bachelor's degrees at technological institutes receive between Mx\$ 5,400 and Mx\$14,400 a month, with a monthly average of Mx\$8,200 in architecture, Mx\$7,900 in computer system engineering, Mx\$10,900 in electronic engineering, Mx\$8,000 in industrial engineering and Mx\$6,500 in administration, among others.

Chart 3.8 Average monthly income for 5B2 level graduates, 2005



Amounts in Mx pesos.
Source: SEP.

184. This information leads to conclude that the training received in higher education institutions not necessarily guarantees an appropriate access to the labour market. The latter depends, to a good extent, on the quality and relevance of such training and on the state of the economy.

185. Throughout the past few years, federal and state policies have discouraged growth in enrolments or the opening of study programmes in existing public institutions, for which there is excess of professionals in the market. This has generated regional tensions in the higher education system, mainly caused by the demands from youths wishing to follow these programmes. Such demand is covered, in a good number of instances, by private institutions, causing them to increase and focus their education options in these programmes.

186. Entrepreneurs have underlined the lack of connection between programmes offered by higher education institutions and the demands from the productive sector. Entrepreneurs required that training correspond to the needs of their firms, demand more participation in curriculum design and the reinforcing technical education in the higher education level.

187. A recent survey⁵³ of nearly 33,000 firms from 23 countries revealed that 40% face difficulties in terms of occupying certain positions due to the lack of availability of appropriate talent in labour markets. The firms facing the biggest difficulties are located in Mexico (78%), Canada (66%) and Japan (58%).

188. Between October and December 2005, hiring problems in Mexican firms worsened in the face of the lack of available specialised university level technicians in fields such as production, maintenance and operation and of engineers with training adapted to firms' needs.

189. Recently, both federal and state-level policies have encouraged entrepreneur participation in the boards of technological universities, state technological institutes and the

⁵³ Manpower, *La escasez de talento en el mundo*, Mexico, 2005.

recently created polytechnic universities, as well as in the Relevance Commissions of technological universities and the Liaison Councils in federal technological institutes.

190. Autonomous public universities have also promoted the creation of structures and programmes with the purpose of fostering their linkage to the productive sector. The progress thus achieved is mixed. In some institutions they are more evident than in others, depending on institutional liaison capabilities, on the relevance and effectiveness of their management schemes and on their policies and strategies to promote and acknowledge the efforts in liaison activities, the relevance of their education options, and the attitude and will of the academic staff to bring these objectives to fruition, among other aspects.

191. The insufficient adjustment observed in the relationship between higher education and the employment system is also a consequence of factors influencing study programmes choices among young people, such as the inclination they believe they possess for a certain professional activity, employment opportunities, family influence and the information provided by the institutions. The youth cohort still prefers to follow programmes for which there is excess supply in the labour market (owing, to a good extent, to the influence families exert on them). This situation is expected to change as students and their families gain knowledge on the behaviour, trends and features of employment and study programmes in Mexico, and as the coverage of programmes, such as PRONABES, expands to change the course of higher education demand (Chapter 6) towards fields relevant to national development.

192. In this context, the Mexican Observatory of the Labour Market currently constitutes a strategic vehicle to improve the bases of federal and state policy design in the framework of CONAEDU and the COEPES, thus contributing to build a more relevant relationship between educational options by higher education institutions and the labour market. It is also a source of relevant information for students and their families, as it is for the institutions in their policy making, in assessing the relevance of their education options as well as to design and update their curricula (chapters 4 and 8).

3.4. Monitoring higher education graduates

193. A relevant graduate student's survey was published in 1996, which employed a sample of graduates from several institutions, both public and private, and a common methodology to make outputs comparable.⁵⁴ The research was carried out in 1995 in Mexico City, with the participation of UNAM, UAM, *Universidad Autónoma del Estado de México* (UAEM), *Universidad Iberoamericana* (UIA) and the Atizapan campus of the *Instituto Tecnológico y de Estudios Superiores de Monterrey* (ITESM). The sample consisted of 38 graduates for each of the two social and two technical study programmes selected, i.e., 152 individuals per university for a total of 760 persons.

194. In terms of graduate employability, the survey showed that, in 1995, unemployment coefficients were higher for female than for male subjects, as well as for graduates under 27 years old with regard to those who were that age or older. Unemployment coefficients were also higher for female graduates from public universities and for male graduates from private universities.

195. ITESM and UIA graduates (both private institutions) showed more probability of earning higher incomes. Graduates from public institutions received income statistically below those from private institutions. Due to the 1995 economic crisis, graduates from public institutions saw their chances to access the labour market affected to a higher degree than graduates from private institutions.

196. Acknowledging that graduate surveys are an essential input in designing, revising and updating curricula and analysing their relationship with the labour market, as well as in the definition of federal, state and institutional policies, SEP and ANUIES agreed, in 1997, to the

⁵⁴ Muñoz Izquierdo, Carlos, *Diferenciación Institucional de la Educación Superior y Mercados de Trabajo*, ANUIES, Mexico, 1996.

creation of a basic mechanism for graduate surveys in order to obtain reliable and relevant data on the most important institutional indicators and variables to support decision making and academic planning. This scheme, applied with a precise methodology, would allow comparing outcomes among institutions. Since 1998, and once the basic mechanism⁵⁵ for graduate monitoring was concluded, ANUIES encouraged its use among its affiliated institutions and SEP did so in every higher education institution. In recent years, those in charge of the instances responsible for these surveys in public universities have taken training courses on the subject.⁵⁶

197. In 2003, with the purpose of learning about the latest progress on graduate monitoring scheme design and employment as well as the outcomes from data analysis and the application of the basic monitoring scheme, ANUIES organised the “Encounter on the Recent Experience of Higher Education Institutions’ Graduate Student Survey” (*Encuentro sobre las experiencias recientes de estudios de egresados en las Instituciones de Educación Superior*).^{57, 58} It was evident that there was a remarkable growth in graduate student surveys carried out by institutions, as well as in the use of their outcomes in designing and revising curricula and programmes, in addition of short and medium term planning.

198. In the 2003-2004 academic year, UNAM carried out a survey of its bachelor degree students (class of 1998) describing their employment status five years after graduation. The outcomes indicated the following: a) 81.6% were employed five years after they concluded their studies; 9% performed activities unrelated to their degree; b) 48% held professional positions, while 12% worked in executive or mid-management positions or as officers; c) 76% worked full-time with average income of Mx\$11,600 (although income were lower for women); and d) 82% found jobs within the first year of graduation.⁵⁹

199. In 2005, UAM carried out a survey on the course followed by their graduate students in the labour market, taking the class that graduated in 2002. The outcomes were as follows: a) 74.5% were employed and 8.6% performed activities unrelated to their degree; b) 37% held professional positions, while 7.5% worked as owners or partners in a firm and 6.8% were independent professionals c) the average income of full time workers reached Mx\$9,000 and d) 75.7% found jobs within the first year of graduation.⁶⁰

200. Albeit the progresses in designing and implementing public university graduate surveys, there are still differences in terms of the scope these surveys have in different institutions. An assessment published in 2003 on the state of this sort of surveys⁶¹ identified five groups of institutions: a) institutions producing very thorough reports covering every dimension of the basic scheme, highly representative samples and employing statistical techniques and models to interpret the data; b) institutions showing remarkable advances in the implementation of their information systems, having produced graduate surveys for certain programmes, but still without the complete horizon of graduates in terms of specific programmes or groups of programmes; c) institutions indicating irregular progress in establishing their information system and updating their directories, lacking clear statistical information and data interpretation of the surveys already carried out; d) institutions considerably advanced in terms of locating and updating their graduate registers, determining the critical path for survey implementation; and e) institutions that had not yet carried out any graduate student surveys.

201. Since early 2001, SEP’s has encouraged that institutions, in preparing and developing their PIFIs, design projects to carry out graduate student surveys using the aforementioned basic scheme. In 2001-2005, 88 projects in 40 universities received support. The authorised projects

⁵⁵ Fresán Orozco, Magdalena (Co-ord.), *Esquema básico para estudios de egresados*, ANUIES, Mexico, 1998.

⁵⁶ *Universidades autónomas de Sinaloa, Chihuahua, Ciudad Juárez, Chapingo, Oaxaca, Campeche, Guerrero y universidades de Sonora, Veracruzana, Durango and Colima.*

⁵⁷ In this event there were presentations from the following institutions: *Benemérita Universidad Autónoma de Puebla, Facultad Latinoamericana de Ciencias Sociales, Instituto Tecnológico de Aguascalientes, Universidad Autónoma de Aguascalientes, Universidad de Colima, Universidad de Guanajuato, Universidad Autónoma de Nuevo León, Universidad Autónoma de Querétaro, Universidad Autónoma de Tamaulipas, Universidad Autónoma de Tlaxcala, UAM and Universidad de Guadalajara.*

⁵⁸ Valenti Nigrini, Giovanna and Gonzalo Varela Petit, *Diagnóstico sobre el Estado Actual de los Estudios de Egresados*, ANUIES, Mexico, 2003.

⁵⁹ UNAM (www.pve.unam.mx/encuesta/01/menu.html).

⁶⁰ UAM (www.sieee.uam.mx).

⁶¹ Valenti Nigrini, Giovanna and Gonzalo Varela Petit, *op. cit.*

have been part of the Comprehensive Programme for Institutional Management Strengthening (*Programa de Fortalecimiento Integral de la Gestión Institucional*) in the context of their PIFI (chapters 2 and 8). The outcomes are being employed by institutions in their curricula and programme update processes, to improve institutional conditions for their operation and in designing different policies and programmes in response to their graduate students' recommendations, that is, to offer relevant programmes in terms of labour market needs.

202. In 2005, with the assistance of funds received for the development of its PIFI, the *Universidad Autónoma del Estado de Hidalgo* carried out ten monitoring surveys on an equal number of bachelor's study programmes and one master's study programme⁶² with the purpose of determining the strengths and weaknesses of its graduate students in order to improve student skills. The sample covered 845 graduate students.

203. The most relevant outcomes were: a) 64% of those surveyed noticed the benefits of their academic training when entering the labour market compared to colleagues from other universities; b) 71% actively searched for employment after concluding their studies and 29% did not; c) of those who searched for a job, 62% found one in less than six months, 16% in six months to a year and 8% in one to two years; 14% did not find any, and continued working where they used to before graduating; and d) average net monthly revenue distribution at the start of their professional career was Mx\$5,260. Women reported income lower than men's.

204. SEP co-ordinates a regular monitoring exercise in the federal technological institute subsystem, employing a representative sample of graduates that concluded their education a year before. These surveys incorporate the view of the organisations where the graduate students work. In addition, the survey obtains information on the rank they have at their jobs, the affinity of their work with the programme they followed, the requirements they had to comply with to be hired, additional training and why they needed it, their efficiency, effectiveness and shortcomings as employees and their main contributions in the workplace.

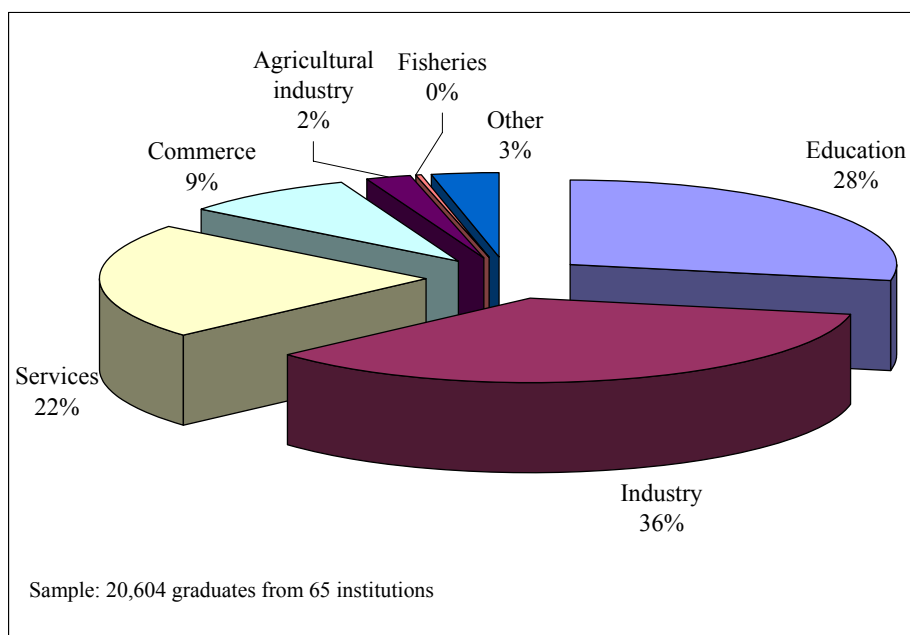
205. The information thus obtained helps technological institutes to identify different regional development needs (such as continuous education, graduate studies with professional focus, certificate courses and *especialidades*, among others). The information on education services and, if applicable, training inadequacies, help institutions adapt their curricula and programmes, the specialty modules and graduate studies supply,⁶³ to improve education service policies and procedures and fostering closer contacts with graduate students.

206. According to the monitoring survey, 20,604 students graduating in 2002-2003 from 65 federal technological institutes, 72% worked a year later in their field of training. Of the total number of graduates, 36% worked in industries, 22% in the services sector, 28% in education, 9% in commerce and the remaining 5% in agriculture industry or other sectors, as it is shown in Chart 3.9. Moreover, Chart 3.10 shows that more graduate students worked in the private sector than in the public.

⁶² Bachelor's degree (*Licenciatura*) in Chemistry, Dentistry, Mining-Metallurgy Engineering, Pharmacy, Industrial Engineering, English Language Teaching, Materials Sciences, Computer Systems, Accounting, Administration and Master's degree in Chemistry. The surveys may be looked up at <http://200.57.63.31/planeacion/index.html>.

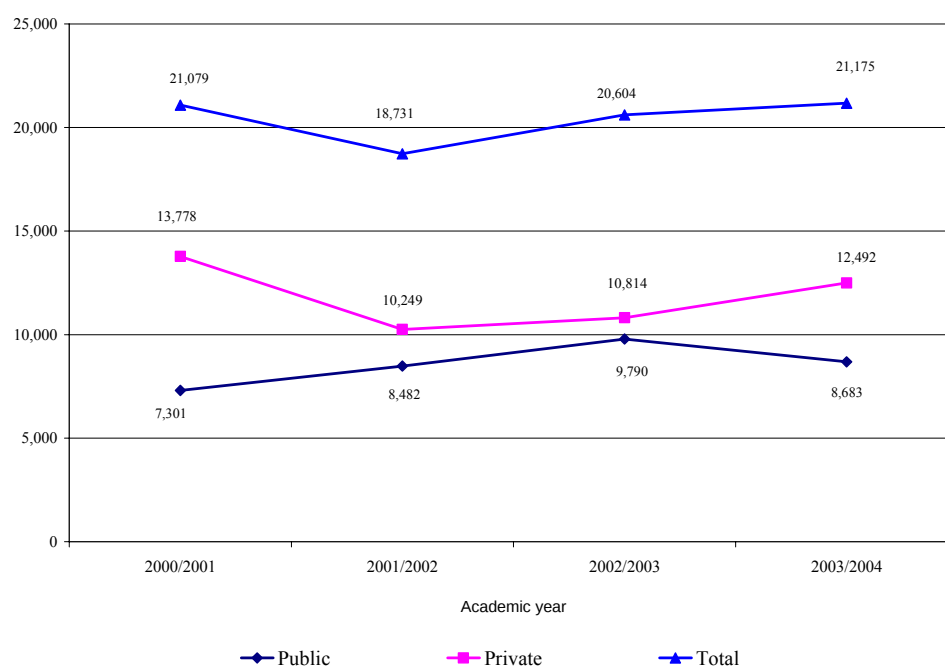
⁶³ The analysis on the curricular reforms is carried out during national meetings.

Chart 3.9 Labour location of graduates from federal technological institutes



Source: SEP.

Chart 3.10 Evolution of labour location of graduates from federal technological institutes



Source: SEP.

207. A recent survey⁶⁴ carried out among graduates from the technological university subsystem (classes of 1997-1999, 1998-2000 and 1999-2001), employed a sample stratified by generation, taking the programme as level or stratus. Output from this survey is being employed by universities for their Relevance Commission work as well as input in their PIFI updating process. The fieldwork took place from September 2003 to March 2004. The most relevant findings were the following:

- Average grades in concluded schooling were 8.5 (out of 10), with 90.8% of graduates having obtained their certificate.

⁶⁴ Mir Araujo, Adolfo, et al., *Los Egresados de las Universidades Tecnológicas, Formación Profesional y Situación Laboral*, SEP and Universidades tecnológicas de Campeche and Regional del Sur, México, 2005.

- 87% of the sample's graduates were employed (89% men and 83.8% women); 36% had had only one job, 31% two, 14% three and 5% four or more jobs. 62.8% was hired indefinitely, 28.4% during a certain period, 3.3% worked independently and 5.4% owned or co-owned a business.
- A year after concluding their training, 81.3% were already working and only 5.7% needed over a year; 18.9% were immediately hired by the firm where they carried out their internship; 24.9% required less than three months; 16.1% from three to less than six months; 9.3% from six months to a year; 5.7% over a year and 11.9% was working and continued to do so.
- 13% had not started working, of which, 47.5% argued that they were taking bachelor's degree courses, proof that university level technical studies may be officially validated as well as of the conditions that prevail in the higher education system to promote continuous learning; 14.2% were homemakers, 19.5% had not found employment in their field or with the appropriate wage, 8.4% had not started searching for a job, 2.1% had health problems, 5.2% had not found employment and 3% argued other causes.
- Graduates worked mainly in two branches: commerce and services, and transformation industry in line with the programmes offered by technological universities. In fact, 52% worked in commerce or services and 32% in the transformation industry. 54% worked as supervisor, technician or specialised worker, 25% at the operative level in production or services, 12.6% as mid-management director, 2.1% as top executive and 6.7% were owners or partners in a business.
- From the total number of graduates working, 72% did so in the private sector and 28% in the public sector, which is consistent with the objectives and programme profiles offered in technological universities. 39% of graduates who worked in the private sector did so at large firms (over 250 employees), 58% in medium-sized companies (between 101 and 250 employees) and 20% in micro-firms.
- In terms of wages, 21.7% earned the equivalent of two monthly minimum wages, 59.7% between two and five monthly minimum wages, and 14.8% over five and up to ten monthly minimum wages.

208. In the past ten years, the programmes with the fastest growth in terms of graduate hiring have been: Marketing, Electronics and Automation, Electricity and Industrial Electronics, Industrial Maintenance, Production Processes and Telematics. The largest number of graduates in the labour markets comes from the Electricity and Industrial Electronics programmes.

209. From the graduate sample, 2,381 were independent entrepreneurs. Graduates from Marketing accounted for 16% of entrepreneurs, followed by Informatics with 14% and Production Processes with 12%.

210. On the other hand, a recent survey⁶⁵ of 2,161 employers in the scope of influence of 37 technological universities revealed that, on a scale of one to five, the level of satisfaction of the employers with regard to the university level technicians was as follows: 4.4 in ability and disposition; 4.3 in responsibility; 4.3 in technical skills; 4.3 in knowledge and 4.1 in creativity and innovation.

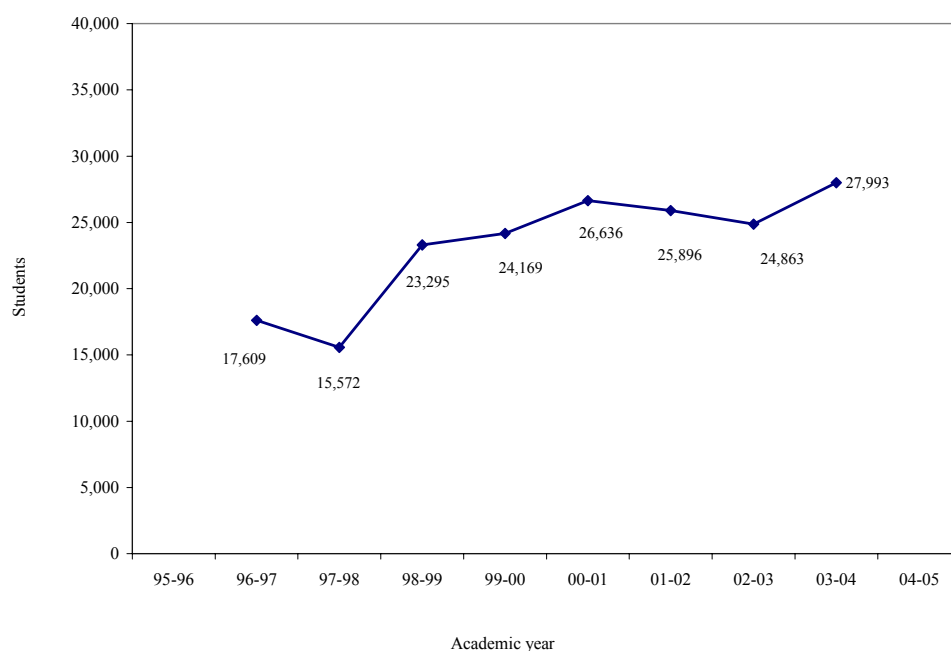
3.5 Activities for professional formation

211. Among the programmes and curricula of technological universities and institutes, the last stage of training is the students' professional internship. This stage is generally carried out at a firm, and involves the materialisation of a project under the tutoring of the institution's and the firm's staff. It may also be accomplished in another sort of organisation, as long as it involves a project interesting to all parties.

212. Chart 3.11 shows the evolution of the number of students in federal technological institutes who carried out internships during the academic years of reference.

⁶⁵ SEP, internal communication, 2005.

Chart 3.11 Number of students of the federal technological institutes in professional internships



Source: SEP.

213. Entrepreneur training and technology-based business incubation is among the tasks performed by technological institutes with the purpose of expanding student professional development and training areas. For example, every year at the National Creativity Event (*Evento Nacional de Creatividad*) and the National Entrepreneur Event (*Evento Nacional de Emprendedores*) students make practical use of their professional profile in a comprehensive manner, by proposing innovative and business solutions related to their training. From January 2005 to February 2006, 4,838 students and 1,945 advisors (professors and entrepreneurs) participated in 1,061 technology projects in the regional and national stages of the contests (Table 3.3).

214. As part of a strategy to approach labour markets, students from technological universities visit companies in the region from the very beginning of their training. In addition, they develop practical schooling projects based on actual firm demands.⁶⁶ The projects developed under this scheme are in line with the different specialties taught in this subsystem: process automation, computer system development, machinery building, organisation manuals, market surveys, quality systems and machinery programming and operation, among others.

⁶⁶ For example, the *Atlas Mercadológico de Ciudad Nezahualcóyotl*, prepared with the participation of professors and students of the *Universidad Tecnológica de Nezahualcóyotl*, containing a set of maps, tables and figures describing the service and business infrastructure of the municipality, which makes it a very useful reference for the local government, entrepreneurs and the general society, or the survey *Caracterización de la situación del sector productivo, del mercado laboral y su relación en los estados de Hidalgo, Puebla y Tlaxcala*, developed by the *Universidad Tecnológica de Tecamachalco*, which is a reference source both in qualitative and quantitative terms allowing to analyse, assess and diagnose the features and trends needed to define regional strategies and lines of entrepreneurial action.

Table 3.3 Participation of students from technological institutes in entrepreneurial and creativity contests

Innovation and entrepreneurial training	Entrepreneurs	Creativity	
	National level	Regional level	National level
Students	1500	2,531	807
Advisors	700	995	250
Projects and firms	160	745	156

Source: SEP.

215. The Federal Government, the Government of the state of Querétaro and the *Universidad Tecnológica de Querétaro* (UTQ) recently agreed with *Bombardier Aeroespacial* the terms and conditions for establishing a new aircraft facility in this state. In the context of the first stage of the project, the UTQ is developing an intensive programme intended to train the first group of employees that will be immediately hired by the firm to cover their human resource needs. Subsequently, during the second half of 2006, a new higher education public institution will be created to offer specific programmes to cover the needs of this emerging sector in this region.

216. As a result of the connection between companies and technological universities, different work programmes have been introduced with large firm corporate areas with the purpose of encouraging graduate hiring and educational programme design. Such is the case of the global firm Schlumberger, which has hired 230 university level technicians in the past two years from programmes such as Industrial Maintenance, Production Processes and Industrial Electricity and Electronics.

217. The technological universities subsystem has 38 firm incubators operating under a model designed by the IPN. Each of them has the objective of incubating ten firms per year, creating, at least, three new jobs per business. Incubators are part of the National Incubation System (*Sistema Nacional de Incubación*) of the Secretariat of Economy (*Secretaría de Economía*, SE), which leads them to participate in financing schemes for entrepreneurs through seed capital. The incubators offer advisory services for business plan preparation and other start-up subjects, as well as laboratory and workshop use to carry out tests.

218. With the purpose of establishing a closer relationship with technological university graduates, SEP has encouraged the creation of alumni associations during the past five years. To date, there are 42 states and one national association (*Asociación Nacional de Egresados de las Universidades Tecnológicas*) with which the Secretariat keeps a close relationship. These groups organise regular meetings that allow locating their alumni in the labour market, to learn about their study programmes as well as to make recommendations to strengthen and improve the education options in universities.

219. Since the implementation of the 21st Century Education Model (*Modelo Educativo para el Siglo XXI*), the curriculum reform that is being carried out in technological institutes considers several graduate profiles in the structure of the 24 generic bachelor degree programmes. These profiles are applied in the context of the local and regional development needs through specialty modules, which are a set of final stage integrating subjects that, along with the internship, are worth 20% of the study programme. In order to respond to the demand for qualified employees in the different positions in the labour market, the subsystem offers also a wide array of continuous education programmes.⁶⁷

⁶⁷ Environmental auditing diploma courses; graduate programmes in energy for Federal Electricity Commission (*Comisión Federal de Electricidad*) employees; an Industrial Engineering bachelor's degree for Minera Cananea; development of the project to create the High Technology Innovation Centre (*Centro de Innovación en Alta Tecnología*) in the *Instituto Tecnológico de Ciudad Juárez*, co-finances by the local and Federal Government and the private sector; training of professionals in Global Logistics, environmental auditors, firm consultants and consultant certification for SMEs with the assistance of the *Secretaría de Economía* and the Transformation Industry Chamber (*Cámara de la Industria de la Transformación*).

220. With regard to the higher education system as a whole, federal and state policies, as well as economic development policies, have currently found windows of opportunity to balance the relationship between graduate supply and the labour market by updating or reforming the existing programmes and defining new relevant ones. These programmes emerge as challenges in terms of their comparability and the identification of the professional and labour skills demanded in a global labour market.

Chapter 4: The regional role of higher education

4.1 Policies and background. 4.2 The regional dimension in the National Education Programme 2001-2006. 4.3 Consortium of Mexican Universities. 4.4 Institutions and their contribution to regional development.

4.1 Policies and background

221. In 1950, the higher education system consisted of 39 institutions and 29,892 students, i.e., a meagre 1% coverage rate for the 19-23 year old cohort.

222. The system grew moderately throughout the fifties and the sixties; the number of institutions went from 39 in 1950, to 60 in 1960 to 109 in 1970, with a student population close to 220,000 students.

223. During the seventies, federal government policies encouraged a rapid system and enrolment expansion as existing institutions expanded and new ones were created (mostly federal technological institutes and public state universities). This policy contributed to quadruple the system's enrolment and increased access opportunities to higher education in different regions.

224. In recent decades, different levels of government have shared common major goals in their regional dimension in the context of higher education: continuous expansion of the public higher education institutions, an increase in coverage and its contribution to state development (Chapter 2).

225. The 1986 Comprehensive Programme for Higher Education Development (*Programa Integral de Desarrollo de la Educación Superior*, PROIDES), focused on the need to include regional subsystems into the national planning framework as well as on the relevance of fostering increased participation of state governments in financing public institutions in their jurisdictions.

226. In order to reduce coverage gaps across states, the federal government encouraged regional growth and distribution of educational supply in the context of the Educational Modernisation Programme (*Programa de Modernización Educativa*) 1989-1994.

227. Since 1990, it has been a SEP policy to privilege the creation of new public institutions in Mexican states operating as decentralised entities of state governments. Thus emerged a new type of higher education institution, the technological university, bringing along an innovative structure and an alternative education model.

228. The PDE 1995-2000 considered also the relevance of achieving equal distribution of education services within unequal regional societies, with the purpose of encouraging opening as many education opportunities as possible. The goal could only be attained focusing on quality and in locations where demand flowed consistently. In addition, concentrating on service expansion in states where the indices of student absorption into higher education were below the national average. Third, discouraging the creation of new public institutions where there was enough capacity to respond to current demand. Fourth, striving for a balanced development of educational options with regard to social needs. Finally, considering labour markets, productive sector requirements and regional and local development perspectives, among other relevant aspects.

229. In 1997, SEP defined an additional set of guidelines to reconcile demand and supply of higher education in Mexican states. Supply expansion should emerge from state government initiatives, grounded on research whose technical features should be approved by the COEPES (Chapter 8). These surveys would justify expanding the existing institutions or academic units or opening new ones based on educational flow analysis. They would also provide the required diversification in types of higher education in order for it to respond as best as possible to the foreseeable regional and state development needs in the short, medium and long term.

230. The aforementioned policy lines are still in operation. Other guidelines have been added by the current administration—in the context of PRONAE—, in agreement with state governments, which are described in section 4.2 of this chapter. Altogether, they form the framework that has guided SEP actions during the past five years, in terms of deciding on expanding and diversifying the relevant educational options in the states, distribute financing responsibilities across the federal and state governments and strengthening the regional dimension of their federal policies.

4.2 The regional dimension in the National Education Programme 2001-2006

231. As an example of the extent to which current national higher education policies involve the regional dimension, PRONAE policies, promoted in the context of their strategic objectives, include the following purposes:

- Promote educational decentralization in order to expand and consolidate good-quality higher education systems in each state, featuring complementary and comparable programmes, student mobility and credit transfer, collaboration and exchange across academic bodies and institutions, and a 50% participation from the states to contribute to operate the recently created institutions or, if applicable, new programmes introduced in existing institutions.
- Expand coverage based on state development plans for higher education and science and technology that include supply and demand analysis, growth projections, optimal use of available capacity, labour market conditions and the need to form professionals, scientists, humanists and technologists in order to contribute to the region's sustainable development, encouraging the inclusion of population segments facing access difficulties.
- Balance geographical coverage and serve areas of interest for national development through projects pursuing the creation of new public institutions in states with lower coverage and service provision in a federalist context that, given their profile, contribute to the configuration of an improved higher education system in each state, striving to cover regional needs with an inter-cultural approach and offering relevant part time and distance programmes for less densely populated areas or youths or adults unable to study at school facilities.
- Expand enrolment in existing public institutions to satisfy regional development demands as long as service quality is not affected or governance is not at risk, guaranteeing their appropriate operation and planning increases in their teaching staff and existing facilities, their typology, development programme and their PIFI, PIID or PDI.
- Encourage the participation of higher education institutions in regional social, human, cultural and sports development programmes.
- Promote strong liaison schemes between institutions and the productive sector and society in general.
- Foster programmes that relate institutions with their regional environment as well as to their cultural, social and economic development processes in order to contribute to their better knowledge and understanding.
- Promote strengthening of academic capacity and competitiveness across public higher education institutions, in order for them to respond to regional development needs in a timely fashion and with increasing quality levels.

232. In the context of the public subsystem expansion, state government initiatives to create new public institutions or programmes in existing ones, must be technically endorsed by the COEPES by means of feasibility studies that should cover six dimensions:

- Macro-regional: justifies creating a new institution that contributes to respond to regional needs within the national context.
- Micro-regional: analyses regional productive structures and socio-economic problems affecting it. In addition, it evaluates the role of public and private institutions in problem-solving contexts. It also helps define the socio-economic environment, the

aspirations and expectations of the social sector members in terms of the creation of institutions or programmes and their contribution to the solution of regional problems.

- Labour market: determines current and future need for professionals in the regional scope of influence. Determines the type of knowledge and skills as well as profiles and possible studies needed in terms of the features of economic units.
- Socio-economic level and educational expectations: identifies the socio-economic household level of students in the last year of upper secondary education in the geographical area of influence, as well as student expectations in terms of continuing their education exploring, in addition, their professional areas of interest.
- Educational service supply and demand: determines past and present behaviour in the regional scope of influence, the flow of upper secondary graduate students and the potential demand of candidates in the short and medium term.
- Teaching staff: identifies the supply of professionals with the appropriate profile in the region, in terms of the education options offered by the institution and its typology.

233. Each of these policies has been related to a set of guidelines leading to concrete measures in 2001-2005. Among them, the diverse support from SEP to state governments in order to reinforce the COEPES, the development of comprehensive public institution programmes (Chapter 9), carrying out projects related to regional needs and the operation of the Programme of Expansion of Educational Supply.

234. State education authorities participate vigorously in defining, operating, and enriching federal policies through their participation in different programmes and CONAEDU, which meets regularly for this purpose. Proof of such participation is that the requests received by the federal government on the context of the Programme of Expansion of Educational Supply must be subscribed by these authorities. This is a vital programme; since it responds to the states' own higher education development plans (designed by the state governments).

235. In addition, entrepreneurs participate in defining policies through their presence in a number of COEPES and the liaison committees of the institutions that have such entities. In the case of the technological university and polytechnic institution subsystems as well as of the state technological institutes, entrepreneurs participate in their governing boards.

236. On the other hand, the state congresses have education and/or science and technology commissions that may also participate in policy-making. Evidently, their influence is relevant, since they pass the budget allocated by the state government to develop higher education institutions and public research centres in the states.

237. In 2001-2005, in co-ordination with state governments, SEP endorsed creating and operating 84 public higher education institutions and the fourth UAM Academic Unit in western Mexico City (Table 4.1 and Chart 4.1).

238. In terms of new institution creation and consistent with current policies, the federal government has privileged the states or regions with coverage rates below the national average. The COEPES have considered economic, social and cultural aspects as well as the guidelines established by SEP in agreement with state governments. In compliance with these policies, the surveys have taken into consideration the macro- and micro-regional environment as well as the labour market, incorporating education supply and demand analysis and upper secondary student expectations.

239. During the academic year 2006-2007, ten new public institutions are considered to start operating: three intercultural, three polytechnic and three state public universities, as well as one state technological institute, with which the number of public institutions created during the present federal administration will be 94.

240. With the purpose of widening and diversifying the educational supply and access, SEP has also endorsed the following: a) 387 new higher education options (143 university level technician, 81 associate degree, 158 bachelor's degree, 2 specialty and 3 master's degree study programmes) in 107 state and technological public universities; b) capacity expansion in 48

state public universities to increase the enrolment levels in 1,673 existing programmes (188 associate degree, 1,474 bachelor's degree, 12 specialty, 55 master's degree and 14 doctorate schemes); and, c) creating other decentralized entities of the state governments, such as the Oaxaca Regional University Network⁶⁸ that, due to its organisation and education model, respond more appropriately to their region's specific development needs.

241. Both the federal and the state governments contribute to the operation of the new or existing institutions or programmes, at a rate of 50% each.

242. In the technological institutes subsystem the following study programmes were created: 52 bachelor's (41 in 34 federal technological institutes and 11 in nine state ones), 69 master's in 21 federal institutes and seven doctorate's in six federal institutes, too. For this purpose the existing capacity of each institution was used.

Table 4.1 Creation of higher education public institutions, 2001-2005

Academic year	Technological universities and academic units	State public universities	Polytechnic universities	State technological institutes	Intercultural universities	Total
2001-2002	6	2	1	8		17
2002-2003	8	9	3	8		28
2003-2004	6			3	1	10
2004-2005	3		7	6	1	17
2005-2006	1		7	2	2	12
Total	24	11	18	27	4	84

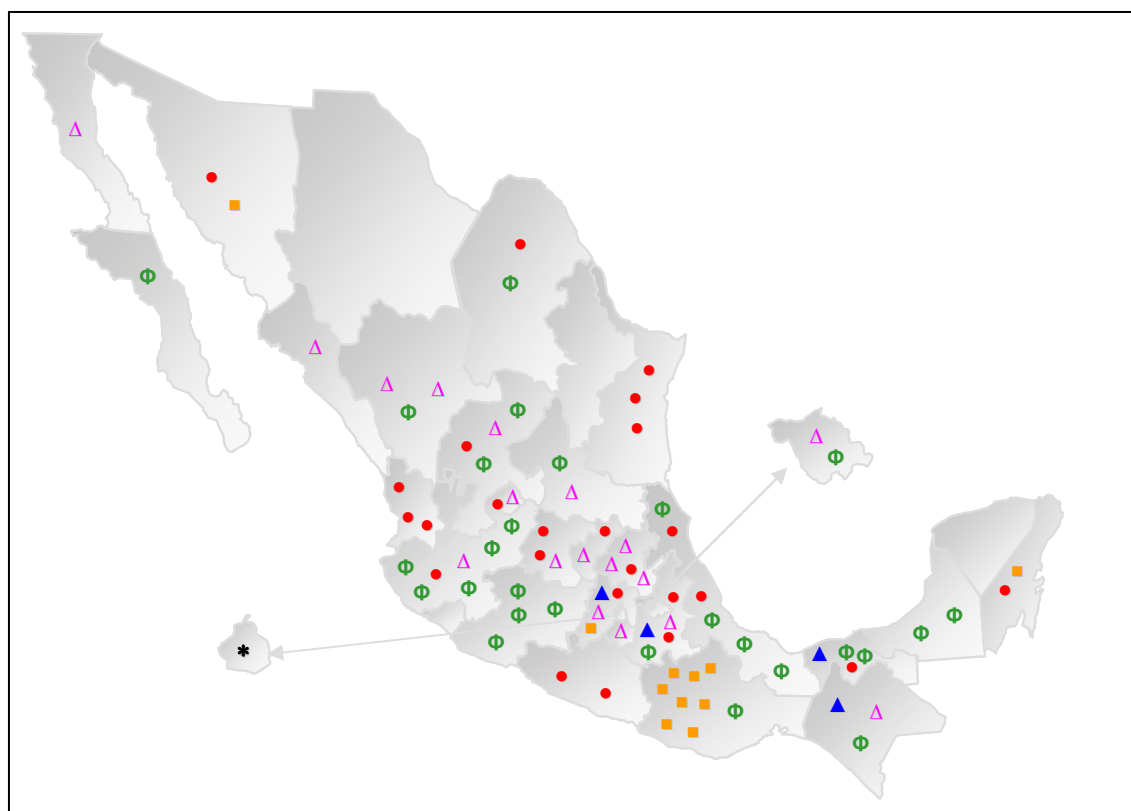
Source: SEP.

243. With the purpose of expanding their coverage and responding to the demand generated in recent years, several universities, such as UNAM, the *universidades autónomas del Estado de México, Benemérita de Puebla, Querétaro, Sinaloa, Ciudad Juárez, Zacatecas, Tamaulipas, Tabasco, Hidalgo, Baja California* and UAM, as well as the *universidades de Colima, Quintana Roo, Sonora and de Ciencias y Artes de Chiapas*, introduced new campuses and education services.

244. In 2001-2005, the *universidades autónomas de Hidalgo, Tabasco, Nayarit* and UAM, as well as the *universidades de Colima, Guanajuato and Veracruzana*, together with 44 technological institutes, created schemes to operate distance learning programmes. During that same period, SEP has worked in co-ordination with the governments of Hidalgo, Durango and Chiapas to establish state distance education systems in order to take education to inaccessible or less densely populated areas. Federal and state investment in the Programme of Expansion of Educational Supply amounted to 3.279 billion pesos in 2001-2005 (Table 4.2).

⁶⁸ The Oaxaca Regional University Network consists of the following universities: *del Mar, del Istmo, del Papaloapan, de la Sierra Sur* and the *Universidad Tecnológica de la Mixteca*. Each of these institutions is a non-autonomous, decentralised entity of the government of the state of Oaxaca.

Chart 4.1 Location of public higher education institutions created in 2001-2005



▲ Intercultural university; ● Technological university; ■ Non-autonomous state public university; Δ Polytechnic university; Φ Technological institute; * UAM unit

Table 4.2 Programme of expansion of educational supply

	1998-2000				2001-2005				Total 1998-2005			
	Number of programmes assisted			Resources granted ¹	Number of programmes assisted			Resources granted ¹	Number of programmes assisted			Resources granted ¹
	New	Existing	Total		New	Existing	Total		New	Existing	Total	
State public universities	147	917	1,064	595,289.00	188	1,634	1,822	844,999.08	335	2,551	2,886	1,440,288.08
4th UAM unit	-	-	-	-	5	-	5	44,300.00	5	0	5	44,300.00
Polytechnic universities.	-	-	-	-	39	34	73	160,801.42	39	34	73	160,801.42
Intercultural universities.	-	-	-	-	5	0	5	32,750.00	5	0	5	32,750.00
Other ²	-	-	-	-	7	5	12	17,686.01	7	5	12	17,686.01
Technological universities	134	85	219	136,252.10	143	219	362	2,179,211.30	277	304	581	2,315,463.40
Total	281	1,002	1,283	731,541.10	387	1,892	2,279	3,279,747.81	668	2,894	3,562	4,011,288.91

/1 Thousand Mexican pesos

/2 Includes the following assistance:

- Aguascalientes CEES and Quintana Roo COEPES (2001),
- *Instituto Campechano* (2001 and 2002),
- *Instituto Hidalguense de Educación Media Superior y Superior* (2001),
- *Centro de Investigación y Docencia en Humanidades del Estado de Morelos* (2001 and 2003),
- Distance Education System of the State of Chiapas (2005).

Source: SEP.

245. The regional dimension in federal policies has brought about the creation and operation of polytechnic and inter-cultural universities, thus strengthening the relevance of regional education options. The public polytechnic university subsystem (Chapter 2) intends to:

- Expand and diversify relevant options in terms of state and regional development needs so as to allow its graduates to participate advantageously in the labour market.
- Contribute to expand the number of options offered to upper secondary education, university level technician and associate degree graduates to continue studying.

- Flexibilise curriculums with multiple access and exit points, adapted to student interests, regional development needs and the labour market.
- Offer programmes focused on student learning and designs based on professional and labour-oriented skills.

246. Among their governing boards, polytechnic universities have Social Councils⁶⁹ (formed by ten members who are renowned in the region for social, cultural, artistic, political and economic reasons). They are empowered to: monitor the university's economic activities and service quality, propose measures to enhance institutional performance, programme relevance and schemes and mechanisms contributing to develop their region; issue the institution's code of ethics and promote accountability in the academic and managerial fields.

247. Polytechnic university curriculums include applied research and technology development, which are both developed jointly with the productive sector. The purpose is for professors and students alike to participate in technology and advice services contributing to improve firm performance in their regions.

248. Created in 2003, the intercultural university subsystem (Chapter 2) consists of institutions located in regions with high densities of indigenous population. They are open to students of every origin and offer training that is relevant for local youths interested in pursuing higher education.

249. Their operation and development is based on the following principles:

- A mission to train professionals and intellectuals committed to the development of their community, their peoples and their region.
- Programme supply is designed considering their community or regional needs and development potential.
- Flexible programmes, in order to offer students ideal conditions according to their needs.
- Teaching indigenous languages as part of the core educational model, to promote development and disseminate their culture in other latitudes.
- Knowledge generating activities focus on indigenous languages and culture as well as on regional sustainable development, which are the sources of training elements and of fundamental actions to promote the revaluation and consolidation of the languages and cultural expressions of forefathers, as well as to explore alternative paths to encourage development respecting the values and traditions that have marked the harmony of their relationship with the environment.
- Students are selected based on a principle of equal participation in terms of peoples, languages, ethnic origins (at least 20% of the student body should be *mestizo*) and gender. This principle is based on the hypothesis that a relevant option in terms of conditions and stimuli for student training and development will favour an enhanced academic performance, compared to former levels and improve their possibilities of involvement in the study and work discipline implicit in university life.
- Among other reasons, since these institutions do not select their students based on conventional academic criteria, student training incorporates one year (the first) of academic activities (basic training) where language mastery is emphasised, since this will enhance their potential, skills and abilities.
- Building close links between the university and the community or region intended to benefit is essential to its performance, from the very design of the project to the delivery of services relevant in terms of encouraging their development.
- The student is the main character in the training process, accompanied by individual or group tutoring academic schemes.

250. The current administration has clearly promoted the regional dimension of higher education by expanding and diversifying programme options, proposing alternatives in different

⁶⁹ In the Reviews of Federal Policies for Education OECD experts recommended involving representatives from the social and economic sectors in different areas of the institutions.

public subsystems to the students and in the context of each of these, in institutions with different typologies. Federal policy strives to contribute the required resources to operate each institution, potentiating their facilities and reducing tensions across institutions, which is achieved by implementing policies associated to the process and consensus reached in each state's COEPES.

251. New public institution creation and development has focused particularly on increasing social participation in their governing bodies and on generating the most appropriate conditions to guarantee their adequate performance as well as their relevance and good quality programmes. Among other federal policies, it has been established that, depending on their typology and the nature of the programmes offered, new institutions must hire full-time and part-time professors in the appropriate proportions and with the desirable academic profiles.

252. During the past decade, the federal and state governments have jointly fostered a set of priority policies intended to strengthen technological higher education⁷⁰ in Mexico's states and regions, thus contributing to improve the relevance of the system's options across the country. The result has been the creation of 50 technological universities, 96 state technological institutes and 18 polytechnic universities.

253. Nevertheless, this emphasis on technological higher education has been criticised by different views, arguing that federal and state policies privilege training for the labour market, as well as a market vision of higher education. They do not consider, however, that the best way in which higher education may effectively contribute to regional and state development is through the relevance of its options.

254. In the context of the public institution planning processes, SEP has encouraged exercises that, since 2001, have led to designing, updating and developing their PIFIs⁷¹ (chapters 2, 8, and 9). These programmes have fostered and endorsed the relevance of their education proposals, their professional community social service programmes⁷² and their liaison schemes with the region's social and economic sectors, among other aspects. All these measures with the purpose of reinforcing public institution contribution to regional development.

255. As in most countries, in the near future, higher education development in Mexico will face the challenge of guaranteeing its quality and financing in the face of increasingly limited financial capabilities from the federal and state governments. There is a growing urgency to reach the necessary consensus to materialize a series of structural reforms, such as the fiscal reform, that will allow governments at every level to increase their possibility of financing existing institutions and the system's future growth. It is also required that institutions diversify their sources of financing and optimise the use of available resources.

256. The encouragement that federal government has given to decentralization, and in this sense, to strengthen the local educational authorities' capacity decision regarding the development of their own higher education state systems, has not yet received the same response in all states. Some of them have made greater efforts than others to consolidate their COEPES.

257. Local authorities express their concern since, sometimes, autonomous state public universities or federal technological institutes do not incorporate fully to the planning and co-ordination processes involved in the state's development of higher education. This is a window of opportunity that is being addressed in order to accomplish the objective of having state planning systems operating efficient and systematically in every state in Mexico.

⁷⁰ In the Reviews of Federal Policies for Education, OECD experts recommended prioritizing the development of technological institutes and universities.

⁷¹ Innovation and Development for Technological Institutes.

⁷² In the Reviews of Federal Policies for Education, OECD experts recommended redefining student social service to favour the disadvantaged.

4.3 Consortium of Mexican Universities

258. In early 2005, the Consortium of Mexican Universities (*Consortio de Universidades Mexicanas*, CUMEX) was established with the participation of a group of state public universities⁷³ that, currently, provide at least 80% of their bachelor degree students with programmes acknowledged for their high quality by assessment and accreditation entities (Chapter 9) owing to a very effective strategic planning and PIFI development process.

259. CUMEX's agenda has the strategic goal of contributing to build a common regional space for higher education in Mexico, articulated by the renowned quality of their bachelor's study programmes.

260. Currently, the Consortium works with SEP in order to establish comparison⁷⁴ mechanisms for their curriculums, credit validation, student mobility and the organization of academic collaboration networks in seven fields: architecture, biology, accounting and administration, civil engineering, medical school, psychology and veterinary medicine and zootechnics. In order to contribute to their development, the Consortium has a consultative body and groups of experts in each field.

261. Currently, eight academic networks have been created around research subjects such as animal health, compact fillings, hydrologic element modelling, leadership in Latin America, Small and Medium Companies (*Pequeñas y Medianas Empresas*, PyMES), financial and managerial profiles, architecture and environment and architecture and heritage.

262. CUMEX and the University Pole of Toulouse, France, recently established academic collaboration schemes for their member institutions in 35 LGAK. In addition, a new mobility programme for economics students has been introduced with support from SEP.

4.4 Institutions and their contribution to regional development

263. Currently, public higher education institutions have different schemes for contributing to development in their region. These schemes may exert an influence over different problem areas and, at the same time, receive extraordinary resources to supplement their subsidies.

264. Public universities have had a history of commitment and relationship with regional development and addressing problems in their environment. They offer a wide array of continuous education programmes and provide many services, such as assisting different actors through legal offices, dentistry and veterinary clinics, social service projects, agricultural sector and entrepreneurial development support centres and various advice and training programmes, among others.

265. These institutions made significant efforts during the past decade to expand, reinforce and improve the quality of their cultural extension programmes and the services they offer to their community, allowing them to relate more closely to different social sectors in terms of addressing problems in the most marginalized communities, in preserving local, state, regional and national culture and promoting scientific, artistic and aesthetic activities in benefit of their community and their environment.

266. Currently, 28 public institutions have radio stations incorporated to the National Producer and Radio Station System of Higher Education Institutions (*Sistema Nacional de Productoras y Radiodifusoras de las Instituciones de Educación Superior*). These stations broadcast a wide variety of news, analysis, science, humanities and sports programming, allowing them to serve their community and the society of their region.

⁷³ The following institutions are currently part of CUMEX: *universidades autónomas de Aguascalientes, Baja California, Ciudad Juárez, Coahuila, Estado de Hidalgo, Nuevo León, San Luis Potosí and Yucatán; Universidades de Colima, Occidente, Quintana Roo and Sonora*, as well as the *Tecnológico de Estudios Superiores de Ecatepec*.

⁷⁴ Employing the Tuning methodology.

267. Through their social service programmes—involving professors and students alike—public universities exert their influence on different population problems, mainly regarding extreme poverty groups. In the past decade, a group of universities⁷⁵ have developed multi-disciplinary regional projects of great impact and social relevance, earning them the Community Social Service Excellence Award (*Premio Nacional a la Excelencia al Servicio Social Comunitario*) granted by the Secretariat of Social Development (SEDESOL) and ANUIES with Ford Foundation support.

268. Links to the productive sector are developed in these institutions with different depth and expansion levels. In most of these universities the relationship materialises through student professional internships in firms and advice and consulting services. Those with larger academic capacity also develop research projects and joint programmes, among others. In order to foster a closer and more effective relationship, most universities have established one or more of the following structures: consultative connection councils, institutional connection units, technology-based firm incubators, entrepreneur and consulting programmes and national or regional strategic research centres. UNAM and IPN have a wide variety of programmes that contribute to the development of PyMES.

269. The technological university subsystem was established in 1991, with three main purposes: a) decentralising higher education services, striving to favour marginalized communities; b) favouring connections between academia and the productive sector; and c) diversifying the structure of education options. In this context, the subsystem's implementation and management is carried out within a scheme of collaboration across different social actors, namely state governments and the region's productive sector.

270. The subsystem has gradually incorporated institutions that are differentiated in terms of their regional location. On one hand, there are the universities in areas with a well developed demographic, industrial and economic base, such as Querétaro, Puebla and Aguascalientes; on the other, there are those playing the role of regional development engines, located in low industrial activity regions, such as Valle del Mezquital or Sierra de Hidalgo.

271. The programmes offered by technological universities are supported by a curriculum organised around three main axes: the general-specialised, the theoretical-practical and the connection between university and production sector. This feature, highly technical and applied, geared towards labour market demands and responding to the productive sector needs, is what distinguishes technological universities.

272. This subsystem has developed projects aimed at processing and marketing agricultural and natural products, energy saving, reforestation and water treatment, among many others. By means of social service programmes, they exert an influence over different groups, particularly the most disadvantaged. The internship programmes in which students participate during the last quarter of their study programmes within a firm⁷⁶ or the region of the university's influence allows them to apply their knowledge and acquire labour experience. The projects implemented are oriented towards the local development and according to the existing resources. Frequently these projects are the start of a new business.⁷⁷

273. The Governing Board of technological universities is formed by three state government representatives, three federal government representatives, one from the municipality and three from the region's productive sector. Each has a liaison area in its structure, thus expanding the relationship with different regional economic actors beyond the Board, contributing to guarantee the relevance of their programmes and to give timely responses to economic and labour market requirements.

⁷⁵ *Universidades autónomas de Coahuila, Chihuahua, San Luis Potosí, del Estado de Hidalgo, del Estado de México, UNAM, Juárez Autónoma de Tabasco, Juárez del Estado de Durango, y las universidades de Guanajuato, Sonora and Veracruzana.*

⁷⁶ In the Reviews of Federal Policies for Education OECD experts recommended establishing an internship period for students in firms as part of the curriculum.

⁷⁷ For instance, research projects aimed at assessing orange tree varieties and *chile* production in greenhouses, coffee gathering and marketing by the Chilón producer co-operative association and the production and marketing of organic fertilizer made with worms, advice for edible mushroom production and preparation of fertilizers with leaves. In these cases, the projects benefit cattle raising associations, co-operatives, producer groups or the general community.

274. With the assistance of the National Academic Relevance Commissions (*Comisiones Nacionales Académicas de Pertinencia*), headed by a regional entrepreneur, the Boards decide the content of the programmes the university should offer every three years. Specific contents are in turn determined by the local Relevance Commissions according to regional demands. In 1994, this subsystem offered 22 technical-managerial programmes, geared towards the goods and services productive sectors; in 2005, provision increased to 365 programmes in fields such as electro-mechanics, textiles, environmental technology, chemistry, economics and administration, ICTs, food and agriculture industry, services and health. They also offer continuous education activities with demand-based programmes and contents.

275. The benefits this training offers are reflected upon their region. According to the system's graduate student monitoring scheme, 70% of the graduate students employed develop their activities within the university's scope of influence.

276. In 2003, a group of 18 technological universities⁷⁸ was created, with the purpose of "Encouraging Regional Development or Development Technological Universities" (*Impulsoras del Desarrollo Regional o Universidades Tecnológicas de Desarrollo*), defining programmes and projects with influence over the region's economic development, as the main item in their agenda. This group has 14 firm incubators that apply innovation as a new way of producing, processing and marketing natural resources. In 2006, the group earned the PyMES Award 2007 (Galardón PyMES) granted by the federal SE in acknowledgement of the efforts made to foster micro, small and medium-sized enterprise competitiveness in Mexico.

277. In collaboration with Cisco Systems, the *Universidad Tecnológica del Valle del Mezquital* offers training courses through the Networking Academy programme, intended to teach the design, building and maintenance of computer networks. The programme is free of charge, and offers the possibility of certification in the field of network administration. The impact of this alliance has allowed students from the *Hñāhñu* ethnic group—from the state of Hidalgo—to encourage ICT development in a marginal area such as the Mezquital.

278. In spite of their development, their effective contribution in terms of equity, their favourable education outcomes, their high indices of graduate acceptance in the labour market and their contribution to regional development, technological universities still face resistance among potential students, who would rather follow bachelor's degree studies in traditional institutions. This rejection is also seen across population segments, which consider that the creation of these institutions has come as a result of implementing federal public policies privileging a market and neoliberal vision of higher education.

279. In compliance with PRONAE policies, the technological institute subsystem has consolidated actions that are clearly consistent with regional development. In terms of their commitment to scientific and technological development and knowledge transmission, technological institutes are aimed at responding to their region's industrial and labour market requirements. Their development plans commit them to designing programmes aimed at solving urgent regional and national problems, especially those related to PyMEs.

280. The understanding of regional problems by the institutions Governing Boards fosters their growing attention. The organisational structure of federal technological institutes has a liaison committee that contributes to the latter, which, in the case of state institutes is carried out by their Governing Board, constituted by federal, state and municipal government representatives, as well as by social and productive sector members.

281. The subsystem's PIID, the programme derived from it for each technological institute and centre, as well as their own Education Model for the 21st Century, promote connection and

⁷⁸ These are: *universidades tecnológicas Regional del Sur, Selva-Chiapas, Campeche, Costa Grande de Guerrero, Región Norte de Guerrero, Norte de Guanajuato, Suroeste de Guanajuato, Tecamachalco, Izúcar de Matamoros, Huejotzingo, Sierra Hidalguense, Huasteca Hidalguense, Valle del Mezquital, Sur del Estado de México, Costa de Nayarit, Norte de Aguascalientes, Centro de Veracruz and Sureste de Veracruz.*

collaborative work between each institute and centre and the government, society and industry institutions in their surroundings.

282. The structure of their bachelor's degree curriculum (Chapter 3) might be among the aspects that best reflect the regional dimension of federal policies in technological institutes. Offering 24 generic programmes, different graduate profiles are taken into consideration for each, adapting to regional needs through specialty modules.

283. The contribution of technological institutes to regional development is also carried out through different lines, some more significant than others, such as community social services, professional internships, incorporating graduates to the productive sector, their continuous⁷⁹ education programme and technology service provision. By means of the social service programmes, these institutions encourage the development of rural and urban disadvantaged population segments and, through their demands, the community service goals have expanded.⁸⁰ The number of students⁸¹ working in approved social service projects has grown systematically, from 22,002 in 1996-1997, to 30,569 in 2000-2001, reaching 31,878 in 2004-2005. This effort has merited SEDESOL's attention and recognition.

284. During their professional internship, students from technological institutes develop a one-semester project relevant to their development, previously agreed upon with their region's firms or organisations and under the advice of a professor. Advisors approve the resulting project as part of the curricular requirements. The number of approved projects has increased from 17,609 in 1996-1997, to 24,169 in 2000-2001, reaching 27,993 in 2004-2005. The follow up and graduate tracer studies show that from 2001 to 2003 academic years, 10%, 13% and 21% respectively of the graduates establish that their internship was instrumental for their hiring. In the case of the technological universities, 15% of the graduates (47,732) in the 1993-2004 period obtained their first employment during their internship. Besides, 94% of the students considered that the internship allowed them to apply their knowledge, abilities and skills acquired in the university and become involved in the solution of specific problems of the firms. On the other hand, 96.1% of the employers of technological universities' graduates have favourably opined about their academic formation and capacities.

285. The most important factors contributing to the achievement of positive results in professional internships are the precision of the project to be carried out by the student, the joint and timely tutoring of both professors and firm's staff and the adequate operational conditions for its development.

286. Private institutions generally contribute to regional development through training, updating and preparing professionals based on their programmes and by the social service projects their students develop. The institutions with the largest academic capacity offer one or more of the following programmes: university extension, specialized health services, firm development and advice and consulting for community development, among others.

287. Despite the above, state governments and local entrepreneurs and organisations have expressed their disagreement in terms of the unsatisfactory training of graduate students, the quality and relevance of the programmes offered and the insufficient of connection with local needs. The latter is a problem associated also to the inadequate knowledge of higher education institution capacities to help solve the problems in their community.

⁷⁹ In the National Informatics Training Programme (*Programa Nacional de Capacitación en Informática*) organized by the Federal Judiciary Council, 7,000 individuals attended 551 courses in 47 cities in 2003 and 2004. Another example is the Entrepreneurial Modernisation Programme (*Programa de Modernización Empresarial*, PROMODE), introduced by the SE, with over 300 courses taught in 130 cities. This programme was introduced in 2004 and is still observed. It is aimed at micro-entrepreneurs from isolated regions in Mexico. The Capabilities Development Programme for the Rural Sector (*Programa de Desarrollo de Capacidades para el Sector Rural*, PRODESCA) encourages external certification of professors, graduates and active professionals in collaboration with the Rural Sector Training Institute (*Instituto de Capacitación del Sector Rural A.C.*) (INCA Rural) and the Secretariat of Agriculture (SAGARPA). This programme responds to cases that benefit producers and rural organisations.

⁸⁰ Such as repairing household electricity wiring in rural communities in the state of Querétaro, preparing urban organisation plans in Aguapán, Nayarit, giving academic advice to lower and upper secondary students and informatics for adults in rural communities of Nuevo León and the project to produce and market *xoconoxtle* (an indigenous fruit) in rural areas of the state of Guanajuato, among many others.

⁸¹ In federal technological institutes.

288. There are tensions in the system stemming from regional and higher education roles. The presence of higher education institutions with different typologies in the states contributes to mitigate such tensions. Tensions within public institutions increase when federal and state policies and programmes generate centrifuge forces in the institutions that weaken the community's contributions to regional development. A significant example is the tension generated within public institutions with Type IV, V and VI typologies (Chapter 2) by the SNI, whose operation may encourage professors to reduce or even neglect performing other roles they are in charge of in order to receive the System's grant. This affects, in particular, their involvement in programmes addressing institutional problems. In order to influence this situation, in 1992, SEP established the Programme for Encouraging Teaching Excellence (*Programa de Estímulos a la Carrera Docente*), which operates under a set of general guidelines institutions must consider in order to establish their particular operation schemes. These guidelines and criteria allow them to encourage a balanced performance of duties among their professors in order to receive the grant. In addition, it reduces the tensions and redirects academic work to make it consistent with the institution's mission and vision.

Chapter 5: The role of research and innovation in higher education

5.1 Introduction. 5.2 Strengthening academic bodies. 5.3 National System of Researchers. 5.4 The SEP-CONACyT Programme to Support the Basic Sciences. 5.5 The SEP-CONACyT National Programme for the Strengthening of Postgraduate Education. 5.6 The Fiscal Incentives Programme for Research and Technological Development. 5.7 CONACyT's Mixed Funds Programme. 5.8 Federal investment.

5.1 Introduction

289. According to PRONAE's diagnosis, public higher education institutions carry out most of the country's scientific, technological and humanistic research. The institutional capacities for GAK and for the formation of new researchers are however, insufficient, very heterogeneously scattered across the country, and their unachieved development among those institutions that, according to their mission, should cultivate it, affects the quality of education programmes and hinders the possibility of their contribution to the social and economical development of the country.

290. In this very sense, PRONAE acknowledges that the challenge lies in expanding and reinforcing academic bodies—according to their profile and development plans—in each DES, in order to increase the institutional capabilities to generate and innovatively apply knowledge; integrate and co-ordinate the institutions' intellectual resources to favour educational programmes and articulate such activities; and train high-level personnel in terms of the social and science and technology development needs in Mexico, in addition to continuing the infrastructure expansion and updating process needed to generate and innovatively apply knowledge in public institutions.

291. The diagnosis also indicates that development in the field of postgraduate studies has been unequal, both in terms of programme quality and addressing different areas of knowledge. A sizeable number of the nearly 2,000 programmes created in 1990-2000 did not have either the necessary infrastructure or the academic staff to guarantee adequate formation. Of the nearly 2,500 programmes that, given their objectives, could have been part of CONACyT's Registry of Excellence for Postgraduate Study Programmes (*Padrón de Programas de Posgrado de Excelencia*), as of 2000, only 150 were acknowledged as good-quality programmes. In this regard, PRONAE indicates that the challenge lies in improving the quality of postgraduate programmes, particularly doctoral, by strengthening the academic bodies that sustain them and the necessary infrastructure for their operation, as well as by increasing enrolment at this level, especially in fields such as exact sciences, engineering and technology, with the purpose of expanding the high level human resource base that contributes to encourage Mexico's sustainable development and the growth of the higher education system.

292. Moreover, the Special Science and Technology Programme (*Programa Especial de Ciencia y Tecnología*, PECyT) 2001-2006 which, according to the guidelines in the Science and Technology Law, must be designed by CONACyT, has established the following strategic goals, each associated with specific actions:

- Increase domestic scientific and technological capacity.
- Increase firms competitiveness and innovation.

293. In terms of the above situation, both the PRONAE and the PECyT incorporated a set of policies and specific lines of action to construct a sound platform that allows the development of the country and its international competitiveness. Among the most relevant:

- Strengthening PROMEP to encourage consolidation of academic bodies and their LGAKs.
- Encourage institutions, in the framework of the design, updating and development of their Comprehensive Programme for Institutional Strengthening, to focus their attention towards developing their academic bodies with the purpose of increasing institutional capacity for GAK, and the supply of good quality study programmes as well as the expansion and updating of the infrastructure necessary to support academic bodies and

their student's work. This process will pay special attention to formation and consolidating academic bodies outside Federal District's public institutions.

- Create appropriate conditions in public higher education institutions to allow the reincorporation, under favourable conditions, of professors who have concluded postgraduate studies, as well as to hire new full time academic staff only with master's degree and, preferably, doctorate; and hire professionals with ample industrial experience to contribute to the expansion and consolidation of their academic bodies.
- Promote the formation of networks of academic bodies with the purpose of generating synergies among those having reached noticeable consolidation levels and those still in development, hence fostering their own consolidation; contribute to professor-researcher training and the development of LGAKs or technology services in strategic areas for national development.
- Promote academic alliances between prestigious Mexican and foreign institutions in order to reinforce the academic capacity of Mexico's higher education institutions.
- Foster basic sciences with the purpose of strengthening the capacity to generate and innovatively apply knowledge in order to form high-level human resources, as well as to improve the quality of the programmes supplied.
- Create the PFPN, with the purpose of continuously improving the quality of postgraduate study programmes supplied by higher education institutions, paying special attention to doctorate level programmes, specially oriented to scientific, social and technological development priorities.⁸²
- Promote expansions in enrolment in high quality postgraduate study programmes with the purpose of reinforcing the national ability to generate and innovatively apply knowledge.

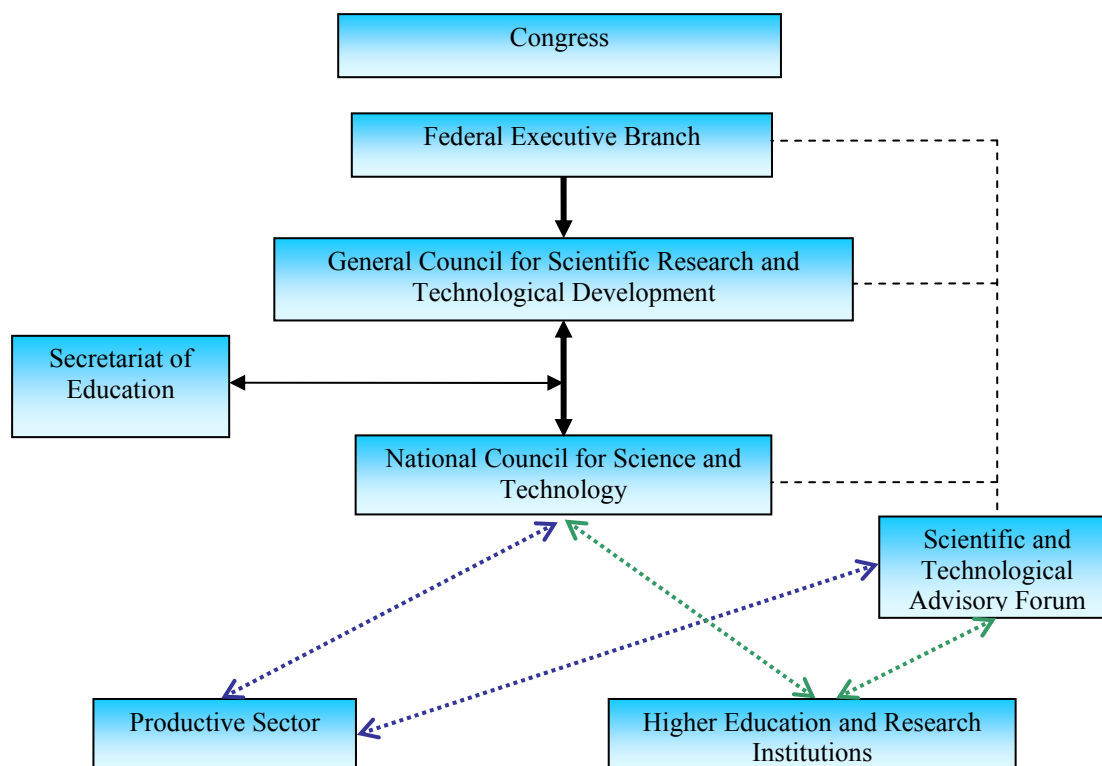
294. According to the Science and Technology Law (*Ley de Ciencia y Tecnología*), approved by the Mexican Congress in 2002, the General Council for Scientific Research and Technological Development (*Consejo General de Investigación Científica y Desarrollo Tecnológico*) is the entity responsible for defining the State policy on science and technology. The General Council is a policy and co-ordination entity integrated by the President of Mexico, nine federal cabinet secretaries, the Director General of CONACyT, the Scientific and Technological Advisory Forum Co-ordinator, the President of the Mexican Academy of Sciences, ANUIES' Executive Secretary General, and, individually, four representative members of the scientific, technological and entrepreneurial fields. The Director General of CONACyT is the Council's Executive Secretary (Chart 5.1).

295. Furthermore, CONACyT is the entity in charge of proposing and designing federal science and technology policies. Its Organic Law defines it as an unsectored, decentralized entity from the State, with its own legal personality and patrimony, as well as technical, operational and managerial autonomy. Its purpose consists in advising the executive branch in articulating the federal government's public policies in these matters, as well as in fostering the development of Mexico's scientific and technological research, in addition to innovation, development and technological modernization.

296. The Science and Technology Law created the Scientific and Technological Advisory Forum (Foro Consultivo Científico y Tecnológico) as an autonomous and permanent consultation entity for the executive branch, and CONACyT's general council and Board. The Forum is a civil association with the purpose of promoting the expressions from the scientific, academic, technologic and productive sector communities in the design of proposals regarding scientific and technological research policies and programmes. The Forum consists of 17 well known and prominent members in their respective communities.

⁸² In the Reviews of Federal Policies for Education, OECD experts recommended improving the quality of doctorate programmes.

Chart 5.1. Structure for the generation of national science and technology policies



297. The Science and Technology Law states that SEP and CONACyT must implement collaboration schemes to encourage basic scientific research, academic bodies consolidation and improvements in the quality of postgraduate studies, as well as technological development, among other aspects. In this sense, with the purpose of addressing the aspects indicated in PRONAE and PECyT diagnoses, and implementing the lines of action previously mentioned, SEP and CONACyT joined their efforts and designed inter-sectorial collaboration programmes in 2001. The description of the main attributes of the following programmes appears below:

- Strengthening Academic Bodies.
- Supporting Basic Science.
- National Programme for the Strengthening of Postgraduate Education.
- Granting Fiscal Incentives to Firms Investing in R&D.

5.2 Strengthening academic bodies

298. Acknowledging the fact that academic activity reaches generally its highest when carried out collectively, PRONAE points out the relevance of promoting the consolidation of academic bodies in order to improve the institutions ability to generate and innovatively apply knowledge, and the supply of high quality programmes, particularly at a doctoral level. The latter are the essential foundations in professional training at 5A and 6 level study programmes, in quality improvement of educational programmes in keeping academic staff updated and accomplishing their roles.

299. An academic body is a group of full time professors who share interest in one or several LGAK, in disciplinary or multidisciplinary fields, and in a set of common academic objectives. Additionally, the members of the group teach one or several study programs closely related to their specialties in preferably 5A4, 5A and 6 level degrees; in individual or group mentoring programs and carry out intense collegiate and academic management activities.⁸³

⁸³ In *Examinations of the Federal Policies of Education*, the experts of the OECD recommended to foster the collective activities and the collegiate life of the educational personnel

300. An academic body is said to be consolidated if the majority of its professors are doctors, their academic production is of high level measured with international standards, an intense collegiate academic activities are carried out in it, and their and members actively participate in domestic and international networks of academic collaboration. The nearly totality of its members have been recognised by PROMEP as having the desired academic profile.

301. PROMEP sets forth a series of supporting lines that have been implemented, particularly since 2001, with the purpose of endowing public institutions with the necessary funds to progress in creating and strengthening their academic bodies. In addition, SEP has provided advice to institutions to contribute to their planning processes where strategies are designed to consolidate their academic bodies.

302. In the context of these strategies, during the period 2001-mid 2006, SEP financed 3,681 projects to state public universities, UAM and UPN, of which 786 have been used to reincorporate the same number of former PROMEP scholarship holders, and to incorporate 2,895 new full time professors holding a postgraduate degree. Of the total, 590 projects intended to promote academic bodies' development and network building. SEP has also financed the accomplishment of 1,584 projects for GAK by the former scholarship holders and new members of the staff. Currently, 73% of the academic personnel of state public universities hold a postgraduate degree, and 23% have the doctorate.

303. Academic bodies should be formed within the framework of institutional policies. Knowledge transmission, with the subsequent human resources corresponding to their typology, as well as consensus building around initiatives tending to optimise the development of the institutions academic role, are part of their scope of action and the *raison d'être* of academic bodies. In the 2006 PIFI update by the universities, SEP has fostered that institutions strength their academic bodies in a horizon of two years to achieve their consolidation, pursuing the continuity of federal policies in this matter, and promoting the increment of their capabilities for research and technological development.

304. In order to contribute to the consolidation of the academic bodies, characteristics associated to the different stages of their evolution have been identified, in terms of the clarity and the soundness in the definition of its LGAKs, of the degree of academic level of its members, of their experience in teaching activities, of their common academic production, of the intensity of the collegiate life in which they participate, and of their experience in the processes of collaboration and academic exchange with peer academic bodies in institutions of higher education both domestic and foreign.

305. Table 5.1 shows the 2002-2006 evolution of the number of consolidated academic bodies, of those in advanced stages of the process and of those in formation, for the public universities. The same information, by institution, is shown in Table 5.2. The numbers of consolidated academic bodies, 239 from 22 state public universities, UAM and UPN; and of those in consolidation, 552 from 39 universities, have become essential indicators for the purpose of identifying the strengths of institution's academic staff as well as their academic capabilities.

306. Charts 5.1 and 5.2 present information about the evolution of consolidated academic bodies and those in advanced phase of consolidation, by area of knowledge, in those institutions. It is pertinent to indicate that, in all the areas of the knowledge, the trend has been positive. Similar behaviour is observed in the case of the academic bodies in process of consolidating.⁸⁴

⁸⁴ Urbano, Guillermina, Guillermo Aguilar y Julio Rubio, *Un primer balance de la operación e impactos del PROMEP en el fortalecimiento académico de las universidades públicas*, SEP, 2006. Available in plaintext www.ses.sep.gob.mx

Table 5.1 Evolution of academic bodies in state public universities, UAM and UPN

Academic bodies	2002	2003	2004	2005	2006*
Consolidated	34	54	68	105	239
In consolidation	170	215	298	325	552
In process of formation	1,385	2,702	2,813	2,888	2,499

*Peer assessment carried out in April 2006.

Source: SEP.

307. The significant advance in the development and consolidation of the academic bodies of the state public universities in all areas of knowledge is due, to a large extent, to the focusing of the institutional efforts motivated by the processes of integral strengthening in course, and to the financial support they have received from SEP for such a purpose.

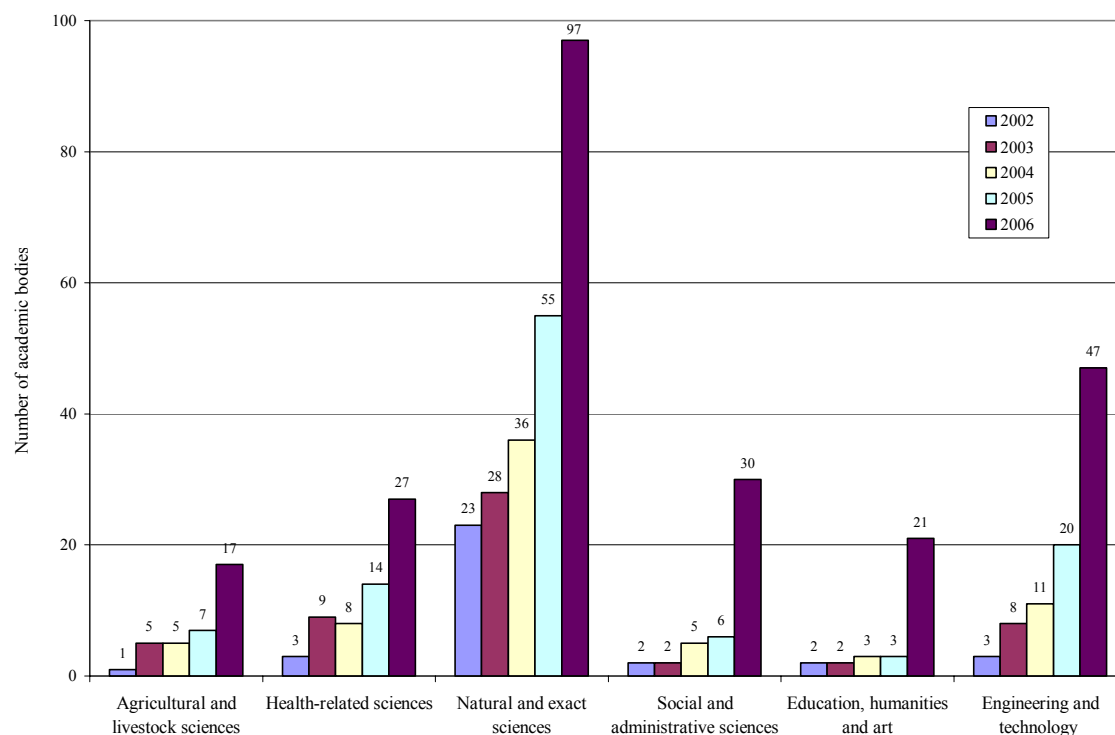
308. It is worth pointing out that in UNAM, IPN and in the public research centres subsystem, considerable numbers of groups of academic staff with attributes similar to those of consolidated academic bodies exist, representing one of their greatest institutional strengths for GAK and for the formation of high level researchers.

Table 5.2 Academic bodies and their level of consolidation, by institution

Institution	2002 registry				2006 registry			
	Consolidated academic bodies	Academia bodies in consolidation	Academic bodies in process of formation	Total	Consolidated academic bodies	Academia bodies in consolidation	Academic bodies in process of formation	Total
<i>Benemérita Universidad Autónoma de Puebla</i>	5	12	83	100	25	48	90	163
<i>Centro de Estudios Superiores de Sonora</i>	0	0	0	0	0	0	20	20
<i>Instituto Tecnológico de Sonora</i>	0	1	10	11	0	1	19	20
<i>Universidad Autónoma Benito Juárez de Oaxaca</i>	0	0	14	14	0	2	35	37
<i>Universidad Autónoma de Aguascalientes</i>	0	1	16	17	3	12	42	57
<i>Universidad Autónoma de Baja California</i>	1	11	46	58	8	19	42	69
<i>Universidad Autónoma de Baja California Sur</i>	0	1	32	33	1	3	29	33
<i>Universidad Autónoma de Campeche</i>	0	2	17	19	0	2	24	26
<i>Universidad Autónoma de Chiapas</i>	0	2	37	39	0	5	74	79
<i>Universidad Autónoma de Chihuahua</i>	0	3	48	51	1	4	64	69
<i>Universidad Autónoma de Ciudad Juárez</i>	0	0	0	0	0	7	44	51
<i>Universidad Autónoma de Coahuila</i>	0	1	13	14	0	8	59	67
<i>Universidad Autónoma de Guerrero</i>	0	0	0	0	0	3	92	95
<i>Universidad Autónoma de Nayarit</i>	0	3	33	36	0	2	63	65
<i>Universidad Autónoma de Nuevo León</i>	3	12	108	123	16	28	118	162
<i>Universidad Autónoma de Querétaro</i>	1	3	29	33	2	11	38	51
<i>Universidad Autónoma de San Luis Potosí</i>	7	11	53	71	13	17	72	102
<i>Universidad Autónoma de Sinaloa</i>	0	4	49	53	6	13	82	101
<i>Universidad Autónoma de Tamaulipas</i>	1	1	22	24	5	13	33	51
<i>Universidad Autónoma de Tlaxcala</i>	0	0	10	10	0	5	30	35
<i>Universidad Autónoma de Yucatán</i>	0	6	48	54	5	20	54	79
<i>Universidad Autónoma de Zacatecas</i>	0	1	77	78	2	17	90	109
<i>Universidad Autónoma del Carmen</i>	0	0	2	2	0	2	24	26
<i>Universidad Autónoma del Estado de Hidalgo</i>	2	9	31	42	12	16	13	41
<i>Universidad Autónoma del Estado de México</i>	0	7	55	62	5	20	71	96
<i>Universidad Autónoma del Estado de Morelos</i>	0	6	36	42	10	21	34	65
<i>Universidad Autónoma Metropolitana</i>	0	0	0	0	49	71	171	291
<i>Universidad de Ciencias y Artes de Chiapas</i>	0	1	4	5	0	3	6	9
<i>Universidad de Colima</i>	3	5	40	48	8	16	37	61
<i>Universidad de Guadalajara</i>	1	26	201	228	27	58	278	363
<i>Universidad de Guanajuato</i>	5	13	18	36	14	19	71	104
<i>Universidad de Occidente</i>	0	0	18	18	0	2	24	26
<i>Universidad de Quintana Roo</i>	0	2	13	15	0	2	17	19
<i>Universidad de Sonora</i>	5	10	47	62	9	21	79	109
<i>Universidad del Istmo</i>	0	0	0	0	0	0	8	8
<i>Universidad del Mar</i>	0	0	8	8	0	2	15	17
<i>Universidad Juárez Autónoma de Tabasco</i>	0	2	29	31	0	10	56	66
<i>Universidad Juárez del Estado de Durango</i>	0	1	29	30	1	5	31	37
<i>Universidad Michoacana de San Nicolás de Hidalgo</i>	0	8	49	57	14	19	92	125
<i>Universidad Pedagógica Nacional</i>	0	0	0	0	1	2	58	61
<i>Universidad Tecnológica de la Mixteca</i>	0	0	16	16	0	0	20	20
<i>Universidad Veracruzana</i>	0	5	44	49	2	23	180	205
Total	34	170	1,385	1,589	239	552	2,499	3,290

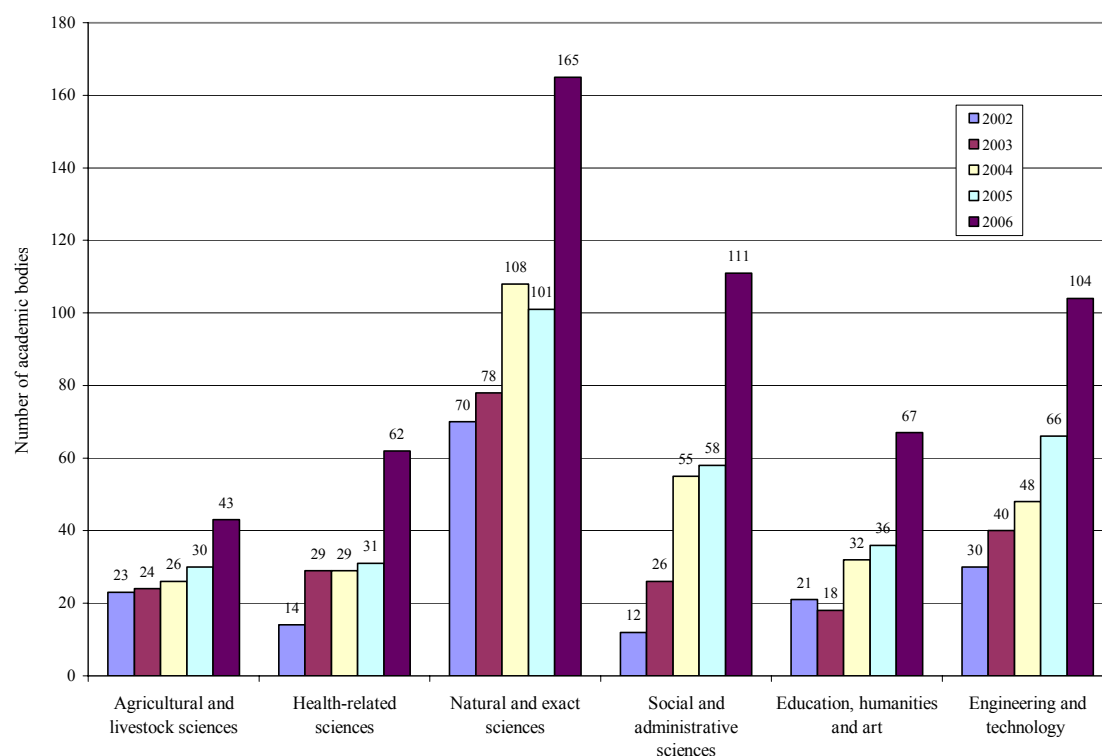
Source: SEP, Mid 2006.

Chart 5.1 Number of consolidated academic bodies in public state universities, by area of knowledge and year



Source: SEP

Chart 5.2 Number of academic bodies in process of consolidation in public state universities, by area of knowledge and year



Source: SEP

309. A fundamental characteristic distinguishing consolidated academic bodies is that their members collaborate in national and international academic networks. Between the objectives of

the so-called Thematic Networks of Collaboration, of which the consolidated academic bodies are nodes, are:

- To propitiate stable and permanent scientific interactions.
- To strengthen the identified academic capabilities.
- To enhance the LGAKs.
- To promote the exchange and mobility of academic staff and students.
- To form high level human resources.
- To exchange scientific and technical information.
- To consolidate initiatives and lines of collaboration.
- To make existing resources cost-effective, promoting scientific and technological development.

310. In order to facilitate their recognition, SEP has classified the networks in domestic or international and, in terms of their degree of regionalisation, into regional or general, as detailed below:

- General international networks, RIG.
- Regional international networks, RIR.
- General domestic networks, RNG.
- Regional domestic networks, RNR.

311. Table 5.3 shows the 22 thematic networks established up to 2006 with PROMEP's support, classified by area, field, participating institutions, countries and academic bodies. As illustrated, 25 national institutions take part in one or more thematic networks (some of them are not PROMEP members) and five the countries (France, the Great Britain, Spain, Canada and the United States) where the foreign institutions are located. It is not surprising, given their state of consolidation, that academic bodies in the natural and exact sciences, as well as in engineering and technology, are the most frequent nodes. In addition to these 22 thematic networks, the Network of Macro-universities, coordinated by UNAM and integrated by several Mexican and Latin America universities has been established.

312. In the 2001-2006 period, through PROMEP, SEP has allocated Mx\$2.302 billions to state public universities, UAM and UPN, for activities related to the consolidation of their academic bodies and networks integration.

313. Furthermore, within the Mobility of Higher Education in North America Programme (*Programa para la Movilidad de la Educación Superior en América del Norte*, PROMESAN), described in Chapter 10, up to 38 consortia have been integrated, each one formed by three or more institutions of each of the participant countries (United States, Canada and Mexico), at least nine of which share the characteristics described for the thematic networks.

314. From the integration of networks of academic bodies and institutions, as well as of the previously described consortia, the internationalisation of the Mexican higher education system is being propitiated.

315. The balance between teaching and research functions in higher education institutions that, by their typological profile must perform them is oriented by the full time professor's desirable profile policy. It defines, among academic staff, the appropriate individual balance in their activities: teaching, mentoring, GAK and departmental duties. To obtain the professor's desirable profile recognition, the candidate must demonstrate a high performance in all of them. There is not specific financial support for research or teaching separately.

316. The 2005-2006 Strategic Agenda of the technological institute subsystem, emphasises on strengthening the process of improvement of the profile of its full time academic staff, and the development of their academic bodies to increase its capacity to generate and innovatively apply knowledge and to better sustain teaching of its postgraduate programmes. As of today 54% of its full time professors have postgraduate studies, 37% of them hold master or doctorate

degrees, which represents an increase of almost seven percent above the 30.8% of 2002. On the other hand, 369 professors have the desirable profile status granted by SEP.

317. The evaluation, first carried out in 2006, of the level of development of the academic bodies in these institutes has shown that 51 are in formation process, 37 in process of consolidation and two are consolidated.

318. In the technological institute subsystem, a set of academic networks has been recently conformed. Its objectives are:

- To foster joint projects of GAK.
- To extend and complement the LGAKs developed by professors and academic bodies.
- To promote, develop and strengthen the LGAKs that support its postgraduate programmes.
- To enhance the quality of study programs.
- To foster, support and advise the formation of students and the professors updating.

319. Currently, there are 34 academic networks described in Table 5.4.

Table 5.3 Collaboration networks among academic bodies

International regional networks, (IRN)	Area	Field	Network	Participating institutions		Participating institutions and academic bodies
International general networks, (IGN)				Domestic	International	
Domestic regional networks, (DRN)						
General domestic networks, (GDN)						
1 (IRN)	Agriculture and livestock sciences	Animal nutrition	Assessment of the change and predictability of the nutritional value of the cereals employed in animal feeding in Mexico	UABC, UANL, <i>Colegio de Postgraduados</i> , UNAM	Alberta, Kentucky and California Universities	UABC (Animal nutrition) UANL (Animal nutrition and feeding systems)
2 (IRN)	Agriculture and livestock sciences	Animal nutrition				
1 (IRN)	Health sciences	Physiology	Physiology	UCOL, BUAP, UNISON	Universities of California and Utah	UCOL (Basic sciences) BUAP (Pharma-biology) UNISON (Physics-math)
2 (IGN)	Health sciences	Immunology	Immunology	UANL, UAZ	Agronomy Research Institute	UANL (Immunology) UAZ (Autoimmunity)
1 (GDN)	Natural and exact sciences	Neurobiology	Multi-disciplinary body for the study of the neurological bases of conduct	UAA, UATLX, UAM-I, UV		UAA (Study of proteins in biological systems) UATLX (Biological sciences) UAM-I (Behavioural pharmacology and neuro-psycho-biology) UV (Neuro-biology of behaviour and scientific dissemination)
2 (GDN)	Natural and exact sciences	Materials	Immobilisation of proteins on bio-compatible surfaces	UASLP, UAM-I, <i>Centro de Investigación Científica de Yucatán</i> (CICY)		UASLP (Complex Fluids) UAM-I (Polymers)
3 (GDN)	Natural and exact sciences	Ecology-environment	Determining the ecologic risk of an aquatic environment	UABC, UAM-I, UNAM		UABC (Marine pollution and toxicology) UAM-I (Ecotoxicology)
4 (GDN)	Natural and exact sciences	Materials	Physical properties of structured solids: design, construction and optical characterization of new composite materials	UNISON, BUAP, <i>Centro de Ciencias de la Materia Condensada-Ensenada</i> (CCMC) UNAM, <i>Centro de Investigaciones en Óptica</i> (CIO), CINVESTAV-Querétaro		UNISON (Optical phenomena) BUAP (Materials physics)
5 (DRN)	Natural and exact sciences	Biotechnology	Chemical and biological studies of natural products	UAQ, UAEMOR, UNAM		UAQ (Pharma-biological) UAEMOR (Natural products)
6 (DRN)	Natural and exact sciences	Biotechnology	Solid fermentation application to biological insect control, secondary metabolite production and pollutant biodegradation	UGTO, UAM-I, UNAM		UGTO (Fundamental and fungus and bacteria bio-technology aspects) UAM-I (Secondary metabolites and genetic engineering)
7 (IGN)	Natural and exact sciences	Ecology-environment	Environmental implications of municipal solid waste management in Sonora and Baja California: the case of two cities	UABC, UNISON	University College of Northampton Universidad de Alcalá de Henares	UABC (Environment) UNISON (Social issues)
8 (IGN)	Natural and exact sciences	Basic sciences	Quantum chemistry and molecular simulation	UASLP, UAM-I, UAEMOR	Université de Grenoble I	UASLP (Physics-chemistry) UAM-I (Quantum chemistry) UAEMOR (CAEF Quantum chemistry and molecular physics)
9 (IRN)	Natural and exact sciences	Biotechnology	Histological and biochemical research to support recommendations related to economically relevant species management in Mexico	UNACH, UAM-I	University of California-Davis	UNACH (Advanced biotechnology) UAM-I (Science and technology of plants)
1 (IRN)	Administrative and social sciences	Psychology	Cognitive and emotional process neuro-development and associate pathologies	UDG	University of Montreal	UDG (Cell and molecular biology; neuro-science institute)
1 (IGN)	Education, humanities and art	Latin-american studies	The image of spain in Mexico (1876-1982)	UAEMOR, UMSNH	Universidad Complutense de Madrid	UAEMOR (Image research in Mexico in the 19 th and 20 th centuries) UMSNH (Latin-American studies)
1 (DRN)	Engineering and technology	Materials	Advanced materials synthesis and characterisation	UANL, UASLP, UAEH		UANL (Materials synthesis and characterisation) UASLP (Materials) UAEH (Metallurgy)
2 (DRN)	Engineering and technology	Chemical engineering	Adsorbants and catalysts for environmental protection	UANL, UASLP		UANL (Systems engineering; chemical engineering) UASLP (Environmental sciences)
3 (GDN)	Engineering and technology	Materials	Characterisation and control of specific corrosion processes relevant to our national and regional reality	UABC, UNACAM, CCMC-Ensenada-UNAM		UABC (Corrosion and materials) UNACAM (Corrosion engineering and biotechnology)
4 (GDN)	Engineering and technology	Architecture	History of architecture and heritage conservation	UASLP, UADY, UCOL, UMSNH		UASLP (Theory, history and criticism of architecture and design) UADY (Heritage conservation) UCOL (Architecture and heritage) UMSNH (Architecture, city and heritage)
5 (GDN)	Engineering and technology	Biotechnology	Physiology, morphology and engineering of different bioprocesses in solid culture	UDG, UAM-I, <i>Instituto Tecnológico de Durango</i> (ITDGO)		UDG (Bioengineering and biotechnology) UAM-I (Solid-stage culture bioprocesses)
6 (IRN)	Engineering and technology	Electronics and control	Mechanic and control systems	UASLP, UGTO	University of Notre Dame	UASLP (Potency and control electronics) UGTO (Dynamics and robotics)
7 (IRN)	Engineering and technology	Architecture	Innovations in construction	UADY, UAM-A	Worcester Polytechnic Institute	UADY (Construction engineering) UAM-A (Management for design)

Source: SEP

Table 5.4 Academic networks in the technological institute subsystem

Field	Number of academic networks	Network	Leader technological institute or centre	Technological institutes and participating centres
Electric-electronics	5	Control and automation	Chihuahua	Cd. Guzmán
				Durango
				Cd. Madero
				Celaya
				Toluca
				La Laguna
				Nuevo Laredo
				CENIDET
		Potency electric engineering	Morelia	Morelia
				La Laguna
				Aguascalientes
				Cd. Madero
		Potency electronics research	CENIDET	Celaya
				Minatitlán
				Morelia
		Signal processing and implementation	Chihuahua	Mexicali
				Morelia
				Orizaba
				La Laguna
Planning and Development	1	Planning and development inter-technology (RENIPLADE)	Oaxaca	Chihuahua
				Celaya
				<i>Centro de Investigaciones en Óptica A.C.</i>
				<i>Centro de Investigación Científica y Educación Superior de Ensenada</i>
				<i>Centro de Investigación en Ciencia Aplicada y Tecnología Avanzada</i>
				Durango
				Piedras Negras
				Acapulco
				Mérida
				Villahermosa

Field	Number of academic networks	Network	Leader technological institute or centre	Technological institutes and participating centres
Administration	4	MSME management	Celaya	Zacatecas
				Mérida
				Orizaba
				Pachuca
				Apizaco
		Analysis and development of human resources	Aguascalientes	Hermosillo
				Orizaba
				Tijuana
				Villahermosa
				Zacatepec
		Entrepreneurial management and competitiveness	Tehuacán	Aguascalientes
				Matamoros
				Tlalnepantla
				Cd. Juárez
				Cd. Cuauhtémoc
		Entrepreneurial planning and development	Orizaba	Oaxaca
				Matamoros
Computer sciences	4	Mobile computers	Cd. Guzmán	Celaya
				CENIDET
				León
		Software engineering research	CENIDET	Morelia
				Mérida
				Veracruz
				Campeche
				Orizaba
		Artificial intelligence research	CENIDET	Cd. Guzmán
				Toluca
				San Luis Potosí
		Distributed system research	CENIDET	Cd. Madero
				Apizaco
				Pachuca
Mechanics	1	Machine element design	CENIDET	Tlalnepantla
				Celaya
				Veracruz
				San Luis Potosí
				Morelia
				<i>Centro Nacional de Investigación y Desarrollo Tecnológico</i>
Mechatronics	1	Mechatronics	CENIDET	Mérida
				Costa Grande
				CNAD

Field	Number of academic networks	Network	Leader technological institute or centre	Technological institutes and participating centres
Chemical engineering, polymers, environmental	3	Polymer materials	Zacatepec	Cd. Madero
				Tijuana
				Toluca
		Process engineering	Celaya	Orizaba
				Aguascalientes
				Zacatepec
		Environmental engineering	Orizaba	Minatitlán
				Toluca
				Saltillo
				Mexicali
Industrial engineering	4	Work	Cd. Juárez	Zacatepec
				Aguascalientes
				Celaya
				Hermosillo
				Cd. Juárez
		Productive process design and optimisation	Hermosillo	Morelia
				Aguascalientes
				Celaya
				Cd. Juárez
		Quality	Orizaba	Morelia
				Aguascalientes
				Tlalnepantla
				Saltillo
				Cd. Juárez
				Querétaro
				La Laguna
		Manufacture resource optimisation	Tehuacán	Celaya
				Morelia
				Querétaro
				Saltillo
Metallurgy	2	Materials transformation processes	Saltillo	Morelia
				Celaya
				Chihuahua
		Manufacturing	Morelia	Saltillo
				Chihuahua

Field	Number of academic networks	Network	Leader technological institute or centre	Technological institutes and participating centres
Food, biochemistry, agriculture and livestock, marine	9	Food innocuousness	Celaya	Celaya
				Tepic
				Tuxtepec
				Veracruz
		Post-Harvest fruit and vegetable handling	Veracruz	Tuxtepec
				Villahermosa
				Mérida
				Tepic
		Food engineering and processing	Veracruz	Tuxtepec
				Tlajomulco
				Tepic
				Tuxtla Gutiérrez
				Celaya
				Mérida
				Durango
		Agriculture, livestock and forestry production systems	Conkal	Torreón
				Roque
				El Llano
				Tlajomulco
				Veracruz
		Environmental biotechnology	Tuxtla Gutiérrez	Durango
				Mérida
				Veracruz
		Vegetable biotechnology	Tlajomulco	Conkal
				Valle de Oaxaca
				El Llano
				Roque
				Celaya
				Veracruz
				Tuxtla Gutiérrez
				Tepic
		Animal biotechnology	El Llano and Conkal	El Llano
				Conkal
		Enzymatic and microbial biotechnology	Veracruz	Mérida
				Durango
				Tuxtepec
		Sustainable handling of coastal resources	Boca del Río	Veracruz
				Guaymas
				Mazatlán

Source: SEP

5.3 National System of Researchers

320. The number of SNI members, the system that employs international standards to assess and acknowledge the quality of the production generated by professors-researcher of higher educations institutions and the staff of research centres and firms, has increased significantly from 5,879 in 1994 to 7,223 in 2000 and to 12,096 in June 2006. Tables 5.5-5.10 show SNI members distribution by state and subsystem.⁸⁵

321. It should be noted that there has been a yearly increase in the number of SNI members of public state institutions, which results from de-concentration of capacities to generate and innovatively apply knowledge in the past decade, as it was before done with de-concentrating enrolment of 5A4 degrees. This increase has reinforced regional and institutional capacities for research, technological development and innovation.

322. Currently 962 professors of federal technological institutes participate in GAK projects; 231 are SNI members; the latter compares favourably with 51 in 1994 and 92 in 2000 (Chart 5.3 and Table 5.7).

⁸⁵ Table 5.5 shows the total of SNI members. Tables 5.6-5.10 report the professors-researchers and researchers registered in SNI that work in the subsystems described in Chapter 2, exclusively.

Table 5.5 SNI members by state

State	Number
Aguascalientes	70
Baja California	371
Baja California Sur	161
Campeche	44
Chiapas	93
Chihuahua	125
Coahuila	167
Colima	87
Distrito Federal	5,265
Durango	55
Guanajuato	354
Guerrero	29
Hidalgo	150
Jalisco	588
Estado de México	696
Michoacán	331
Morelos	680
Nayarit	14
Nuevo León	388
Oaxaca	101
Puebla	498
Querétaro	261
Quintana Roo	41
San Luis Potosí	222
Sinaloa	126
Sonora	215
Tabasco	66
Tamaulipas	83
Tlaxcala	51
Veracruz	276
Yucatán	246
Zacatecas	84
Regionally located	158
Total	12,096

Source: SNI registry, June, 2006.

Table 5.6 SNI members by public institution

Public state universities	Number
<i>Benemérita Universidad Autónoma de Puebla</i>	279
<i>Centro de Estudios Superiores de Sonora</i>	1
<i>Instituto Tecnológico de Sonora</i>	10
<i>Universidad Autónoma Benito Juárez de Oaxaca</i>	14
<i>Universidad Autónoma de Aguascalientes</i>	42
<i>Universidad Autónoma de Baja California</i>	100
<i>Universidad Autónoma de Baja California Sur</i>	25
<i>Universidad Autónoma de Campeche</i>	20
<i>Universidad Autónoma de Chiapas</i>	16
<i>Universidad Autónoma de Chihuahua</i>	21
<i>Universidad Autónoma de Ciudad Juárez</i>	25
<i>Universidad Autónoma de Coahuila</i>	34
<i>Universidad Autónoma de Guerrero</i>	24
<i>Universidad Autónoma de Nayarit</i>	4
<i>Universidad Autónoma de Nuevo León</i>	238
<i>Universidad Autónoma de Querétaro</i>	66
<i>Universidad Autónoma de San Luis Potosí</i>	155
<i>Universidad Autónoma de Sinaloa</i>	76
<i>Universidad Autónoma de Tamaulipas</i>	40
<i>Universidad Autónoma de Tlaxcala</i>	29
<i>Universidad Autónoma de Yucatán</i>	102
<i>Universidad Autónoma de Zacatecas</i>	73
<i>Universidad Autónoma del Carmen</i>	11
<i>Universidad Autónoma del Estado de Hidalgo</i>	133
<i>Universidad Autónoma del Estado de México</i>	116
<i>Universidad Autónoma del Estado de Morelos</i>	175
<i>Universidad de Ciencias y Artes de Chiapas</i>	9
<i>Universidad de Colima</i>	76
<i>Universidad de Guadalajara</i>	377
<i>Universidad de Guanajuato</i>	145
<i>Universidad de la Sierra Sur</i>	1
<i>Universidad de Occidente</i>	6
<i>Universidad de Quintana Roo</i>	14
<i>Universidad de Sonora</i>	116
<i>Universidad del Istmo</i>	5
<i>Universidad del Mar</i>	20
<i>Universidad del Papaloapan</i>	5
<i>Universidad Juárez Autónoma de Tabasco</i>	41
<i>Universidad Juárez del Estado de Durango</i>	21
<i>Universidad Michoacana de San Nicolás de Hidalgo</i>	194
<i>Universidad Tecnológica de la Mixteca</i>	11
<i>Universidad Veracruzana</i>	144
Public federal institutions	Number
<i>Instituto Politécnico Nacional</i>	438
<i>Universidad Autónoma Metropolitana</i>	686
<i>Universidad Nacional Autónoma de México</i>	2,962
<i>Universidad Pedagógica Nacional</i>	33
Other public institutions	Number
<i>Centro de Investigación y Estudios Avanzados del IPN</i>	534
<i>Colegio de Posgraduados</i>	202
<i>El Colegio de Jalisco, A. C.</i>	9
<i>El Colegio de México</i>	153
<i>El Colegio Mexiquense, A. C.</i>	23
<i>Escuela Nacional de Antropología e Historia</i>	33
<i>Facultad Latinoamericana de Ciencias Sociales</i>	18
<i>Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias</i>	151
<i>Instituto Nacional de Salud Pública</i>	77
<i>Universidad Autónoma Agraria Antonio Narro</i>	37
<i>Universidad Autónoma Chapingo</i>	103
Total	8,473

Within the group of other institutions only those with a significant number of SNI members are shown.
Source: SNI registry. June, 2006.

Table 5.7 SNI members by public technological institute

Public technological institute	Number
<i>Instituto Tecnológico de Aguascalientes</i>	8
<i>Instituto Tecnológico de Apizaco</i>	2
<i>Instituto Tecnológico de Cancún</i>	1
<i>Instituto Tecnológico de Ciudad Cuauhtémoc</i>	1
<i>Instituto Tecnológico de Ciudad Guzmán</i>	1
<i>Instituto Tecnológico de Ciudad Madero</i>	12
<i>Instituto Tecnológico de Ciudad Victoria</i>	3
<i>Instituto Tecnológico de Celaya</i>	29
<i>Instituto Tecnológico de Chihuahua</i>	7
<i>Instituto Tecnológico de Chihuahua II</i>	1
<i>Instituto Tecnológico de Durango</i>	10
<i>Instituto Tecnológico de Hermosillo</i>	1
<i>Instituto Tecnológico de La Laguna</i>	7
<i>Instituto Tecnológico de La Piedad</i>	1
<i>Instituto Tecnológico de León</i>	4
<i>Instituto Tecnológico de Mérida</i>	3
<i>Instituto Tecnológico de Morelia</i>	12
<i>Instituto Tecnológico de Oaxaca</i>	6
<i>Instituto Tecnológico de Orizaba</i>	3
<i>Instituto Tecnológico de Puebla</i>	2
<i>Instituto Tecnológico de Querétaro</i>	3
<i>Instituto Tecnológico de Saltillo</i>	6
<i>Instituto Tecnológico de Tepic</i>	5
<i>Instituto Tecnológico de Tijuana</i>	15
<i>Instituto Tecnológico de Tlalnepantla</i>	1
<i>Instituto Tecnológico de Toluca</i>	4
<i>Instituto Tecnológico de Tuxtepec</i>	4
<i>Instituto Tecnológico de Tuxtla Gutiérrez</i>	2
<i>Instituto Tecnológico de Veracruz</i>	15
<i>Instituto Tecnológico de Zacatepec</i>	6
<i>Centro Nacional de Investigación y Desarrollo Tecnológico</i>	22
<i>Centro Intedisciplinario de Investigación y Docencia en Educación Técnica</i>	1
<i>Instituto Tecnológico de Conkal</i>	6
<i>Instituto Tecnológico de San Luis Potosí</i>	1
<i>Instituto Tecnológico El Llano Aguascalientes</i>	1
<i>Instituto Tecnológico del Valle de Oaxaca</i>	1
<i>Instituto Tecnológico de Roque</i>	1
<i>Instituto Tecnológico de Tlajomulco</i>	3
<i>Instituto Tecnológico de Torreón</i>	4
<i>Instituto Tecnológico de Boca del Río</i>	3
<i>Instituto Tecnológico de Guaymas</i>	1
<i>Instituto Tecnológico de Mazatlán</i>	2
<i>Instituto Tecnológico Superior de Irapuato</i>	3
<i>Instituto Tecnológico Superior de Tacámbaro</i>	1
<i>Tecnológico de Estudios Superiores de Ecatepec</i>	6
Total	231

Source: SNI registry, June 2006.

Table 5.8 SNI members by polytechnic university

University public polytechnic university	Number
<i>Universidad Politécnica de Aguascalientes</i>	1
<i>Universidad Politécnica de Pachuca</i>	13
<i>Universidad Politécnica de Puebla</i>	1
<i>Universidad Politécnica de San Luis Potosí</i>	5
<i>Universidad Politécnica de Sinaloa</i>	1
<i>Universidad Politécnica de Tlaxcala</i>	1
<i>Universidad Politécnica del Valle de México</i>	1
Total	23

Source: SNI registry, June 2006.

Table 5.9 SNI members by public research centre

Public research centre	Number
<i>Centro de Ingeniería y Desarrollo Industrial</i>	6
<i>Centro de Investigación Científica de Yucatán, A.C.</i>	48
<i>Centro de Investigación Científica y de Educación Superior de Ensenada, B.C.</i>	142
<i>Centro de Investigación en Alimentación y Desarrollo, A.C.</i>	77
<i>Centro de Investigación en Matemáticas, A.C.</i>	46
<i>Centro de Investigación en Materiales Avanzados, S.C.</i>	43
<i>Centro de Investigación en Química Aplicada</i>	31
<i>Centro de Investigación y Asistencia en Tecnología y Diseño del Estado de Jalisco</i>	16
<i>Centro de Investigación y Desarrollo Tecnológico en Electroquímica</i>	11
<i>Centro de Investigación y Docencia Económicas, A.C.</i>	55
<i>Centro de Investigación y Estudios Superiores en Antropología Social</i>	103
<i>Centro de Investigaciones Biológicas del Noroeste, S.C.</i>	93
<i>Centro de Investigaciones en Óptica, A.C.</i>	57
<i>Corporación Mexicana de Investigación en Materiales, S. A.</i>	2
<i>El Colegio de la Frontera Norte, A.C.</i>	51
<i>El Colegio de la Frontera Sur</i>	71
<i>El Colegio de Michoacán, A.C.</i>	37
<i>El Colegio de San Luis, A.C.</i>	11
<i>Instituto de Ecología, A.C.</i>	64
<i>Instituto de Investigaciones Dr. José María Luis Mora</i>	33
<i>Instituto Nacional de Astrofísica, Óptica y Electrónica</i>	101
<i>Instituto Potosino de Investigación Científica y Tecnológica, A.C.</i>	44
Total	1,142

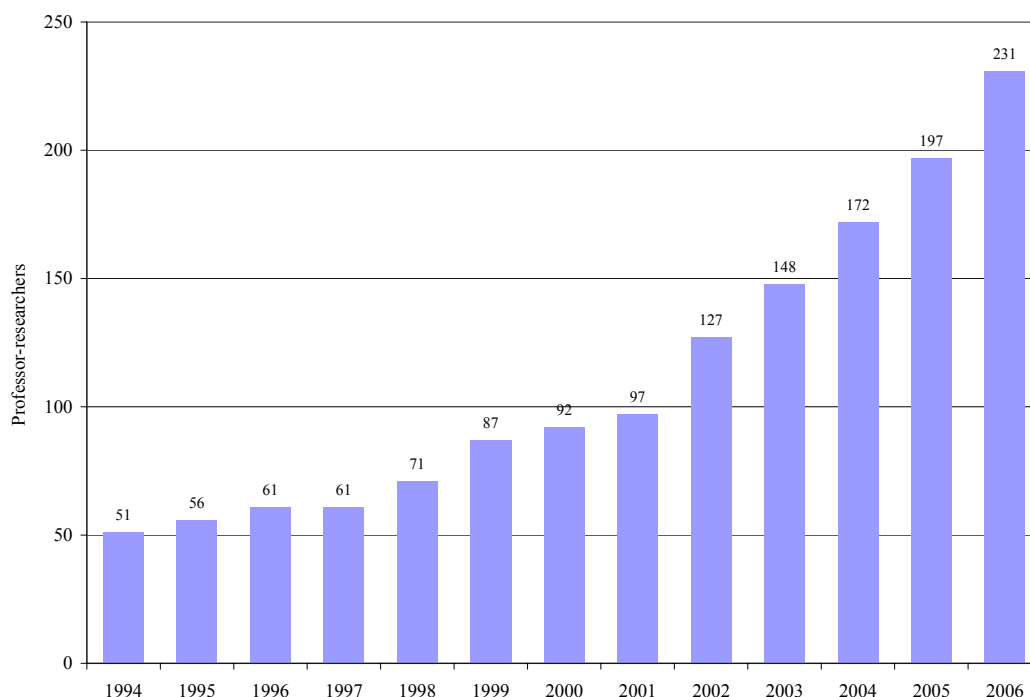
Source: SNI registry, June 2006.

Table 5.10 SNI members by private institution

Private institution	Number
<i>Centro Académico de Estudios Superiores</i>	1
<i>El Colegio de Tlaxcala</i>	7
<i>Escuela Libre de Psicología, A. C.</i>	1
<i>Instituto de Ciencias Jurídicas de Puebla</i>	3
<i>Instituto Tecnológico Autónomo de México</i>	80
<i>Instituto Tecnológico y de Estudios Superiores de Monterrey</i>	227
<i>Instituto Tecnológico y de Estudios Superiores de Occidente</i>	17
<i>Laboratorio Nacional de Informática Avanzada</i>	1
<i>Universidad Anáhuac</i>	3
<i>Universidad Anáhuac de Xalapa</i>	1
<i>Universidad Anáhuac del Sur</i>	3
<i>Universidad Autónoma de Guadalajara</i>	5
<i>Universidad Cuauhtémoc</i>	1
<i>Universidad de las Américas Puebla</i>	75
<i>Universidad de Monterrey</i>	5
<i>Universidad del Claustro de Sor Juana</i>	2
<i>Universidad del Valle de México</i>	3
<i>Universidad Iberoamericana</i>	73
<i>Universidad Iberoamericana-Puebla</i>	3
<i>Universidad Intercontinental</i>	1
<i>Universidad La Salle, A.C.</i>	6
<i>Universidad Marista de Mérida</i>	2
<i>Universidad Panamericana</i>	24
<i>Universidad Popular Autónoma del Estado de Puebla</i>	9
Total	553

Source: SNI registry, June, 2006.

Chart 5.3 Evolution in the number of SNI members in technological institutes, 1994-2006



Source: SNI registry, June 2006.

5.4 The SEP-CONACyT Programme to Support the Basic Sciences

323. SEP's public policies regarding the role of GAK in higher education institutions is clearly expressed by stating that this activity, carried out especially by full-time professors, must be a means to contribute to enhance the quality of education, instead of an end in itself.

324. In this policy context, and throughout the current federal administration, SEP and CONACyT have publicised calls to reinforce the capacity of higher education institutions with the appropriate typology to carry out basic science research. Given the programme's objectives and the assessment criteria applied, its goal is to support projects that help widen the frontiers of knowledge, while contributing to improve the quality of higher education, to train scientists and academicians and to consolidate the academic bodies of participating institutions.

325. In the call to participate in the Programme to Support the Basic Sciences (*Programa de Apoyo a la Ciencia Básica*) priority areas of attention are defined and several support modalities that care of individual and group needs alike. It is nevertheless relevant to point out that the assessment criteria are equally rigorous in all modalities. The areas susceptible of being supported are:

- Physics-mathematics and earth sciences.
- Biology and chemistry.
- Medicine and health sciences.
- Humanities and behaviour sciences.
- Social sciences and economics.
- Biotechnology and agriculture and livestock sciences.
- Engineering sciences.
- Multidisciplinary research.

and projects presented:

- By young professors-researchers.
- By senior professors-researchers.
- By academic bodies.
- For collaboration between a consolidated academic body and another in consolidation.
- For strengthening academic bodies networks.
- For supplemental operative expenses.

326. Table 5.11 details the number of applications and of authorized projects⁸⁶ by field of knowledge in the 2002, 2003 and 2004 calls. The highest number of supported projects corresponds to the fields of physics, mathematics, earth sciences, biology and chemistry, coinciding with the areas that concentrate the highest number of consolidated academic bodies. The trend in the number of approved projects with regard to the total number of applications has been positive in every field of knowledge, especially in 2003 and 2004. The ratio of approved projects to the total number of applications has increased to 37.6% in 2004.

327. The scientific-academic assessment of proposals, as well as project monitoring activities are carried out by peer committees, selected among those in CONACyT's Accredited Evaluator Registry (*Registro CONACyT de Evaluadores Acreditados*). The assessment has privileged projects presented by academic bodies or networks, in consistence with the federal policy.

Table 5.11 Number of applications and supported projects, per field of knowledge and year

Area	2002 call		2003 call		2004 call	
	Applications for support	Supported projects	Applications for support	Supported projects	Applications for support	Supported projects
Physics, mathematics and earth sciences	357	175	379	158	317	186
Biology and chemistry	388	134	551	125	395	132
Medicine and health sciences	329	93	343	64	245	80
Humanities and behaviour sciences	99	51	115	31	74	40
Social sciences	166	48	143	24	83	33
Biotechnology and agricultural and livestock sciences	243	64	315	49	253	69
Engineering	354	99	463	81	365	108
Multidisciplinary research			100	26	69	29
Total	1,936	664*	2,409	558	1,801	677

*21 projects out of 664 approved in 2002 were fully supported by SEP.
Source: CONACyT.

328. Table 5.12 presents the distribution of projects by modality. It is interesting to point out the increase in the support received by projects under the responsibility of young researchers, many of whom are newcomers at higher education institutions. For 2002, the table shows only the 643 projects approved and financed by SEP-CONACyT's Sectorial Fund.

⁸⁶ Data provided by CONACyT.

Table 5.12 Evolution in the number of projects approved, by type

Type	2002 call	2003 call	2004 call
Senior professor-researcher	314	276	207
Two academic bodies	22	26	28
Young professor-researcher	79	72	107
Operative expenses	96	66	258
One academic body	121	102	68
Academic body networks	11	16	9
Total	643*	558	677

*Information of 21 projects fully supported by SEP in 2002 is not included.

Source: CONACyT.

329. Table 5.13 presents information related to the states where the institutions with the largest number of applications and supported projects within the past three years are located. The entities which concentrate institutions with significant numbers of consolidated academic bodies, or in process of consolidation and of SNI members, are: Distrito Federal, Morelos, Baja California, Guanajuato and Puebla, are thus the entities with the largest number of financed projects. In the states of Michoacán, Querétaro, Baja California and Morelos, where PROMEP's influence in their autonomous universities has been considerable, the increase in consolidated academic bodies, or those in process of consolidation and of SNI members the number has increased significantly. Likewise in the states of Guanajuato and Nuevo León, where their autonomous university projects have received increasing assistance every year.

330. It should also be remarked that, as a result of the federal policies promoting the decentralisation of scientific activities, there were applications for support and were financed projects coming from consolidated academic bodies, professors-researchers and researchers of institutions in practically every Mexican state. Altogether, the relative participation of projects supported, formulated by professor-researchers from institutions in Distrito Federal, has decreased from 308 in 2002 to 256 in 2004, albeit the increase in approvals from 643 to 677 (Table 5.13), i.e., their share decreased from 51% to 43%.

Table 5.13 Evolution in the number of projects supported, by state

State	2002 call		2003 call		2004 call	
	Applications for support	Supported projects	Applications for support	Supported projects	Applications for support	Supported projects
Distrito Federal	719	308	820	257	595	256
Baja California	72	29	93	20	95	48
Guanajuato	76	27	97	32	88	44
Jalisco	49	13	84	11	71	20
México	91	22	117	14	83	20
Michoacán	42	13	51	10	47	26
Morelos	147	49	144	38	106	39
Nuevo León	94	14	124	18	105	28
Puebla	106	31	134	30	95	39
Querétaro	6	2	81	18	62	21
Other*	534	135	664	110	454	136
Total	1,936	643	2,409	558	1,801	677

*Includes the following states: Aguascalientes, Baja California Sur, Campeche, Chihuahua, Chiapas, Coahuila, Colima, Durango, Guerrero, Hidalgo, Nayarit, Oaxaca, Quintana Roo, San Luis Potosí, Sinaloa, Sonora, Tabasco, Tamaulipas, Tlaxcala, Veracruz, Yucatán and Zacatecas.

Source: CONACyT.

331. The number of financially supported projects of public federal institutions of higher education is remarkable (Table 5.14). It is also evident that the share of state public autonomous

universities has had a considerable increase from one call to the next, both in absolute and in relative terms, from 107 projects in 2002 to 126 in 2003 to 172 in 2004, from 16.6% to 22.6% to 25.4% of total projects approved, respectively. This is a consequence of the increasing academic capacities of the latter subsystem, during the last years.

332. In terms of the subsystems described in Chapter 2, the share of supported projects to public research centres has increased significantly, especially during the past year. Those form technological institutes and private institutions remained practically constant, with an average share of 1.4% and 2.9% respectively. Data shown in Table 5.14 are clearly consistent with the typologies and vocations described for each subsystem. Also relevant is the participation of institutions in the health services sector.

Table 5.14 Evolution in the number of supported projects, by type of institution

Institution	2002	2003	2004
	Supported projects	Supported projects	Supported projects
UNAM	218	162	161
UAM	22	31	24
IPN/CINVESTAV	88	89	106
State public universities	107	126	172
Public research centres	99	71	124
Technological institutes	8	8	11
Government institutions	42	30	25
Private universities	25	10	20
Non-profits and firms	4	8	0
Health services sector	30	23	34
Total	643	558	677

Source: CONACyT.

333. It is quite interesting to see the products derived from the activities financed in the context of the SEP-CONACyT Basic Sciences call for projects (Table 5.15). The number of projects supported, in regard with the 2002 call only, have generated 1,712 thesis, of which 1,033 belong to postgraduate studies—the bulk of the research for the 2003 and 2004 calls has not yet concluded—.

334. Human resource formation at high academic levels—specifically 459 doctors—is evidence that the federal policy aimed at stimulating GAK in higher education institutions are giving good results in terms of its impact in high quality education its improvement and assessment. Additional evidence of the benefits of the Programme to Support the Basic Sciences is its favourable outcome; 1,704 articles published in renowned journals as well as over 2,333 papers presented at different meetings and congresses. Total support for projects through this programme amounted to Mx\$1.7576 billion during 2002-2204.

Table 5.15 Scientific activity products derived from the 2002 call

2002 call	
Products	Reported production
Books	121
Chapters in books	214
Papers	1,704
Papers presented congresses	2,333
Bachelor's degree thesis	679
Master's degree thesis	574
Doctorate thesis	459
Thesis Sub-total	1,712
Prototypes	8
Patents	3
Other	139
Pilot plants	2
Total	6,236

Source: CONACyT.

335. In response to the 2005 call, 2,780 project proposals, according to the modalities considered, were received for: operative expenditures; young professors-researchers and professors-researchers; one or two academic bodies and consolidated academic bodies networks. Once the Evaluation Committee examined the nature of the research proposed, its impact in the institution's study programmes, the academic profile of the person responsible for the project and the commitment to form masters and doctors in sciences, recommended supporting 669 projects worth Mx\$637 million.

336. Nevertheless, consensus has not yet been reached in terms of setting national priorities in R&D fields. However in order to address state and sectoral priorities, CONACyT operates the so-called mixed funds aimed at addressing these priorities of basic research and technological development, as well as human resources formation. Sectoral funds operate in a similar fashion, with resources from CONACyT and several federal government secretariats (energy, health, economy, labour, etcetera). CONACyT and its counterpart set jointly the priorities of funds.

337. Co-operation across higher education institutions and research centres, a tradition in terms of joint research projects, was reinforced with a specific chapter (Chapter VIII) of the recently approved Science and Technology Law (*Ley de Ciencia y Tecnología*) that rules the relationship between research and education. Among other things, the law defines the level of co-ordination between SEP and CONACyT in their contribution to consolidate academic bodies, postgraduate study programmes and basic science project development; the obligation of researchers registered at research centres to participate in teaching activities; and, interacting aimed at increasing the quality of education. These actions translate into collaborative environments between higher education institutions and public research centres.

338. CONACyT has recently reported a series of successful examples of the relationship between higher education institutions and the productive sector.⁸⁷

⁸⁷ *Casos de Éxito de Proyectos Reportados 2005*, CONACyT, 2005.

5.5 The SEP-CONACyT National Programme for the Strengthening of Postgraduate Education

339. Acknowledging that there was not enough quality postgraduate study programmes supply in 2000, to increase, in the short and medium terms, the number of researchers and national capacities for research, technological development and innovation, SEP and CONACyT designed PFPN in 2001. This programme consists of PNP and PIFOP. With the contribution of the PFPN, the current federal administration has pursued the expansion and diversification of good quality postgraduate studies, as well as their de-concentration towards the states.

340. The PFPN has two specific objectives: 1) acknowledging quality study programmes in *especialidad*, master's and doctorate degrees, regardless of their orientation and from every field of knowledge by registering them in PNP; and 2) fostering continuous quality improvement of postgraduate study programmes supply by higher education institutions in Mexico, for them to be included in PNP in 2006, at the latest, by means of participatory planning exercises to formulate their PIFOPs.

341. Created in 2002, PNP gradually replaced CONACyT's Registry of Excellence of Postgraduate Study Programmes, established in the early 90s, which only incorporated programmes from scientific and technological fields. The PNP acknowledges good quality in postgraduate study programmes in every field of knowledge, as well as every orientation (professional or research activities) and student profile.

342. In order to formulate its PIFOPs, public and private institutions got involved in a continuous quality improvement process of their postgraduate study programmes, with the purpose of being registered in PNP in the period 2002-2006. In early 2006, 382 programmes from 92 institutions (some carried out in more than one academic unit) were going through such process.

343. The contribution of PIFOPs to the consolidation of postgraduate study programmes supply allowed that many higher education institutions—for the first time— employed an effective tool for quality continuous improvement of their programmes in the framework of institutional planning, taking its whole postgraduate study supply into account.

344. Table 5.16 shows the progress in the number of postgraduate study programmes registered and supported in the context of the PFPN. The table shows that the number of programmes acknowledged for their good quality increased from 150 (51 doctors' degree programmes) in 2000 to 661 (182 doctors' degree programmes) in 2006, as a result of PFPN. Tables 5.17 and 5.18 give the number of postgraduate study programmes supported by PIFOP in 2005, by subsystem and the number of study programmes registered in PNP in 2006, by subsystem, respectively.

Table 5.16 Evolution of PNP and PIFOP, 2000-2006

	2000	2002	2004	2005	2006
CONACyT's Registry of Excellence for Postgraduate Study Programmes	150	57	9	0	0
PIFOP SEP-CONACyT	0	354	452	382	0
PNP SEP-CONACyT	0	244	244	340	661

Source: SEP-CONACyT.

Table 5.17 Number of postgraduate programmes supported by PIFOP, by subsystem, in 2005

Institution	Programmes
Federal public institutions	53
State public universities	180
Technological institutes	37
Private institutions	36
Public research centres	37

Source: SEP-CONACyT.

Table 5.18 Number of postgraduate programmes registered in PNP, by subsystem, in 2006

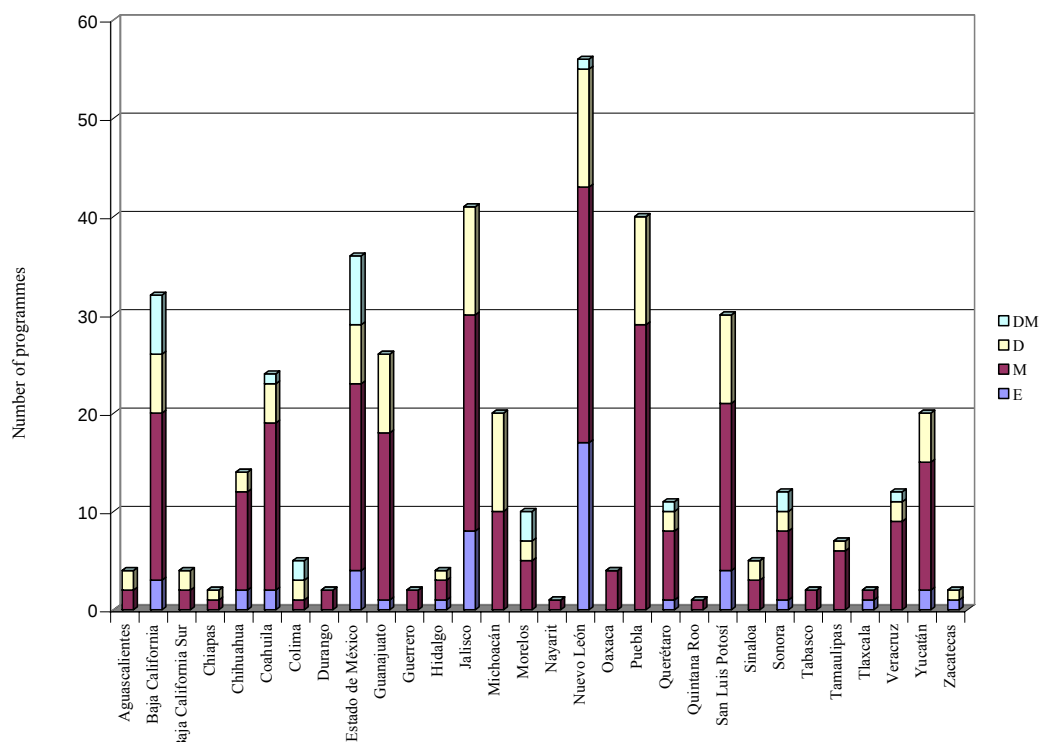
Institution	Programmes
Federal public institutions	226
State public universities	249
Technological institutes	32
Private institutions	48
Public research centres	70
Other	36
Total	661

Source: SEP-CONACyT.

345. The PFPN has fostered strategic planning exercises and continuous quality improvement schemes for developing the supply of postgraduate study programmes of state institutions. Charts 5.4, 5.5 and 5.6 show its effects; they describe the strengthening of postgraduate programmes supply at every level and field of knowledge, produced with its support and institutional effort. Chart 5.4 indicates that the total number of good quality doctorate programmes registered in PNP at the institutions participating in the PFPN has increased significantly during the reference period. The increase has strengthened national capacities for researchers' formation and for scientific and technological research and innovation.

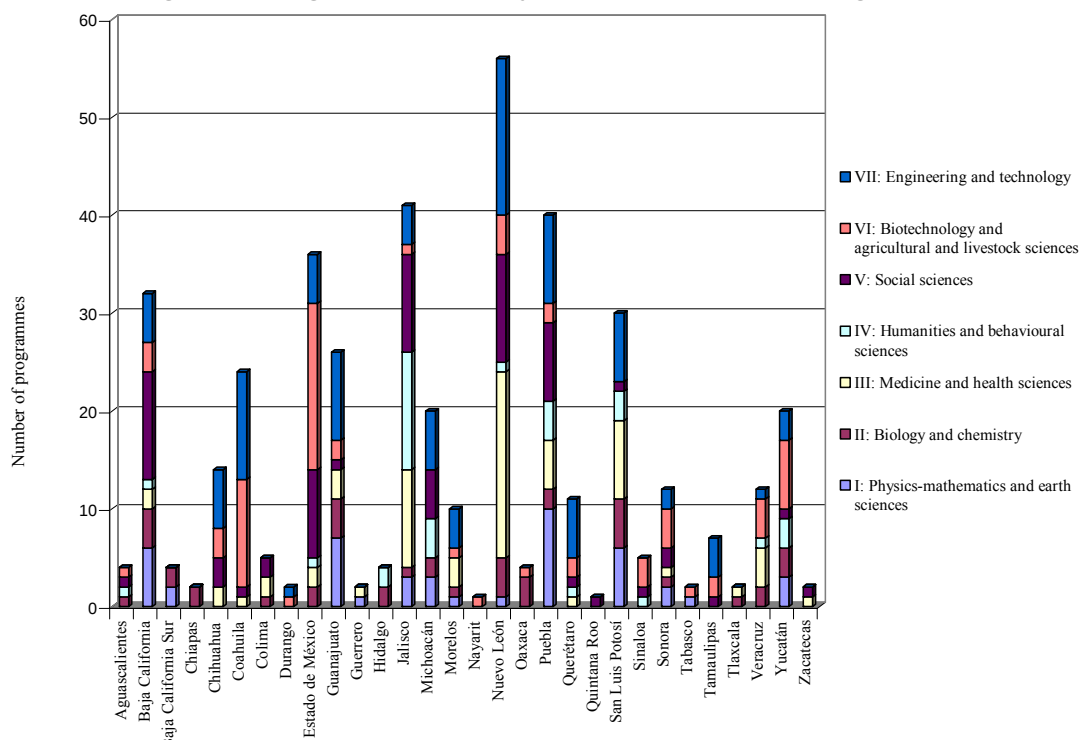
346. As planned originally in PFPN 2001-2006, PIFOP has accomplished its mission of fostering quality. Currently a new version of the programme is being designed.

Chart 5.4 Programmes registered in PNP by state and study level



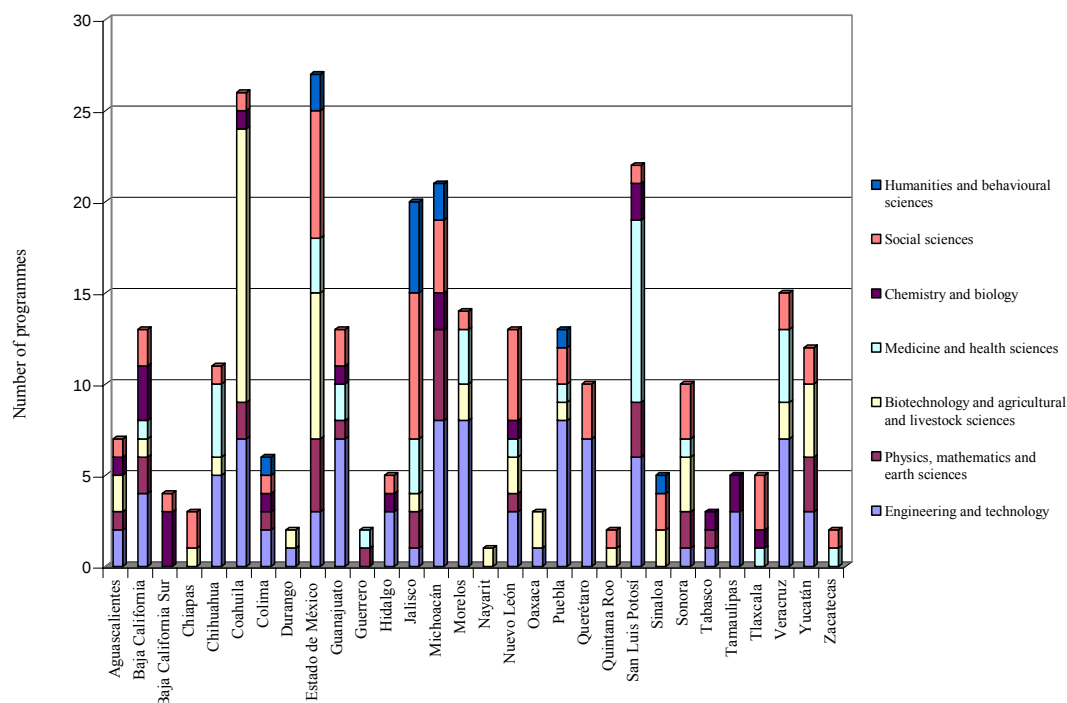
Mexico City 198 programmes: DME: 1, DM: 10, D: 78, M: 105 and E: 4
Source: SEP-CONACyT.

Chart 5.5 Programmes registered in PNP by state and field of knowledge



Mexico City 198 programmes: Area I: 22, Area II: 17, Area III: 28, Area IV: 38, Area V: 46, Area VI: 9 and Area VII: 38
Source: SEP-CONACyT.

Chart 5.6 Postgraduate study programmes improving its quality in the context of PIFOP, by state and field of knowledge, in late 2005



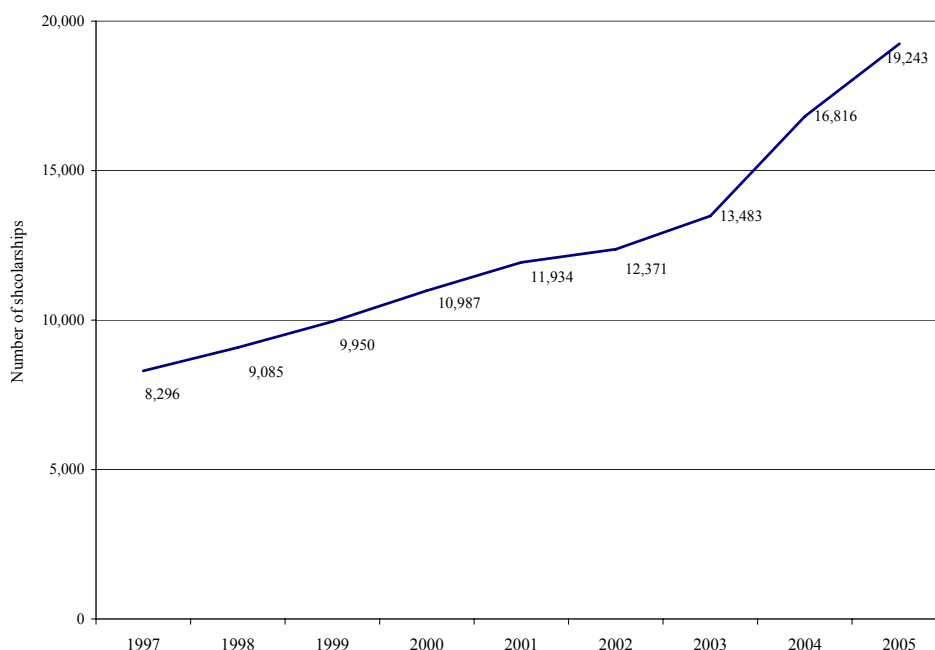
Mexico City 87 programmes: Humanities 11, Social sciences 15, Biology and chemistry 4, Medicine and health sciences 10, Biotechnology and agricultural and livestock sciences 2, Physics, mathematics and earth sciences 4 and Engineering 41
Information as of April 2006, before assessment of the call 2006 PNP.
Source: SEP-CONACyT.

347. In order to strengthen its postgraduate programmes, the technological institutes' 2005-2006 Strategic Agenda, included an assessment process aimed at identifying their status. As a result, policies and strategies were designed to promote a comprehensive strengthening and actions are currently being implemented. Compared with only four study programmes registered in PNP in 2002, nowadays 32 have achieved the same status.

348. During the 2002-2006 period, 722 programmes received benefits from PFPN. In this sense, CONACyT's support to institutions in terms of scholarships for their regular postgraduate students deserves special mention.

349. CONACyT's scholarship programme is an additional effort besides PROMEP in terms of generating the qualified human capital needed for Mexico's development, especially to provide higher education institutions with young, highly qualified staff. The number of scholarships has increased since 2001 from 11,934 to 19,243 in 2005, which represents an increase of 61.2% (Chart 5.7). The number of new scholarships granted during the first quarter of 2006, reached 3,160.

Chart 5.7 Number of postgraduate study scholarships, 1997-2005



Source: CONACyT.

5.6 The Fiscal Incentives Programme for Research and Technological Development

350. The Fiscal Incentives Programme for Research and Technological Development (*Programa de Estímulos Fiscales a la Investigación y el Desarrollo Tecnológico*, PFIDT) was designed in 2001 as an incentive for research and technological development projects. This programme aims at developing products, materials and production processes representing scientific or technological progress, and has the purpose of linking higher education institutions with the productive sector. The programme is steered by CONACyT, SHCP, SEP and SE, all of them federal government entities.⁸⁸

351. Firms can obtain incentives from this programme if their investment in R&D has direct benefits for Mexico, such as in: patents, licensing of technology, generation of labour posts, among others. Cost and investment headings eligible for the granting of the fiscal incentive are those directly and exclusively related to the development and final execution of projects up to and not after the prototype and test phases; running costs for external services relevant to the execution of projects; investments in laboratory equipment, experimental pilot plants, hardware and software, specialized information systems, and patents licensing, among others. Additionally, running expenses the firm incurs in the execution of projects, either using their own resources or those of the corporate group it belongs to, are eligible for granting.

352. In its fifth consecutive year of operation, the programme has demonstrated its usefulness, having achieved its objectives, as it may be inferred from the increase in the number of applications received. It is interesting to note that the applications for support have come both from large corporate groups and from PyMES. The amount of resources transferred to the programme has increased from Mx\$415 million in 2001 to Mx\$496 million in 2002 and to Mx\$500 million in 2003

⁸⁸ In the *Reviews of Federal Policies for Education*, OECD experts recommended fostering the links between the productive sector and higher education institutions.

(Table 5.19). In 2004, one billion pesos were invested in 1,308 projects. This figure almost trebled in 2005, three billion pesos for 2,083 projects. In almost every instance, research activities are carried out in public higher education institutions.

Table 5.19 Fiscal Incentives Programme, 2001-2003

Item	Applications			Total
	Large firms			
	2001	2002	2003	
Firms	64	82	112	258
Projects	346	577	698	1,621
Private investment* +	1,764	3,574	5417	10,755
Requested incentive +	529	649	965	2,143
	PyMES			
Firms	128	160	163	451
Projects	333	490	499	1,322
Private investment* +	687	2,214	1,504	4,405
Requested incentive +	206	262	286	754
	Granted			
	Large firms			
Firms	60	76	102	238
Projects	315	429	508	1,252
Incentive granted +	296	346	322	964
	PyMES			
Firms	90	125	143	358
Projects	233	358	410	1,001
Incentive granted +	119	150	178	447
Total granted +	415	496	500	1,411

*Investment from companies participating in the fiscal incentive programme.

+ In Mx millions.

Source: CONACyT.

353. The rate of return of the fiscal incentives programme has had a significant positive effect, since the firms benefited with technological developments have improved their processes and revenues, thus contributing more resources to the tax authorities and to the programme's sustainability.

5.7 CONACyT's Mixed Funds Programme

354. CONACyT's Mixed Fund Programme represents another instance by which scientific and technological development is fostered. Article 23, Fraction IV of the *Science and Technology Law* considers the creation of CONACyT mixed funds, with the purpose of granting assistance and financing for activities related directly to scientific and technological research development. Article 35 of the same Law establishes that CONACyT will be empowered to create and operate Mixed Funds in agreement with state governments and municipalities either at the regional, state or municipal level to assist scientific and technological research. These funds may include highly specialized human resource training.

355. Mixed funds have the following goals:

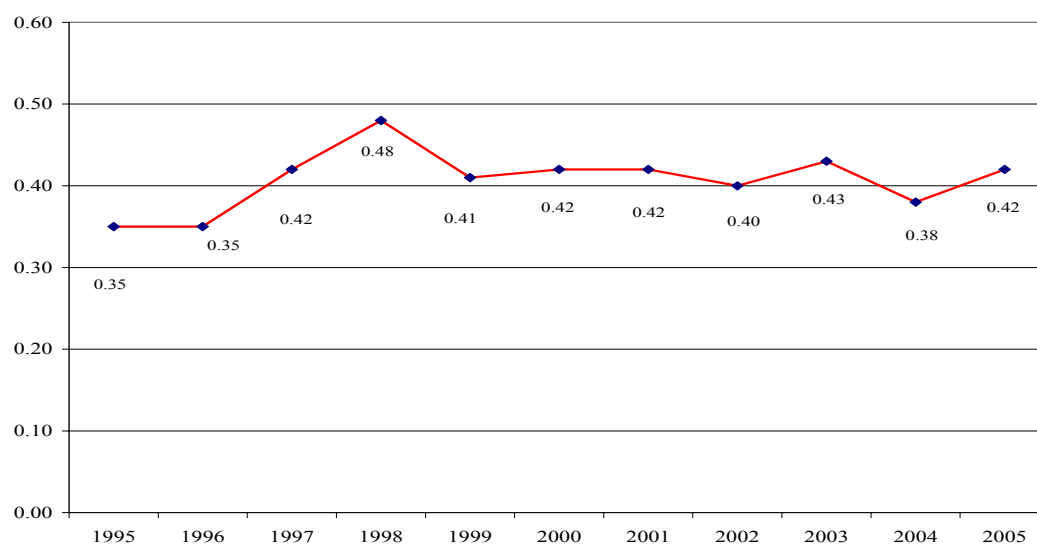
- Identifying strategic needs for states to generate and consolidate their scientific and technological capacity starting from their natural development inclination.
- Involving the private sector in the mixed fund financing scheme in order to:
 - Increase the competitiveness of the productive sector.
 - Increase productive plant capacity.
 - Strengthen productive capacities with infrastructure and highly trained staff.
- Reinforce the links between academia and private firms based on service provision, and assimilation, adoption and technology transfers.
- Disseminate and divulge science and technology.

356. Currently there are 32 mixed funds, 30 at the state level and two at the municipal level (Ciudad Juárez and Puebla). To date, Mx\$ 480.1 million have been directed for their operation. The entities that are currently in the process of creating these funds are Distrito Federal and Oaxaca.

5.8 Federal investment

357. Chart 5.8 presents a time series rendering of federal expenditure in science and technology in terms of GDP (1995-2005).

Chart 5.8 Science and technology federal expenditure as share of GDP



Source: CONACyT, 2005.

358. Table 5.20 shows SEP's investment in 1995-2005 to assist in GAK across public higher education institutions. The decrease in 2002 and 2003 is due to the separation of CONACyT's budget from the education sector's budget after 2002.

Table 5.20 Federal investment in science and technology^{1/}

Year	Secretariat of Education (<i>Secretaría de Educación Pública, SEP</i>)	Secretariat of Energy (<i>Secretaría de Energía, SENER</i>)	Secretariat of Health (<i>Secretaría de Salud, SSA</i>)	Secretariat of Agriculture, Livestock, Rural Development, Fishery and Nutrition (<i>Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación, SAGARPA</i>)	CONACyT ^{2/}		Other sectors ^{3/}
					Nacional Council for Science and Technology (<i>Consejo Nacional de Ciencia y Tecnología</i>)	Public centres	
1995	4,417.7	1,013.0	213.1	462.6	1,433.4	790.3	19.3
1996	5,886.0	1,458.3	274.3	666.1	1,666.9	1,079.8	53.4
1997	7,608.5	3,981.1	337.9	812.9	2,125.8	1,598.2	92.5
1998	9,569.5	5,980.7	498.7	1,011.6	2,611.4	2,182.5	61.4
1999	11,272.0	4,363.3	735.4	1,334.5	2,767.9	2,693.1	82.2
2000	13,183.4	6,367.2	688.1	1,350.0	2,989.0	3,439.4	147.4
2001	15,001.4	5,407.5	727.5	1,800.0	3,422.3	3,339.7	609
2002	15,215.3	4,732.1	1,020.5	1,844.7	4,491.4	3,190.4	706
2003	9,777.6	5,259.2	2,211.1	1,925.7	5,076.7	3,485.6	619.8
2004	9,869.3	4,468.0	1,423.2	1,936.3	5,440.6	4,037.1	3,069.6
2005 ^e	10,387.0	5,519.7	1,337.2	2,050.2	5,440.6	4,037.1	3,069.6

^{1/} Investment figures in millions of current Mexican pesos. The value of federal investments in science and technology changed from 2000 on, after including the amount of fiscal incentives for research and technological development.

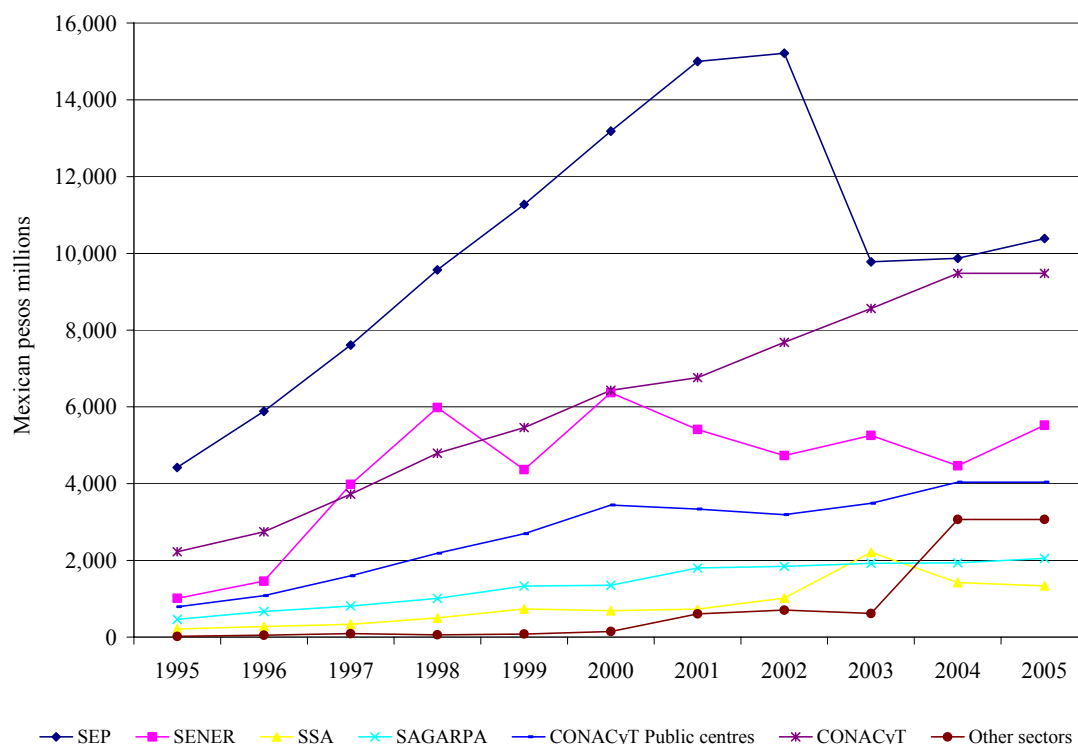
^{2/} Up to 2002, CONACyT and the public research centres were sectorised in SEP. Therefore, their investment figures for horizontal addition purposes in 1995-2002 are part of SEP's total.

^{3/} Including the Secretariats of Internal Affairs, Foreign Affairs, Tourism and the General Attorney's Office. Includes, from 2000 on, fiscal incentives for research and technological development.

Source: CONACyT, SHCP, INEGI, SENER and SAGARPA.

359. On the other hand, Chart 5.9 presents the annual behaviour of sectoral participation in federal expenses in science and technology, with a remarkable contribution from SEP.

Chart 5.9 Evolution of investment in science and technology by administrative sector



Source: *Quinto Informe de Gobierno. Anexo Estadístico*. (Fifth State of the Union Message. Statistical Appendix), 2005.

360. Judging from the evidence regarding the reduced group of private higher education institutions that carry out systematic scientific research activities, as well as by the limited number of postgraduate programmes acknowledged for their quality in this subsystem, private fund contribution for the development of projects for GAK in general, and in the education sector in particular, has had little significance. Private funds aimed at developing scientific activities in public institutions are also much reduced. Therefore, it may be said that the bulk of scientific activity in Mexico is financed with public resources.

361. The insufficient financing aimed at science and technology in Mexico is a challenge to overcome. In fact, investments in terms of GDP should increase in order to generate optimal development levels. Such goal will require more involvement —compared to the currently insufficient participation— from the public and the private sectors. This increase in investment has not materialized since no consensus has been reached in Congress in terms of a set of structural reforms —such as fiscal reform— that are essential to this purpose, among other reasons.

362. The information presented in this chapter allows to infer that, during the past five years, federal policies and their means have been significant to strengthening the countries capacities for research, technological development and innovation have propitiated significant progress in consolidating academic bodies in public institutions, as well as in their participation in domestic and international networks; geographic de-concentration of high quality postgraduate programmes, specially doctorate degrees; the reinforcement of institutional capacity for GAK, in order to make adequate contributions with increasing quality levels to national development, among other aspects.

363. It should be pointed out that, despite the advances described above, SNI membership is still insufficient to properly sustain the development and competitiveness of the country; its number is below the OECD country members' standards. Nevertheless, the national capacities constructed

in the last decade –full time professors with doctorates, professor-researchers with the desirable profile and with SNI recognition, full time SNI researchers, consolidated academic bodies, good quality postgraduate programmes and infrastructure for GAK– will accelerate the researchers’ formation, in the short term. Particularly, it is expected that these capacities will be also increased as a result of the significant number of full time academic staff and students pursuing doctoral studies and the comprehensive strengthening processes of the public institutions, currently in course.

364. In the following years efforts should continue along the same path, increasing investment in higher education and in science and technology, strengthening the programmes and strategies that have proved effective, and consolidating the policy instruments that in the past five years have rendered the positive results described in this chapter, towards making the higher education system’s *Vision 2025* a reality.

Chapter 6: Equity

6.1 Introduction. 6.2 The higher education students' profile. 6.3 Equity and the National Education Programme 2001-2006. 6.4. The National Programme of Scholarships for Higher Education, PRONABES 6.5 Convergence of PRONABES with Oportunidades. 6.6 Other scholarship programmes in favour of equity. 6.7 Education loans. 6.8 Expanding access opportunities to the public subsystem. 6.9 Quality improvement as a strategic dimension of equity 6.10 Access to and permanence in higher education institutions. 6.11 Student contributions. 6.12 Budget gaps per student. 6.13 Progress in equity during the past decade.

6.1 Introduction

365. Enrolment in the National Education System (*Sistema Nacional de Educación*, NES) and especially in higher education grew rapidly throughout the second half of the twentieth century. In 1950, the higher education system counted 29,892 students in 39 institutions. In 2000-2001, enrolment had increased to 2,197,702 students, and in 2004-2005 it reached 2,538,256 individuals studying in 1,892 public and private institutions. These figures reveal that, in the same period, the higher education system grew over 80-fold, while the population quadrupled. This reflects a considerable effort from society and governments alike to give a larger number of young Mexicans access to higher education.

366. The noticeable expansion of the higher education system as well as the quick-paced growth in enrolments has not represented, however, sufficient benefit for lower income population segments. Therefore, in the 19 to 23 year old cohort, usually linked to higher education, the benefits from public investment are not yet equitable.

367. In 2000, 45% of this age group, consisting of youths from urban, medium to high-income families, followed higher education programmes. Oppositely, only 11% of those living in poor urban areas and 3% of those living in poor rural areas had access to this level of education. Indigenous student participation was minimal.

368. The XII General Census of Population and Housing, 2000 (*XII Censo General de Población y Vivienda, 2000*), found, in addition, that 37% of youths in the 20 to 24 year old cohort abandoned their studies for economic reasons, a situation that was made evident too in the National Youth Survey (*Encuesta Nacional de Juventud*) of that year (Table 6.1).

Table 6.1. Reasons for not pursuing higher education

Reasons	Male	Female	Total
No resources	20.5	22.4	21.5
Finished my schooling	7.1	8.3	7.7
I did not like studying	24.8	20.4	22.5
I had to work	24.8	12.1	18.1
Marriage	6.8	17.3	12.4
Other	10.0	13.4	11.8
No answer	5.9	6.1	6.0
Total	100	100	100

Source: *Encuesta Nacional de Juventud*, 2000.

369. Youths from higher income families are better suited to take advantage of the benefits brought about by public investment in higher education. Thus, in 2000, the participation from children of low-income households in public higher education was much lower than the share these families represent in the total Mexican population. Particularly, the participation from youths in the lowest decile of income distribution was 12 times lower than that of the highest income decile. Recent surveys⁸⁹ have indicated the regressive features of public investment in higher education,

⁸⁹ World Bank, *La pobreza en México: Una evaluación de las condiciones, las tendencias y la estrategia del Gobierno*, Mexico 2004.

albeit the policies and strategies implemented during the past two decades in order to revert such situation.

6.2 The higher education students' profile

370. With the purpose of assisting the system's and its institutions planning, programming and assessment tasks as well as the research of experts in these issues, the federal and state governments have made sizeable efforts in recent years to systematise and disseminate statistical information for higher education. Nevertheless, until recently, the student profile was relatively unknown.⁹⁰ Since 1999, SEP and ANUIES promoted a set of surveys⁹¹ that have approached the students' main features and social practices. These surveys have ten analysis dimensions,⁹² and some of their most relevant outcomes in terms of coverage in public universities, technological institutes and private institutions are the following:

- 27.7% are between 17 and 19 years old, 62% between 20 and 24 years old, and 10.3% are 25 or older; 94.6% are single.
- 31.8% work and study; of them, 31.1% work less than 10 hours a week; 31.2% between 11 and 20 hours and 37.7% between 21 to 40 hours. Of the total number of working students, 53.6% say they have an occupation related with their field of study.
- 99.6% say they always or almost always are on time at the institution and 55.1% always or almost always prepare ahead for their lessons.
- 15.1% read and do school assignments away from the classroom for less than 1 hour a week, 48.4% between 1 and 5 hours, 21.7% between 5 and 10 hours and 14.8% over 10 hours a week.
- Half of the student cohort in the system belongs to the first generation in their families accessing higher education. In this context, 52.9% of students' fathers and 64% of their mothers have not had contact⁹³ with higher education before. In contrast, 76.1% of the fathers and 62.9% of the mothers from private institutions did have contact with the higher education system (12.1% had followed graduate studies), reflecting a clear social segmentation in the higher education system.
- In addition, 37.9% of the students consider that their future employment possibilities are high, 49.2% are medium, 8.8% are low, 0.4% null, and 3.7% does not know. In contrast, 53.9% of the students in private institutions consider that their possibilities are high and 38.1% medium.
- With regard to the workplace, 34.4% would rather work in a private firm, 22.5% establish their own business, 17.2% work at the public sector, 14.0% develop as independent professionals and 9.2% prefer working at an education institution, among others.
- In terms of the factors that influenced their choice of field, from the students' point of view, vocational aptitude for a professional activity is the first one, followed by employment opportunities. The third place would go to the parents' influence and the fourth to the information provided by higher education institutions. The influence of teachers and the vocational advice they might have received in upper-secondary school is less relevant than the previous four factors. These elements, in addition to the fact that five out of each ten students are the first in their family to access higher education explain, to a certain extent, the preference students show for certain programmes (such as Law, Administration,

⁹⁰ In the Reviews of Federal Policies for Education, OECD experts recommended the generation of statistics regarding the students' social origin.

⁹¹ De Garay S., Adrián, *Los actores desconocidos*, ANUIES, México 2001 (SEP financed research); *En el camino de la Universidad*. UAM Azcapotzalco and Ediciones Gráficas EÓN. 2005.

⁹² The ten dimensions are: Students' social origin and situation; future development perspectives; factors considered in the decision of which bachelor's degree programme to follow; changes in bachelor's degree admission processes; study habits and social practices; culture consumption practices; conditions of study at home; professors' teaching practices; organisation of sessions in the classroom; and institutional infrastructure and services.

⁹³ Having completed or left unfinished post-secondary technical studies or teaching or university bachelor's degrees.

Accounting, Medicine and Education, among others) for which, as described in Chapter 3, there is an excess supply in the Mexican professional career market.

371. Specifically in technological universities,⁹⁴ 93.8% of their students are single, and are an average of 19.4 years old; 27.9% works, of which, 31.0% works less than 10 hours, 28.6% between 10 and 20 hours and 40.5% over 20 hours per week. Of those working, 49% does so to pay for their education, 17.8% to help with household expenses, 10.3% to support their families, 14.5% to be economically independent and 8.4% to gain professional experience. 99.8% say they arrive at the institution on time always or almost always and 47.1% always or almost always prepare ahead for their lessons. In terms of their possibilities of having an occupation related to their profession when concluding their studies, 28.9% considers them high, 61.2% medium, 9.5% low and 0.4% null.

372. An especially important aspect in terms of technological university students is that almost all of them (nine out of ten) represent the first generation in their families to have access to higher education. This is a significantly larger share in comparison with public autonomous universities and public technological institutes, which is proof that the government's equity objective in the technological university subsystem is being accomplished. This subsystem is playing a very important role in the higher education system; three out of ten students might not have had access to higher education were it not for a technological university in their community.

6.3 Equity and the National Education Programme 2001-2006

373. The pursuit of equity in accomplishing an educational project to satisfy Mexico's needs and aspirations compels governments to search for equal access to education, particularly high quality opportunities and for students to conclude their studies in a timely fashion. Education with equity is an effective means to reduce social imbalances, demanding the design and operation of policies and mechanisms to compensate for the adverse socio-economic conditions capable young students must face.

374. PRONAE considers that education must act as a catalyst for social cohesion. For this to happen, it is essential to continue expanding and diversifying access opportunities to education, specially for disadvantaged social groups, in order to advance towards greater equity in access to high quality education. In its strategic objective "Expansion of Coverage with Equity", the programme sets forth a series of policies that have steered SEP's work during the past five years:

- Since it is a strategic medium for social equity, the federal government will give priority support to public higher education.
- In collaboration with state governments and in the context of federalism, public higher education will be expanded in order to strengthen the system and increase its coverage with equity. Projects aimed at increasing the education opportunities of young persons from vulnerable social segments and women will receive special attention.
- Special economic support will be offered to low income students to enhance their access opportunities and their permanence in public higher education programmes, as well as to contribute to the timely conclusion of their schooling. In granting economic support, students from indigenous, rural and marginalized urban areas will have priority.
- Creation of new services and public institutions will receive full assistance as long as they are fully justified by state development plans for higher education and science and technology as well as by the respective feasibility analysis. The states and regions with the lowest coverage indices will be given top priority.

⁹⁴ De Garay S., Adrián, *Las trayectorias educativas en las Universidades Tecnológicas*, Mexico, SEP, co-edition, UT Sierra Hidalguense, 2006.

- Programme expansion will include different local and regional cultural expressions to respond to the needs of youths in areas and regions traditionally marginalised from higher education.
- The use of modern information and communication systems will be promoted in favour of equity in higher education.
- Distance education programmes will be promoted in order to take them to areas less densely populated or difficult to access.
- Inter-institutional agreements will be encouraged with the purpose of allowing student mobility across programmes with efficient schemes for credit validation.
- The subsystem of technological universities and state technological institutes will continue to develop, preserving their educational style and encouraging the use of their facilities.

375. These policies have been implemented mainly through creating and operating PRONABES, other scholarship programmes as well as by expanding and reinforcing the scope of the Programme of Expansion of Educational Supply.

6.4 The National Programme of Scholarships for Higher Education, PRONABES

376. In 2001, the federal government launched PRONABES in co-ordination with state governments and public higher education institutions. This programme intends to expand access opportunities to public higher education for a larger number of youths facing adverse economic conditions, assisting them in obtaining university level technician, associate professional or bachelor's degrees in quality programmes⁹⁵.

377. Based on its Operation Rules,⁹⁶ originally designed by SEP and which have periodically been enriched—to guarantee their adequate performance—with initiatives from state education authorities and public institutions considering their experiences in terms of programme operation, PRONABES operates under the responsibility of state governments or public higher education federal institutions. These Rules contain the general guidelines for its operation, as well as the commitments assumed by federal government, the state governments, the public higher education institutions and the scholarship beneficiaries.

378. A distinctive feature of its operation is that nearly all (over 90%) its resources are aimed at paying the scholarships received by its beneficiaries. The only additional expenses authorized are those inherent to the administration of the trust, the programme's financial statement auditing and to the certification of its quality management systems. Owing to the shared responsibility between the federal government, the states and the higher education public institutions, PRONABES has exercised its resources transparently, effectively and efficiently.

⁹⁵ In the Reviews of Federal Policies for Education, OECD experts recommended considerably expanding the scholarship system.

⁹⁶ Published in the Official Gazette (*Diario Oficial de la Federación*) in 2001, 2002, 2003, 2004 and 2005.

Table 6.2 Requirements to obtain a PRONABES scholarship

New students:
▪ Mexican nationality. ▪ Conclusion of ISCED level 3. ▪ Acceptance in a public higher education institution for ISCED levels 5B2 or 5A4 programmes. ▪ Not to have previous ISCED level 5B2 or 5A4 degrees. ▪ Household income equal to or under four general monthly minimum wages from the geographical zone where the institution is located.
For students already enrolled at 5B2 or 5A4 level programmes
In addition to the above requirements: ▪ Having taken and passed all subjects (subjects, modules or credits) in the curriculum of the cycles (academic years) prior to the application and having achieved a minimum average of 8.0 in a 0 to 10 scale.

379. The executive instances of PRONABES in each state or federal institution are the Programme's Technical Trust Committees. In the first case, they consist of two state government representatives, the head or representative of each public higher education institution in the state, a SEP's representative and another from the Executive General Secretariat of ANUIES. As for the public federal institutions, the Technical Committees consist of three representatives assigned by their head and one from the Executive General Secretariat of ANUIES. This type of organisation encourages shared responsibilities in the accomplishment of the Programme's objectives.

380. The state governments, supported by the COEPES, have given special priority to scholarships for students in programmes relevant for the region's economic and social development. This has led the percentage share of students with scholarships in different fields of knowledge to be different from the corresponding share in total enrolment in higher education (Chapter 2).

381. When the number of applicants complying with the requirements can not be covered by the available budgetary resources, a selection is made in terms of the applicants' economic need, privileging the students starting or continuing their studies in public institutions located in indigenous, rural and marginalised urban communities and/or those whose families are part of the Family Registry of *Oportunidades* (the poverty alleviation programme), as well as in terms of their previous academic performance. If the above conditions are identical, priority will be given to students accepted or already studying in programmes accredited by entities acknowledged by the COPAES, or classified as level 1 (with possibilities of earning their accreditation in the short term) in the CIEES Programme Registry (Chapter 9).

382. The students who obtain a scholarship to start their studies may renew it the following academic year as long as they have followed and passed every subject in their first year curriculum. From the third year onwards, in order to maintain economic support, students must take and pass every subject in their curriculum with minimum average grades of 8.0 (out of 10). These requirements are also applicable to students already studying when applying for the scholarship (Table 6.2).

383. PRONABES' scholarships consist of a monthly support according to the level (in terms of programme years) in which the student is enrolled: Mx\$750 for the first year, Mx\$830 for the second, Mx\$920 for the third and Mx\$1,000 per month for the fourth and fifth years, in case the bachelor's degree programme lasts that long. In contrast with other programmes, PRONABES' scholarships are paid throughout twelve months, in order to encourage student permanence. The amount of the scholarship is used by the students for their support, tuition and enrolment fees, transportation, materials and, in some cases, to contribute to their family expenses.

384. The institutions that have PRONABES' students must incorporate them to an individual or group tutoring programme in order to monitor their school trajectories, timely detection of potential risk situations in terms of their permanence in the institution and to encourage improvements in their academic performance. These programmes operate very differently depending on the institution. Some of them are accomplishing their objectives, which reflects upon student permanence and adequate performance, but others need strengthening. In the latest PRONABES' external assessment, it was particularly indicated that tutoring and pedagogic support programmes in institutions receiving scholarship students are still in development, in spite of the promotion efforts that SEP has made since early 2001 to establish or strengthen their individual and group tutoring programmes in the context of these institutions' planning processes.

385. On the other hand, the students who have obtained a scholarship from PRONABES assume the obligation to start their studies on a date set by the institution they are enrolled at and take the curriculum's subjects at the appropriate periods, as well as to attend regularly and comply with their social service commitment in any of the community development programmes organized by the institution or the state government, or collaborating in lower or upper secondary student tutoring programmes for no less than six-month-periods.

386. The Programme began operating in every Mexican state during the 2001-2002 academic year, granting 44,422 scholarships. In the 2005-2006 academic year, 161,787 students received this kind of support and 20,440 scholarship students concluded their studies. Currently, 54,591 fellowship holders have finished their studies (Table 6.3).

Table 6.3 PRONABES' operation

Academic year	Renewed scholarships	New scholarships	Total	Fellowship holders having concluded their studies
2001-2002	-	44,422	44,422	2,768
2002-2003	28,238	66,301	94,539	6,987
2003-2004	58,855	63,787	122,642	7,751
2004-2005	72,453	65,399	137,852	16,645
2005-2006	79,499	82,288	161,787	20,440

Source: SEP

387. According to its objectives, PRONABES has granted scholarships to students from the first to the fifth year of their programmes and has privileged the new entrants. The number of scholarships granted has grown each year in every public subsystem. To date, 322,197 students have received support from PRONABES to enter, continue or conclude their ISCED 5B2 or 5A4 level studies.

388. For the programme's operation, 5.98 billion pesos have been allocated, with funds being contributed by the federal and state governments, and the federal higher education public institutions. Considering the amounts allocated each year in the budget, PRONABES has enjoyed a considerable capacity to respond to the number of scholarship applications that comply with the requirements established in its Operating Rules (Table 6.4).

Table 6.4 Number of applications and scholarships granted

Academic year	Applications fulfilling the requirements	Scholarships granted	Response %
2001-2002	63,189	44,422	70.30
2002-2003	102,503	94,539	92.23
2003-2004	140,215	122,642	87.47
2004-2005	155,580	137,852	88.61
2005-2006	177,648	161,787	91.07

Source: SEP.

389. PRONABES has facilitated student permanence in higher education programmes and has contributed to the improvement of their academic performance. This is evident in the percentage of renewed scholarships that reaches, on average, 70%.

390. In addition, 65% of students currently enjoying a PRONABES scholarship belong to families with incomes of up to two monthly minimum wages, and 35% over two and up to four (Table 6.5).

Table 6.5 Percentage share of scholarships by family income

2001-2002	2005-2006
22% 1 MMW or less	17% 1 MMW or less
38% over 1 and up to 2 MMW	48% over 1 and up to 2 MMW
40% over 2 and up to 3 MMW	32% over 2 and up to 3 MMW
-	3% over 3 and up to 4 MMW

MMW: monthly minimum wage.

Source: SEP.

391. Since PRONABES started operating, the number of women scholarship holders has been larger than men's. The figure has increased every year, partly due to a better academic performance from women (Table 6.6).

Table 6.6 Percentage share of scholarships by gender

Gender	2001-2002	2002-2003	2003-2004	2005-2006
Female	51	53	55	56
Male	49	47	45	44

Source: SEP.

392. The distributions of fellowship holders by level and knowledge area are presented in tables 6.7 and 6.8, respectively.

Table 6.7 Percentage share of scholarships by level

ISCED level	2001-2002	2002-2003	2003-2004	2005-2006
5B2	14	16	11	11
5B4	86	84	89	89

Source: SEP.

Table 6.8 Percentage share of 5A4 ISCED level fellowship holders by field of knowledge

Academic year	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Administrative and social sciences	Education and humanities	Engineering and technology
2001-2002	6	9	5	28	5	47
2005-2006	4	9	4	32	7	44

Source: SEP.

393. The programme has eased access to public higher education to indigenous students and to those living in marginalised rural and urban areas. During the 2005-2006 academic year, 45% of fellowship holders lived in rural and marginalised urban areas. The programme has promoted indigenous student access and permanence in public higher education institutions. During the aforementioned academic year, the percentage of indigenous students with scholarships was 5%. In states such as Chiapas, Guerrero and Oaxaca, this figure reached 5, 7, and 18%, respectively, and has shown yearly increases.

394. PRONABES' monitoring by SEP in co-ordination with state education authorities and public higher education institutions⁹⁷ as well as external assessment entities⁹⁸ in charge of ANUIES with support from the Economics Teaching and Research Centre (*Centro de Investigación y Docencia Económicas*, CIDE), indicates that the Programme has contributed to reduce desertion rates among students, particularly during the first year, to enhance their academic performance and to increase their permanence and timely conclusion of studies.

395. In addition, in technological universities, 95% of fellowship holders passing regularly from their first to their second year, that is, that follow and pass every first-year subject, conclude their studies at the appropriate time.

396. About PRONABES, external assessments have concluded the following:⁹⁹

- It is not only a policy mechanism that addresses an undisputable demand for equitable access to higher education, but its institutional design has been enclosed in transparent rules that allow the accomplishment of their objectives, while simultaneously establishing the responsibilities within its scope. It is viable and well built in institutional terms, with correspondence between general and specific objectives as well as with its operating mechanisms.
- It is adequately focused and responds to a level of demand proven through national data from entirely trustworthy sources and adequate statistical techniques. Its policy impacts are all favourable and it assists fellowship holders in accessing and concluding their studies according to schedule.
- Its high renewal rates and its coverage expansion during the first cycles in operation indicate the success of this policy and its demand. Financial efficiency is kept high in almost every trust, which allows intensive resource employment for the ultimate objective of this policy.
- It is an effective means to generate economic equity in higher education. Therefore, it will be necessary to continue promoting increased operative coverage and, with it, access and permanence opportunities for students from less favoured social groups in public higher education.
- The final balance of the first four and a half years of Programme operation is encouraging and positive. The Programme is giving attention to a disadvantaged segment of the population, according to equity criteria, increasing their possibilities

⁹⁷ SEP, *Reporte de seguimiento operativo del Programa Nacional de Becas para la Educación Superior 2002-2003*.

⁹⁸ Bracho, Teresa, *Evaluación del Programa Nacional de Becas para la Educación Superior, 2001-2004*, ANUIES, México 2005.

⁹⁹ Idem.

of accessing and remaining in the education system. The possibilities of academic success will be improved when higher education institutions are capable of building better tutoring and pedagogic support systems for the target population, which is still an unresolved issue. In this context, assuring the funding of PRONABES in the medium and long term is still a priority. Only a policy mechanism with these features, capable of becoming institutionalized, will be effective to incorporate youths from poorer sectors into higher education. The nature of the programme and the sort of long term investment at stake demands its continuity beyond the current administration, in order to have a transcendent impact on the generation of future welfare opportunities.

397. When comparing the outcomes of the University Level Technician Graduate General Examination (*Examen General de Egreso del Técnico Superior Universitario*, EGETSU) applied by CENEVAL in 2003-2005, PRONABES' scholarship students from technological universities in urban and rural areas show similar results in terms of the percentage of confirmations of their high performance. This means that PRONABES has contributed to place rural students on a similar footing as their urban counterparts.

398. A SEP survey of 34 technological institutes¹⁰⁰ indicates that the average grades of all students enrolled at institutes in urban and rural areas is 84.1% and 81.8%, respectively. PRONABES' fellowship holders grades average 88.7 and 86.3, respectively, which compares favourably with the general grade averages and those of non-fellowship holders, which were 79.4 and 77.2, respectively (Table 6.9). PRONABES contributes to generate conditions for rural students to register performance levels equivalent to those of urban students.

Table 6.9 Grade averages in 34 technological institutes

Area	Average grades (0-100)		
	PRONABES fellowship holders	Non-fellowship holders	General
Urban	88.7	79.4	84.1
Rural	86.3	77.2	81.8

Source: SEP.

399. PRONABES is accomplishing its goals. The programme has been acknowledged by the youths for whom it makes the difference between accessing higher education or not, as well as by the public higher education institutions and its heads, immediate witnesses of the outcomes achieved by its fellowship holders.

6.5 Convergence of PRONABES with *Oportunidades*.

400. *Oportunidades* is a federal inter-institutional programme aimed at promoting human development among the extreme poor. The programme grants support in terms of education, health, nutrition and income for a savings fund. Several instances are part of its operation such as SEP, the Secretariat of Health (*Secretaría de Salud*, SSA), the Mexican Social Security Institute (*Instituto Mexicano del Seguro Social*, IMSS), SEDESOL and the state and municipal governments. The programme operates based on a rigorous selection system, focused on socio-economic features of social groups, which allows it to aim its resources on the families that really need them, overriding the discretionary subsidies and supports defined based on political criteria. Over against assistive and paternalistic policies, shared responsibility is essential in this programme, since families are an active part of their own development. Children's school attendance and community attendance to health units constitutes the basis for support money.

¹⁰⁰ 15 in urban areas and 19 in rural areas.

401. *Oportunidades*' priority lies in strengthening the woman's place in the family and the community. For that reason, mothers receive the monetary transfers directly, without intermediation of government officers, authorities or leaders of any sort, by means of clearing institutions, thus guaranteeing its transparent distribution.

402. In the education context, the programme operates from the third year of primary education and, since 2001 it expanded its education benefits to individuals between 14 and 20 years of age from poor households, enrolled in upper secondary education. The amount of the scholarship for girls is higher, with the purpose of encouraging their school attendance. Only a year after its inception, *Oportunidades* offered over 400,000 scholarships at that level, with a net impact of a 38% increase in rural enrolments and 6% in urban enrolments.

403. *Oportunidades* has an assets component called "Youths with Opportunities" (*Jóvenes con Oportunidades*), which allows students to choose from four options: to continue studying in higher education (skills aspect); to start a productive project; to improve their housing; or to acquire a health insurance. The assets component consists of a savings fund in which the beneficiary gradually accumulates points that can be changed for money which is accessible through a specific account. The youth may use her/his savings when finishing upper secondary school, choosing one of the above four options. Evidently, the most desirable choice would be to continue studying at a higher education institution.

404. A substantial number of former *Oportunidades* fellowship holders are currently studying in public higher education institutions with the assistance of PRONABES. In the 2004-2005 academic year, PRONABES' beneficiaries from *Oportunidades* accounted already for 8.7% of the total figure.

405. Albeit its conception as an independent programme, the structure and operation of PRONABES makes it consistent with *Oportunidades*, and it has become a means in favour of an equity policy given that it allows the continuity of granting scholarships to disadvantaged students, from ISCED level 0 up to 5A4.

6.6 Other scholarship programmes in favour of equity

406. Complementing PRONABES, the federal government has implemented other scholarship programmes for higher education. Worth mentioning among them are the transportation and academic excellence scholarships granted by SEP to university level technician, technical bachelor's degree or bachelor's degree students from public institutions. There are also the scholarships granted to students from 7th or 8th semester enrolled in public teaching school programmes to carry out intensive practices and comply with their social service requirement, and the CONACyT scholarships, for postgraduate studies in quality programmes in Mexico or abroad. During the 2004-2005 academic year, 84,485 students received a transportation or academic excellence scholarship, 18,282 received a grant for intensive practices and social service and 17,026 for postgraduate studies (Chapter 5).

407. Generally, public institutions grant different types of support to low income students for them to have access to and remain in their programmes. Others offer economic assistance in the form of a variable scholarship, according to the students' socio-economic situation; others still, exempt the students from paying tuition and enrolment fees as long as they maintain a level of academic performance according to institutional rules.

408. Additionally, the General Education Law (*Ley General de Educación*) indicates that private institutions with programmes granted with RVOE or incorporated before a public institution, must allocate scholarships to students lacking the necessary resources to study there but complying with

the required academic capacity and merits. The number of scholarships granted must be equivalent to, at least, 5% of their total enrolment.

409. The National Scholarships Fund (*Fondo Nacional de Becas*, FONABEC), created in 2001 with resources contributed by private individuals from different sectors is a programme that operates according to a series of rules similar to PRONABES'. Currently, the programme has granted 10,200 scholarships mostly to technological university students.

410. The Society for Promotion of Higher Education (*Sociedad de Fomento a la Educación Superior*, SOFES) was created in 1997 by a group of private institutions with the aim of granting student loans to attend their institutions. The society started operating with a loan from the World Bank, with SHCP endorsement. Currently, SOFES has granted over 27,000 loans to bachelor's or postgraduate degree students.

6.7 Education loans

411. Certain states, such as Sonora, Hidalgo, Tamaulipas, Guanajuato and Quintana Roo have student loan programmes for higher education. Since this is an equity-promoting type of financing, the federal government and the World Bank have jointly designed the Higher Education Student Assistance Programme (*Programa de Asistencia a Estudiantes de Educación Superior*, PAEES). The programme consists of five elements: 1) supporting PRONABES as its main goal; 2) designing and implementing a student loan system in states wishing to establish one; 3) assisting upper secondary disadvantaged *Oportunidades* students (poor and indigenous) capable of concluding higher education programmes; 4) carrying out surveys to strengthen the national equity policy and institutional development schemes; and 5) promoting private investment in education loans. The PAEES will operate in 2005-2013 through a World Bank loan of US\$171 million. Currently, nine states participate in PAEES (Table 6.10). "The challenge lies in strengthening PRONABES and structuring a financial support system combining scholarship granting with student loans".¹⁰¹

6.8 Expanding access opportunities to the public subsystem

412. As discussed in chapters 4 and 8, the federal government has encouraged the creation of new institutions with diverse typologies and the expansion of the response capacities of existing institutions by means of the Programme of Expansion of Educational Supply, with the purpose of diversifying access opportunities to public higher education in co-ordination with state governments and in the context of the aforementioned policies.

413. Of the 84 public institutions that have been created, 40 are located in poor areas, allowing youths from these regions to access and expand their opportunities to follow higher education programmes.

¹⁰¹ World Bank. *Programa de Asistencia a Estudiantes de Educación Superior. Project Appraisal Document -PAD-* November 2005. The states incorporated to the Programme are Sonora, Hidalgo, Tamaulipas, Guanajuato, Quintana Roo, Jalisco, Nuevo León, Aguascalientes and Chihuahua.

Table 6.10 PAEES stages

Elements	Stage I (2005-2009)		Stage III (2010-2013)
		Stage II (2006-2009)	
Element 1 Strengthening PRONABES and developing a regulatory framework for higher education student assistance	→	→	→
Element 2 PAEES strengthening	→	→	→
Element 3 Assistance for disadvantaged students	→	→	→
Element 4 Education loans for students from different states	Quintana Roo		→
		State 2 →	→
		State 3 →	→
		Other states →	→
			State 4 →
			Other states →
Element 5 Encouraging private investment in student loan granting		→	→

414. The public university segment includes the Regional University Network of the State of Oaxaca, consisting of five institutions and several campuses, expanding access opportunities to higher education in one of the most marginalised Mexican states.

415. As discussed in Chapter 4, in 2001-2005 the *universidades autónomas de Hidalgo, Tabasco* and *Nayarit* and the *universidades de Colima, Guanajuato* and *Veracruzana* together with 44 technological institutes created schemes to operate virtual programmes, with the purpose of bringing education to scarcely populated areas or those difficult to access. During that same period, SEP worked in co-ordination with the governments of Hidalgo, Durango and Chiapas to establish distance education state systems with the same purpose.

6.9 Quality improvement as a strategic dimension of equity

416. Equity in education means access to high quality institutions and programmes. Therefore, PRONAE considers it essential to adopt and reinforce the measures aimed at improving programme and service quality. With this purpose, it introduces the policies and lines of action described in Chapter 2.

417. In order to guide the planning processes that have been the articulating axis of quality improvements and guarantees, the Programme considers that a good quality education programme is that which has ample social acceptance given its graduates' solid training; high graduation or degree earning rates; professors that are competent in terms of generation, innovative application of knowledge and its transmission, organised into academic bodies; a relevant and updated curriculum; timely services for individual and group student attention; modern support infrastructures; efficient management systems and social services in consonance with the programme's curriculum.

418. Chapter 9 describes the results achieved to date in the process of comprehensively strengthening public institutions and, in particular, of improving the programmes and services

offered. Currently, in a sizeable number of institutions, most students are following 5B2, 5A4 or postgraduate degree studies in programmes acknowledged for their quality by external assessment and accrediting bodies, achieving significant progress in terms of equity during the past five years.

6.10 Access to and permanence in higher education institutions

419. In order to access higher education institutions it is essential to have the official certificate that endorses the conclusion of upper secondary education and comply with the requirements established by each institution. In the context of federal policies, SEP has promoted selective and transparent admission schemes to access higher education institutions.¹⁰²

420. At most institutions, applicants have to pass an admission or selection test. Certain public and private universities design and apply their own exams; others employ the standard test designed by CENEVAL, the Basic Skills and Knowledge Test (*Examen de Habilidades y Conocimientos Básicos*, EXHCOBA) from the *Universidad Autónoma de Baja California*, or the College Board Test. In the context of technological institutes, the National Technological Education System Council (*Consejo del Sistema Nacional de Educación Tecnológica*, COSNET) coordinated the design, application and assessment of the entry test for applicants to higher education programmes in these institutions, until 2005. From 2006 onwards, the CENEVAL test will be gradually introduced.

421. Test outcomes and, if applicable, the student's average grades in their upper secondary education, are the basis to decide their admission, taking the availability in each programme as main reference.

422. Certain public institutions offer students the possibility of automatically entering higher education when graduating from their own upper secondary level system without needing to follow a selection process. This scheme has recently been declared¹⁰³ unconstitutional by the Supreme Court of Justice, since it does not privilege equity in the access process.

423. Regarding inter-cultural universities, student selection is done by means of equitable participation schemes based on peoples, language and gender representation.

424. The diffusion of number of options students have to access higher education programmes is carried out in a quite varied way. SEP has an electronic page where it offers information on the system's offerings and their quality. There are also direct links to practically every higher education institution. In addition, this portal has a list of every private institution with RVOEs granted by SEP. On the other hand, state governments generally offer these services through their on-line portals.

425. In terms of options for promoting access to higher education, the most employed is the advance notification of calls for applications, which attract general interest from students, motivating them to search the different media with information on their preferred programmes or institutions. In general, in addition to the institutional services in electronic media, the information is also published in the newspapers or communicated on the radio, TV, magazines and periodicals.

426. This call for applications establishes the institution's requirements and, if applicable, the number of spaces available in each programme and the possibilities of transferring credits to other domestic or foreign institutions.

¹⁰² In their Reviews of Federal Policies for Education, OECD experts recommended implementing a selective admission process for all candidates based on a test and their upper secondary education grades; controlling the entrance flow to different fields based on candidate qualities and graduate students' experience.

¹⁰³ At the *Benemérita Universidad Autónoma de Puebla*.

427. Vocational advice programmes in upper secondary schools —sometimes part of the curriculum— are among the most effective means for communicating these opportunities.

428. Albeit the systematic efficiency improvements in degree earning—from 38% in 1994 to 42.3% in 2000, to 57% in 2004—student desertion, particularly during the first year, is still high, and may reach an average of 20% or more. Desertion in health sciences is under average, while in exact sciences, engineering and humanities leavers exceed the general average.

429. There is no systematic and comparable information across institutions on the causes of desertion and their relative weight. Certain studies indicate that this is a multi-variate and complex phenomenon, and that there may be different causes depending on the institution.¹⁰⁴ Among these: the shortage of funds, weak prior academic training; scarce vocational advice; high failure rates; unfulfilled expectations generated amongst students by the institutions before entry; incorporation and induction of students into institutions under weak and insufficient attention schemes; professors lacking competence to teach first year curricula; difficulties at work; marital status commitments; rigidities attributable to institutions, such as university regulations, curricula and school management, inadequate subject scheduling in terms of covering student needs and lack of sufficient infrastructure for academic work, among others.

430. In order to improve permanence levels, institutions have developed compensating programmes, introductory courses and individual and group attention. Nevertheless, not all of them are adequate in terms of the stated objectives. On the other hand, general accessibility to facilities is being improved in benefit of challenged students.

6.11 Student contributions

431. The magnitude of student contributions in terms of tuition and enrolment fees varies according to the public or private nature of the system. This difference may be more significant across the institutions in each subsystem. In the context of private institutions, fees may vary according to institutional prestige, costing somewhere between a monthly Mx\$500 and Mx\$10,000.

432. Some public institutions charge merely symbolic or null fees, and others charge from Mx\$500 to Mx\$2,000 a month, which accounts for 2% to 10% of their annual revenue budget. Others still may charge between Mx\$2,500 to Mx\$7,000 a month, that is, between 10% and 20% of their revenue. Therefore, in most institutions student contributions are not significant sources of financing, but they generally contribute to improve the working conditions for professors and students, to supplement annual operative expenses and, on occasion, to expand their institutional scholarship programmes.

433. Even in this situation, the subject of student contribution to higher education financing is present in current debates. There are those who consider it necessary to implement an indiscriminate gratuity regime in every public institution in Mexico, which would generate larger imbalances in public investment distribution across higher education institutions.

434. However, in order to prevent talented young people with merits and improvement aspirations from missing the opportunity of having higher education due to economic reasons, the current administration, in co-ordination with state governments and public higher education institutions, designed and implemented PRONABES in 2001, and reinforced or promoted other

¹⁰⁴ Fresán Orozco, Magdalena and Alejandra Romo López, “Los factores curriculares y académicos relacionados con el abandono y el rezago”, in Chain Revueltas, Ragueb (comp.). *Deserción, rezago y eficiencia terminal en las IES*, ANUIES, México, 2001; Muñiz Martelón, Patricia. *Trayectorias educativas y deserción universitaria en los ochenta*, ANUIES, México, 1997; González F., Luis Eduardo, “Repitencia y deserción universitaria”, en *Informe sobre la Educación Superior en América Latina y el Caribe 2000-2005*, IESALC, Venezuela, 2006; Rodríguez Lagunas, Javier, et al., *La deserción escolar en la UAM-I*, Comunicación interna, UAM, 2005.

scholarship programmes. The scholarship money is generally used by the students as payment for enrolment and tuition fees, as well as for transportation, food, school supply purchases and to contribute to household expenses.

435. In general, student expenses are still covered by their families, this support continues being crucial, usually being the father or mother on whom such responsibility lies.

436. The challenge in this sense consists in expanding PRONABES' coverage so that a larger number of youths in need of economic support to access higher education may do so.

6.12 Budget gaps per student

437. The annual cost index resulting from dividing the total subsidy received by public institutions by the total number of students is significantly higher in federal than in state institutions (Chapter 7). In addition, the cost per student index in this group shows considerable differences.

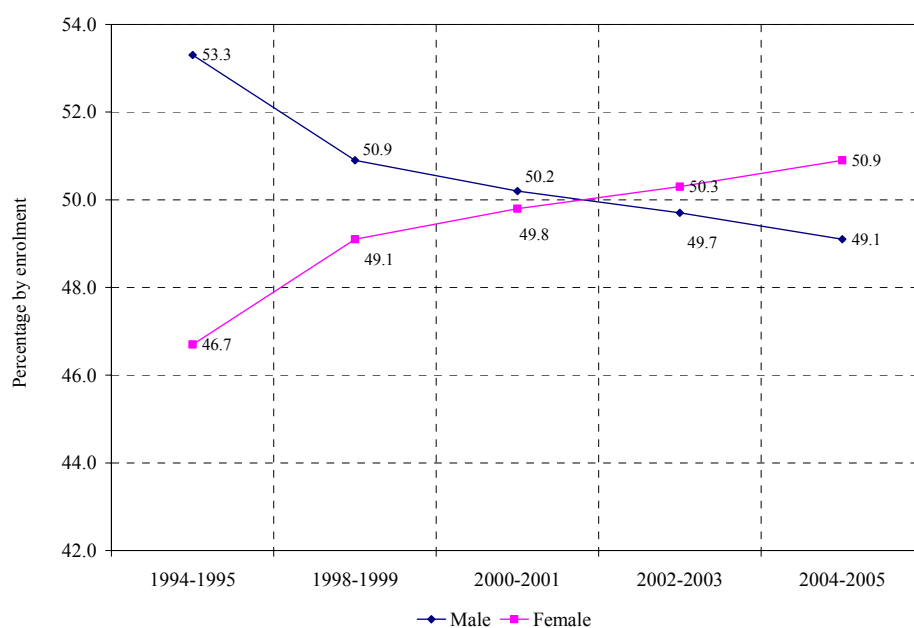
438. According to the equity principle, these gaps should disappear and a new subsidy scheme should be applied, one that is equitable and takes into account institutional performance criteria (Chapter 7). This model, agreed with ANUIES, will be implemented this year employing resources approved for this purpose by the House of Deputies of the Mexican Congress in the PEF. The implementation of this model will introduce a process that will influence an old problem in terms of regular public university financing, and it will encourage focusing efforts in these institutions towards continuously improving and guaranteeing the quality of the programmes and services they offer.

6.13 Progress in equity during the past decade

439. During the past ten years, federal and state equity policies in higher education have achieved the following:

- Encourage continuous improvement and guaranteeing of education programme and process quality, as a strategic dimension of equity.
- Systematically increase female participation in higher education enrolment from 46.7% in the 1994-1995 academic year to 50.9% in 2004-2005 (Chart 6.1) as well as in the graduate structure, even in fields traditionally considered as primarily male. Currently, every year a similar number of women and men graduate and obtain their professional certificate. These data confirm that female participation in enrolment and in the population of graduates is similar to their participation in the age group that is typically linked to higher education. At the same time, they indisputably prove they are taking advantage of the opportunities presented by the system in a proportion similar to men.

Chart 6.1 Percentage share of total enrolment, by gender



Source: ANUIES, *Anuario estadístico 1994 y 1995*; SEP, *Formato 911 de 1997 a 2005*.

- Approaching and expanding access opportunities to higher education from disadvantaged groups through creating new public institutions and distance education services, expanding school and non school-based programmes in existing institutions and implementing a series of programmes of non reimbursable scholarships, have allowed a segment of the youth population to access higher education, which was traditionally left out in the past.
- Generalise schemes contributing to enhance equity in the student selection and admission process in public institutions.
- Establish or strengthen individual and group tutoring programmes in public universities,¹⁰⁵ with the purpose of guiding students in their study and address their needs in a timely fashion, as well as monitoring their schooling history and identify different problems that might put their permanence in institutions at risk. SEP is currently encouraging the operation of similar programmes in technological institutes.

¹⁰⁵ In the Reviews of Federal Policies for Education OECD experts recommended developing tutorship and guidance services for fellowship holders and university students.

Chapter 7: Financing

7.1 Introduction. 7.2 Investment in higher education. 7.3 Resource allocation models. 7.4 Academic staff.

7.1 Introduction

440. As discussed in Chapter 8, the Planning Law (*Ley de Planeación*) mandates the executive branch to prepare a PND establishing objectives, goals, strategies and priorities to promote the country's development during the administration in which it is approved, although its projections and plans might refer to a longer term.

441. The plan includes sectoral programmes designed by the federal public administration entities, which must detail specific objectives, policies, priorities, strategies and goals to encourage sectoral development.

442. Both the general plan and the sectoral programmes must contain an estimation of the resources needed to accomplish their goals. In this sense, PRONAE establishes that, in order to continue expanding the education sector without sacrificing quality while achieving progress towards equity in education opportunities, the Federal Government will foster the increasing allocation of public and private resources to education.

443. In the particular instance of higher education, PRONAE indicates that, in order to meet its goals, annual financing should be increased until the 1% of GDP objective is reached in 2006. Such increase would allow, among other aspects, the establishment and operation of PRONABES across Mexico (Chapter 6); strengthening the Programme of Expansion of Educational Supply in budgetary terms (chapters 4 and 8) as well as the programmes aimed at improving and guaranteeing the quality of higher education; and, contributing to close the gaps in cost per student indicators across federal and state institutions and within the latter.

444. PRONAE considers also a series of supplementary actions to achieve the objective of increasing investment in higher education towards its better performance, offering increasing quality in terms of the attention paid to students and other users of the services provided by public higher education institutions, such as:

- Strive to increase the contributions to public higher education institution financing from the state governments where they are located.
- Promote increases in own revenues from public institutions and the pursuit of supplementary financing sources, especially those contributing to implant them in their community.
- Encourage the employment of international financing funds in terms of materialising projects to improve higher education institutions.
- Further the access to international funds for academic co-operation and exchange between Mexican and foreign higher education institutions.
- Attract funds from domestic and international non-profit organisations to finance higher education.

445. The 2002 reform to the LGE established that the annual share the State—federation, states and municipalities—should allocate to public education and education services expenditure should not be below 8% of GDP. Of this percentage, no less than 1% should be directed to scientific research and technology development activities in public higher education institutions.

446. SEP sends its annual budget proposal to SHCP, based on the estimated financing needs of the different programmes under its scope of responsibility as well as according to the goals stated in

PRONAE and, every year, the budget draft the executive branch submits to the House of Deputies for analysis and approval, includes items aimed at financing public higher education institutions and extraordinary programmes.

447. The PEF is the outcome of a series of agreements reached in the House of Deputies after a complex process that includes analysis and negotiations across the representatives of the political parties, the representatives of the states and the related commissions.¹⁰⁶ Several government actors participate in these negotiations, as well as representatives from the social and political arena, including stakeholders.

448. The size of the resources associated with the PEF depends on how much revenue will be made available through taxes, other fees and charges and the revenues obtained from the direct budgetary control entities which, altogether, integrate the Federal Revenue Law (*Ley de Ingresos de la Federación*).

449. The direct allocation of extraordinary resources to federal and state public universities agreed, regardless of the federal policies, by the House of Deputies in the expenditure budgets of the past three years, has generated significant tension across the public higher education institutions, which have instead demanded transparency of the criteria employed and criticised the discretionary allocation of resources as a result of individual or group stakes.

7.2 Investment in higher education

450. Chart 7.1 shows the evolution of the 1995-2005 public and private education expenses as a share of GDP. The national expenditure increased 49.6% in that period, attaining 7.3% of GDP in 2005, and proof of the systematic progress towards the 8% of GDP goal for the National Education System.

451. The contribution of public expenditure to national expenses was 5.6% of GDP and 1.7% from the private sector. Most of the public expenditure funds come from the federation, since states only contribute 1% of the total figure, below the private contribution.

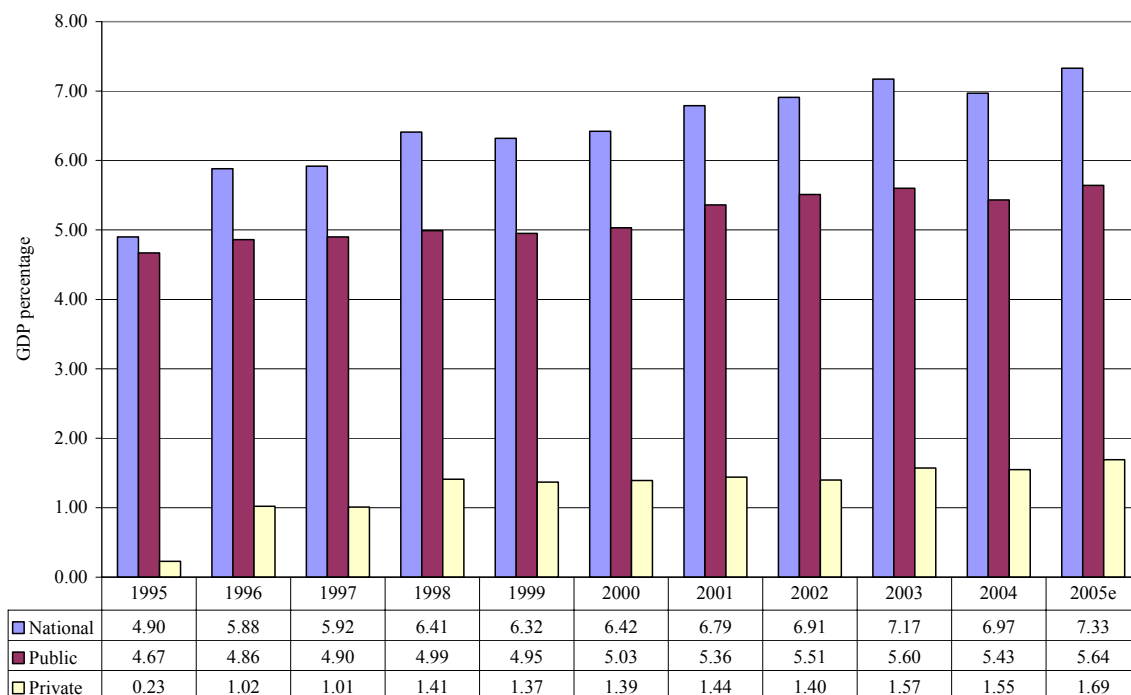
452. Chart 7.2 reports the behaviour of federal expenses in education and in higher education during the period of reference. Here, it is clear that federal expenditure in education increased 63.1% in real terms, and the expenses for higher education did so by 57.2%, which related favourably to the 56% increase in public subsystem enrolments from academic years 1994-1995 to 2004-2005.

453. The evolution of federal expenditure in higher education at constant 2005 pesos and as a share of GDP is presented, respectively, in charts 7.3 and 7.4. In 2005, this item reached 0.81% of GDP.

454. Chart 7.5 describes the 1995-2005 evolution of public expenditure in education per student from different levels of the National Education System. In 2005, the expenditure per student in higher education was 2.2 times higher than in upper secondary school, 3.2 times higher than upper technical professional (3B), 3.1 times higher than for lower secondary education, 4.9 times higher than elementary school and 4.4 times higher than preschool.

¹⁰⁶ Three commissions participate in the process of determining the budget for education: the Public Education and Education Services Commission, the Science and Technology Commission and the Budget and Public Accounts Commission.

Chart 7.1 Evolution of public and private expenditure in education as share of GDP



Due to rounding out, total figures may not equal partial value addition.

Source: *Quinto Informe de Gobierno* (Fifth State of the Union Address), 2005.

455. The gap in expenditure per student in higher education and that of basic education or preschool has been closing since 1990. What was thought of in 2001 as a window of opportunity for financing in upper secondary and higher education due to reductions in primary school enrolments, was cancelled to a large extent by the agreement issued by the legislative branch in 2002 to make preschool education compulsory for children of three, four and five years of age.

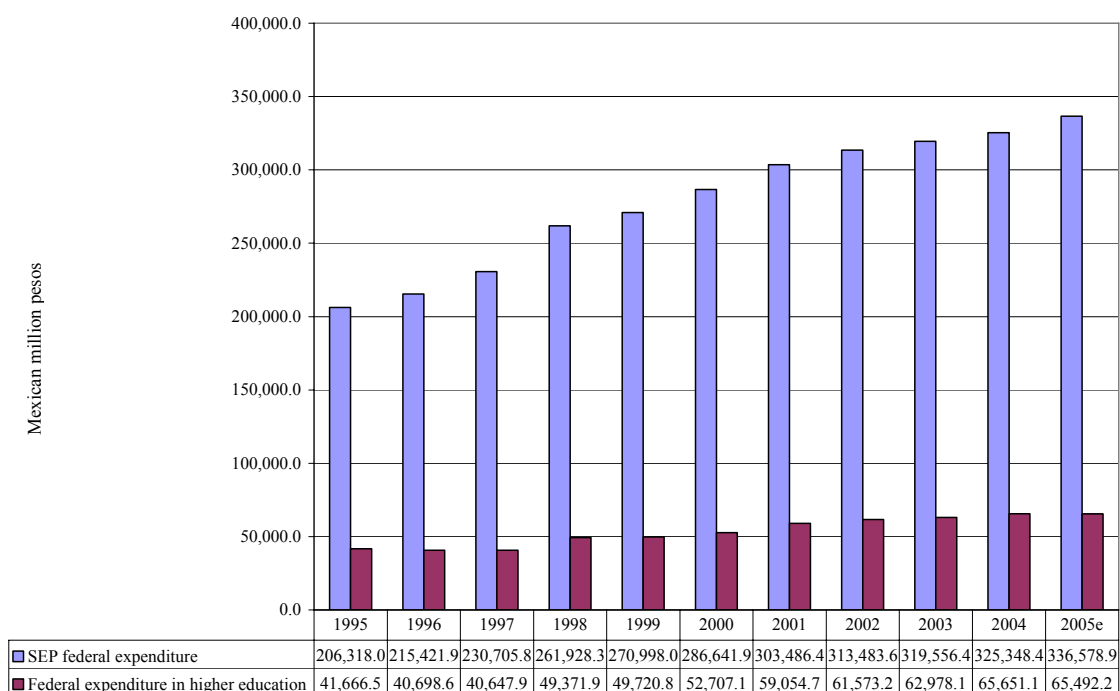
456. Faced with this situation and a context featuring an insufficiency of public revenue, higher education financing ended up within a scenario of increased competition for resources.

457. Ensuring adequate financing for public higher education will require a fiscal reform generating increases in public revenues, as well as schemes guaranteeing increased efficiency from public institutions, geared towards equity and social benefit principles and the elimination of the regressive nature of the investment.

7.3 Resource allocation models

458. Until 1988, the allocation of a general federal subsidy to public universities was based upon the application of a formula whose only variable was the number of attending students. As happens when applying one-variable formulas, this model paved the way for unmeasured school growth, as well as for distortions in basic statistics from some universities.

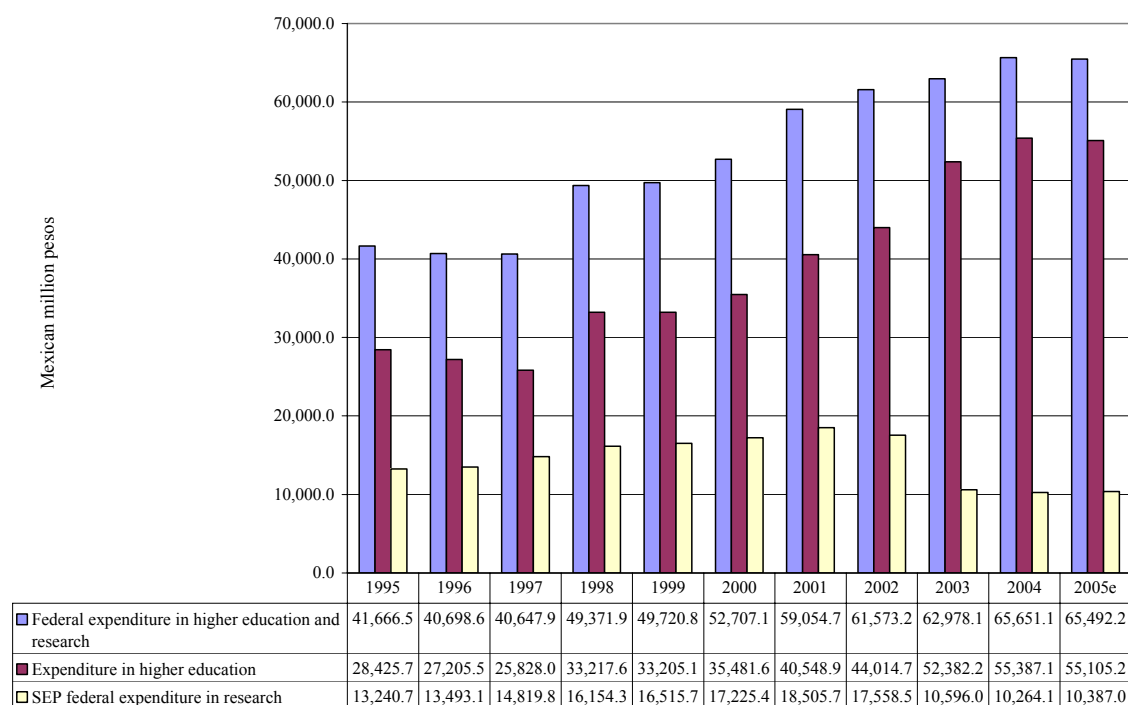
Chart 7.2 Evolution of federal public expenditure in education and higher education



Amounts expressed in million 2005 pesos. Higher education includes funding for research in public institutions.

Source: *Quinto Informe de Gobierno* (Fifth State of the Union Address), 2005.

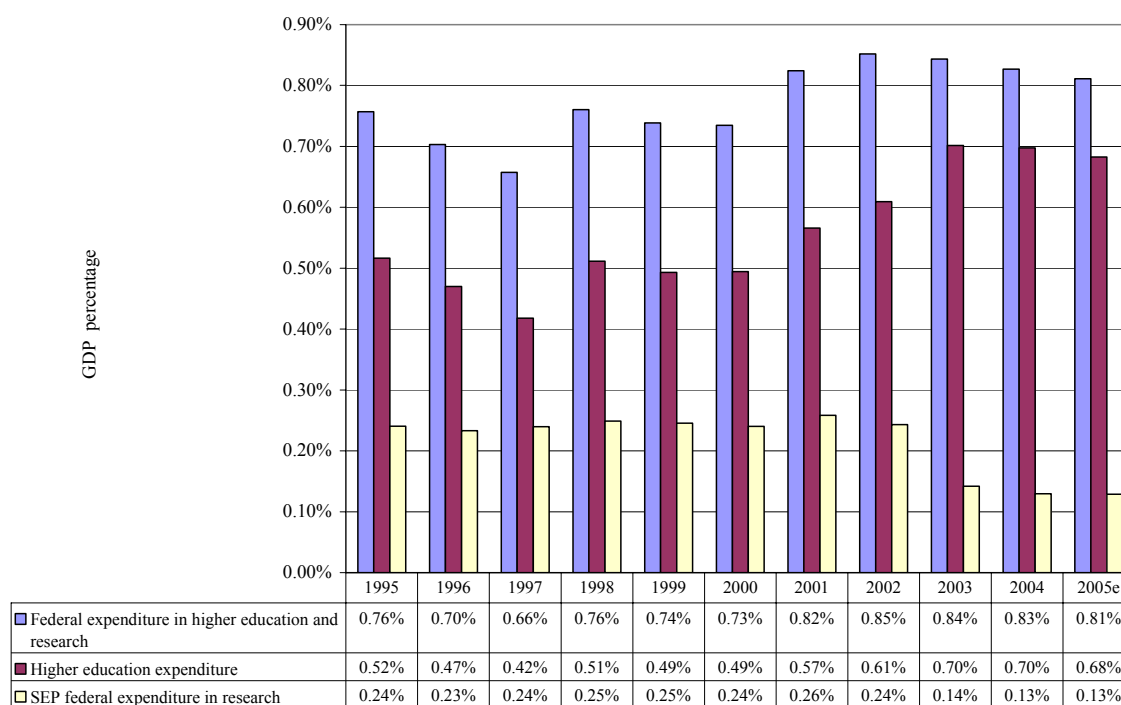
Chart 7.3 Evolution of federal expenditure in higher education



Amounts expressed in million 2005 pesos. Funding for research in higher education institutions is disaggregated.

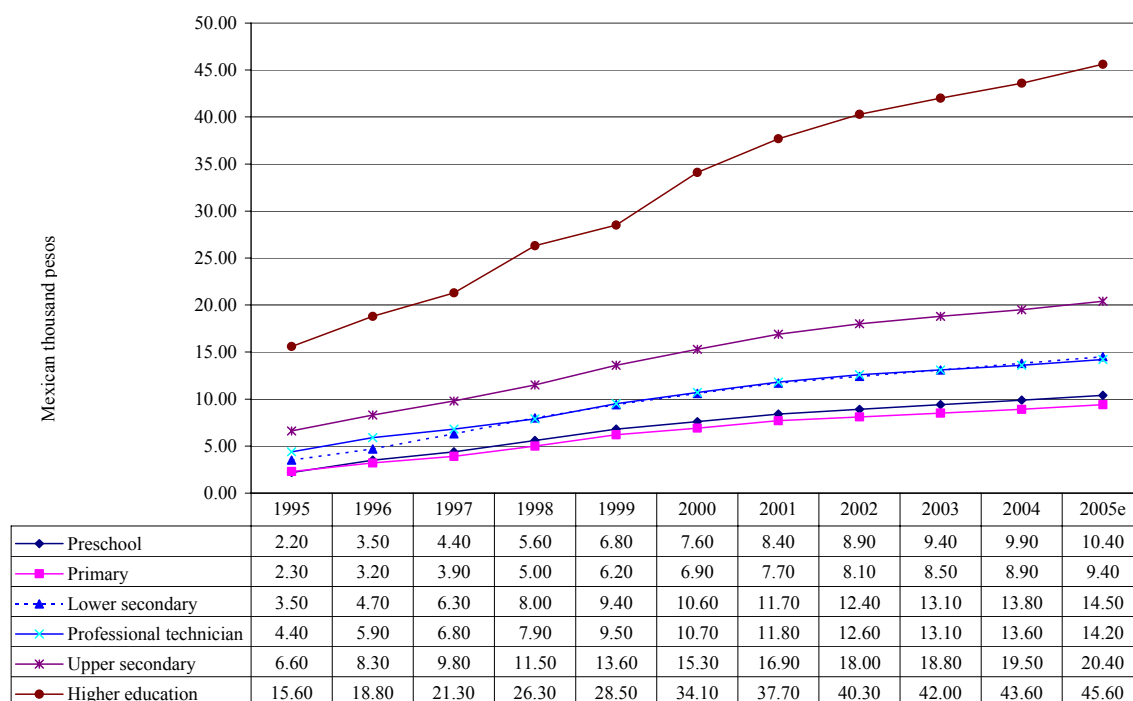
Source: *Quinto Informe de Gobierno* (Fifth State of the Union Address), 2005.

Chart 7.4 Evolution of federal expenditure in education as share of GDP



Source: *Quinto Informe de Gobierno* (Fifth State of the Union Address), 2005.

Chart 7.5 Evolution of public expenditure per student in different levels

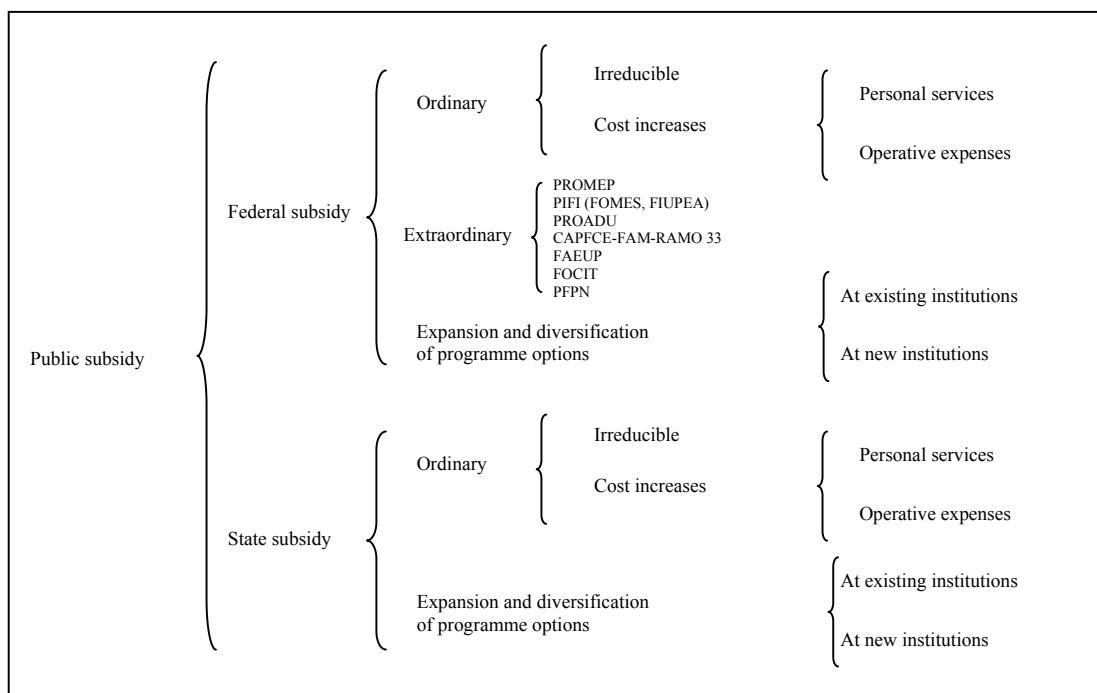


Source: *Quinto Informe de Gobierno* (Fifth State of the Union Address), 2005.

459. From 1988 to date, the model for allocating resources to public institutions is essentially based on the size of the working staff authorized by SHCP.

460. The federal subsidy transferred to federal public institutions and decentralised state public entities consist of three elements: the ordinary and extraordinary subsidies and the grant associated to the Programme of Expansion of Educational Supply. On the other hand, the state subsidy consists of the ordinary subsidy and the grant associated with expanding and diversifying programme options (Diagram 7.1).

Diagram 7.1 Public subsidy



461. The ordinary subsidy covers current expenses oriented at sustaining regular institution operation. It is allocated based on previously approved input costs such as authorised payroll plus other operative expenses. This item concentrates over 90% of the total subsidy for higher education. There is no variable in the allocation formula that encourages continuous improvement in institutional quality.

462. The cost increases with regard to personal services are authorised by SHCP based on federal government wage policies. These policies include increases both in wages and in fringe as well as transferred benefits, calculated according to the formulas authorized by SHCP. Such formulas refer to transferred and fringe benefits such as Christmas bonus, seniority premium, vacation premium, differential days, social security, housing and retirement savings, and are applied according to the laws and regulations in effect at the public sector.

463. A group of state public universities receives the federal subsidy under the “solidary support” regime, by which they may establish their own pay scales and incentive programmes. According to that regime also, new polytechnic and inter-cultural universities are financed.

464. Federal and state contributions to each institution’s ordinary subsidy are fixed and formalized by means of a three-party agreement signed by the federal and state governments and the relevant institution.

465. Through the extraordinary subsidy, the federal government intends to involve public autonomous institutions in their policy development activities. This subsidy is basically intended to improve and guarantee higher education quality by means of:

- PROMEP, which contributes to improve professor profiles and develop academic bodies in public higher education institutions.
- The Fund for Modernisation of Higher Education (*Fondo para la Modernización de la Educación Superior*, FOMES), which objective is to contribute in developing comprehensive strengthening programmes in public universities by means of allocating resources to their associate projects intended to improve professor profiles and educational programme quality; incorporate new approaches and ICTs in education; update curricula and programmes; establish and operate schemes for individual and group student attention; expand and update laboratory, workshop and information centre infrastructure; develop comprehensive systems of academic and financial information; improve management processes, etc.
- The ANUIES-assessed Investment Fund for State Public Universities with Evaluated and Accredited Programmes (*Fondo de Inversión para las Universidades Públicas Estatales con Evaluación de la ANUIES*, FIUPEA) which purpose consists in allocating resources for PIFI development (chapters 2 and 9) in public universities by carrying out projects with the purpose of encouraging quality assurance of education programmes acknowledged for their merit through their accreditation by specialised entities approved by COPAES or for being temporarily classified at level 1 in the registry of CIEES-assessed programmes.
- The Extraordinary Support Fund for Public State Universities (*Fondo de Apoyo Extraordinario a las Universidades Públicas Estatales*, FAEUP), created in 2002, which consists in assisting projects designed by these institutions with incidence on structural problem solution and positive impact on their medium and long-term financial viability.
- The University Development Support Programme (*Programa de Apoyo al Desarrollo Universitario*, PROADU), which supports specific actions in terms of domestic and international collaboration across institutions and their academic bodies.
- The Fund of Multiple Contributions (*Fondo de Aportaciones Múltiples*, FAM) which has the objective of expanding and modernising physical infrastructure and equipment in institutions.
- The PFPN, with the purpose of granting resources to institutions in order to encourage quality improvements in the postgraduate studies they offer and register at PNP, as well as to ensure the quality of those already registered (Chapter 5).
- The Technological Institutes Quality Fund (*Fondo de Calidad de los Institutos Tecnológicos*, FOCIT), which purpose consists in granting resources for these institutions to carry out their PIIDs and the projects recently designed in the context of the subsystem's and each institute's Strategic Agenda in order to accelerate the continuous improvement process in their programme and service quality.

466. PROMEP's resources are distributed based on the academic formation needs of in service full time professors and academic bodies' development that each institution has justified in terms of the Strengthening Programmes of their DES, in the context of their PIFI.

467. FOMES and FIUPEA resources are allocated after the PIFI annual assessment and of the impacts in the process of improving and guaranteeing institutional quality. The resources are allocated with the purpose of materializing projects in the context of PIFIs that have obtained a favourable opinion from expert committees. PIFI objectives must focus on increasing the institution's academic capacity and competitiveness and improve their management.

468. In addition, PFPN focuses on encouraging improvements and ensuring postgraduate programme quality in order to achieve their PNP registry (Chapter 5).

469. The FAM was created in 1998 by the House of Deputies with the purpose of assisting infrastructure development of public decentralised higher education institutions in the states. It includes funds for physical infrastructure construction, equipment and maintenance. Federal public institutions receive this kind of support in their ordinary budgets.

470. The extraordinary subsidy, except in the FAM case, is formalised by agreements between SEP and the institutions. Of their own accord, state governments may allocate additional funds agreed directly with public higher education institutions to reinforce their programme development.

471. On average, the extraordinary federal subsidy for quality improvements in state public universities accounts for 11% of their total ordinary state and federal subsidies. Nevertheless, its share in total subsidy exclusively directed at operative expenses (excluding payroll) may reach 40%. Thus the relevance those institutions assign to extraordinary financing funds and the participatory processes in terms of allocation.

472. Annual expansion and diversification needs in each state's education options are usually planned by the state governments with the contribution of the COEPES (chapters 4 and 8) in the context of policies and guidelines established by the federal government in agreement with state administrations. To this end, support for equipment, operative expenses and new academic positions is granted through agreements signed between the federal government, the state government and the institutions, thereby establishing the equal contribution from both governments (state and federal) in the required financing. As for federal public institutions, the resources to expand their education options and to open new positions are incorporated into their ordinary budget.

473. The ordinary subsidy received by technological universities, state technological institutes, polytechnic universities and inter-cultural universities is generated by equal contributions from the federal and state governments. This formula is the result of the federal government's policy whose objective is to encourage increases of investments in higher education from state governments. The state contribution to financing these state government decentralised public entities reinforces their commitment to regional development. Nevertheless, due to diverse situations that exert pressure on their financial situation, some state governments have found it difficult to comply with the commitments assumed in co-ordination agreements signed with the federal government in the context of this financing policy. This generates tensions between governments and institutions that witness their ability to develop their programmed activities decrease in the face of annual budgetary adjustments.

474. The federal share in the ordinary subsidy for state public universities fluctuates from 47% to 88.6%. On average, the share reached 66.5% in 2005, with an average state contribution of 33.5% (Table 7.1). The sizeable differences in federal and state contributions to these institutions' financing, that generate tensions in the system and across universities, originate in agreements between the federal government and the states prior to 1997. Since then, every expansion of education options in state public universities is financed on equal terms by the federal and state governments.

475. In the 1995-2005 period, the ordinary subsidy of public state universities increased 43.2% in real terms (from Mx\$19,388 billion to Mx\$27,760 billion). Throughout the past decade, federal contributions increased 37.4% and state contributions by 55.6%.

Table 7.1 Federal and state shares in the ordinary subsidy for public universities, 2005.

Federal public universities

Institution	Federal %	State %
<i>Universidad Nacional Autónoma de México</i>	100.0	0.0
<i>Universidad Autónoma Metropolitana</i>	100.0	0.0
<i>Universidad Pedagógica Nacional</i>	100.0	0.0
Average	100.0	0.0

State public universities

Institution	Federal %	State %
<i>Universidad Autónoma de Aguascalientes</i>	75.8	24.2
<i>Universidad Autónoma de Baja California</i>	54.6	45.4
<i>Universidad Autónoma de Baja California Sur</i>	83.4	16.6
<i>Universidad Autónoma de Campeche</i>	69.4	30.6
<i>Universidad Autónoma del Carmen</i>	63.7	36.3
<i>Universidad Autónoma de Coahuila</i>	50.0	50.0
<i>Universidad de Colima</i>	80.5	19.5
<i>Universidad Autónoma de Chiapas</i>	74.9	25.1
<i>Universidad Autónoma de Chihuahua</i>	59.7	40.3
<i>Universidad Autónoma de Ciudad Juárez</i>	71.0	29.0
<i>Universidad Juárez del Estado de Durango</i>	85.3	14.7
<i>Universidad de Guanajuato</i>	65.3	34.7
<i>Universidad Autónoma de Guerrero</i>	87.9	12.1
<i>Universidad Autónoma del Estado de Hidalgo</i>	76.0	24.0
<i>Universidad de Guadalajara</i>	52.0	48.0
<i>Universidad Autónoma del Estado de México</i>	50.2	49.8
<i>Universidad Michoacana de San Nicolás Hidalgo</i>	69.1	30.9
<i>Universidad Autónoma del Estado de Morelos</i>	74.6	25.4
<i>Universidad Autónoma de Nayarit</i>	80.4	19.6
<i>Universidad Autónoma de Nuevo León</i>	62.2	37.8
<i>Universidad Autónoma Benito Juárez de Oaxaca</i>	88.3	11.7
<i>Benemérita Universidad Autónoma de Puebla</i>	79.4	20.6
<i>Universidad Autónoma de Querétaro</i>	82.6	17.4
<i>Universidad Autónoma de San Luís Potosí</i>	88.6	11.4
<i>Universidad Autónoma de Sinaloa</i>	85.9	14.1
<i>Universidad de Sonora</i>	51.5	48.5
<i>Instituto Tecnológico de Sonora</i>	50.0	50.0
<i>Universidad Juárez Autónoma de Tabasco</i>	60.0	40.0
<i>Universidad Autónoma de Tamaulipas</i>	60.2	39.8
<i>Universidad Autónoma de Tlaxcala</i>	80.3	19.7
<i>Universidad Veracruzana</i>	47.0	53.0
<i>Universidad Autónoma de Yucatán</i>	87.9	12.1
<i>Universidad Autónoma de Zacatecas</i>	78.8	21.2
<i>Universidad de Quintana Roo</i>	50.0	50.0
Average	66.5	33.5

Source: SEP

476. The *universidades autónomas de Chihuahua, Ciudad Juárez* and *Nayarit* have succeeded in designing alternative financing mechanisms with the relevant state congresses by raising funds from local taxes.

477. During 2005, the average annual cost per student indicator¹⁰⁷ for federal public universities was Mx\$80,420, while the cost at state public universities reached an average Mx\$41,280. In this subsystem, however, the annual cost index per student showed a significant variation across institutions, from a low Mx\$22,090, to a high of Mx\$79,120 during that same year.

478. The average annual cost per student indicator at technological universities and institutes was Mx\$31,320 in 2005 and Mx\$23,850 for technological institutes.

479. As for federal public universities, given their national importance of their activities in generation and innovative application of knowledge and other extension tasks, a significant share of their ordinary budget goes to these roles, which leads to consider other indicators besides the enrolment in the calculation of the annual cost per student. Nevertheless, there are clear differences between the cost per student indicator in federal and state public universities, within the latter and across subsystems, generating tensions within the higher education system.

480. Institutions and SEP agree that the current allocation model for the ordinary subsidy could be improved. Since 1998, SEP and ANUIES have worked towards designing a new additional subsidy scheme, based on the following general guidelines:

General Principles

- Strengthening Autonomy. The model pursues a stronger autonomy and constitutes a guarantee of compliance with institutional purposes. Once the institution receives the relevant financial allocation, according to the model's criteria, it will be possible to employ it to fulfil institutional goals.
- Objectivity. The model is based on a series of objectively measurable variables. This implies the adoption of clear and provable criteria allowing institutions to plan their activities, define their goals and assess their outcomes with the resources they receive.
- Transparency. The institutions and their communities know the allocation criteria.
- Equity. The model operates employing the same criteria for every institution, which excludes the possibility of allocating resources to an institution responding to calculations considering different criteria.
- Alignment with federal policies. The variables incorporated in the model are closely related to the objectives of the federal policies to propitiate the effective coadjuvancy of the institutions to the achievement of the national objectives and goals.

Guidelines

- The model is based upon institutional performance criteria intended to acknowledge the improvements in substantive roles of the higher education institutions.
- The model is easily understood and operated by every party involved, in order to avoid confusions or misinterpretations in its application.
- The model is multivariate. It takes into account different variables in order to avoid the distortions generated by models depending on one variable. Nevertheless, for the model to comply with the above guideline, the variables must be limited to the most relevant (number of students, completion rates, programmes acknowledged for their quality by assessment and accreditation entities and their associate enrolment, professors credited with the desirable profile and registered at the SNI).
- The model acknowledges different costs per student according to levels and disciplines.
- Research financing is related to teaching financing through the close relationship between both roles.

¹⁰⁷ The cost per student index is calculated dividing the total university's ordinary and extraordinary subsidy by the sum of the higher education students plus a third of upper-higher secondary students should the university offer this latter educational level. Ordinary and extraordinary subsidies may be looked up in the Higher Education Under-secretariat webpage (www.ses.sep.gob.mx).

- The implementation process must be done gradually and on a case-by-case basis, in order to determine its performance and induce a continuous improvement process in every institution as well as to close any gaps.

481. After a long process of formula creation and consensus-reaching across institutions, SEP will apply in 2006 a new model to allocate public federal subsidy, with the resources allocated for such purpose in the 2006 PEF.

482. The application of this new model¹⁰⁸ will take into account public institution performance and will open the way to close current gaps across them related to the annual cost per student indicator. Moreover, the new model will soon become a permanent force in terms of the continuous improvement and quality assurance of the education programmes and services offered by public institutions, contributing, without a doubt, to attain equity in education. Its application in future time will require a scheme supported by a new legal frame to make mandatory external assessment and accreditation of educational programmes and the diffusion of their results.

7.4 Academic staff

7.4.1 Pay Scales

483. The establishment in 1988 of the current allocation model of the ordinary subsidy to public institutions brought about the incorporation of the official pay scale for full time academic staff into the public subsystem, whose structure consists of three categories: assistant professor, associate professor and professor, each divided into levels A, B and C.

484. The annual ordinary subsidy allocation considers the number of authorized positions in the institution in each category and level, as well as the wages associated to each of them.

485. Institutional regulations include the profiles of full time professors for each category and level (academic degrees, teaching, research and extension experience, academic production, etc.). Although these profiles may change from one institution to another, they generally require the following: for an assistant professorship of any level or associate professorship A, candidates must have a bachelor's degree;¹⁰⁹ for associate professorships levels B or C, applicants must be candidates to a master's degree or hold such degree, respectively; to have the position of professor at any level, candidates must have a doctorate degree.

486. Depending on institutional typology or priorities, and in order to assure a coherent environment, the regulations acknowledge the differences both in activities and production of academicians in terms of their categories and pay scale levels.

487. It is worth acknowledging that salaries assigned to categories by public pay scale levels make no distinction among the diverse professional fields of academic staff, so that the professions social level demand is not taken into account. This situation has been the subject of criticism by diverse currents of opinion. To canalize these critics requires an ample analysis and debate in the system in order to appreciate its scope and consequences; a debate not given up to date.

¹⁰⁸ In the Reviews of Federal Policies for Education, OECD experts recommended a review of the procedures to allocate federal funds at institutions; a certain portion determined according to simple arithmetic rules; another considered in the context of the multi-annual formal agreement between SEP and the institution.

¹⁰⁹ In general, the profiles associated to each category and level in institutional pay scales are very similar, since most of them were built taking the UNAM scales as reference.

7.4.2 Hiring

488. There are different schemes higher education institutions in the system employ to recruit their academic staff. The mechanism most generally used is by announcements published in the media, the institutions' electronic pages or their bulletins.

489. The invitation sets forth the requirements to be satisfied in terms of academic formation level, experience, academic production, etc. as well as the roles to be performed in the institution, working hours, category, level, and wage for the position according to the institution's pay scale, in addition to other benefits that may be offered to attract higher-level and more experienced staff.

490. Certain institutions publish their invitations in domestic and international media, which allows them a wider spectrum of applicants that, in turn, strengthen their academic staff, especially in areas for which training in Mexico—for example, in terms of doctorate programmes—is not yet sufficient to satisfy institutional needs.

491. Candidates are selected by means of interviews and tests, following different schemes and procedures. Among these, the most frequently employed are based on the work of peer commissions.

492. As discussed in Chapter 6, 9.2% of the students in the higher education system are interested in working at an education institution. When they conclude their studies, they pursue their incorporation into a higher education institution or research centre from their native state.

493. The first option of the postgraduates from federal public institutions in Mexico City, especially those from doctorate programmes, is to work at any of these in developing the academic profession, given their prestige and available infrastructure. Nevertheless, the opportunities these institutions currently have to offer are very scarce, given their choice to stop growing and that full time professors, albeit satisfying the requirements for retirement, do not do so, owing to the low pension levels they have right to. This situation is creating a serious problem in terms of staff renewal in these institutions, for which there is not yet a viable solution. An equivalent case is observed in other institutions and public research centres.¹¹⁰

494. On the contrary, pension and retirement systems in autonomous state public universities, most of them agreed with university worker unions when life expectancy was approximately 60 years, have caused professors to retire early (at an average of 52 years of age) and in favourable conditions. Under the dynamic retirement regime, they continue to receive their entire wage and benefits, which are updated periodically in revisions to collective labour contracts.

495. In addition to the serious financial structural problems these systems have generated, they also cause difficulties in terms of replacing retired professors, since their pensions are paid with the annual ordinary subsidy.

496. In order to solve these complex problems, SEP and ANUIES systematized the operation schemes of retirement and pension systems in each of the autonomous state public universities in 2001. Through comparable actuarial analysis, the amount of the aggregate (approximately Mx\$250 billion) and itemised liability was calculated.

497. Once the situation was clear, a series of strategies were designed to change the systems in most universities through formulas adapted to each situation. This has reduced aggregate contingent

¹¹⁰ In 2005, *El Colegio de México* found a solution to the ageing problem among its academic staff by introducing a new pension and retirement scheme funded by staff contributions and federal government support. Its financial viability is possible given the size of its staff.

liabilities by 59% and has generated better conditions for these institutions to guarantee their viability and effective contribution of their revenue, permanence and institutional development promotion schemes. In 2002-2006 SEP transferred Mx\$3,473 billion to reinforce the financing funds of the reformed retirement and pension systems and the operation of diverse academic staff retention schemes from 28 public autonomous state universities.

498. One of the objectives of federal education policies during the past 15 years, is for higher education institutions to enjoy the appropriate conditions to hire the staff with the appropriate profile to develop their tasks. During the seventies, the federal government established a scholarship programme for graduates from bachelor's degrees to follow advanced studies in domestic or foreign institutions. This scheme, managed by CONACyT, has granted scholarships for quality postgraduate studies (Chapter 5) in national interest areas, thus contributing to train high level human resources to reinforce the academic staff in public and private institutions and research centres.

499. Furthermore, in 1997-2005, SEP has granted 8,406 positions to state public universities with the purpose of hiring professors with master's degrees (preferably doctorates), contributing to expand and update the working conditions of their academic staff and students. The significant improvement in physical infrastructure and equipment of state public universities during the past decade and with extraordinary assistance from SEP, are currently an important attracting element for potential academic staff with desirable features. This has generated more frequent hiring of graduates from Mexico City federal public institutions as well as high level and experienced personnel, incorporated with the assistance of CONACyT's Talent Repatriation Programme (*Programa de Repatriación de Talentos*), taking advantage of the positions granted by SEP.

7.4.3 Incentives and promotions

500. A study of the regulations of the higher education system institutions reveals that there are different schemes and procedures for promoting and retaining their academic staff.

501. The Federal Government allocates resources additional to the ordinary subsidy at federal and state public universities with the purpose of contributing to promotions among their academic staff across categories and levels. Such promotions must be previously endorsed by the regulating entities of the institution, which are generally formed by academic peer commissions. As for state public universities, the resources allocated by the Federal Government are supplemented by contributions from the state governments in proportions equivalent to that of the ordinary subsidy.

502. Technological institutes and universities base their promotion policies on a scheme of position creation and cancellation. The General Directorate for Technological Higher Education (*Dirección General de Educación Superior Tecnológica*) and the General Co-ordination of Technological Universities (*Coordinación General de Universidades Tecnológicas*) of SEP must anticipate the resources required to manage the wage difference that derives from promotions. As for state technological universities and institutes, federal resources must be supplemented at a 50% share by state government contributions, based on the co-ordination agreement.

503. Compared to federal and state public university systems, the academic staff promotion mechanism in state technological institutes and universities limits the effectiveness of their full time academic staff permanence schemes. Likewise, the promotion schemes at federal technological institutes are also limited in terms of their effectiveness to retain high-level full time professors, thus encouraging talent drains from this subsystem towards others. In both cases, financial difficulties, have not made possible to attend this problem.

504. In order to reinforce the measures to retain academic staff in higher education institutions, since 1992, the Federal Government incorporated resources in addition to the ordinary subsidy, to be employed in the Programme for Encouraging Teaching Excellence in federal and state public universities as well as in federal technological institutes. The incentives full time professors and associate professors receive are economic benefits in addition to their salary and, therefore, are not a fixed, regular or permanent income. Due to these characteristics they are not subject to negotiation with unions.

505. Considering the general guidelines established by SEP in 2002, state public universities and federal technological institutes establish their regulations, procedures and assessment systems in the context of incentives, which must be approved by SEP in order to allocate the relevant resources.

506. Based on such guidelines, teaching performance is assessed based on a score from 1 to 1,000, distributed as follows:

- Quality: a maximum of 700 points.
- Commitment: a maximum of 300 points.
- Permanence: a maximum of 200 points.

507. Among the quality factors, institutions take into account activities and production expected from the members of their academic staff to earn the economic incentive, based on institutional policies and typology.

508. Based on the above factors, a reviewing commission issues an opinion giving the score to the full time professor applying for the incentive. The score determines his position in the pay scale, as specified in Table 7.2.

Table 7.2 Programme for Encouraging Teaching Excellence in state public universities and technological institutes

Score	Level	Minimum wages
301-400	I	1
401-500	II	2
501-600	III	3
601-700	IV	4
701-800	V	5
801-850	VI	7
851-900	VII	9
901-950	VIII	11
951-1000	IX	14

Source: SEP

509. Federal technological institutes and some autonomous state public universities have recently adapted their internal regulations with regard to incentive schemes; basing them on the items included in the desirable profile of a university professor and the roles they play, in order to encourage improved compliance of their institutional duties. Other autonomous state public universities are going through a similar process.

510. It is worth mentioning that state public universities may include their part time staff in their incentive programmes (half-time, three-quarter time and on hourly basis professors), when they have the necessary additional resources, obtained through budget reductions in the personal services item, contributions from the state government or own revenues.

511. The federal resources allocated to incentive programmes in state public universities, federal technological institutes and UAM for the 2001-2006 period amounted to Mx\$6.337 billion.

512. Incentive programmes play a strategic role¹¹¹ in the context of academic staff permanence policies. In addition to improving the income of professors standing out in terms of performance, they are an effective tool for steering professorial activities and production towards achieving objectives and goals in terms of institutional aims. Incentives have been, however, criticised by certain segments of the academic communities and unions, due to the considerable amounts these incentives imply with regard to wages and to their renewable feature based on a yearly performance assessment.

513. Given their hiring schemes, technological universities and state technological institutes do not include incentive programmes, thus weakening their permanence mechanisms. Professors at these institutions demand an incentive programme to improve their income.

514. Current concerns among academic staff focus on earning a salary that satisfies their household needs, on enjoying appropriate social security benefits and job stability, as well as on ensuring they have the adequate environment for the development of their full time in their institutions. Academic staff in federal public institutions also demands retirement programmes that satisfy their requirements.

515. Professorial mobility across higher education institutions is mainly done through short stays, periods or sabbatical leaves. Given the difficulties implied in reconciling the regulation at each institution and the agreements between institutions and labour unions in terms of free professor transit across them, there is currently no national-level scheme of professorial mobility.

516. In contrast, owing to the SEP-sectored features of federal technological institutes, they indeed have a mobility mechanism for their staff across an institute that works efficiently.

7.4.4 Academic staff reinforcement

517. In 1996, the Federal Government, through SEP, introduced a policy to encourage improvements in the academic staff profiles of public institutions and their academic bodies (basically, state public universities and federal technological institutes) that, given their typology, should have more full time professors with postgraduate degrees to guarantee the fulfilment of the institutional goals (Chapter 5).

518. This policy has been implemented through the PROMEP, which was designed¹¹² by SEP in collaboration with CONACyT and ANUIES.

519. PROMEP's objectives are the following:

- Enhance the habilitation level of full time active academic staff in public higher education institutions (individual alternative).
- Encourage developing and consolidating academic bodies registered at these institutions' DES (collective alternative) in order to support better student training in the public higher education subsystem.

¹¹¹ Incentive programmes are frequently criticised by groups of professors and researchers who consider that they have weakened the labour relationship between unions and institutions, that they have promoted the differentiation in professor earnings and that the rate at which product generation is expected from professors does not correspond to the pace inherent in each field.

¹¹² In the Reviews of Federal Policies for Education, OECD experts recommended introducing a professor-training programme.

520. PROMEP acknowledges that higher education quality depends of a variety of factors, but the most relevant among them is the academic staff. Therefore, its design is based on the soundest international regulations and main attributes that characterise higher education professors and their functions:

- Fully trained professors. Higher education professors must be trained and ready to perform the series of academic roles they should perform. This training implies furthering their knowledge to levels above those they teach. Ideally, the fullest training comes with a doctorate, which prepares completely for academic tasks.
- Professors with the appropriate experience. Every professor must be experienced in the tasks for which they are hired. Full time staff must be experienced in teaching and in generation and innovative application of knowledge. Subject professors, in turn, must have the relevant experience to guarantee that student from practice-oriented programmes are informed of the best methods and practices employed in their careers.
- An adequate distribution of full time and subject professors. Institutions must have the adequate ration of full time and subject professors to allow the accomplishment of academic tasks according to the nature of their programmes.
- Balanced distribution of professor time across academic tasks. Full time professors must balance their teaching tasks (in the broadest sense), with academic management and planning, and generation and implementation of knowledge. The latter allows the incorporation of updated knowledge and rigorous scientific practises in the education processes.
- Assigning the appropriate professors to each course. Full time professors with high-level training and ample academic experience should teach the basic courses of education programmes. Practical courses, in contrast, require appropriately experienced subject professors.
- Articulate academic bodies with outside links. Professors should create articulate academic bodies within the institutions, but with outside connections in order to develop modern academic values and habits, effectively plan institutional development, make original contributions to universal knowledge and ensure the adequate accomplishment of university tasks.

521. In order to detail the desirable training of higher education professors, given the different requirements of education programmes offered at public higher education institutions, the nature of education options has been classified into five categories:

- Practical programmes (P)—whose graduates will predominately focus on professional practice. Their curricula do not contain a large share of basic courses in Sciences or Humanities, or courses requiring long attention periods from students.
- Highly individual practical programmes (PI)—its graduates will also focus predominately on professional practice. Their curricula do not contain a large share of basic courses in Sciences or Humanities, but they possess large shares of courses requiring long attention periods from the student.
- Scientific-practical programmes (CP)—their curricula contain a large share of courses aimed at communicating practical experiences and a significant share of basic courses in Sciences or Humanities. Its graduates will focus mainly on professional practice.
- Basic programmes (B)—whose graduates tend to focus mostly on teaching tasks or, after doctorate studies, research and teaching tasks. Their curricula consist mostly of basic courses in Sciences or Humanities and in many instances, by courses requiring attention from small groups in laboratories and workshops.
- Intermediate programmes (I)—their graduates will aim for professional practice, on one hand, and academic activities, on the other.

522. Graduate programmes or bachelor's degree programmes type CP, PI or P are this same kind, respectively, or will tend to be type I or B, according to their particular features. Graduate programmes related to bachelor's degree programmes type B or I are identical in type.

- Usually, the programmes in which the first higher degree is obtained in three years or less are those of type P, PI or CP. The minimum training acceptable for professors participating in these programmes is a bachelor's degree or one year postgraduate technological programme (*especialidad*), although in type CP it is required to have a master's degree. The advisable training in every programme is an *especialidad* or a master's degree. The share of professors that should have the preferred degree will depend upon the type of programme (P, PI, or CP).
- As for bachelor's degrees, the minimum acceptable training will be a master's degree and the preferred training is a doctorate, requiring a large share of the latter in type B and relatively few in type P programmes.
- The minimum training for specialty programme (type P, PI or CP) professors is a master's degree.
- Likewise for master's degrees type P, PI or CP where the minimum training for professors is preferably a doctorate. In type B programmes, the minimum training is a doctorate.
- Accordingly, in doctorate programmes every professor should have one.

523. Based on these criteria and on international references, SEP established quantitative indices (in the context of PROMEP) to define the desirable situation for professors participating in higher education programmes, which appear in tables 7.3 and 7.4. These indicators have guided the academic staff reinforcement process in recent years.

Table 7.3 Student attention and professor composition by type of programme for the first stage of higher education—bachelor's degree or shorter (desirable indicative values)

Indicator		Programme type				
A/PTC	Desirable	P	PI	CP	B	I
	Minimum	80	33	25	15	20
F _{TC}		0.13	0.36	0.57	0.92	0.76

A: students, PTC: full time professor, F_{TC}: Fraction of total hours worked by PTC.

Table 7.4 Full time professor academic formation by type of programme for the first stage of higher education—bachelor's degree or shorter (indicative values)

Programme	Minimum degree	Preferred degree	Fraction of PTC with preferred degree				
			P	PI	CP	B	I
Bachelor's degree	Master's degree	Doctorate	3%	5%	15%	70%	30%
3 years or less	Bachelor's degree or one year postgraduate technological programme (<i>especialidad</i>)	Master's degree	3%	5%	15%	na*	na*

*na: not applicable.

524. In order to encourage PROMEP operation in public universities, SEP established since 1997 (through SESIC, currently the Under-secretariat for Higher Education) collaboration agreements with these institutions, defining the following after a planning process for academic

staff and academic bodies development and considering the education options offered by each DES in a ten-year horizon and on a yearly basis for 1996-2000:

- Requirements for full time professors with the appropriate levels: desirable academic degree, field and specialty.
- Academic formation requirements for active full time professors in order to attain the appropriate profiles according to the type of training required based on the typology of the programmes in which they participated.
- Creation and transformation of the necessary academic positions to improve student/professor relationships according to the nature of their DES education options.
- Infrastructure requirements to support teachers attaining the desirable profile of a university professor.

525. In the design of PROMEP it was estimated that it would take 10 or 12 years to change the profile of full time professors in state public universities and similar institutions, to finally conform academic bodies comparable to those in the best higher education systems in the world. The goals were the following: between 2006 and 2008, the share of full time professors in those institutions would double, and those with doctorates would account for 22%; the remaining full time professors would have a master's degree or an *especialidad*.

526. In order to achieve these goals it was considered essential that institutions systematically comply with hiring staff for the new positions SEP granted, in the context of their academic bodies development programmes. The vacancies should have to be occupied by personnel that complied with the training standards specified in the programme. On SEP's side, granting supports to enhance training levels among active professors by their following quality postgraduate studies and for academic bodies development.

527. In 2001, SEP assessed the operation of PROMEP, in the context of PRONAE development, and their impact on the process of enhancing the training profile of public university academic staff and their conformation into academic bodies. This allowed to identify operative aspects that should be reinforced through incorporating new strategies and support lines¹¹³ contributing to achieve their objectives and goals and influence more effectively the development and consolidation processes of these institutions' academic bodies.

528. From 2005, with the changes in SEP's organic structure, the same policies for PROMEP support were incorporated to accelerate the reinforcement process of the technological institutes' academic bodies.

529. The number of full time professors at state public universities acknowledged by SEP for having the desirable academic profile has increased systematically since 2002. It may be expected that this indicator will continue increasing in the short and medium term as a result of the policies, strategies and means established by universities in their PIFI, and of the support offered by SEP to materialise these programmes, as well as to increase the number of professors with the desirable academic profile.

530. In the first call for applications in 2005, 290 professors achieved their acknowledgement as professors with the desirable profile in federal technological institutes, whereas, in 2006, 79 additional teachers did so.

¹¹³ Since 2001, SEP grants additional resources to state public universities and UAM for newly incorporated professors with graduate degrees and former PROMEP scholarship professors to have the basic material to develop their tasks, enjoy a permanence scholarship that allows them to compete in the institution's incentive programme and to carry out projects for generation and innovative application of knowledge.

531. PROMEP's impact in terms of academic strengthening in public institutions is described in detail in a recent SEP's publication¹¹⁴ and in Chapter 9. Nine years after its creation, the academic staffs of the state public universities have certainly improved. Not only there is the reinforcement brought by the increase in the number of full time professors that are now part of the staff but also, their training profile has improved significantly. These actions have notably reinforced institutional academic capacity in terms of offering good quality programmes and services, as well as in the field of generation and innovative application of knowledge.

532. PROMEP goals for 2006-2008 in terms of doubling the share of full time professors in the academic staff of state public universities and for 22% of them to have doctorate degrees were attained in 2005. The objective of having the remaining full time professors obtain master's or *especialidad* degrees seems difficult, however, given the eligibility conditions of active professors. It is possible that, in 2006-2008 the share of professors with bachelor's degrees in state public universities will have reduced, at least, to 20%, considering the number of professors currently following postgraduate studies and hiring full time professors with postgraduate degrees using the 903 positions granted by SEP in early 2006.

533. The challenge now lies in accelerating the academic reinforcement process at technological institutes and public institutions training professionals in basic education. For this purpose, PROMEP scope is being expanded and strengthened in these institutions, in the context of the new SEP's structure.

534. PROMEP goals are being accomplished, both in the individual and collective aspects. Their impact is clear and significant, and will be made evident more forcefully in the medium term if policies maintain their effectiveness and direction. It will also be necessary for this purpose that the institutions continue improving their regulations in terms of admission, promotion and permanence of their academic staff as well as reinforcing their policies and strategies in order to continue increasing their academic capacity and competitiveness in the context of participatory strategic planning, as it has been the case during the past five years.

¹¹⁴ Urbano, Guillermina, Guillermo Aguilar and Julio Rubio, *Un primer balance de la operación e impactos del PROMEP en el fortalecimiento académico de las universidades públicas*, SEP, 2006. Available in plaintext www.ses.sep.gob.mx

Chapter 8: System planning, governance and regulation

8.1 The National System for Permanent Higher Education Planning. 8.2 The Planning Law. 8.3 COEPES' reactivation. 8.4 Recent planning work. 8.5 The National Council of Education Authorities. 8.6 System regulation and institutional governance.

8.1 The National System for Permanent Higher Education Planning

535. In 1978, in the context of the 18th Ordinary Meeting of ANUIES' General Assembly, the National Education Plan was approved in which the guidelines for the creation of the National System for Permanent Higher Education Planning (*Sistema Nacional para la Planeación Permanente de la Educación Superior*, SINAPPES) were included. These guidelines intended to promote agreements in terms of commitments and tasks across the federation, the states and the institutions for planning the development of this education level in Mexico. The SINAPPES was integrated by the National Co-ordination for Higher Education Planning (*Coordinación Nacional para la Planeación de la Educación Superior*, CONPES), COEPES of all the 31 states, eight Regional Councils and by the institutional planning units in each of the public higher education institutions.

536. In order to give formal bases to the planning responsibilities, the executive branch formulated a bill, which was analysed by the legislative branch and that, by late 1978, originated the Higher Education Co-ordination Law (*Ley para la Coordinación de la Educación Superior*). This law established the bases to develop and co-ordinate education to address national, regional, and state needs as well as their financing by the federal, state and municipal governments. A relevant impact of planning in higher education was that this law considered the allocation of federal resources to public higher education institutions based on institutional planning, academic improvement programmes, managerial enhancement and a series of priorities defined in their own planning process.

537. The introduction of SINAPPES, endorsed by the higher education co-ordination law, saw its peak translated into actions for training planners, spreading planning methods and techniques, creating information systems and multiplying planning instances within institutions.

538. Moreover, the CONPES consisted of federal government and ANUIES' representatives. Its role centred on generating agreements regarding the proposal, spreading and assessing of general policies for higher education; on permanently assessing the development of higher education plans and programmes, advocating institutional, state and regional programmes and promoting programme consistency with the national context.

539. In the 1978-1996 period, CONPES functioned irregularly. Nevertheless, it was still a space for the federal government and ANUIES—in its capacity as the highest instance in terms of representation capacity across system institutions at the time—to reach highly relevant agreements for education policies. Among other things, the National Higher Education Programme for 1983 (*Programa Nacional de Educación Superior, 1983*) was approved at the CONPES as well as the 1986 PROIDES, the mechanism for improving quality in higher education in 1991-1994 by means of 11 priority action lines,¹¹⁵ the creation of the National Commission for Higher Education Assessment (*Comisión Nacional para la Evaluación de la Educación Superior*, CONAEVA) in 1989, the CIEES in 1991, CENEVAL in 1994, the ANUIES' Academic Personnel Upgrading Programmes (*Programas de Superación del Personal Académico*, SUPERA) in 1994 and SEP's PROMEP in 1996.

¹¹⁵ The eleven priority actions were the following: curricula updating and quality improvements in professional training; professor training; researcher training; adaptation and review of educational options; definition of an institutional identity in terms of research and graduate studies; updating academic infrastructure; reordering of management and regulations; development of institutional information systems; diversifying financing sources and encouraging the participation of the social and productive sectors in higher education areas

540. The Regional Councils for Higher Education Planning (*Consejos Regionales para la Planeación de la Educación Superior*, CORPES) were assigned the task of promoting agreements and co-operation programmes across governments and institutions from a same region. Given its role, each CORPES consisted of the state governors, the heads of the state education secretariats or their equivalent authority, and the rectors or directors of the region's higher education institutions. These councils were established in 1979, and did not meet again, given the difficulties for gathering their members and for building and processing a regional agenda that convened and reconciled the interests of the respective region's state government and institutions.

541. COEPES' general goal was to attain the co-ordinated development of higher education in the states, consistent with the National Plan for Higher Education and the science and technology policies issued by CONACyT, as well as state development policies, striving for the higher education system to contribute to the state's economic, social, cultural, scientific and technological development, while promoting academic improvement, efficient resource use and relating education programmes with national and state problems.

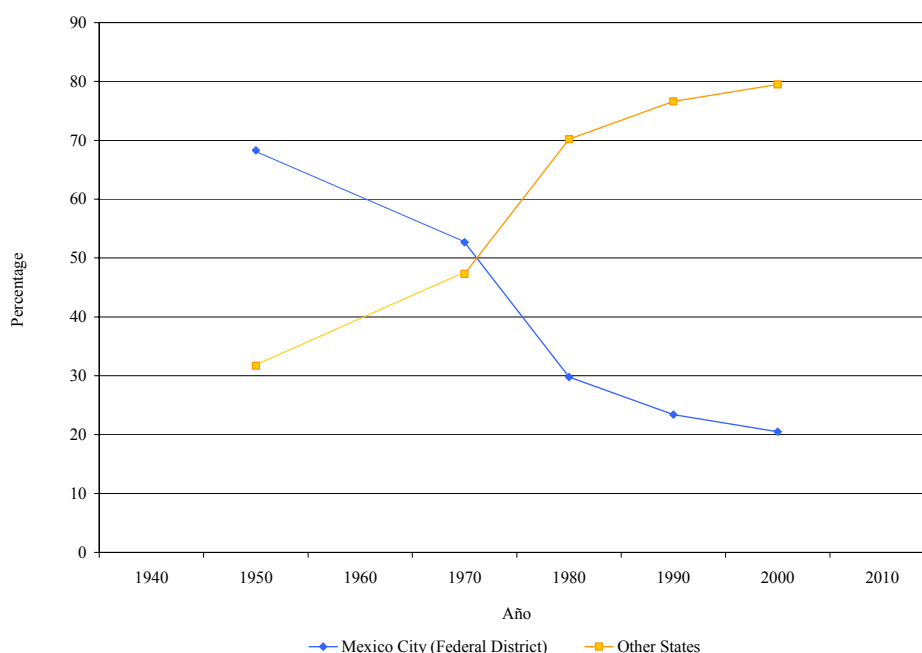
542. COEPES were constituted with representatives from the federal and state governments and the heads of the higher education institutions in the states. They were established throughout 1979 and, since that date and until 1996, worked differently across states. Their results were generally limited, which caused higher education planning in the states to be insufficient and, most of all and with few exceptions, responding to personal or institutional initiatives and not to systematic state processes.

543. During the eighties and nineties, progress in developing a planning agenda for higher education in Mexico flowed against the growing complexity of the system itself, which consisted of autonomous institutions, facilities dependent of the federal and state governments, private institutions and a wide spectrum of student profiles and stakes within the establishments themselves (students, executives and unions), thrown together in the centre of an array of ideologies and political affiliations.

544. The planning efforts in the context of a decentralising federalist federal policy attained, among other things, a growing share of the total population enrolled in higher education to be serviced.¹¹⁶ In 1970, only 47.3% of the total population enrolled in higher education attended institutions located in the 31 Mexican states. In 1980, this figure had increased to 70.2%, reaching 76.6% in 1990 and 79.5% in 2000 (Chart 8.1).

¹¹⁶ Source: SEP format 911 and Anuarios Estadísticos, ANUIES.

Chart 8.1: Deconcentration of national higher education enrolment figures



Source: SEP

8.2 The Planning Law

545. With the passing of the Planning Law (*Ley de Planeación*) in 1983, planning activities were reinforced and institutionalized as a basic tool in decision-making and design of the institutional future in several sectors of public life. Planning thus gained relevance in government duties, considered in Article 26 of the Mexican Constitution, in terms of a democratic and participatory planning system that identifies national objectives, features, instances, sector, tools and schedules.

546. This law obligates the President to formulate a PND for his/her administration, detailing the national objectives, strategies and priorities in terms of the country's comprehensive and sustainable development, as well as of the resources allocated to such ends. This law empowers different entities from the federal government to formulate sectoral programmes, such as PRONAE, for the same period as the national plan.

547. The Planning Law sets the bases for the executive branch to co-ordinate its planning activities with the states and foster and assure the democratic participation of different social groups in the preparation of the PND as well as the sectoral programmes. Additionally, it establishes the framework for actions from private individuals to contribute to the accomplishment of the goals and priorities in the national plan and its programmes.

8.3 COEPES' reactivation

548. In order to reactivate the COEPES and promote their regular functioning, SEP (through the Under-secretariat for Higher Education and Scientific Research, currently the Under-secretariat for Higher Education) produced the document *Procedures for Conciliating the Supply and Demand of Higher Education in Federal Entities (Proposal to Reinforce the COEPES' Mission)* [*Procedimientos para la Conciliación de la Oferta y Demanda de Educación Superior en las*

Entidades de la Federación (Propuesta de Refuerzo de la Misión de las COEPES)], where consolidating and reactivating the COEPES is considered essential to achieve co-ordinated, relevant and rational higher education development in the states.

549. This document proposes a general structure for COEPES, as well as their roles, work procedures and the necessary criteria to expand supply and create new institutions, namely: educational flow analysis based on official statistics, proposals regarding the required diversity of the methods through which higher education is provided, expected unit costs per facility and student, feasibility surveys (macro and micro-regional levels, labour market, socio-economic and education expectations, supply and demand, teaching body formation), space and infrastructure needs and formalizing agreements across the entities involved, among other aspects.

550. The document was distributed across state education authorities and higher education institution heads, both at the university and technological institute levels across the country. This measure paved the way for the joint effort of the under-secretariats related to higher education at SEP (SESIC, the under-secretariats for Education and Technologic Research and for Planning and Co-ordination) to contribute in organizing state and institutional efforts in favour of developing higher education systems in the states.

551. Such co-ordination effort led, since 1998, to call the states to submit their higher education development projects for addressing the yearly future demand of this type of education, which would have to be prepared by the COEPES within a minimum horizon of five years.

552. As opposed to prior practices, a fundamental feature of this process consisted in requiring public higher education institutions, including the autonomous ones, to obtain a technical endorsement from COEPES through the state government (and the latter's formal commitment to contribute 50% of the operative expenses of the new supply), whenever they requested financial support from the federal government to increase their enrolment, open new programmes and build new campuses. The planning process has respected and promoted institutional diversity, a better adjustment to Mexico's complex reality.

553. This, and other similar measures, promoted COEPES' reactivation, which led these entities to co-ordinate the preparation of five-year and annual higher education development plans in each state, following the guidelines in the 1997 document. It was also possible to advance in establishing legal frameworks to root them.¹¹⁷

554. Based on state plans, in 1998-2000, the federal government advocated the creation of 60 higher education public institutions, 147 new study programmes in state public universities and 134 in technological universities, as well as the expansion in enrolments in 917 existing programmes in state public universities and 85 in technological universities. In order to accomplish this, Mx\$732 million were invested. Beyond the financial aspects, this effort represented the first systematic and co-ordinated process between SEP and the state governments to implement guidelines generated in previous years and contribute to organize growth within the education system, while pursuing a collaboration in accomplishing COEPES' objectives, specially with regard to relating educational programmes to the social and economic development needs of states and regions.

¹¹⁷ In some states, COEPES' operation is currently based on their Education or Higher Education Codes and on other executive branch decrees or on agreements established between the executive branch and higher education institutions.

8.4 Recent planning work

555. The current federal administration continues working with state governments in the process of reinforcing COEPES' capabilities and agendas by means of a set of strategies that have promoted: the incorporation of a representative of the entity in charge of promoting the state's economic development into its structure; the design of a state plan¹¹⁸ for higher education and science and technology development, that has allowed rooting the initiatives to expand and diversify education options in the state and strengthen the institutions' academic capacities for GAK and their relationship with the problems in their environment; their active participation in the operation of PRONABES, contributing to define areas and programmes of interest and acknowledged good quality to train the number of professionals required by the state's social and economic development and, based on that, set priorities to grant economic support; and, assisting the state governments in granting RVOEs to programmes from private institutions.

556. In the context of the participatory planning processes promoted by SEP since early 2001, public higher education institutions have set goals in their comprehensive institutional strengthening programmes addressing features such as high institutional performance standards, the profile of their academic staff, development and consolidation of their academic bodies, and their LGAKs, updating and flexibilising their curricula and programmes, student tutoring programmes, accreditation of university level technician programmes, as well as associate professional and bachelor's degrees, developing comprehensive information systems, updating the regulatory framework and certifying their managerial processes.

557. Similar to PIFIs, PIFOPs' main purpose is to encourage improvements in graduate programme quality in order to achieve their PNP register and thus their quality acknowledgement.

558. The policies to encourage federalization promoted by the federal government during the past decade have led the states to play a more active role in designing the nation's education policy by fostering their own initiatives and giving each education task the particular features of Mexico's different regions. Decisions are thus adopted as the outcome of a debate and analysis process shared by federal and state authorities. This has caused the CONPES to lack a space and a work agenda consistent with the development planning needs of an increasingly complex and decentralized system consisting of a wide array of institutions not represented at ANUIES. This is why it has not been called to sessions since late 2000.

559. Redistributing responsibilities and attributions in benefit of local governments has resulted in more relevance for education in the development context of Mexico's regions, both for individuals and society. In contrast, SEP has concentrated on the essential tasks assigned by the law which, among others, focus on the responsibility of guaranteeing education's national character, encouraging a continuous improvement and quality assurance of education services and proposing improved admission, permanence and success conditions among students.

560. Based on COEPES' work, on the policy guidelines described in Chapter 4 and the federal government's Programme of Expansion of Educational Supply, in co-ordination with the state governments, SEP has developed a powerful programme since early 2001, focused on creating public higher education institutions and expanding education options in existing institutions to increase access capacity to the higher education system (Chapter 4).

561. In 2001-2005, SEP has also granted economic support for state planning scheme reinforcements in Quintana Roo, Aguascalientes, Sinaloa and Hidalgo, as well as to create state

¹¹⁸ Currently, 27 states have these plans.

higher education systems. The establishment of these systems in Guanajuato, Chiapas, Tamaulipas and Hidalgo has been a significant step towards building common higher education spaces in the selected states, with active participation from institutions (such as technological universities, federal and state technological institutes, polytechnic universities and the state public university, if applicable), effective development planning of higher education and the options offered in the state, the comparability of education options¹¹⁹ to support and foster student mobility, credit transference, collaboration network creation and academic exchanges across institutions and their academic bodies, among other aspects. Currently, these systems are being structured in the states of Sinaloa, Durango, Campeche, Nayarit and Puebla.

562. Agreements must be reached by consensus, acknowledging state sovereignty, university autonomy, education federalization measures and current guidelines established in the Higher Education Co-ordination Law (*Ley para la Coordinación de la Educación Superior*). The agreements are formalized by contracts that clearly state each party's commitments.

563. Albeit COEPES' reactivation and the recent planning work carried out in that framework, it should be acknowledged that, in order to guarantee effective higher education planning processes in the near future, there should be a solid regulatory scheme detailing the powers granted to these commissions fostering their regular performance in terms of periodical changes in the authorities of the state and federal governments and of the support they may lend to developing their tasks.

564. Despite that PRONAE establishes the need to strengthen co-ordination and linking across higher and upper secondary education, the progress has been scarce keeping a relevant window of opportunity open. A worthy example in this sense is the Master's Degree in Science Teaching from CIIDET, a programme that, in March 2004, counted over 2,500 enrolled teachers, of whom nearly 300 (11.3%) taught upper secondary school. Currently, CIIDET offers a Diploma course in Basic Teaching Competencies for Upper Secondary Education Teachers. Both programmes reinforce teaching abilities related to basic science teaching, which increases the expectations for success among the students migrating from one level to the next.

8.5 The National Council of Education Authorities

565. The CONAEDU was created in 2004, based upon articles 14 and 17 of the General Education Law and the co-ordination agreement between SEP and the education authorities in the states.

566. Creating this council has contributed to reinforce the planning, co-ordination and decision-making schemes applied by the federal and the state governments with the purpose of developing the National Education System and, particularly, the higher education system, striving, from that very level, to improve upper secondary education. Currently, the Council has met eleven times, carrying out periodical assessments of the performance of PRONABES, their operating rules are periodically enriched, analyzing the progress in the planning and quality improvement processes in progress in public institutions, generating initiatives to strengthen the system's planning and assessment schemes and the assessment and co-ordination mechanisms for granting the RVOE, among other aspects.

567. The CONAEDU has created a work agenda with subjects dealt with previously by the CONPES, which is proof of the progress in terms of educational federalism and acknowledging the reality in which the higher education system currently develops in Mexico. Reinforcing the planning schemes of this system requires expanding the Council's consultation mechanisms and

¹¹⁹ In order to achieve this goal, the Tuning methodology is being employed.

university and institution associations' participation, as well as from business entities and from other instances in the federal and state governments to contribute to the definition of policies and decision-making.

8.6 System regulation and institutional governance

568. The basic regulatory framework of higher education is briefly described in Chapter 2, and in more detail in Annex I.

569. Given the wide array of typologies across the institutions and their legal frameworks, there is a large variety of organizational and government structures within higher education institutions.

570. Federal and state public universities under autonomy regimes are self-governing in terms of their Organic Laws, which are issued by the federal legislative branch for federal public universities and by the state Congresses when it regards state public universities.

571. Autonomy is based on Article 3, fraction VII of the Constitution, states that: The universities and other higher education institutions which have been granted autonomy by the law will be empowered to and responsible for governing themselves; they will accomplish their tasks consisting of educating, researching and disseminating culture according to the principles stated in this article, respecting academic and research freedom as well as freedom of analysis and debate of ideas; they will determine their programmes and curricula; establish their terms of admission, promotion and permanence of the academic staff; and will manage their patrimony. Labour relationships concerning both academic and administrative staff will be ruled by item A of this Constitution's Article 123, under the terms and conditions established in the Federal Labour Law according to the features of a special task to make them agree with the autonomy, academic and research freedom and the ends of the institutions this fraction makes reference to, (...).

572. Currently, most autonomous public universities have acknowledged that this regime constitutes a sizeable social commitment, which is why they are assuming a larger responsibility in terms of transparency and accountability to society and its representatives. In this sense, the transparency and accountability features of these institutions are not in conflict with their autonomy, since they are not mutually exclusive principles. On the contrary, they have allowed universities to publish their use of resources and demonstrate their employment in terms of their autonomy's own rationality and the achievement of their objectives and goals, which is allowing higher levels of recognition from society.

573. It is important to mention in this regard that, in 2002, the Official Gazette published the Transparency and Public Governmental Information Access Law (*Ley de Transparencia y Acceso a la Información Pública Gubernamental*), whose purpose is to guarantee every individual their access to information possessed by the powers of the Union, the autonomous constitutional entities or those with legal autonomy, as well as by any other federal agency. In its Article 3, fractions IX and XIV, this law states that autonomous higher education institutions are subject to facilitating the information required from them.

574. Federal policies have fostered institutional autonomy strengthening. In this sense, over 60% of the total enrolment in higher education is served by this type of institutions. On the other hand, with the creation of new, non-autonomous, higher education institutions, the Mexican State strives to guarantee the system's growth in knowledge areas that are strategic for regional, and thus, national development.

575. Autonomous public university's government structures are formed by a group of collegiate entities (university council, governing board, patronage board, technical, department or division

councils, among others) working in co-ordination in a regime of specific powers. These are planning and decision-making instances in the context of university functioning.

576. For example, the University Board¹²⁰ is in charge of setting institutional regulations and policies, approving the institution's Development Plan, the programmes and curricula, the annual expenditure and revenue budgets, the creation of new academic units, areas or departments and the reading and approval of the rector's annual report, among other powers. The rector is the head of the Board and, generally, the university's secretary general is the Board's secretary.

577. In some universities the Board is empowered to designate the rector after a consultation within the university's community, whereas, in others, it is empowered to appoint the members of the Governing or Directive Board.

578. The Governing Board is a collegiate entity generally formed by nine or more internal and external members, with the power to appoint and remove the rector (and, if applicable, other university officials), review the rector's work programme and her/his annual report, and issue recommendations for the adequate performance of the institution. In some universities, it is a vehicle to solve controversies between the rector and the University Board or other collegiate entity.

579. In addition, the Patronage Board is empowered to manage the university's patrimony, raise additional funds and, in some cases, establishing the fees that should be paid by the students for enrolment and tuition. These boards are generally constituted by six or more internal or external members.

580. Academic entities (divisions, departments, schools, faculties, centres, institutes, etc.) also have collegiate units formed by their respective authorities and representatives of the students and the academic staff. It is in those groups where the entity's planning takes place, based on institutional policies. Among other things, they are empowered to establish specific guidelines to develop and program academic and managerial activities, approve projects for curricula and programmes, the entity's expenditure budget proposal and the report presented by the head of the entity.

581. The government structure of decentralized institutions from state governments such as technological, polytechnic and inter-cultural universities, as well as state technological institutes consists basically of a Board of Directors, formed by state government representatives and federal government members (through SEP), in addition to members from the region's and municipality's productive and social sectors. They are empowered to establish institutional regulations and policies approve the Development Plan, and programmes and curricula, the annual revenue and expenditure budget, the annual rector's report and the organizational structure of the institution, among other aspects. Certain boards are empowered to form candidate triads for the rector's position and submit them to the state's governor for her/his decision. At some institutions, the governing structure is complemented by other collegiate consultative entities.

582. Based on Article 18 of SEP's Internal Rules, the General Directorate for University Higher Education must: propose the pedagogical rules and programmes and curricula for higher education; establish co-ordination mechanisms with institutions teaching university higher education in order to agree on planning and evaluation policies and actions; promote universities to formulate comprehensive institutional strengthening programmes through participatory strategic planning exercises, encourage policies for academic staff updating, training and improvement, participate in the review and decision making related to projects for higher education institution creation; manage federal contributions to higher education institutions functioning as decentralized agencies and other

¹²⁰ Or Academic College, University Assembly or General Board, among other denominations. They generally consist of institution officials and representatives from the academic staff and the students. In some cases, administrative representatives participate too.

institutions in its sphere of influence, with the participation of the Secretariat's relevant administrative units; and review and issue resolutions on the applications for official programme acknowledgement in higher education, authenticate the certificates, degrees or diplomas issued by higher education institutions; and grant revalidations or programme equivalents for higher education according to the applicable regulations and guidelines, organisational Chart 8.1.

583. In the context of a decree mandating the creation of technological universities, rectors¹²¹ shall design the comprehensive development and annual operative programme, apply the subsystem's working policies, propose the appointment of institution officials to the Board of Directors, as well as the university regulations and the regional contents of the training programmes, present an annual report of the state of the university, prepare and apply the operative budget, strengthen the relationship with different social sectors, prepare a strategic institutional agenda and comply with federal and state regulations in terms of accountability, among other things.

584. Moreover, based on article 20 of the Secretariat's Internal Regulations, the General Co-ordination of Technological Universities is responsible for proposing the subsystem's development policies, promoting participatory planning processes, as well as self-evaluation and external evaluation procedures for the programmes and the institutional management that foster assuring and improving their service quality; encourage the creation of academic bodies and the relevant application of knowledge. All of the above should be carried out in co-ordination with the state education authorities, organisational Chart 8.1.

585. With participation of rectors in the Board and from the results of the commissions in which they participate, the policies of operation of the subsystem are defined taking into account the opinion and suggestions of the academic commissions and of entailment, pertinence, planning and evaluation. Of this form the consensuses necessary are reached to define the strategic agenda that allows the development and whose objective is to obtain the consolidation of each one of the institutions in the subsystem.

586. In turn, the National Association of Technological Universities (*Asociación Nacional de Universidades Tecnológicas*, ANUT), created in 2005 through an agreement among rectors, has the goal of contributing to strengthen educational programmes, to homologate managerial processes, to improve accountability and the quality of services and technological programmes offered by its members. In addition, it has the purpose of being a vehicle for dialogue with the federal and state executive branches, the federal and state education authorities, the legislative branch and selected instances in the productive and social sectors.

587. Concerning polytechnic and inter-cultural universities, the rectors from these institutions have a series of powers similar to those enjoyed by technological universities.

588. The performance of federal technological institutes responds to the regulations established by the federal government and SEP's internal regulations. The Secretariat is responsible for their co-ordination and approving their revenue and expense budgets as well as their teaching, research and extension programmes.

589. Their government system brings together two essential elements: on one hand, the centralized features of the system guarantee the establishment and application of national interest policies, lines of action and objectives; on the other, the regional diversity in Mexico poses the need

¹²¹ The rector must satisfy a pre-established profile in terms of the operative standards of technological universities. Usually, the rector is appointed by the governor of the state in which the university is located, whereas, in other universities, the rector is appointed or ratified by the Board of Directors.

to make institutional decisions, which, in fact, is part of the organizational philosophy of this subsystem.

590. Among the main powers the SEP's Internal Rules grant to the General Directorate for Technological Higher Education (organizational chart 8.1), are the following: to structure pedagogical standards, contents, curricula and programmes, teaching methods and materials for learning assessment; provide technical and pedagogical assistance to state technological institutes; co-ordinate with the state governments to assure the relevance, evaluation, quality, the best coverage and effectiveness of the education services provided by technological institutes in Mexico's 31 states; encourage participatory planning processes across the system; promote and stimulate academic body consolidation and LGAKs; foster connections with the productive sector; and establish liaison strategies with national and foreign higher education institutions.

591. In terms of policies, programme and goal definitions, the National Council of Directors of Technological Institutes plays an important role since, in its capacity as the highest consultative entity of the general directorate, it is responsible for analyzing the diverse problems faced in the subsystem in order to design, in a parliamentary and democratic fashion and, in certain cases, through specialized commissions, recommendations in terms of federal policies towards the development of technological higher education, as well as with regard to the updating of the educational model, the curricula and programmes and the strategic lines of action, like the Institutional Programme for Innovation and Development, 2005-2006 (*Programa de Innovación y Desarrollo, 2005-2006*).

592. The Secretary of Education appoints the federal technological institute directors. As for the state technological institutes, the appointment is co-ordinated by the federal and state governments, and the social sectors, represented in the Institutional Board. This practice guarantees both the attention to national interests, from the point of view of the strategic relevance of this subsystem in terms of the socio-economic development of Mexico's 31 states, as well as to the compliance with federal policies in terms of the decentralisation of educational federalism and the acknowledgement of the regions where these institutions are located.

593. Federal technological institute directors enjoy a wide managerial freedom, both in terms of the regional environment and of the institution itself. They are supported by the different boards, committees and academies that contribute in bringing together all the necessary elements for adequate decision making or innovative application of knowledge, dissemination of culture and liaison.

594. Based on Article 21 of SEP's Internal Regulations, the General Directorate for the Higher Education of Professionals of Education is responsible for the following: propose and foster development policies across higher education institutions and programmes oriented at training education professionals; in co-ordination with the Under-secretariat for Basic Education, propose the pedagogic rules and the curricula and programmes for higher education courses offered in teacher institutions; encourage that teacher institutions reach higher development levels through participatory strategic planning processes and comprehensive programmes for institutional strengthening; participate in the analysis of projects to create higher education institutions; propose and evaluate the Secretariat's policies in terms of the authorization or official acknowledgement of programmes taught at private teacher institutions, as well as those related to programme revalidation and equivalence, in co-ordination with the General Directorate for Accreditation, Incorporation and Revalidation; regulate the integration of a national system of education professional training.

595. The government structures of private institutions are diverse, and generally respond to their size and the guidelines established by their patrons.

596. Just as there are different forms of organizing the governance of higher education institutions in Mexico, there is a wide array of forms in which the institutions are organized to carry out their work. Most federal and state public universities are divided into schools, faculties, institutes and centres. The schools and faculties usually perform teaching tasks, while the centres and institutes carry out activities related to the GAK. Other public universities operate based on department or matrix-based structures, which allows for increased efficiency in teaching and better connection of teachers with innovative application and generation of knowledge.

597. Public, non-autonomous universities generally base their operation on matrix-based organizational structures. Both the federal and the state technological institutes base their operation on a department and process related structure.

598. Acknowledging previous studies and admittance to higher education based on ability assessment are windows of opportunity for the National Education System. Nevertheless, Agreement N.286, published in the Official Gazette on October 30, 2000, establishes the general criteria to which the revalidation of studies carried out abroad should adjust and their programme equivalence, as well as the procedures by which the relevant knowledge should be accredited in terms of the levels or grade covered through self-learning, working experience or based on the certification regime related to on the job training. In turn, Article 44 of the General Education Law establishes that, regarding adult education, the knowledge acquired through partial or global examinations according to the procedures referred to in articles 45 and 64 of such law may be credited.

599. On the other hand, Article 45 of the General Education Law establishes that SEP, along with the competent federal authorities will set up a certification regime applicable across Mexico, and related to the labour training in terms of which it may be possible to gradually credit knowledge, abilities or skills. In addition, it contemplates that the authorities will determine the general guidelines applicable across the country in order to define the knowledge, abilities or skills susceptible of being certified, in addition of the procedures issued by the local authorities in terms of specific requirements. Article 64 of this law indicates that, through its head, is able to establish procedures to issue certificates, diplomas or degrees to those demonstrating their knowledge to a certain level or grade, acquired in a non school environment or by means of labour experience.

600. The ability (not to be confused with academic grades) evaluation, certification and accreditation model developed in Scotland (the Scottish Qualifications Authority, SQA)¹²², is a scheme that has proven its relevance in terms of reinforcing lifelong learning linked to individual development and incorporation to economic life. Mexican institutions are going through a process of knowledge and adoption of ability evaluation schemes for the population. Certain institutions have established assessment centres, mainly related with high-level standards -level 5 in the National Council for Normalization and Certification classification (*Consejo Nacional de Normalización y Certificación*, CONOCER)- such as general consulting, design and teaching of training courses and preparing documents with computer software.

601. Establishing and consolidating links across domestic higher education institutions, in terms of tools such as credit transferring, and student and teacher mobility among other mechanisms, represents a window of opportunity for the higher education system in Mexico. Currently, this system does not have a national-level scheme to transfer credits across its own institutions. Nevertheless, the progress accomplished in recent years has been important, such as the fact of reaching specific agreements across institutions in terms of student mobility and credit transfers across technological universities and institutes that, to date, account for the incorporation of 6,013 graduates from technological universities to continue their education at the bachelor's degree level

¹²² see www.sqa.org.uk

in technological institutes, based on an agreed scheme involving programme equivalences and 2,166 graduates from other institutions.

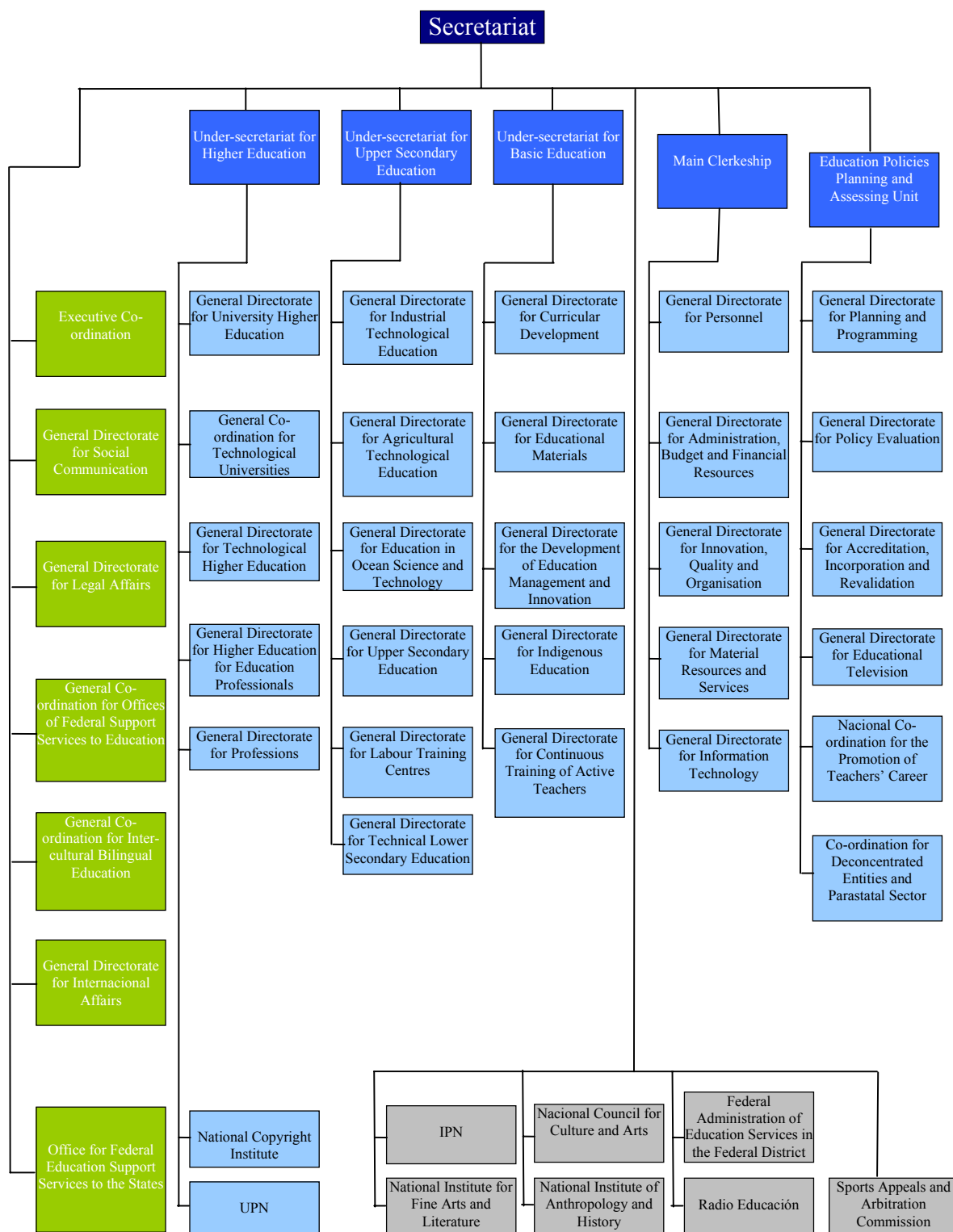
602. In terms of the institutions that have academic reciprocity agreements, the Santander-Universia Mobility Scholarship Programme (*Programa de Becas de Movilidad Santander-Universia*) is encouraging and supporting student mobility for up to six-month periods. This programme¹²³ consists of granting a monthly sum (Mx\$5,000) as economic support during the period of student mobility across institutions having collaboration agreements with Santander.

603. It is worth mentioning that the regulatory complexity across institutions, the diversity of their legal regimes, their labour contracts and the rigidity of their curricula tend to limit the possibilities of establishing a nationwide scheme for credit transfers and student and professor mobility. Through its website, www.sep.gob.mx, SEP links national institutions that have uploaded information on the web, assisting candidates in the detection of available opportunities in higher education and, if applicable, transfer opportunities across domestic and foreign programmes and institutions.

604. Regarding the connections across higher education institutions and other forms of education (adult, continuous, short term on the job training, remedial training and based on the employer, among others), it is worth mentioning that practically every higher education institution carries out activities related to these training processes. One of the most frequent activities relates to staff training and development through continuous education. Thus, for example, during the 2004-2005 academic year, industrial federal technological institutes taught nearly 1,000 courses, with over 35,000 attendants, equivalent to 62,000 hours of training taught by 1,740 instructors. The main areas were entrepreneurial, directive and human development; languages; computing and communication; engineering, production and quality; education and ethics; and ecology and environmental development.

¹²³ The programme description may be found at www.universia.net.mx

Chart 8.1. Organisational Structure of the Secretariat of Education



Chapter 9: Assuring and improving the quality of higher education

9.1 The assessment and accreditation system of higher education. 9.2 Assessment activities 9.3 Assuring and improving the quality of higher education.

9.1 The assessment and accreditation system of higher education

605. The first actions in terms of higher education assessment in Mexico date from the 1970's as a result of government programmes and several ANUIES' initiatives.¹²⁴

606. The Federal Government's Educational Modernization Programme (*Programa para la Modernización Educativa* 1989-1994) institutionalized the assessment actions. This programme established as one of its priority lines of action the permanent internal and external evaluation of institutions in order to encourage an improvement in programme and service quality, and the goal of creating an agency to design and articulate a national evaluation process for higher education.

607. In 1989, the CONPES created CONAEVA, which designed a national strategy to conceive and operate a National Evaluation System. Such strategy was based on three general, parallel and simultaneous lines of action: the institutional evaluation that institutions would carry out (self-assessment), the evaluation of the systems and subsystems in charge of experts and instances and the institutional evaluation of study programmes and functions through a qualified academic community peer assessment scheme.

608. In 1990 and 1991, as part of the first general line of action of CONAEVA, public institutions carried out their self-assessment process. They presented their reports before the Commission and their improvement programmes were submitted to SEP. The best supported projects, as well as those with the highest possibility of generating effective structural change were financed by the Secretariat with *ad-hoc* resources.

609. From 1992, this self-assessment has rooted in most public institutions as part of their planning processes, of their Institutional Development Plan design and of the external evaluation.

610. In order to carry out the system's global assessment, a group of experts was brought together, accomplishing reviews of the university and technological subsystem that served as basis for the definition and reinforcement of public policies whose objective was to contribute to the system's development and its quality improvement.

611. In the context of the third general line of action of CONAEVA, CONPES created the CIEES in 1991 as a non-governmental agency. The main role of these committees consisted in accomplishing diagnostic evaluations of study programmes and institutional roles, and the accreditation of programmes and academic units. In the past fifteen years, the CIEES have concentrated their activity in diagnostic evaluation, and have not exercised their power to accredit study programmes, which is currently done by means of another scheme. In the context of diagnostic evaluation, since 1992, self-assessment encouraged by CONAEVA became an intrinsic part of the work scheme in these committees.

612. Currently, nine committees form the CIEES.¹²⁵ Since 1991, they have displayed intense activity in terms of educational programme assessment and institutional roles through methodologies and evaluation frameworks that encompass a broad variety of categories and elements, taking into account, for their definition, international standards and criteria.

¹²⁴ During the XII Ordinary Meeting of ANUIES, in 1971, a proposal to create a National Examination Centre was introduced.

¹²⁵ Exact and Natural Sciences, Engineering and Technology, Agricultural and Livestock Sciences, Health Sciences, Architecture, Design and Urbanism, Education and Humanities, Social and Administrative Sciences, Cultural Diffusion and Institutional Management and Administration.

613. With the purpose of supplementing inter-institutional evaluation and contribute to build the National Evaluation System, CONPES created CENEVAL in 1994. This is a non-governmental entity, whose objective consists in contributing to improve the quality of upper secondary and higher education, assessing the learning levels achieved at any stage of education through the application of standardized tests.

614. The governing board of CENEVAL is integrated by two SEP's representatives and one of each of the following organisms: Engineering Academy (*Academia de Ingeniería*), Mexican Academy of Sciences (*Academia Mexicana de Ciencias*), Nacional Academy of Medicine (*Academia Nacional de Medicina*), ANUIES, FIMPES, Mexican Bar-Academy of Lawyers (*Barra Mexicana-Colegio de Abogados*), National Actuaries College (*Colegio Nacional de Actuarios*), Psychologists' National College (*Colegio Nacional de Psicólogos*), Federation of Veterinarians and Zootechnicians Colleges and Associations of México (*Federación de Colegios y Asociaciones de Médicos Veterinarios y Zoocentistas de México*), Associated Civil Engineers (*Grupo ICA*), Mexican Public Accountants Institute (*Instituto Mexicano de Contadores Públicos*), IPN, ITESM, *Universidad Tecnológica de México* and of the *universidades autónomas de Puebla, México, San Luis Potosí y Yucatán*.

615. CENEVAL has designed and applied nationwide exams, among other things, for admission to upper secondary education (EXANI I) and to higher education for: 5B2 and 5A4 levels (EXANI II), and 5A and 6 levels (EXANI III), for the assessment of the level of learning achieved by students having covered part of the bachelor's degree curriculum (EXIL), as well as to evaluate the level of academic knowledge and skills of graduates by the application of EGETSU or the General Bachelor's Degree Graduation Examination (*Examen General de Egreso de la Licenciatura*, EGEL).

616. In late 2000, the creation of COPAES paved the way for constructing a system accrediting the study programmes offered by institutions. COPAES is an instance entitled by SEP to grant formal acknowledgement to organizations whose objective is to accredit 5B2 and 5A4 level study programmes offered by both public and private institutions, for renewable five-year periods; previous evaluation of their structural, technical, and operational capabilities, as well as procedures' management, impartiality and assessment framework. Such assessment is based upon the Guidelines and General Framework for Accrediting Processes of Academic Programmes in Higher Education (*Lineamientos y Marco General para los Procesos de Acreditación de Programas Académicos del Nivel Superior*) established by COPAES. This general framework establishes, particularly, the areas that every organism must consider in the accrediting processes: academic staff, curriculum, methods and instruments to assess students' learning; institutional services for students' learning; infrastructure and supportive equipment for study programmes development; research lines and activities, if needed, for the programme's teaching; institutional linkage; institutional regulation for the operation of the programmes; academic and administrative leadership; planning and evaluation processes; administration and financing as well as evaluation criteria, indicators and benchmarks associated to each area.

617. The general goal of COPAES consists on regulating the accrediting process and giving certainty to the technical and operative skills of the accrediting bodies in charge of accrediting study programmes. Its particular objectives are the following: encourage constant improvements in the quality benchmarks of higher education programmes by means of developing effective and reliable accrediting processes; contribute with education authorities in their purpose of increasing and assuring the quality of higher education; foster the expansion of educational knowledge by publicizing programme accreditations; guide society in terms of programme quality; monitor the accrediting bodies acknowledged by COPAES and intervene as good faith mediator in disputes between the bodies and the institutions.

618. The governance assembly of COPAES consists of representatives of SEP, ANUIES, FIMPES, and of the National Academies of Medicine and Engineering, as well as of the Mexican Academy of Sciences, of the Colleges of Veterinarian and Zootechnician and Engineers, of the Mexican Bar and of the Mexican Public Accountants Institute.

619. It is important to point out that COPAES' recognition of a specialized accrediting organism makes sure that the latter's framework for study programme accreditation is consistent with the one established by the council itself which, in turn, is closely related to the evaluation schemes of CIEES. This is allowing the construction of a coherent system of evaluation and accreditation, proof of which is that once any of CIEES disciplinary committee classifies a 5B2 or 5A4 study programme in level 1 of its registry, it achieves the accreditation in the short term, should the corresponding accrediting bodies be available.

620. In order to assess and acknowledge the quality of postgraduate programmes offered by public and private institutions, CONACyT established the Excellence Postgraduate Programme Registry (*Padrón de Programas de Posgrado de Excelencia*) in 1990. This Registry essentially incorporated science and technology programmes and, within these, only those at the master's degree or doctorate level training scientists and technologists. *Especialidad* programmes and those aimed at professional practice were not considered in it, however.

621. To expand the registry's coverage and incorporate more rigorous assessment criteria, SEP and CONACyT established the PNP in 2001, with the purpose of acknowledging the quality of different *especialidad*, master's degree and doctorate programmes, postgraduate profiles and knowledge areas. The registry's structure has implied identifying the attributes distinguishing quality programmes internationally, and is currently an accountability tool for higher education institutions, in terms of the public recognition for the quality of the programmes that are part of it (Chapter 5).

622. The process of modernizing higher education during the 90's implied establishing criteria and procedures to assess the performance of professors associated to incentive programmes, which contributed to introduce qualitative and income differentiation measures for professors in public institutions (Chapter 7). In addition, it intended to create more competitive teaching environments. Faculty evaluation by institutional opinion commissions and incentive schemes maintain their prevalence and have become effective means to encourage institutional policies aimed at improving and assuring the quality of their roles.

623. The SNI, created in 1984 with the purpose of encouraging the permanence of the highest level professor-researchers in public institutions, currently constitutes the most popular means to assess the quality of academic production by professor-researchers, employing peer commissions. The system, currently managed by CONACyT, has also contributed to the process of differentiating faculty earnings.

624. Since 2001, the current federal administration has implemented the following lines of action, understanding that assessment processes are an essential means to encourage quality assurance and improvement and in order to foster equity by allowing the detection of differences in programme quality, as well as the learning levels achieved by the students:

- Encourage higher education institutions to reinforce their planning and self-assessment processes and schemes.
- Foster diagnostic evaluation of study programmes and institutional management and administration and cultural diffusion roles by the CIEES.

- Promote external evaluations of incoming and outgoing students with the purpose of accomplishing a diagnosis of the system, institutions and programmes applying CENEVAL's standardized nationwide tests.
- Encourage study programmes to achieve level 1 of the CIEES registry and/or their accreditation by COPAES-acknowledged entities.
- Allocate *ad-hoc* resources to public institutions in order to improve the quality of their study programmes in the context of their PIFI, thus achieving their accreditation or, alternatively, to assure their quality.
- Promote the creation of specialized non-government entities formally acknowledged by COPAES to accredit study programmes.
- Foster the consolidation of CIEES, CENEVAL, PNP, COPAES and the FIMPES accrediting system.
- Endorse international acknowledgement of the programme accrediting scheme, in the context of the international agreements in which Mexico participates.
- Improve the requirements and procedures for granting the RVOE to study programmes taught by private institutions and strengthening co-ordination with state governments in this process.

9.2 Assessment activities

625. From 1991 and until mid 2006, the CIEES have assessed 2,910 study programmes (1,288 in 1991-2000 and 1,622 in 2001-mid 2006), issuing 4,115 opinions and 62,325 recommendations to improve or assure programme quality and institutional roles. It should be mentioned that, until 2003, committee activity concentrated in diagnostic evaluations of study programmes, and management and cultural diffusion in public universities. Since 2004, the committees are carrying out assessment activities in technological universities and, since 2005, in federal technological institutes and selected private institutions.

626. Since 2001, at SEP's request, the CIEES prepared a programme registry in which each assessed programme was classified in one of three levels: 473 in level 1 (ready to be accredited), 578 in level 2 (with potential to achieve accreditation in the medium term) and 237 in level 3 (with possibilities of accreditation in the long term). The structure of this registry has changed in 2001-2006 as a result of the quality improvement processes SEP has encouraged since 2001 across public institutions by means of the formulation, updating and development of their PIFI. The number of study programmes classified into levels 1 and 2 has increased systematically during the aforementioned period, to reach 1,465 and 977, respectively by mid 2006 (Table 9.1).

Table 9.1 Evolution of the CIEES-assessed programme registry

Consolidation level	2001	2002	2003	2004	2005	2006*
1	473	587	800	989	1213	1,465
2	578	798	1,052	1,126	1,092	977
3	237	481	522	520	504	468
Total	1,288	1,866	2,374	2,635	2,809	2,910

*Data as of July 2006.

Source: CIEES.

627. It is important to observe the evolution of those study programmes suitable to achieve accreditation in the medium and long terms (CIEES levels 2 and 3, respectively). Its number increased in the 2001-2004 period due to the external assessment processes that allowed the recognition of their status. Since 2004, the number of these programmes is decreasing because of its transit to higher levels as a result of the attention that institutions have given to CIEES

recommendations, in the planning processes that have motivated the formulation, updating and development of their PIFI.

628. In 1994, CENEVAL's EXANI II was applied to 65,345 students and in 2005 to 443,580, accounting for 77% of the total number of students entering higher education at the university level technician, associate professional and bachelor's degree level that year (Table 9.2). The number of institutions in every Mexican state applying EXANI II increased from 41 in 1994 to 146 in 1999 and to 486 in 2005.

Table 9.2 Number of students taking the EXANI II test

1994	65,345
1995	93,596
1996	114,987
1997	126,124
1998	161,456
1999	236,595
2000	250,108
2001	279,850
2002	287,269
2003	335,733
2004	396,058
2005	443,580
Total	2,790,701

Source: CENEVAL.

629. It is worth mentioning that other institutions apply tests other than EXANI II for their candidate selection to university level technician, associate professional or bachelor's degree courses; such as the EXHCOBA, designed by the *Universidad Autónoma de Baja California*, the College Board Exam, and the COSNET, or those designed by the institutions themselves.

630. On the other hand, the total number of individuals taking the EGEL changed from only 234 in one programme (Accounting) in 1994, to 18,065 in 19 programmes in 1999 and 62,212 in 24 programmes in 2005, accounting for 20.5% of the total number of graduates from bachelor's degree that year (Table 9.3). The institutions applying the EGEL went from 118 in 1999 to 468 in 2005. As for technological universities, graduates from 57 of these institutions are taking the EGETSU compared with six of them in 2000. In addition, the number of individuals taking the test increased from 553 in 10 programmes in 2000,¹²⁶ to 21,274 in 30 programmes in 2005 (Table 9.4). The number of examinees in 2005 amounts to nearly the universe of graduates from that subsystem in the same year. The percentage of students having received satisfactory and outstanding academic acknowledgments from CENEVAL in their EGETSU results has grown significantly, from 47% in 2000 to 68.5% in 2005.

¹²⁶ In 2000 the first examinations for admittance to the university level technician programme were carried out in ten of the total number of study programmes offered by the technological university subsystem.

Table 9.3 Number of students taking the EGEL test

1994	234
1995	3,353
1996	8,294
1997	9,325
1998	11,014
1999	18,065
2000	24,122
2001	28,666
2002	37,698
2003	48,601
2004	53,905
2005	62,212*
Total	305,489

*Including 1,293 examinees taking the technical nursing test.
Source: CENEVAL.

Table 9.4 Number of students taking the EGETSU test

2000	553
2001	2,005
2002	4,522
2003	9,574
2004	12,630
2005	21,274
Total	50,558

Source: CENEVAL.

631. Since 2001, the federal government has carried out an intense promotion effort in the sense that the assessment opinions issued by the CIEES and their recommendations, as well as the test outcomes from the standardized CENEVAL examinations, be considered by public institutions as a strategic input in the planning process initiated in 2001 that has generated the design, development and updating of their comprehensive strengthening programmes.

632. In the 90's, for institutions to participate in the external assessment processes it became necessary to establish confidentiality agreements between them and CIEES and CENEVAL with regard to the assessment outcomes, thus weakening the transparency and accountability schemes in the institutions and preventing their being known by educational service users and other stakeholders.

633. In 2004, at SEP's request, an agreement was reached in the General Assembly of ANUIES to publicize the study programmes classified in level 1 of CIEES registry of each of their member institutions. No consensus has been reached yet, however, with regard to levels 2 and 3 or for the results obtained in the standardized CENEVAL examinations.

634. Since 2002 COPAES has acknowledged 23 organisms (Table 9.5), which as of mid 2006 had accredited 881 study programmes. Of these, 620 corresponded to public and 261 to private institutions (Chart 9.1). Accreditations are valid for a five year period and can be renewed for a similar period. The organisms keep COPAES regularly informed on the development of the assessment activities and their outcomes; the Council, in turn, regularly supervises their performance and, if applicable, issues recommendations. To date, COPAES has not been required by any higher education institution to mediate in solving disputes with the accrediting body.

635. In order to inform interested parties and society in general, COPAES publishes the study programmes that have achieved accreditation and the institutions where they are taught in its webpage (www.copaes.org.mx) and nationwide printed media.

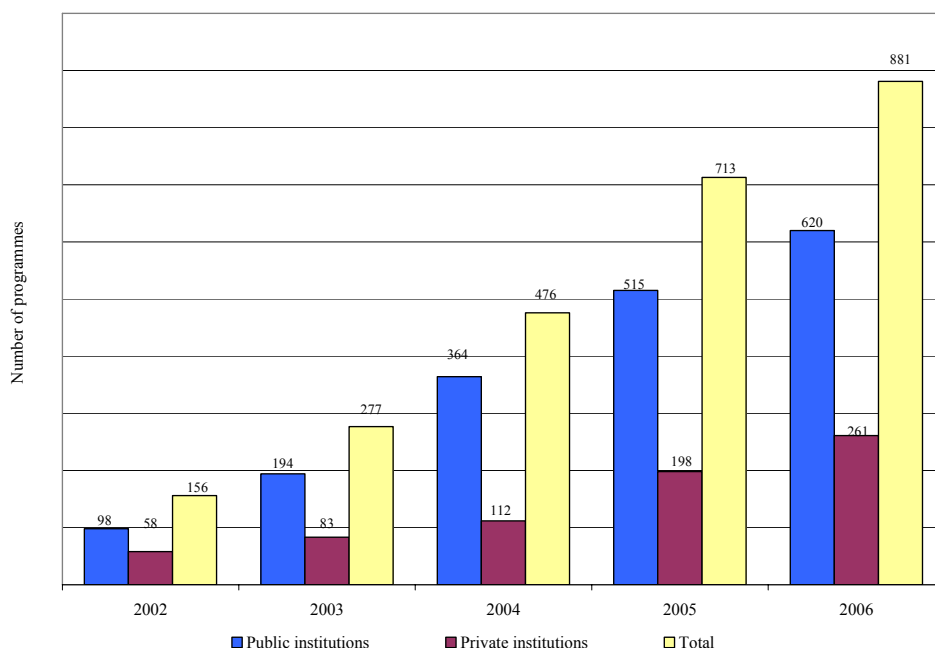
636. Recent increase in the number of accrediting bodies that currently cover, altogether, almost the totality of knowledge areas of study programmes supplied by institutions, has strengthened the quality assurance schemes of higher education. With this, it is also expected that the number of accredited study programs increases significantly in the short and medium terms, in part, because some of those registered in level 1 of CIEES have not achieved their accreditation due to the inexistence of an accrediting body in their knowledge area.

Table 9.5 Accrediting bodies by COPAES, year of acknowledgement

Year	Accrediting bodies	Acronym
2002	<i>Consejo de Acreditación de la Enseñanza de la Ingeniería, A.C.</i>	CACEI
	<i>Consejo Nacional de Educación de la Medicina Veterinaria y Zootecnia, A.C</i>	CONEVET
	<i>Consejo Mexicano para la Acreditación de la Educación Médica, A.C.</i>	COMAEM
	<i>Asociación Nacional de Profesionales del Mar, A.C.</i>	ANPROMAR
	<i>Comité Mexicano de Acreditación de la Educación Agronómica, A.C</i>	COMEAA
	<i>Consejo Mexicano de Acreditación de la Enseñanza de la Arquitectura, A.C.</i>	COMAEA
2003	<i>Consejo Nacional para la Enseñanza e Investigación en Psicología, A.C.</i>	CNEIP
	<i>Consejo de Acreditación de la Enseñanza en la Contaduría y Administración, A.C .</i>	CACECA
	<i>Consejo Nacional de Educación Odontológica, A.C.</i>	CONAEDO
	<i>Consejo Nacional de Acreditación en Informática y Computación</i>	CONAIC
	<i>Asociación para la Acreditación y Certificación de Ciencias Sociales, A. C.</i>	ACCECISO
2004	<i>Consejo Mexicano de Acreditación y Certificación de la Enfermería, A. C.</i>	COMACE
	<i>Consejo Mexicano para la Acreditación de Programas de Diseño, A.C.</i>	COMAPROD
	<i>Consejo Nacional de Enseñanza y del Ejercicio Profesional de las Ciencias Químicas, A.C.</i>	CONAECQ
2005	<i>Consejo Nacional para la Calidad de la Educación Turística, A.C.</i>	CONAET
	<i>Consejo Nacional para la Acreditación de la Ciencia Económica A.C.</i>	CONACE
2006	<i>Consejo Nacional para la Calidad de Programas Educativos en Nutriología, A. C.</i>	CONCAPREN
	<i>Consejo Mexicano para la Acreditación de la Educación Farmacéutica, A. C.</i>	COMAEF
	<i>Consejo Nacional para la Acreditación de la Educación Superior en Derecho, A.C.</i>	CONFEDE
	<i>Consejo Nacional para la Acreditación de la Enseñanza en Derecho A.C.</i>	CONAED
	<i>Comité para la Acreditación de la Licenciatura en Biología, A.C.</i>	CACEB
	<i>Consejo Mexicano para la Acreditación de la Enseñanza de la Cultura de la Actividad Física, A. C.</i>	COMACAF
	<i>Consejo para la Acreditación de la Comunicación, A. C.</i>	CONAC

Source: COPAES, 2006.

Chart 9.1 Accredited study programmes in public and private institutions, 2002-2006



Source: COPAES. As of mid 2006.

637. Currently, external assessment and accreditation for education programmes is carried out in every Mexican state, involving both public and private institutions (Chart 9.2).

638. In fact, at least 80% of 5A4 level students in the *universidades autónomas de Aguascalientes, Baja California, Ciudad Juárez, Coahuila, Hidalgo, Nuevo León, Puebla, México, San Luis Potosí, Tabasco and Yucatán*, as well as the *universidades de Colima, Guadalajara, Occidente, Quintana Roo and Sonora*, are enrolled in assessable programmes acknowledged for their quality by assessment and accrediting bodies.

639. The *institutos tecnológicos de Cajeme, Poza Rica, Puebla, Ecatepec, Celaya, El Llano-Aguascalientes, Boca del Río* and the *IPN*, as well as the *universidades tecnológicas de León, Torreón, Querétaro, la Selva, Huasteca Hidalguense, Valle del Mezquital, Tabasco, Norte de Guanajuato, Aguascalientes, Norte de Aguascalientes, Ciudad Juárez, Puebla, Emiliano Zapata del Estado de Morelos, Zacatecas, San Juan del Río, San Luis Potosí, Tijuana, Nayarit, Regional del Sur de Yucatán, Metropolitana de Yucatán, Coahuila, Sierra Hidalguense, Tula-Tepeji, Cancún, Hermosillo, Jalisco and Tlaxcala*, also have an equivalent percentage of their 5A4 and 5B2 level enrolments, respectively, in good quality assessable programmes acknowledged by the same evaluation committees and accrediting bodies.

Chart 9.2 Assessment and accreditation in Mexico, 2006



640. Bachelor's degree enrolment in public universities in study programmes subject to evaluation acknowledged for their quality, currently accounts for 65% of total enrolment. In the case of technological universities the percentage of students enrolled in 5B2 study programmes in CIEES' level 1 registry or accredited by organisms acknowledged by COPAES amounts 76%, which has allowed significant progress in achieving equity in education in the past five years. These percentages are expected to increase rapidly in the short term as a reflection of the measures intended to strengthen public universities.

641. Moreover, technological institutes have had a remarkable performance in their practice of continuous improvement and quality assurance, and are currently working to strengthen their bachelor's degree study programmes in the context of their Strategic Agenda 2005-2006, in order to increase the number of study programmes accredited from 47 in 2005 to 169 in 2006 (which account for 58% of their enrolment), in contrast with only eleven accredited study programmes in 2001. Currently, 62 study programmes have achieved accreditation.

Table 9.6 Number of 5A4 and 5B2 level study programmes in level 1 of the CIEES registry and/or accrediting bodies acknowledged by COPAES in state and federal public universities and institutions

State public universities	Level 1	Accredited
<i>Benemérita Universidad Autónoma de Puebla</i>	35	18
<i>Instituto Tecnológico de Sonora</i>	6	8
<i>Universidad Autónoma de Aguascalientes</i>	34	23
<i>Universidad Autónoma de Baja California</i>	33	48
<i>Universidad Autónoma de Baja California Sur</i>	1	1
<i>Universidad Autónoma de Campeche</i>	7	2
<i>Universidad Autónoma de Chiapas</i>	7	1
<i>Universidad Autónoma de Chihuahua</i>	17	21
<i>Universidad Autónoma de Ciudad Juárez</i>	25	20
<i>Universidad Autónoma de Coahuila</i>	34	27
<i>Universidad Autónoma de Guerrero</i>	9	0
<i>Universidad Autónoma de Nayarit</i>	3	0
<i>Universidad Autónoma de Nuevo León</i>	53	28
<i>Universidad Autónoma de Querétaro</i>	17	2
<i>Universidad Autónoma de San Luis Potosí</i>	41	29
<i>Universidad Autónoma de Sinaloa</i>	15	1
<i>Universidad Autónoma de Tamaulipas</i>	40	12
<i>Universidad Autónoma de Tlaxcala</i>	3	7
<i>Universidad Autónoma de Yucatán</i>	23	13
<i>Universidad Autónoma de Zacatecas</i>	9	7
<i>Universidad Autónoma del Estado de Hidalgo</i>	21	12
<i>Universidad Autónoma del Estado de México</i>	75	18
<i>Universidad Autónoma del Estado de Morelos</i>	11	1
<i>Universidad de Ciencias y Artes de Chiapas</i>	3	1
<i>Universidad de Colima</i>	40	17
<i>Universidad de Guadalajara</i>	62	44
<i>Universidad de Guanajuato</i>	18	12
<i>Universidad de Occidente</i>	24	13
<i>Universidad de Quintana Roo</i>	14	3
<i>Universidad de Sonora</i>	35	9
<i>Universidad del Mar</i>	0	1
<i>Universidad Juárez Autónoma de Tabasco</i>	22	2
<i>Universidad Juárez del Estado de Durango</i>	14	4
<i>Universidad Michoacana de San Nicolás de Hidalgo</i>	4	0
<i>Universidad Tecnológica de La Mixteca</i>	0	3
<i>Universidad Veracruzana</i>	53	19
Federal public institutions		
<i>Instituto Politécnico Nacional</i>	6	35
<i>Universidad Autónoma Metropolitana</i>	16	23
<i>Universidad Nacional Autónoma de México</i>	10	34
Other public institutions		
<i>Universidad Autónoma Agraria Antonio Narro</i>	12	5
<i>Universidad Autónoma Chapingo</i>	0	4
<i>Universidad del Ejército y Fuerza Aérea</i>	1	2

Source: SEP, CIEES and COPAES, Mid 2006.

Table 9.7 Number of 5A4 level study programmes taught in technological institutes in level 1 of the CIEES registry and/or accrediting bodies acknowledged by COPAES

Technological institutes	Level 1	Accredited
<i>Instituto Tecnológico de Aguascalientes</i>	0	5
<i>Instituto Tecnológico de Atlixco</i>	0	1
<i>Instituto Tecnológico de Boca del Río</i>	1	0
<i>Instituto Tecnológico de Cd. Victoria</i>	0	1
<i>Instituto Tecnológico de Celaya</i>	1	4
<i>Instituto Tecnológico de Chetumal</i>	3	0
<i>Instituto Tecnológico de Chiná</i>	0	1
<i>Instituto Tecnológico de Ciudad Valles</i>	1	0
<i>Instituto Tecnológico de Conkal</i>	0	1
<i>Instituto Tecnológico de Durango</i>	0	3
<i>Instituto Tecnológico de La Laguna</i>	0	2
<i>Instituto Tecnológico de Matamoros</i>	0	1
<i>Instituto Tecnológico de Mérida</i>	1	0
<i>Instituto Tecnológico de Mexicali</i>	0	1
<i>Instituto Tecnológico de Minatitlán</i>	0	1
<i>Instituto Tecnológico de Morelia</i>	7	1
<i>Instituto Tecnológico de Nogales</i>	2	0
<i>Instituto Tecnológico de Oaxaca</i>	0	1
<i>Instituto Tecnológico de Orizaba</i>	0	3
<i>Instituto Tecnológico de Pachuca</i>	2	0
<i>Instituto Tecnológico de Puebla</i>	2	4
<i>Instituto Tecnológico de Querétaro</i>	0	1
<i>Instituto Tecnológico de Saltillo</i>	0	1
<i>Instituto Tecnológico de San Luis Potosí</i>	0	2
<i>Instituto Tecnológico de Tijuana</i>	0	2
<i>Instituto Tecnológico de Tlalnepantla</i>	0	1
<i>Instituto Tecnológico de Toluca</i>	0	2
<i>Instituto Tecnológico de Veracruz</i>	0	3
<i>Instituto Tecnológico de Zacatepec</i>	1	0
<i>Instituto Tecnológico del Valle de Oaxaca</i>	0	1
<i>Instituto Tecnológico El Llano Aguascalientes</i>	0	1
<i>Instituto Tecnológico Superior de Cajeme</i>	0	3
<i>Instituto Tecnológico Superior de Comalcalco</i>	0	1
<i>Instituto Tecnológico Superior de Irapuato</i>	0	2
<i>Instituto Tecnológico Superior de Poza Rica</i>	0	2
<i>Tecnológico de Estudios Superiores de Ecatepec</i>	0	8

Source: SEP, CIEES and COPAES, Mid 2006.

Table 9.8 Number of 5B2 level study programmes taught in technological universities in level 1 of the CIEES registry and/or accrediting bodies acknowledged by COPAES

Technological universities	Level 1	Accredited
<i>Universidad Tecnológica "Emiliano Zapata" del Edo. de Morelos</i>	4	0
<i>Universidad Tecnológica de Aguascalientes</i>	7	0
<i>Universidad Tecnológica de Campeche</i>	1	0
<i>Universidad Tecnológica de Cancún</i>	4	0
<i>Universidad Tecnológica de Ciudad Juárez</i>	4	0
<i>Universidad Tecnológica de Coahuila</i>	8	0
<i>Universidad Tecnológica de Hermosillo</i>	7	0
<i>Universidad Tecnológica de Jalisco</i>	4	0
<i>Universidad Tecnológica de la Huasteca Hidalguense</i>	4	0
<i>Universidad Tecnológica de la Selva, Chiapas</i>	4	0
<i>Universidad Tecnológica de la Sierra Hidalguense</i>	6	4
<i>Universidad Tecnológica de León</i>	8	7
<i>Universidad Tecnológica de Nayarit</i>	3	0
<i>Universidad Tecnológica de Nezhualcóyotl</i>	2	2
<i>Universidad Tecnológica de Nogales</i>	5	0
<i>Universidad Tecnológica de Puebla</i>	8	0
<i>Universidad Tecnológica de Querétaro</i>	7	0
<i>Universidad Tecnológica de San Juan del Río</i>	6	1
<i>Universidad Tecnológica de San Luis Potosí</i>	5	5
<i>Universidad Tecnológica de Tabasco</i>	7	0
<i>Universidad Tecnológica de Tijuana</i>	4	0
<i>Universidad Tecnológica de Tlaxcala</i>	5	5
<i>Universidad Tecnológica de Torreón</i>	5	5
<i>Universidad Tecnológica de Tula Tepeji</i>	6	0
<i>Universidad Tecnológica de Tulancingo</i>	1	0
<i>Universidad Tecnológica de Valle del Mezquital</i>	5	0
<i>Universidad Tecnológica del Estado de Zacatecas</i>	5	0
<i>Universidad Tecnológica del Norte de Aguascalientes</i>	5	0
<i>Universidad Tecnológica del Norte de Guanajuato</i>	6	0
<i>Universidad Tecnológica del Sur de Sonora</i>	1	0
<i>Universidad Tecnológica del Sur del Edo. de México</i>	2	0
<i>Universidad Tecnológica del Suroeste de Guanajuato</i>	1	0
<i>Universidad Tecnológica Fidel Velázquez</i>	1	0
<i>Universidad Tecnológica Metropolitana de Yucatán</i>	5	0
<i>Universidad Tecnológica Regional del Sur de Yucatán</i>	4	0

Source: SEP, CIEES and COPAES, Mid 2006.

Table 9.9 Number of 5A4 level accredited study programmes of private institutions by COPAES acknowledged accrediting bodies

Private institutions	Accredited
<i>Centro Cultural Universitario Justo Sierra, A.C.</i>	1
<i>Centro de Enseñanza Técnica y Superior</i>	8
<i>Centro de Estudios Cristóbal Colón, A.C.</i>	4
<i>Centro de Estudios Universitarios Xochicalco</i>	1
<i>Escuela Libre de Psicología, A.C. UACH</i>	1
<i>Fundación Universidad de las Américas-Puebla</i>	10
<i>Instituto de Ciencias y Estudios Superiores de Tamaulipas, A.C.</i>	1
<i>Instituto de Estudios Superiores de Tamaulipas</i>	1
<i>Instituto Tecnológico Autónomo de México</i>	1
<i>Instituto Tecnológico y de Estudios Superiores de Monterrey</i>	118
<i>Universidad Anáhuac del Sur, A. C.</i>	6
<i>Universidad Autónoma de Guadalajara</i>	1
<i>Universidad Autónoma de la Laguna</i>	1
<i>Universidad Bonaterra</i>	3
<i>Universidad de Morelos</i>	2
<i>Universidad de Monterrey</i>	2
<i>Universidad de Turismo y Ciencias Administrativas</i>	1
<i>Universidad del Claustro de Sor Juana, A. C.</i>	1
<i>Universidad del Mayab, S.C.</i>	9
<i>Universidad del Noreste</i>	3
<i>Universidad del Noroeste, A. C.</i>	1
<i>Universidad del Valle de Atemajac</i>	5
<i>Universidad del Valle de México</i>	22
<i>Universidad del Valle de Orizaba</i>	2
<i>Universidad Iberoamericana</i>	21
<i>Universidad Intercontinental</i>	3
<i>Universidad La Salle, A. C.</i>	11
<i>Universidad Panamericana</i>	4
<i>Universidad Popular Autónoma del Estado de Puebla</i>	11
<i>Universidad Regiomontana, A. C.</i>	2
<i>Universidad Valle del Bravo</i>	1
<i>Universidad Valle del Grijalva</i>	1
<i>Universidad Villa Rica</i>	1
<i>Universidad WestHill</i>	1

Source: SEP and COPAES, Mid 2006.

642. In addition, 32 private institutions¹²⁷ have achieved a “plain” accreditation through FIMPES’ Institutional Accreditation System (*Sistema de Acreditación Institucional*), allowing them the choice to participate in the administrative simplification programme and SEP’s Registry of Private Institutions of Academic Excellence (“*Instituciones particulares de excelencia académica*”)

643. Some private institutions are accredited by foreign agencies, such as the Southern Association of Colleges and Schools (SACS), from the US. This is the case of the *Universidad de las Américas* in Puebla, the *Universidad de las Américas* in Mexico City, ITESM and the *Universidad de Monterrey*.

644. Since its creation and given its strategic features, the technological university subsystem has been subject to a wide array of external supplemental evaluations in addition to SEP’s¹²⁸ assessment in the context of improving the equity and relevance of higher education in Mexico. In order to verify its general compliance of its institutional mission, one of these assessments has been carried out by a group of foreign experts¹²⁹ every three years, since 1996. In their first evaluation (1996), these experts remarked that technological universities operated a promising model, with quick growth both in terms of units and of enrolment and programme offerings. Furthermore, the second assessment (1999) confirmed the value of the university model and the third (2002) concluded that the model had been working appropriately, providing the services expected and continuing its efforts to open up in the international front. According to international criteria, these assessments state that older universities evaluated boast adequate levels, and the outcomes of the work will have continuous implications for the next ten years.¹³⁰ These assessments have led to a series of recommendations that are being dealt with by means of policies implemented by SEP, the state governments and the universities in the context of a strategic agenda for 2001-2005. Currently, the fourth evaluation is in process.

645. The PNP gradually replaced CONACyT’s Excellence Programme Registry. To date, 629 study programmes supplied by 48 public and private institutions have achieved their PNP register. These study programmes have been classified into the International Quality (*Competente a Nivel Internacional*, CNI) or High Quality (*Alto Nivel*, AN) categories (Chapter 5).

646. In order to grant RVOE to study programmes taught by private institutions more strictly, SEP formulated the Secretarial Agreement N.243 in 1998, that established the general bases for official authorization or acknowledgement of study programmes and, in 2000, issued Agreement N.279, expressly establishing the requirements and procedures related to the RVOE higher education authorization at every level and modality.¹³¹ This agreement regulates the academic staff; study programmes; institutional denomination; scholarships granting; supervision visits; and withdrawal of RVOE.

¹²⁷ Centro de Estudios Superiores San Ángel, Centro Universitario de Comunicación, Escuela Bancaria y Comercial, Fundación Universidad de las Américas-Puebla, Instituto Tecnológico Autónomo de México, Instituto Tecnológico y de Estudios Superiores de Occidente, Normal Superior FEP, Sistema CETYS-Universidad, ITESM, Universidad Anáhuac y Anáhuac del Sur, Universidad Bonaterra, Universidad Chapultepec, Universidad Cristóbal Colón, Universidad La Salle Bajío. A.C., Universidad de las Américas, A.C., Universidad de Morelos, Universidad de Monterrey, Universidad del Claustro de Sor Juana, Universidad del Mayab, Universidad del Sol, Universidad del Tepeyac, Universidad del Valle de Atemajac, Universidad del Valle de México, Universidad La Salle, A.C., Universidad Madero, Universidad Marista (formerly Centro Universitario México), Universidad Panamericana, Universidad Popular Autónoma del Estado de Puebla, Universidad Simón Bolívar, Universidad Tecnológica Americana, Universidad Tecnológica de México.

¹²⁸ Carried out, since 2003, through the technological University Subsystem Quality Assessment Model (*Modelo de Evaluación de la Calidad del Subsistema de Universidades Tecnológicas*), based on 23 indicators assessing the educational model’s performance from five essential points: effectiveness, efficiency, relevance, contact and equity.

¹²⁹ Pair, Claude, John R. Mallea, Jacques Mazeran, Pierre Piejus and Alain Pleurdean, *La evaluación externa de las Universidades Tecnológicas. Un medio eficaz para la rendición de cuentas*, Informes y recomendaciones 1996, 1999 y 2002, Ed. Limusa, Universidad Tecnológica de la Sierra Hidalguense and SEP 2004.

¹³⁰ Ibidem.

¹³¹ In the Reviews of Federal Policies for Education, OECD experts recommended reinforcing the criteria for RVOE granting.

647. The Agreement N. 279 incorporated parameters and criteria regarding the profile required from the faculty participating in teaching such programmes similar to those established by SEP in the context of PROMEP in terms of public institutions. In addition, it established the bases for the Programme for Administrative Simplification (*Programa de Simplificación Administrativa*) for institutions complying with a series of requirements and accredited by a public or private agency with which SEP has agreed on assessment mechanisms regarding education service quality.¹³² Currently, 14 private institutions are under such regime and have been incorporated in SEP's registry of Private Institutions of Academic Excellence.¹³³

648. Since 2001, SEP, within the framework of the General Law of Education, has rigorously applied the guidelines of Agreement N.279 in terms of RVOE granting, strengthening the supervision schemes for private institutions offering study programmes acknowledged by the federal government. As of today, SEP has granted RVOE to a total of 7,759 study programmes offered by 498 private higher education institutions in the 32 federative entities.

649. In compliance with article 58 of the General Law of Education, the authority is obliged to supervise the study programmes to which it has granted RVOE. According to this, SEP supervised, during the period 2003-2006, 8,209 study programmes (some in more than one occasion) and 68,385 academic staff curricula. As a consequence of these supervisions, sanctions were applied to 309 institutions as trespasses to the law were confirmed in the operation of 2,132 study programmes; RVOE was withdrawn from 69 study programmes.

650. In co-ordination with state governments, they have worked towards improving their acknowledgement schemes and procedures, as well as in terms of programme operation supervision. With this purpose, 31 co-ordination agreements have been signed with the corresponding number of state governments.

651. Albeit their efforts, society still considers there is a significant number of private institutions operating without complying with the basic quality standards. Recently, the Senate passed a reform to the Higher Education Co-ordination Law (*Ley para la Coordinación de la Educación Superior*) that introduces a new scheme for granting and renewing the RVOE. Specifically, this scheme establishes that the RVOE will only be effective for five years and that, in order to renew it the programme must be accredited by an entity acknowledged by the education authority that granted it.

652. This reform has been turned to the House of Deputies in which its contents are being analysed, particularly, in relation to the scope and consequences of making study programmes' external assessment and accreditation mandatory, in private and public autonomous and non autonomous institutions.

653. To summarise: higher education assessment and accreditation in Mexico is currently carried out by the CIEES, CENEVAL, 23 accrediting entities that have been formally acknowledged by COPAES, PNP, SNI, the FIMPES' Institutional Accreditation System and the self-evaluation agencies of state governments and institutions. These instances and agencies have built a sizable system consisting of reference frameworks, criteria, indicators, standards, measuring tools and promotion strategies whose essential goal is to contribute to continuous improvement and assurance

¹³² SEP agreed with FIMPES in 2001 that its institutional accreditation system should be employed, in the context of the programme, to assess the quality of educational services offered by private institutions.

¹³³ *Universidad Tecnológica de México, Centro de Estudios Universitarios San Ángel, Instituto Tecnológico de Estudios Superiores de Occidente, Universidad del Claustro de Sor Juana, Universidad Cristóbal Colón, Universidad del Valle de México, Centro Universitario de Comunicación, Universidad Panamericana, Universidad La Salle Bajío, Universidad Simón Bolívar, Universidad del Mayab and Universidad de las Américas, Mexico City, la Universidad Chapultepec y la Universidad La Salle.*

of quality in higher education institutions.¹³⁴ UNESCO has acknowledged the schemes and mechanisms in this set, making Mexico one of the countries contributing to build an international database managed by this entity registering the study programmes acknowledged for their high quality.

654. During the last decade, higher education assessment as a means to improve and assure the quality of this level has succeeded in overcoming several obstacles and attitudes of apathy, showing considerable progress. Moreover, public policies in this subject have shown continuous improvement. Furthermore, there is ample consensus that allows the generalization of a culture of external assessment featuring a tendency to institutional improvement. The contribution of ANUIES has been essential in this sense.

655. The progress achieved notwithstanding, there is still a long way to go, especially in terms of having accrediting organisms for every programme offered by the system, strengthening the existing ones' operation and response capacity, and their co-ordination within a National Assessment and Accreditation System.

656. In addition, every external assessment outcome should be made public to guarantee broad institutional transparency and accountability schemes.

¹³⁴ In the Reviews of Federal Policies for Education, OECD experts recommended maintaining the policy of assessing higher education institutions.

Table 9.10 Higher education assessment and accreditation contexts

Context		Assessment	Accreditation
Academic study programmes		Institution assessment units CIEES	COPAES Accrediting bodies SEP-CONACyT National Registry of Postgraduate study programmes RVOE by: • SEP • state governments • public institutions (incorporation)
Academic staff		National System of Researchers Admission mechanisms (competitive exams) Promotion and permanence schemes at institutions (Teachers' incentive programme)	
Students	Access	Admission exams designed by the institutions CENEVAL standardised exams (EXANI II and EXANI III) EXHCOBA test COLLEGE BOARD exam Medical Residence Candidates' national exam	
	Process	Institutional evaluation schemes (by academic staff) Departmental exams designed by institutions CENEVAL standardised exams (EXIL)	
	Outcome	CENEVAL standardised exams (EGEL/EGETSU)	

657. To the extent that institutional performance assessment is publicised and has a direct influence on public institution financing, there will be more certainty as to the rooting of their managerial schemes for quality assurance and continuous improvement. The main beneficiaries will be students and society, by having more objective information in terms of the quality of academic study programmes offered by institutions.

658. The implementation in 2006 of the new resource allocation model for state public universities will lead to increased focusing of institutional efforts in terms of achieving higher quality and performance levels (Chapter 7).

9.3 Assuring and improving the quality of higher education

659. The rapid expansion of enrolment in public institutions, mainly during the 70s and 80s, could not be supplemented by the necessary schemes and tools to assure the quality of their study programmes and roles. Consequently, considerable backwardnesses were accumulated in the public institutions and the quality of their programmes was considerably affected: faculty levels below

known standards, insufficient academic equipment and low completion rates, leading to high costs per graduate student.¹³⁵

660. With regard to the first aspect, for example, of the 18,093 full time professors registered in public state universities in 1998, only 8% had a doctorate degree; 32% a master's degree or specialty; and 60% had a bachelor's degree. Therefore, most full time professors did not hold the adequate degree for the level they taught, nor had the training required to generate or innovatively apply knowledge, which is considered part of the mission and standards in these institutions.

661. In order to deal with this staff deficiency and other system problems in higher education, during the past decade, SEP designed a set of programmes and strengthened others, most of which are still effective given their considerable impact in improving institutional quality.

662. An example of this is PROMEP (Chapter 7), created in 1996 with the purpose of improving the professors' training levels and the development of academic bodies from public institutions.¹³⁶ Therefore, its design was based on the main attributes and soundest international regulations that characterise higher education professors and their responsibilities. In the context of this programme, SEP established the features defining full time professor profiles as academic work professionals in two dimensions: their training (represented by a doctorate in their respective discipline) and their occupation (simultaneous teaching, student tutoring, research and academic management tasks). The features defining a consolidated academic body were also defined, as well as quantitative indicators defining the desirable situation of professors participating in study programmes classified into five categories according to their nature: practical, practical-individualized, scientific-practical, intermediate and basic (Chapter 7).

663. In 1997-2005, PROMEP granted 5,635 scholarships for full time professors from public universities (2,591 in 2001-2005) to pursue quality postgraduate studies in Mexico or abroad (Table 9.11). The total number of scholarships for doctorate programmes is 2.65 times that of master's degree grants and 626 times the figure for specialties, privileging the maximum level of professor training.¹³⁷ As of December 2005, the number of PROMEP former scholarship holders who had post graduated reached 2,529. As for federal technological institutes, a total of 4,269 scholarships were granted during the same period (2,032 in 2001-2005) of whom 1,400 have post graduated.

Table 9.11 PROMEP scholarships granted to full time professors from public universities and technological institutes, by area of knowledge (1997-2005).

Area	Doctorate	Master's degree and specialty	Total
Agricultural and livestock sciences	371	140	511
Health sciences	254	254	508
Natural and exact sciences	800	2,870	3,670
Administrative and social sciences	954	429	1,383
Education and humanities	584	363	947
Engineering and technology	1,242	1,643	2,885
Total	4,205	5,699	9,904

Source: SEP.

¹³⁵ SEP, *Quehacer educativo*, 2000.

¹³⁶ In the Reviews of Federal Policies for Education, published in 1997, OECD experts recommended introducing a faculty-training programme.

¹³⁷ As a complement of this number of scholarships, the Academic Improvement Programme (*Programa de Superación Académica*, SUPERA), managed by ANUIES and operated with federal public resources, granted 2,065 scholarships in 1994-2001 to full time professors registered in member institutions, of which, 4.6% took specialty programmes, 57.1% master's degrees, and 38.3% doctorate degrees. As of December 2005, the number of graduate professors reached 1,407.

664. Furthermore, SEP granted 8,406 positions to state public universities during this period with the purpose of hiring professors with master's degrees (preferably doctorates) in order to improve the student/full time professor ratio, strengthen academic bodies' development and the LGAKs they promote. Over Mx\$10.617 billion was allocated to the programmes of academic excellence for full time professors, subject to their performance and compliance with the tasks assigned to them. Since early 2006, 903 new full time professor positions were assigned at these institutions, increasing the total number to 9,309.

665. PROMEP's contribution to the academic strengthening of public institutions is significant. In fact, owing to this programme's support, as well as the new positions granted by SEP and other institutional efforts, the number of full time professors in state public universities increased from 18,093 in 1998 to 27,046 by mid 2006. The share of teachers with bachelor's degrees decreased from 60% to 27%, the share of specialty or master's degrees increased from 32% to 50% and that of professors with doctorates grew significantly to 23% from 8%.

666. The strengthening of the academic university staffs, as a result of SEP's policies and programmes, has promoted that the number of their professors registered as SNI members increased from 1,899 in 2002 to 3,014 in 2006 and of those with desired profile from 5,556 to 7,383, which reflects, on the one hand, the quality improvement of academic staff and the quality of their production, and on the other hand, the increase in number of full time professors that carries out balanced activities of teaching, students tutoring, GAK and departmental duties, which contributes to the fulfilment of institutional goals (Table 9.12).

667. The outcomes of the academic reinforcement process at state public universities will become even more significant in coming years, as a result of the following:

- Improvements in their policies and regulations towards a balanced development of teaching, tutoring, GAK and academic management activities.
- Hiring new full time postgraduate professors, preferably doctors.
- The sizeable number of full time professors currently pursuing postgraduate studies.
- The additional resources granted by SEP in 2001-2005 to develop their PIFI.

Table 9.12 Progress in the academic capacity of state public universities

Indicator	2002		2003		2004		2006	
	Abs.	% with respect to FTP* total	Abs.	% with respect to FTP total	Abs.	% with respect to FTP total	Abs.	% with respect to FTP total
FTP in SNI	1,899	8.3	2,201	9.1	2,486	9.8	3,014	11.1
FTP with desirable profile	5,556	24.2	4,621	19.1	5,806	22.8	7,383	27.3
FTP population in SPU	22,987	100	24,185	100	25,428	100	27,046	100

*Full time professors.

Source: SEP.

668. As for federal technological institutes, the share of professors with master's and doctorate degrees grew from 30.8% in 2001, to 37.5% in 2005. Those following postgraduate studies, increased from 47% to 54%¹³⁸ and the number enrolled in the SNI from 92 to 233 in 2005.

¹³⁸ Estimations calculate that, by 2006, 70% will have followed graduate programmes.

669. In order to prevent lagging infrastructure and contribute to update and normalize their information systems, in 1990-2000 SEP transferred extraordinary funds (for Mx\$4.576 billion 2000 pesos) to public universities (basically state institutions) through FOMES. Since 2001, FOMES resources contribute in financing PIFI development in universities (Chapter 7).

670. In order to continue with the improvements and quality assurance efforts in public higher education institutions, SEP established a series of policies and strategies in 2001 (Chapter 2) aimed at fostering participatory strategic planning exercises, focusing on the staff's academic improvement, the development of academic bodies and their LGAKs, the incorporation of new approaches to education centred on the student or on learning, updating and flexibilising their curricula and programmes, incorporating information and communication technologies into the processes to improve academic work conditions for professors and students, updating institutional regulations, developing and operating comprehensive information systems, certifying strategic management processes by international standards such as ISO:9000, paying attention to structural problems that put their academic and financial feasibility at risk, and creating effective models in terms of accountability, among other things.¹³⁹

671. The development of PIFIs and PIIDs in public universities and technological institutes, respectively, has fostered academic bodies and their LGAKs strengthening, establishing innovation schemes, continuously improving and assuring quality in study programmes, management and services offered by institutions. As a result, the number of university level technician and bachelor's degree programmes accredited or classified as level 1 in the registry, the number of professors acknowledged as having the desirable profile of a university instructor, out of the number of faculty members at the SNI, of consolidated academic bodies, in an advanced consolidation stage or in the process of being created (Tables 5.7 and 5.8) as well as the number of certified strategic management processes is increasing. This has contributed to the progress in developing academic bodies that compare to those in quality higher education systems in any other country.

672. Moreover, the share of updated study programmes in public autonomous universities has also increased, from 52% in 2000, to 80% in 2005. In addition, the share of professors working in tutoring programmes has grown from 52% to 83% and the number of students in these programmes has increased from 30% to 68% during the same period. As for technological universities, 30 study programmes were updated in this subsystem, the share of professors participating in tutoring programmes increased from 50% to 89% and the number of students taken from 35% to 88% during this same period.

673. In 2001-2005, UNAM created or modified 21 bachelor's degree programmes and 98 postgraduate study programmes.

674. Twenty-two technological universities¹⁴⁰ have been successful in leading at least 75% of their graduates to receive satisfactory or outstanding achievement attestations from CENEVAL in the application of EGETSU, which accounts for the solid training of professionals graduating from this subsystem. Currently, the remaining technological universities are making great efforts to strengthen the strategic focus of planning to foster the achievement of similar outcomes.

¹³⁹ In the Reviews of Federal Policies for Education OECD experts recommended developing tutoring and support services for student guidance from upper secondary and higher education programmes, as well as to design more flexible bachelor's degree programmes.

¹⁴⁰ The *universidades tecnológicas de Aguascalientes, del Norte de Coahuila, Tulancingo, Sierra Hidalguense, Nezahualcóyotl, Valle del Mezquital, Izúcar de Matamoros, San Luis Potosí, Morelia, Huasteca Hidalguense, León, Nayarit, Jalisco, Norte de Aguascalientes, Norte de Guanajuato, Emiliano Zapata del Estado de Morelos, Metropolitana, Valle de Toluca, Estado de Zacatecas, Tijuana, Cancún and Querétaro.*

675. Several universities¹⁴¹ are incorporating approaches centred on student learning in their study programmes, in the context of the efforts to strengthen their institutions. When study programmes are updated, institutions generally include the recommendations received from their graduate students through periodical surveys.

676. In 2001-2005, in addition to the ordinary subsidy received by autonomous, technological and polytechnic universities, the federal government directed an additional Mx\$17.1696 billion intended to carry out 5,751 projects. These projects are related to the development of their PIFIs and solving structural financial problems in autonomous state public universities generated by their retirement and pension systems (Table 9.13).

677. The advances observed in period 2001-2006 allow inferring that the projects formulated and financed to develop the PIFI of each university have been, in general, useful instruments to take care of the identified main problems in the institutions' self assessment in the academic and management areas. They have also contributed to fortify the development of the academic bodies and their LGAKs, to develop schemes of individual and group attention of students; to increase the number of updated programs; to incorporate new technologies and learning approaches centred in the student, to design flexible curricula and to increase the number of programs recognized by its good quality; they have also favoured the innovation, the closing of quality and development gaps between the DES of an institution and within them and to improve management.

Table 9.13 Number of projects supported in the framework of universities' PIFIs

Project	2001	2002	2003	2004	2005	Total
Improving and guaranteeing programme quality	225	275	315	314	720	1,849
Strengthening teaching staff	19	37	134	194	422	806
Developing academic bodies and networks	13	85	171	243	0	512
Applying student or learning centred approaches	13	25	64	70	34	206
Tutoring schemes	17	35	96	68	70	286
Curricular flexibility	25	38	54	5	85	207
Incorporating new technologies	11	11	14	13	36	85
Distance education	5	3	3	8	6	25
Library strengthening	37	48	39	27	45	196
Graduate monitoring	15	24	18	8	23	88
Regulation and management	35	80	82	28	115	340
Space construction and adapting	202	230	200	210	213	1,055
Structural reform projects		20	26	19		65
Projects in the context of the Equity Fund 2002		31				31
Sub-total	617	942	1,216	1,207	1,769	5,751

Source: SEP.

678. In the context of the planning and preparation process of the 215 PIID of the technological institutes, its Twenty-First Century Education Model was designed and implemented¹⁴² (Chapter 4), and the Virtual Technological Library was created.¹⁴³

¹⁴¹ The *universidades autónomas del Carmen, del Estado de Hidalgo, del Estado de México, Yucatán, Aguascalientes, San Luis Potosí, Nuevo León, Tamaulipas, Juárez del estado de Tabasco, Chiapas, Nayarit, Guerrero*; the *universidades de Colima, Sonora, Guanajuato, Veracruzana, Ciencias y Artes de Chiapas, Occidente*, and *universidades tecnológicas de Campeche, Cancún, Metropolitana, Nezahualcóyotl, Nogales, Puebla, Regional del Sur, Tabasco and Torreón*.

¹⁴² In this model, each process is animated by the synergy of its components: philosophical, academic and organizational. The philosophical component encompasses principles, a shared vision for technological institutes and a code of ethics and values; the academic dimension considers professional training, a concept of learning and education practice and the organizational dimension includes leadership, process management and education administration for high performance.

¹⁴³ The technological institutes' Virtual Technological Library (*Biblioteca Virtual Tecnológica, BiViTec*) allows consulting books, specialized journals, international patents, industrial standards, process simulators, dictionaries, encyclopedias and audio and video clips. It operates 24 hours, 365 days and may be consulted from any computer with Internet connection, which increases the potential use of resources in this subsystem and assures equal access to specialized and state of the art information for students, professors and

679. On the other hand, the IPN updated 22 bachelor's degree programmes, incorporating a new education approach.

680. In the context of its development programmes, SEP allocated Mx\$864 million in 2001-2005 to build new facilities and modernise laboratories in federal technological institutes. As for state institutes, the investment has been of Mx\$1.152 billion, of which Mx\$563.7 million were spent by the Federal Government and Mx\$588.6 million by the state governments.

681. To date, 71 technological institutes have succeeded in certifying their educational processes with international ISO:9000 standards and 56 technological universities and 12 private institutions certified their strategic management processes with the same standards. In the context of the strategic agenda of technological institutes, efforts are being made to achieve certification of educational processes in over 68 institutions.

682. In the context of PROMIN, the planning processes taking place in public teacher education institutions have led each of them to have a PDI and an Annual Work Programme. PROMIN has contributed to the dynamism of internal life within the institutions, favourably influencing improvements in its quality and management. It has also contributed to incorporate external assessment within the subsystem, which is practiced since 2003 by means of applying CENEVAL's standard examinations.

683. SEP allocated Mx\$220 million in 2002-2004 for PDI development in teaching schools. Currently, efforts are being made to design a Teacher Education School State Development Plan (*Plan Estatal de Desarrollo de la Educación Normal*) in each state, by means of participatory planning processes in two environments: the state and the teacher education institutions. The process is coordinated by the state education authority. In order for the Programme development to be favourably assessed by peer committees, SEP will allocate Mx\$422 million in 2006. With them the first bases have been set for an effective planning scheme to improve the quality of teacher education in the states and the comprehensive strengthening of institutions that offer it.

684. By means of PIFOP development (Chapter 5), in early 2006, 382 study programmes in 92 public and private institutions were in a continuous quality improvement process in order to achieve their PNP register. This programme's contribution to consolidating postgraduate programme options has allowed many higher education institutions to develop a comprehensive scheme for continuous quality enhancement of their programmes.

685. In all, 722 study programmes have received benefits from PFPN. In particular, full time students enrolled there receive scholarships from CONACyT in order to contribute to their remaining in the programmes and their adequate performance. As a result of this programme, the number of high quality postgraduate study programs increased from 150 at the end of 2000 to 629 in 2006, enhancing the country's capacity for training professors and researchers and therefore for GAK.

686. The number of full time professors and researchers registered at the SNI has systematically increased since 1994 when there were 5,879. In particular, in 2000-2006 there is an increase in membership from 7,223 in 2000 to 12,096 in 2006; of these, 44.4% work at institutions located in Mexico City and 39.4% in others located in Estado de México, Morelos, Jalisco, Puebla, Nuevo León, Guanajuato, Baja California, Michoacán, Veracruz, San Luis Potosí, Sonora and Yucatán.

researchers from technological institutes in Mexico's 31 states. It has provided services to 1,418,443 users who have consulted 8,936,081 documents.

687. Completion rates¹⁴⁴ among 5B2 and 5A4 graduates in every subsystem and the system as a whole have systematically improved, from 38.3% in 1994, to 42.3% in 2000 and 57% in 2004.

688. The number of 5B2, 5A4, 5A and 6 level study programme graduates registered at SEP who have obtained their professional licenses increased by a factor of 2.3, from 113,995 in 1995 to 259,593 in 2005, of which 45.6% are men and 54.4% are women. The total number of professionals registered in that decade was 1,902,876, thus bringing the total figure of registered professionals to 4,644,960.

689. Although the policies and means applied by SEP—in co-ordination with state governments and institutions— during the past decade to improve or guarantee the quality of higher education have fostered significant progress, they are insufficient to build a system distinguished by its high quality and equity as well as by its international competitiveness. Nevertheless, there is solid platform with which to continue building and strengthening effective schemes to manage continuous improvements and quality assurance in the system and its institutions. The path is clear and the objectives solidly set. Their becoming a reality in coming years inevitably requires the continuity of public policies and the co-ordination of the three levels of government, as well as institutional efforts to root and consolidate effective assurance and continuous quality improvement schemes to allow an adequate performance of their roles and their internationalization.

¹⁴⁴ Cerón Roa, Armando, Marisol Cerón Roa and Roger Díaz de Cossío, *Eficiencia de las Instituciones Mexicanas de Educación Superior*, Instituto de Ingeniería, UNAM, 2005. Research carried out with SEP financing since 1997.

Chapter 10: Internationalization and globalization of higher education

10.1 Introduction. 10.2 Internationalization of higher education institutions 10.3 Student mobility. 10.4 The Latin America, Caribbean and European Union Common Higher Education Area (ALCUE).

10.1 Introduction

690. Since the early 90s, references to globalisation and macroregional integration became common, as well as their consequences on higher education. The 1989-1994¹⁴⁵ Education Modernization Programme already indicated that: “the global integration of development poses a challenge on the education system and demands training Mexican citizens to take advantage of scientific and technologic progress, integrating them into their culture”.

691. In January 1994, with NAFTA in effect, new challenges were incorporated into the higher education system. An independent agency was established before the conclusion of the negotiation period, the Trilateral Task Force on Higher Education, TTFHE, with representatives from the main public and private higher education institutions, ANUIES and SESIC and CONACyT on behalf of the Mexican federal government. The TTFHE contributed with efforts to reach parallel agreements in terms of higher education across the three member countries, defining the main topics with regard to building education systems in North America.¹⁴⁶

692. On the other hand, SEP promoted the internationalization process of public universities through SESIC, granting aid for faculty training abroad and academic bodies strengthening through PROMEP (described in detail in chapters 5 and 7) as well as to manage and monitor a trilateral mobility programme, among other aspects.

693. The European Union’s ALFA Programme has offered several opportunities in terms of globalizing Mexican institutions, carrying out projects across their professor-researchers and academic bodies and those from institutions in programme member countries. The programme has offered its endorsement to 298 projects submitted by 188 Mexican institutions (amounting to 38% of the total number of projects receiving support) in its six calls for submissions.

694. CONACyT has also promoted strategic alliances across Mexican higher education institutions and research centres and those from countries in priority areas for Mexico, through financing schemes such as the Sectoral Fund from the Foreign Affairs Secretariat (*Fondo Sectorial de la Secretaría de Relaciones Exteriores*).¹⁴⁷

10.2 Internationalization of higher education institutions

695. Even if the internationalization of higher education in Mexico has been taking place for several decades, in terms of academic co-operation and exchange with institutions almost all over the world, the formal strategy to carry them out is relatively recent.

696. In 2002, the Mexican Association for International Education (*Asociación Mexicana para la Educación Internacional*, AMPEI) surveyed 43 public and private Mexican universities¹⁴⁸ in order to identify to which degree the international landscape had been incorporated into their programmes and activities. The most relevant conclusions from this survey follow:

¹⁴⁵ SEP, Programa de Modernización Educativa 1989-1994, Mexico, 1989.

¹⁴⁶ Didou, Sylvie, *Sociedad del conocimiento e internacionalización de la educación superior en México*, ANUIES, Mexico, 2000.

¹⁴⁷ CONACyT, *CONACyT 2001-2004 35 años creando con ciencia en México*, unpublished institutional booklet, México, 2004.

¹⁴⁸ Gacel Ávila, Jocelyne, published in *Educación Global*, Asociación Mexicana para la Educación Internacional, 2002.

- Number of international agreements: 2,201 reported, of which 1,294 with public institutions and 907 from private universities.
- Academic staff mobility: 696 agreements reported with public universities and 230 with private institutions.
- Student mobility: private institutions participated in mobility programmes endorsed by 835 agreements, while public institutions participated in 418. Public universities were the only institutions offering students financial mobility support.
- Internationalization of research: public universities worked with 553 agreements as frameworks for carrying out 306 research projects with foreign institutions, while private universities did so in 41 projects endorsed by 60 agreements with foreign institutions.
- Co-operation networks: 69% of the institutions surveyed participated in international co-operation networks.
- Foreign students in Mexican institutions: there were 193 full degree students in public universities and 2,983 in private universities. In addition, 3,714 foreign students attended Mexican culture and Spanish language programmes in public universities and 955 in private institutions. Also, 672 students attended public universities for one or two semesters and 3,397 in private universities.

697. The results gathered from the International Co-operation Survey (*Encuesta sobre Cooperación Internacional*),¹⁴⁹ distributed among a representative sample of ANUIES' affiliated institutions in 2001-2002, suggest that 92% of their internationalization activities were being handled through bilateral agreements and projects and, to a lesser extent, by multilateral schemes. In terms of fields, most agreements took place in the Social Sciences (23%), Education (23%), Engineering (20%), Natural Sciences (15%) and Health (13%). Out of the 3,486 professors and students that carried out activities in foreign institutions in 2001, 46% did so in Europe (mainly France, Spain, Germany, Italy, Sweden and Austria), 33% in the US and 17% in Latin America. In turn, out of the 2,953 foreign students and professors attending the institutions surveyed, 37% came from US centres, 34% from Europe and 18% from Latin America.

698. In terms of the *Vision* for higher education towards the 2025 goal, PRONAE 2001-2006 states that: [...] Higher education institutions will be highly capable of responding to the academic needs of its students, increasingly diverse given their social and ethnic origins, and will be part of domestic and international academic co-operation and exchange networks endorsing faculty and student mobility programmes [...].

699. In order to achieve this goal, the current administration has promoted the internationalization of higher education institutions by means of a set of policies and guidelines fostering the strength of their academic capacity and competitiveness; inter-institutional agreements allowing support for student mobility across programmes from institutions with efficient mechanisms for mutual credit acknowledgement, promoting a comprehensive equivalence of their studies; endorsing projects and actions favouring co-operation, academic exchange and academic network integration both from domestic and foreign institutions; and, access to international co-operation and academic exchange funds between Mexican and foreign higher education institutions.

700. The current internationalization process must be the product of institutional over individual actions. Indeed, short term effects impact students; academic staff and the content and educational programme design. Going forward, the impact reflects upon the quality of education, the graduate profile and the institution's positioning. In sum, internationalization contributes to educational quality, to its relevance and to intensify its humanist features in response to a better understanding of different cultures.

¹⁴⁹ Morones, Guillermo, *Encuesta sobre Cooperación Internacional 2001-2002*, ANUIES, México, 2006.

701. SEP has also fostered the internationalization of public university programmes through the PROADU. In the context of the co-operation programme in North America, Mx\$440 million were allocated in 1995-2005 to trilateral co-operation programmes across institutions, as well as in bilateral co-operation and academic exchange programmes, international congresses organized by scientific societies and several activities carried out by professors and academic bodies from public higher education institutions (Chapter 7).

702. Lately, with the co-operation of the British Council, public university internationalization has been pursued by endorsing different programmes related to English language teaching. The English Teachers Training Programme (*Programa de Capacitación y Formación de Maestros de Inglés*) in Mexican public institutions began operating in 2002 in 32 universities, ending in late 2004. In order to develop such programme, SEP contributed Mx\$7.3 million and the British Council £600,000.

703. Furthermore, based on web technology, the Virtual English Programme (*Inglés Virtual en tu Centro*) intends to promote English language teaching and learning. The programme is offered at the Self-access Centres operating in universities. In order to develop programme activities, the British Council and SEP have contributed £300,000 and Mx\$8 million, respectively.

704. International scientific and technologic co-operation promoted by CONACyT has been dynamic.¹⁵⁰ Since 2001, the number of agreements with foreign universities has increased every year. Nearly 25 agreements were signed with US universities in 2004, favouring over 500 Mexican students. The fields in which most projects have developed are: physics, mathematics and Earth sciences (35%); biology and chemistry (24%); engineering (17%); biotechnology and agricultural and livestock sciences (12%) and health sciences (6%).

705. The Repatriation Programme for Mexican Scientists (*Programa de Repatriación para Científicos Mexicanos*) working abroad has facilitated their incorporation into domestic research and higher education institutions. On the other hand, CONACyT provides the resources required to pay a year's worth of wages, benefits, incentives and research scholarships, as well as travel and moving expenses for the researcher and his/her family in order to work at the selected institution. Seventy-one proposals to foster the repatriation of Mexican scientists having already concluded their stays in institutions abroad were approved in 2004.

706. Also, during that year, CONACyT's financial aid programme assisted 2,778 students with resources worth Mx\$654.4 million. This made it possible for them to pursue postgraduate studies in institutions abroad, resulting in a 16.4% increase in the number of fellowship holders with respect to the previous year. The main destinations for Mexican fellowship holders were Great Britain and the US. These countries attracted, respectively, 27% and 24% of the fellows, followed by France (15%), Spain (14%) and Canada (6%). Of the total number of scholarships granted to study abroad, 2,333 were aimed at obtaining doctorate degrees and 343 to master's degrees. Financial aid may come in different forms:

- Total: when they cover the full cost of tuition, living expenses and medical insurance.
- Partial: when it supplements the payment of one or all of the above items.

707. Higher education institutions are increasingly incorporating the international dimension into their programmes and activities. It should be noted, however, that most of these institutions have neither developed clearly stated strategies for this purpose, nor long-term objectives and goals

¹⁵⁰ CONACyT, Informe General del Estado de la Ciencia y la Tecnología 2005, unpublished institutional paper, Mexico, 2005.

within the framework of an institutional policy towards globalisation.¹⁵¹ International activities are generally developed apart from the institutional development plans and are not sufficiently structured in order to meet the most urgent internal needs.

708. Neither is there a clear definition of the financial items oriented towards internationalization. There is, nevertheless, a true institutional commitment in terms of these activities reflected on the amounts of resources allocated to endorsing international co-operation initiatives, as well as to the efforts to attract and publicize any opportunities for external financing through domestic and foreign agencies.

709. Although the examples of Mexican higher education exports are scarce, it is worth noting that ITESM has *campi* in Latin America and offers, at least, 15 distance master's degree programmes, with a regional coverage of 50,000 students.¹⁵² In addition the *Universidad Autónoma de Hidalgo* has a campus in Salamanca, Spain, offering postgraduate programmes in Mexican History. Similarly, in order to develop and promote Mexican culture and the Spanish language, UNAM has established two units in the US and an additional one in Canada.

710. As a result of the qualitative review of its internationalization process carried out in 2001 by the *Universidad de Guanajuato*,¹⁵³ an Institutional Internationalization Plan was defined to establish a series of internally consistent standards, objectives, strategies and goals to guide this process. This framework constitutes, in addition, the current guiding path of their activities.

711. By this same token, Guanajuato's State Programme for Higher Education (*Programa Estatal de Educación Superior para el Estado de Guanajuato*) 2001-2025, includes an international dimension promoting the development of an internationalization strategy at higher education institutions consolidated in an Institutional Plan.

712. As mentioned in Chapter 5, there are 22 academic exchange and collaboration networks—formed by consolidated academic bodies—created among higher education institutions and between these and domestic and international research centres. Additional networks operate under different criteria from those established by SEP, among them stands out the Macro-university Network (*Red de Macrouiversidades*) coordinated by UNAM.

713. The current endorsement for technological institute internationalization is based on this subsystem's educational model and its PIID (Chapter 4). This has been a two-pronged process: on one hand, it has implied the presence of an international dimension within the institutes, which has allowed sharing success stories with other countries mainly by visiting faculty programmes, technical internships and human resource training; on the other, it gives international projection to their capabilities and resources through academic exchange programmes, including actions such as high-level human resource training, technologic research and development, faculty and student exchanges, technology transfer and process improvement projects.

714. Among the most relevant internationalization actions carried out in technological institutes are:

- During the past 20 years, 175 professors received doctorates in sciences and 90 master's degrees in sciences from US institutions.
- Academic exchanges are carried out with over 20 highly recognized US institutions.

¹⁵¹ Gacel Ávila, Jocelyne, *La internacionalización de las universidades mexicanas, políticas y estrategias institucionales*, ANUIES, Mexico, 2000.

¹⁵² Gacel Ávila, Jocelyne, Isabel Jaramillo, Jane Knight, Hans de Wit, *Generación de ingresos, comercio y presencia de proveedores internacionales, The Latin American Way: trends, issues and directions*, in press, México, 2006.

¹⁵³ Internationalization Quality Review, *Evaluación de la Calidad en la Internacionalización de la Universidad de Guanajuato*, Unpublished document translation, IQR, Red Internacional, 2001.

- Currently, 41 postgraduate study programmes are included in the Ministry of Foreign Affairs' catalogue of international quality postgraduate programmes, which are requested by foreign students in the context of the co-operation agreements Mexico has with several countries.
- In that sense, 64 technological institutes have established co-operation agreements with foreign institutions, mainly from France, UK, Spain, US and Cuba, among others, thus sending fellows to these countries to follow quality postgraduate studies.
- Since 2003, Bolivia, Paraguay and Venezuela operate programmes for their students to study at programmes such as industrial engineering, environmental engineering and computer system engineering.
- The *institutos tecnológicos de Puebla, Morelia, Celaya, Tijuana, Chihuahua, Zacatepec* and the *Centro Nacional en Investigación y Desarrollo Tecnológico*, develop professional training programmes aimed at professors and researchers with the *Universidad Politécnica de Valencia*; and the *Instituto Tecnológico de Acapulco* with the *Universidad Villas de Cuba*.

715. Among the main features of the technological university subsystem internationalization process, dating back to the 90s, is the solid and growing co-operation with the French Government. Worth noticing in this context is the University Level Technician Mobility Programme (described below), established in 2001, and the French language programme in technological universities.

716. Furthermore, in 2003, SEP, the French Ministry of Education and *Peugeot* established in 2003 the agreement creating the Peugeot Training Centre in the Technological University of Querétaro. In 2005, this centre trained 198 employees of this firm's Mexican agencies.

717. Since 2002, in the context of 5B2 qualifications, the International Centre for Pedagogical Studies—part of the French Ministry of Education—and the World Bank have developed several international conferences in Europe and Latin America, aimed at defining the experiences and challenges in order for these programmes to better adjust to society's and the labour market needs. In this sense, the political proposals group, intended to re-launch and improve professional training in Peru, was established in the context of the past conference that took place in Lima, Peru in November 2005. Several international organizations and government agencies from France, Mexico, Venezuela, Brazil and Chile as well as the Mexican technological universities contribute their expertise to this group.

718. In 2002-2004, SEP signed a series of agreements contributing to the globalisation process of technological universities, by means of exchanges among institutions offering 5B2 studies in France, Canada and the US. Also, the ministry signed an agreement in 2002 with the University of Cantabria, Spain, to develop student mobility programmes and applied research and studies. In addition, the *Universidad de Cantabria*, together with the *universidades de Murcia* and *Politécnica de Cartagena* are currently carrying out a strategic analysis project with the *universidades tecnológicas de Aguascalientes, Nayarit* and *Cancun* aimed at fostering PyMES development in their regions of influence.

719. Since the establishment of an aircraft building plant in Querétaro (Chapter 3), the *Universidad Tecnológica de Querétaro* currently teaches the intensive training programme based on educational contents that are similar to Quebec's institutions, with the purpose of training the human resources the company requires. During 2006 a new higher education institution will supply study programmes to respond to the needs of this sector in Mexico, with the co-operation of the Montreal School Commission.

10.3 Student mobility

720. The Programme of Student Mobility in North America (PROMESAN) emerges as an initiative of the Canadian, US and Mexican governments aimed at strengthening co-operation in higher education, research and training. The programme finances co-operation projects under the form of consortia constituted by, at least, three higher education institutions from each country. Since 1995, eight calls have been issued resulting in financing the constitution of 78 consortia in which 512 participating institutions from these three countries. The consortia projects have involved 1,157 students in the following areas: agricultural and livestock sciences, health sciences, natural and exact sciences, social and administrative sciences, education and humanities and engineering and technology.

721. The Student Mobility Programme with France, formalised in 2001 and financed by SEP and the French Government, fosters student mobility and incorporation into French institutions for students from public state and technological universities and, more recently, from technological institutes registered in engineering and technology programmes acknowledged for their quality by assessment and accrediting bodies. The programme contributes to the training of Mexican third-year engineering students in renowned French institutions. Similarly, the students graduating from technological universities follow the *Licence Professionnelle* studies (5B3). Through this programme, the two years of 5B2 level studies are fully acknowledged by French institutions. The programme has assisted 230 students in its four calls for applications. Most of these students have had an excellent performance.

722. Furthermore, University Mobility in Asia and the Pacific (UMAP),¹⁵⁴ which currently operates in the Asia-Pacific region, is the result of the mandate issued at the Mexican Pacific Academic Forum.¹⁵⁵ The general goal of this initiative is to create a six university consortia within the Asia-Pacific region intended to develop and strengthen communication, learning and teaching abilities among students and academic staff in their use of ICTs, by means of academic exchanges supported by a study credits acknowledgement framework. When this project concludes, 72 students and 18 academic staff members from the six universities in the consortia will have benefited from this initiative.

723. With the purpose of contributing to the development of additional abilities and experiences in their students' training process, certain private institutions have recently expanded the coverage of their student mobility programmes with foreign institutions.

10.4 The Latin America, Caribbean and European Union Common Higher Education Area (ALCUE)

724. Consistent with the 2025 *Vision* for higher education (Chapter 2), SEP's current administration has followed a policy of fostering international co-operation as a means of contributing to develop and improve quality across higher education institutions. To this end, renowned Mexican and foreign institutions have established academic alliances to strengthen the academic capacity of Mexican institutions and promote the international acknowledgement of the Mexican assessment and accreditation scheme in the context of the international agreements in which Mexico participates.

725. During a meeting of education ministers organized by UNESCO in November 2000—merely a few months after the Bologna Declaration of 1999—the creation of a Common Higher

¹⁵⁴ Aguayo, Miguel A., Carlos Salazar and Genoveva Amador, *Desarrollando habilidades para trabajar en red, La gestión de un Consorcio de Movilidad Académica en Asia y el Pacífico: UMAP, UMAP-SEP*. Universidad de Colima, Mexico, 2004.

¹⁵⁵ The Mexican Pacific Academic Forum was officially formed in 1999, with eleven higher education institutions from Mexico's Pacific area, headed by the University of Colima.

Education Area among the European Union, Latin America and the Caribbean was agreed. In fact, this decision derived from a previous mandate issued by the Chiefs of State that met in Brazil in June 1999.

726. With the purpose of contributing to build a common area, a monitoring committee was formed, originally represented by Spain and France; Mexico and Brazil and St. Kitts and Neves, representing Europe, Latin America and the Caribbean, respectively. These nations would be responsible for involving the remaining countries in the activities leading to the creation of a new space. The committee has worked in the design of policies and strategies to foster regional co-operation, which has been acknowledged in the declarations issued after the education ministers' meetings in Madrid (2002), Guadalajara (2004).

727. In the Mexico City meeting, the area's 2015 *Vision* was agreed. Such vision's main features are:

- Considerable development of co-operation and exchange mechanisms and networks among institutions and academic bodies contributing to higher education's knowledge management, scientific, technologic and cultural advancement.
- Effective programme comparability mechanisms to allow the acknowledgement of studies, diplomas and competences, based on mutually acknowledged domestic systems for the assessment and accreditation of study programmes.
- Programmes fostering intense student, researcher and professor mobility as well as that of the technical and administrative staff.
- Study centres and studies on the European Union carried out in Latin America and the Caribbean and vice-versa.
- Transparent funding sources for programme development.

728. In order to build the area and materialize the *Vision* contents, the following strategies were agreed upon:

- Enhancing mutual knowledge of higher education systems in ALCUE's member countries.
- Identifying and disseminating success stories in terms of academic co-operation and exchange among higher education institutions and their academic bodies.
- Involving higher education institutions in building the common area.
- Fostering higher education's comparability, mainly in the thematic areas where there is previous degree-related work.
- Fostering the establishment and adequate development of coordinated mobility programmes for students, researchers and faculty, as well as technical and administrative personnel that take into account programme acknowledgement, if applicable.
- Promoting the establishment and adequate management of programmes fostering co-operation and exchange mechanisms and networks among institutions and their academic bodies, especially in terms of the development of joint programmes and degrees.
- Promoting the shared use of ICTs in the common area's programmes and actions.
- Fostering the creation of assessment and quality-guarantee mechanisms based on comparable criteria and good practices in countries where they have not been created yet.
- Encouraging mutual knowledge of domestic assessment and accreditation systems for study programmes and promoting their acknowledgement across nations.
- Propose creating an ALCUE quality brand for common area networks, programmes and projects.
- Foster the creation of ALCUE Study Centres.
- Promoting greater domestic and external visibility of the common area building process.

- Encouraging identification of financing sources and mechanisms to supplement government involvement in the common area building process.
- Identifying and reducing the barriers that prevent the common area's building process.

729. With the purpose of developing the strategies, the following countries joined the steering committee: Portugal, Poland, Colombia, Nicaragua and Jamaica. Currently, the steering committee works towards creating a set of initiatives to achieve the acknowledgement of both regions' higher education systems, the systematization of the existing successful academic co-operation and exchange programmes, the development of ALCUE's Chair, named "Knowledge Society", designed by the Latin American School of Social Sciences in the context of a student mobility programme, and the identification of financing sources and mechanisms to finance their activities.

730. Mexico acknowledges that ALCUE is a strategic medium in strengthening the globalisation of its higher education institutions, reinforcing bilateral and multi-lateral relations across states and contributing to the process of continuous quality improvement of the domestic higher education system.

731. In order to contribute to build a common area, Mexico participates in the Tuning Latin America Project, which takes into account a similar experience developed by the Tuning Educational Structures in Europe project,¹⁵⁶ sponsored by the European Commission in the context of the Socrates project. To date, 18 Latin American and Caribbean countries are contributing to this effort aimed at continuously improving higher education domestic system quality through their respective education ministries or similar agencies and the participation of 182 higher education institutions. The Tuning Latin America project aims for the following:

- Contribute to the development of easily comparable degrees and programmes.
- Encourage high convergence levels across four fields of knowledge in the first stage and eight in the second.
- Facilitate educational structure transparency.
- Develop professional profiles in terms of generic and specific skills for each field of knowledge.
- Create systems encouraging good quality.

732. Under the responsibility of the Under-secretariat for Higher Education and the involvement of the following universities, Mexico has participated in all four initial fields (mathematics, history, education and administration) through the Tuning National Centre: UAM, *Colima*, *Guanajuato* and *the universidades autónomas de Puebla, Yucatán, Hidalgo*, and ITESM. The second stage, which involves fields such as architecture, civil engineering, law, nursing, geology, chemistry, physics and medical school, has incorporated a considerable number of Mexican institutions.¹⁵⁷

733. During the recent meeting of the Tuning Latin America project members, which took place in June 14-16, 2006 in Brussels, 27 generic competences were compared. These competences were identified through surveys answered by students, graduates, employers and academicians from the Latin American project and compared with the outcomes from the European project analysis. Since very evident similarities were found in both sets of competences, the project will now focus on detecting curricular changes which, if applicable, will have to be incorporated in order for those abilities to be achieved. The achievements in this context will be analysed in the following meeting,

¹⁵⁶ González, Julia and Robert Wagenaar, Tuning Educational Structures in Europe, Informe Final Fase Uno, documento institucional inédito, Universidad de Deusto and Universidad de Gröningen, 2003.

¹⁵⁷ *Universidad Autónoma de Aguascalientes, Universidad Autónoma de Baja California, Universidad de Colima, Universidad de Guanajuato, Universidad de Guadalajara, Universidad Autónoma del Estado de Hidalgo, Universidad Autónoma del Estado de México, Universidad Autónoma del Estado de Morelos, Universidad Autónoma de Nuevo León, Benemérita Universidad Autónoma de Puebla, Universidad Autónoma de Querétaro, Universidad Autónoma de San Luis Potosí, Universidad de Sonora, Universidad Autónoma de Yucatán, IPN and UNAM.*

which will be held in Mexico on February 2007. This meeting is expected to have the participation of nearly 450 experts from 18 countries and 182 Latin American universities.

734. The expected comparability produced by curricular changes will contribute to student and academic mobility and, more generally, to achieve the goals stated in the context of the Latin America, the Caribbean and the European Union common higher education area.

735. In parallel, Mexico participates in building the Ibero-American Knowledge Area (EIC), understood as a common space to promote regional integration and the strengthening of co-operation for knowledge generation, diffusion and transfer based on complementarity and mutual benefits, such that it generates quality improvements and relevance of higher education, research and innovation for the sustainable development of the region.¹⁵⁸

736. Recently¹⁵⁹ the Ministers of Education of the countries that conform the Organization of Latin American States decided to advance in the progressive structuring of the EIC by means of actions that will have to be sustained in the principles of: graduality, flexibility, prioritization, quality, co-responsibility, multilateral co-ordination, mutual benefit and sustainability. Also they decided to impel and to fortify the domestic systems of evaluation and accreditation of study programmes and institutions and to advance in the mutual recognition of these systems like fundamental elements for the development of the EIC.

737. The process of globalisation of Mexican higher education is currently on a promising path in terms of achieving challenging goals. In order to succeed, academic capabilities and competitiveness from the institutions that make the higher education system should continue to be strengthened, incorporating them into the international dimension in their programmes and activities, in the context of an explicit institutional policy aimed at globalisation; advance in the potential for flexibility and comparison across programmes and credit acknowledgement, expand student and professor mobility programme coverage, create additional co-operation and academic exchange networks across institutions and their academic bodies and strengthen the international dimension in federal, state and institutional policies, among other aspects.

738. The capacities that at the moment the higher education system has conforms a platform on which it is possible to continue constructing new steps for the process of internationalization of Mexican higher education and its institutions. Success will only materialise by assigning the highest priority to assurance and continuous improvement of quality.

¹⁵⁸ OEI, *Bases de la iniciativa: Espacio Iberoamericano del Conocimiento*. XVI Conferencia Iberoamericana de Educación. Organización de Estados Iberoamericanos para la Educación, la Ciencia y la Cultura, 2006.

¹⁵⁹ Ministers of Education Conference, OEI. Uruguay, July 2006.

Chapter 11: Conclusions

11.1 Public policies: strengths and opportunities 11.2 Trends and challenges.

11.1 Public policies: strengths and opportunities

739. The preceding chapters have described the current situation of the higher education system in Mexico in detail as well as the progress achieved during the past decade as a result of federal and state public policies. It has also called the reader's attention to the challenges faced by the system and its institutions.

740. Since the eighties, a very relevant strong feature of Mexican higher education policy has been the continuity of its main goals in terms of coverage, diversification, decentralizing federalism, equity, quality, relevance, administration, planning, assessment and co-ordination, which are evident in the sectoral development programmes.

741. With one Under-secretariat in charge of higher education, SEP's new organic structure –in effect since 2005– provides more certainty in terms of the design and coherent implementation of federal policies in this regard, allowing for a more homogeneous strengthening of the public institutions that constitute the different subsystems; better regulation of the private subsystem, in co-ordination with state governments; and higher effective incidence in building a national higher education system (a common space) as well similar systems in every state.

742. Strengthening the scope and effectiveness of educational policy, requires:

- Assuring that its formulation, scope and priorities are the outcome of an efficient and effective consultation, planning, co-ordination and consensus-building process, especially with regard to the relevance and necessary elimination of the regressive features of public investment in higher education.
- Increasing the ability to acknowledge the growing complexity of the system's operation as well as the multiple typology of the institutions that compose it, with the purpose of buffering and balancing tensions, complying with the system's objectives and foster more effective contributions from institutions in terms of achieving national goals.
- Expanding particular objectives in order to promote an effective articulation of the higher education system with the previous levels of the National Education System.
- Expanding and intensifying its international dimension.

743. Enhancing the impact of federal education policies requires guaranteeing that higher education's funding schemes be coherently articulated with federal and state policy objectives in order to achieve federal and state goals.

744. Better and more efficient co-ordination across SEP instances and with other government agencies, including those in the states, as well as with the institutions, is indeed necessary in order to facilitate their implementation and operation.

11.2 Trends and challenges

745. Federal and state-level policies have contributed to build a complex and diverse higher education system that has significantly grown and developed during the past decade. Policy success is evident in the continuous improvement of the system's indicators. Nevertheless, if Mexico is to respond in a more timely fashion and with increasing levels of quality to the demands of the knowledge society, globalisation, social and economic development and the sizeable

transformations the nation is experiencing, federal and state policies should continue facing the challenges of higher education development in Mexico—in an environment of increased democratic participation—fostering its expansion and consolidation with equity. With that purpose, the federal education programme for the coming years will have to consider policies that contribute to:

- Continue the system's growth and coverage with equity. The system's future expansion should not put at risk the progress in terms of quality achieved in the last decade.
- Accelerate the pace of percentage increases in participation from students enrolled in ISCED 5B2 and 6 level study programmes, as well as in enrolment levels in basic and natural sciences, humanities and arts with respect to the overall enrolment in the higher education system.
- Ensure that public institutions make efficient use of their physical capacity by means of adequate activity scheduling and that they continue increasing their efficiency for them to better respond to the growing demand for higher education.
- Encourage recently created public institutions to expand their infrastructure according to their development plans, for them to achieve their highest absorption potential in the expected time frame.
- Make certain that the process of institutional profile diversification and the attributes of the educational options continue responding in a relevant fashion to the needs and demands of social and economic development.
- Continue developing the inter-cultural university subsystem ensuring they are accessible to all types of students, the adequate performance of its educational model and its continuous improvement and quality assurance schemes.
- Strengthen, expand and diversify technological higher education across states, ensuring their quality, their relevance and their integration into state systems.
- Continue expanding and diversifying access and permanence opportunities in good-quality higher education for disadvantaged youths. In order to achieve this, PRONABES' coverage should be expanded, at the same time guaranteeing its financial sustainability. In addition, the PAEES must be strengthened along with the development and consolidation of student credit systems across every Mexican state.
- Reduce disparities between higher education and the labour market. To achieve this goal, the institutions should continue improving the relevance of their educational options and the activities they offer and PRONABES' coverage should be expanded. Likewise, it is also necessary to strengthen the Mexican Labour Observatory as well as the public information schemes on behaviours, dynamics, trends and domestic and international features in terms of employment and occupation.
- Create the Distance Education University (*Universidad de Educación a Distancia*) with the purpose of expanding access opportunities to higher education, respond to diverse training needs and contribute to globalise Mexican higher education, thus taking advantage of the experience and capabilities of the institutions encompassed in each subsystem in addition to the networks created to support and operate the university.
- Continue encouraging the following across institutions:
 - Training professionals with the required background in fields such as language mastery; analytical, instrument and technological ability development and a reasonable knowledge of general culture in order to compete efficiently in international labour markets.
 - Academic bodies' development and consolidation.
 - Limiting hiring of full-time faculty members only to those holding postgraduate degrees, preferably doctorate.
 - Rooting the concept of desirable faculty profile, especially in institutions type III, IV, V and VI.

- Improving institutional schemes and programmes to develop the academic careers of their faculty.
- Assessing the relevance of their educational options and their adjustment, if applicable.
- Flexibilising their study programmes and incorporating new technologies and approaches focused on student learning into the educational process.
- Establishing more flexible training models and expanding continuous education supply in the field of teacher training and competence and ability updating across working professionals, as well as adult educational needs.
- Continuous improvement in student admission schemes, guaranteeing equity.
- Applying standardized testing throughout the course of the studies and upon conclusion, using outcomes as input in planning and continuous quality improvement processes in their programmes.
- Strengthening individual and group attention schemes for students and regularly assessing their performance.
- A better knowledge of the students they serve in order to ensure, among other things, the relevance of compensating or remedial and individual or group-tutoring programmes that contribute to their adequate performance and timely graduation.
- Continuously improve completion rates across study programmes.
- Incorporating the international dimension into the study programmes and the managerial schemes.
- Increasing social participation in their consultative and government boards.
- Building, establishing and consolidating management systems for continuous improvement and quality assurance, co-operation, transparency and accountability.
- Reinforcing linking capabilities with the productive sector and its contributions to innovation.
- Strengthen PROMEP's support lines, especially for technological institutes and teacher education institutions, thus intensifying the process of faculty profile improvement.
- Establish programmes and schemes making adequate contributions to full time faculty permanence in technological universities and state technological institutes as well as to renew the academic staff of federal institutions.
- Continue promoting the creation of federal and state higher education systems, featuring the institutions' complementary and comparable quality educational supply, networks of academic collaboration and exchange across academic bodies and institutions, student mobility and credit transference. Achieving this will require:
 - Intensifying the incorporation into the higher education system of institutions aimed at training primary education professionals.
 - Intensifying the current process of comprehensive public institution strengthening, increasing their participatory institutional and strategic planning abilities which contribute to root assurance and continuous quality improvement of staff, study programmes—considering their different levels and types—, co-operation programmes and academic and managerial performance, thus increasing their possibilities for advanced GAK, globalization and the timeliness and quality of their contributions to innovation and regional development.
 - Consolidating CONAEDU's performance, strengthening their higher education planning and co-ordination mechanisms. Creating a consultative council contributing to CONAEDU's decision making would contribute to achieve this goal.
 - Continue strengthening the COEPES in the context of decentralizing federalism, ensuring their regular operation, leadership in their management and the active participation of the heads of public and private higher education institutions, other

state government instances related with decision making in higher education and from representatives from the social and productive sectors in each state.

- Continue building a national assessment and accreditation system for higher education; foster consolidation efforts across their agencies, which will have to feature high competitiveness, transparency and technical autonomy levels, and the dissemination of their assessment judgements.
- Continue strengthening assessment frameworks and co-ordination across the federal and state governments in order to grant RVOEs to programmes taught by private institutions and set the bases for their periodic renewal based on their programme accreditation by COPAES-acknowledged accrediting bodies.
- Making external assessment and accreditation compulsory for study programmes supplied by public and private institutions and publicize the outcomes of these assessments in order to strengthen the current quality assurance schemes.
- Establishing a new regulatory framework covering issues related to planning, assessment, accreditation, co-ordination and financing in the context of decentralising federalism and a comprehensive information system which, through new technologies, might be able to monitor the main system indicators, assessing its status, evolution and trends. This new framework should incorporate and establish the duties of both CONAEDU and the COEPES in terms of planning and a scheme for its co-ordination; the national assessment and accreditation system, supported upon co-ordination among the CIEES, CENEVAL and the COPAES-acknowledged accrediting bodies; make external assessment and accreditation compulsory for educational programmes; an explicit scheme for federal and state contributions to public institution subsidies and an allocation model privileging equity that includes, taking the institutions' typology into consideration, variables related to institutional performance and their contribution to the achievement of federal and state strategic goals and objectives.
- Improving articulation of extraordinary financing, for assurance and continuous quality improvement of 5B2, 5A4, 5A and 6 level study programmes supplied by the institutions.
- Increase Mexico's scientific, technologic and innovation capabilities through researcher training in quality doctorate programmes.
- Increase federal and state investments in higher education and science and technology; strengthen the current schemes and develop new incentive programmes to foster increasing private financing for science and technology and a closer relationship between the productive sector and higher education institutions.
- Intensify the actions fostering a more equitable distribution of public investment in higher education.
- Increase the monthly earnings of the academic and management staff from public higher education institutions.
- Continue fostering further adjustments to the pension and retirement systems of autonomous public state universities that have not done so and that increasingly risk their short-term financial viability. Keep reinforcing the financing funds of the reformed retirement and pension systems at 26 universities.
- Maintain Mexico's active participation in the process of building and consolidating the common higher education space ALCUE and the Ibero-American Knowledge Space, as well as in generating international schemes aimed at acknowledging the assessment and accreditation domestic systems in addition to evaluating and disseminating the quality of cross-border higher education.

746. Facing the current challenges and achieving the ambitious goals contained in PRONAE's *Vision 2025*, requires consolidating the implementation of higher education policies which, given

their recent impact and the expectations for it in the short term, are generating relevant outcomes in terms of continuous improvement and ensuring of educational quality, in addition to keeping those policies that, albeit in their implementation stages, their impact will only be tangible in the medium and long-term.

Appendix 1. The Legal Framework for Higher Education

747. The right to an education is one of the individual guarantees the Mexican Constitution grants each of the nation's citizens. On the other hand, Article 2 of the *Ley General de Educación* (General Education Law) states that: ...every inhabitant will have the same access opportunities to the National Education System only by complying with the applicable general regulations...

748. Education in Mexico is a basic element in building and improving democratic life. These beliefs are the foundation of the aspiration to achieve educational equity in access, permanence and educational and professional success.

749. Given its complexity and public character, the basic regulatory framework for higher education in Mexico rests on legal instances of different types and levels, such as the Mexican Constitution (*Constitución Política de los Estados Unidos Mexicanos*) with Articles 3 and 73, fraction XXV, among the most relevant, the General Education Law (*Ley General de Educación*), the Higher Education Co-ordination Law (*Ley para la Coordinación de la Educación Superior*), the Organic Law for the Federal Public Administration (*Ley Orgánica de la Administración Pública Federal*), the Science and Technology Law (*Ley de Ciencia y Tecnología*), the Regulative Law for Article 5 of the Constitution (*Ley Reglamentaria del Artículo 5º Constitucional*), and the Federal Labour Law (*Ley Federal del Trabajo*), as well as state-specific education and tertiary education laws, the public universities' (autonomous or not) organic laws, SEP's Agreements N.279 and N.286, in addition to the co-ordination, operation and financial assistance agreements between the federation and states or institutions, among others.

750. The constitutional legal framework for higher education may be analysed from two points of view, one strictly legal and another closely related with the national development democratic planning schemes mandated by the Planning Law (*Ley de Planeación*).

751. From a strictly legal perspective, fraction V of Article 3 of the Constitution establishes that: [...] In addition to teaching preschool, primary and secondary education referred to in the first paragraph, the State will promote and consider every type and form of education, including higher education, necessary for the nation's development, will support scientific and technologic research, and encourage our culture's strengthening and dissemination. [...]

752. Fraction VII of this constitutional article indicates that: Universities and other higher education institutions granted autonomy by the law, will be empowered to and responsible for governing themselves; [...]

753. Fraction VIII of Article 3 states that: With the purpose of unifying and co-ordinating education across the Republic, the Congress will issue the necessary laws aimed at sharing the educational social role among the federation, the states and the municipalities, at establishing the economic contributions corresponding to such public service and at indicating the applicable sanctions for those officers that do not comply with or enforce the related regulations, as for all those who infringe them.

754. In turn, Fraction XXV of Article 73 of the Constitution, states that: The Congress will be empowered to establish, organize and sustain rural, elementary, upper, secondary and professional schools across the Republic; as well as scientific research, art and technical studies' [...], as well as to dictate the laws aimed at adequately distributing the exercise of the educational role and the economic contributions corresponding to such public service among the federation, the states and the municipalities [...]

755. With regard to autonomy, the second paragraph of Article 1 in the General Education Law (*Ley General de Educación*) indicates that: The social and educational role of universities and other higher education institutions referred to in fraction VII of Article 3 of the United Mexican States Political Constitution will be regulated by the laws ruling such institutions. Fraction VI of Article 10 indicates that: Higher education institutions granted autonomy by the law, are parts of the Nacional Education System.

756. Article 9 of this law establishes that: In addition to teaching preschool, primary and secondary education, the State will promote and consider every type and form of education, including higher education, necessary for the nation's development, will support scientific and technologic research, and encourage the dissemination of national and universal culture by direct means or through its decentralized entities, financial support or any other means available.

757. Article 10 of the General Education Law establishes that: Education taught by the State, its decentralized agencies and private entities with official programme approval or acknowledgement, is a public service. This article determines the actors that conform the National Educational System:

- I.- Students and faculty;
- II.- Educational authorities;
- III.- The academic plans and study programmes, methods and educational materials;
- IV.- State educational institutions and its decentralized agencies;
- V.- Private institutions with official programme authorization or acknowledgement; and
- VI.- Higher education institutions with autonomy granted by law.

According to the article, these actors must teach in such fashion as to allow the students to incorporate into society and, at the appropriate moment, develop a productive activity that will ease the worker to study.

758. Article 12 defines the powers that are exclusive to the federal educational authority, among which should be mentioned: [...]

- VI.- Regulating the national formation, updating, training and professional advance system for basic education teachers; [...]
- VIII.- Regulating a national credit, revalidation and equivalence system facilitating student transition from one educational mode to another; [...]
- XI.- Design global planning and programming for the National Education System, its assessment and general evaluation guidelines local educational authorities must carry out [...]

759. Article 13 defines: Of exclusive competence of local educational authorities are, among others, the following:

- IV.- Providing formation, updating, training and professional improvement services for basic education teachers in compliance with the general regulations determined by the Secretariat [...]

760. Article 14 establishes that: In addition to the exclusive powers mentioned in articles 12 and 13, federal and local education authorities will concurrently have the following powers: [...]

- VII.- Permanent promotion of research as a basis for educational innovation;
- VIII.- Fostering technological teaching and scientific and technological research [...]

761. Article 25 indicates: The Executive branch and the government of each federal entity will contribute to finance public education and educational services under the applicable public revenue and expenditure terms. The annual share the State —federation, federal entities and municipalities— should allocate to public education and education services expenditure should not be below 8% of the country's GDP. No less than 1% of the GDP should be directed to scientific research and technological development activities in Public Higher Education Institutions. Budgetary allocations to each educational level should be continuous and linked among themselves with the purpose of allowing the population to achieve the highest educational level possible [...].

762. Furthermore, Article 28 establishes that: Investments in education undertaken by the State, its decentralized agencies and private entities are considered as social interest investments.

763. Article 29 indicates: The Secretariat [of Education] should assess the National Education System without prejudice to that carried out by the local educational authorities in terms of their respective faculties [...].

764. Article 32 indicates that: Educational authorities will take measures aimed at creating conditions allowing a full exercise of each individual's right to access education, increased educational equity and achieving effectively equal access and permanence opportunities in educational services.

765. Such measures will be preferably directed at groups and regions with the highest educational lags or facing disadvantages in terms of their social or economic situation.

766. Article 33 establishes that: In order to comply with the above provisions, educational authorities should carry out the following activities in the context of their respective powers: [...]

VI.- Establish distance education systems; [...]

VIII.- Develop scholarship and other economic assistance programmes for students; [...]

XI.- Promote increased participation from society in education, as well as support from private entities to financing and the activities referred to in this chapter; [...]

767. Article 54 indicates that: Private entities will have the power to provide education of every type and mode.

Approval and acknowledgement of these activities will be granted to specific study programme. In order to teach new programmes, the corresponding approval or acknowledgement, whichever applies, will be required.

Approval and acknowledgement of the study programmes made reference to in such authorisations incorporate the institutions obtaining them into the National Education System”.

768. Article 55 establishes that: Official programme approvals and acknowledgements will be granted if the applicants have:

I.- An academic staff with proof of the appropriate formation to teach the level in question and, if applicable, that satisfies the remaining requirements made reference to in article 21;¹⁶⁰

II.- Facilities complying with health and sanitation, security and pedagogic facilities determined by the granting authority. The opening of a new facility will require a new approval or acknowledgement, whichever applies [...].

¹⁶⁰ This article indicates that, in order to exercise the teaching profession at institutions established by the State, its decentralised agencies or private entities with approval or RVOE, teachers must comply with the requirements stated by the competent authority.

769. On the other hand, Article 58 indicates that: Authorities granting official approvals and acknowledgements must inspect and surveil the educational services that they have approved or acknowledged.

770. Article 60 indicates that: Studies carried out within the National Education System will be valid across the Republic. National Education System institutions will issue certificates and affidavits, diplomas, titles or academic degrees to individuals concluding their study programmes in terms of the requirements established in the respective curricula and plans. Such certificates, affidavits, diplomas, titles and degrees will be valid across the Republic.

771. Article 61 details that: Studies carried out outside the National Education System may become officially valid by means of their revalidation, as long as they are comparable to studies carried out within the system.

772. Article 63 indicates that: The Secretariat will determine the general standards and criteria applicable throughout the Republic, to which revalidation and equivalent study affirmations must adjust.

The Secretariat will have the power to revalidate and grant study programme equivalence different from those referred to in Fraction V of Article 13.

Local educational authorities will grant revalidations and equivalences only when they make reference to study programmes and curricula taught at their respective jurisdictions.

Revalidations and equivalences granted in terms of this article will be valid throughout the Republic.

773. Article 64 indicates that: By agreement of the Secretariat's head, it will be possible to implement procedures to issue certificates, affidavits, diplomas or degrees to those demonstrating their end-of-programme knowledge to a certain educative level or school grade, acquired by autodidactic means or by means of labour experience.

774. The main purpose of the Law for Higher Education Co-ordination (*Ley para la Coordinación de la Educación Superior*) published on December 29, 1978 consists in: ... setting the bases to distribute higher education roles across the federation, the states and the municipalities, in addition to considering the corresponding economic grants in order to contribute to develop and co-ordinate higher education.

775. Article 3 of this law indicates the following: Higher education is the level taught after upper secondary school or its equivalent. It encompasses teachers training, technological and university education, including short professional programmes and those aimed at obtaining the bachelor's, masters and doctorate degrees as well as updating and specialization courses.

776. Article 4 establishes that: Teaching, research and culture dissemination roles played by higher education institutions will maintain a harmonious and complementary relationship amongst them.

777. In addition, Article 5 details that: The establishment, extension and evolution of higher education institutions and their co-ordination will be carried out addressing national, regional and state priorities as well as institutional teaching, research and culture dissemination programmes.

778. Article 8 indicates the following: The federation, the states and the municipalities will provide higher education public services in a co-ordinated fashion and within their respective jurisdictions, addressing their needs and possibilities, according to the provisions in this law and the General Education Law.

779. Article 11 indicates that: In order to develop higher education addressing national, regional and state needs and teaching, research and culture dissemination institutional requirements, the State will provide for co-ordination of this type of education across the Republic by means of fostering a harmonious interaction across higher education institutions and of allocating available public resources aimed at such service according to the priorities, objectives and guidelines considered in this Law

780. Article 12 establishes the federation's role in terms of co-ordination: Without prejudice to concurrence of states and municipalities, the federation will carry out the following actions in order to provide for the co-ordination measures referred to in the previous article:

- I. Promote, encourage and co-ordinate programme actions linking institutional and inter-institutional planning of higher education with the objectives, guidelines and priorities demanded by the country's comprehensive development;
- II. Sponsor and endorse the celebration and application of agreements to foster and develop higher education in a harmonious fashion across the federation, the states and the municipalities;
- III.- Foster evaluation of higher education development with institutional participation;
- IV.- Endorse higher education by allocating public federal resources, and
- V.- All other actions considered in this law and other applicable provisions.

781. Article 13 establishes that: In terms of higher education co-ordination, the federation, the states and the municipalities will take into account the opinions of higher education institutions both directly and through their representative groups.

782. Article 17 details that: Public higher education institutions classified as decentralized entities, will be empowered if applicable, to grant, deny or cancel the official acknowledgement for higher education programmes, understanding that such acknowledgement from the relevant higher education authority will be required for every facility, extension, entity and curriculum.

Such acknowledgement may be granted by state governments or the decentralized entities created by the latter, only with regard to facilities and curricula established and taught in the territory of the relevant state.

783. The federation will allocate resources, according to Article 21 of this Law: [...] In consideration of its budgetary capabilities and in terms of the teaching, research and culture dissemination needs of public higher education institutions for them to achieve their objectives [...].

784. Article 23 states that: The resources allocated to higher education institutions according to the Federation's Expenditure Budget will be defined addressing national priorities and institutional participation in the higher education system's development, taking into account institutional planning and academic and administrative improvement programmes, as well as the aggregate amounts for operational expenses.

Under no circumstances will any consideration, other than the educational purposes, will be taken into account in order to decide on the allocation of resources. In terms of Expenditure Budget allocations, the law indicates that: [...] Granting public sector resources to institutions teaching higher education programmes is a transcendental element for the free and democratic development of this level of education, without regard of ideologies or political party affiliations [...].

785. Article 38, fraction I, item e, of The Organic Law of the Federal Public Administration (*Ley Orgánica de la Administración Pública Federal*) establishes that: SEP will be the instance

responsible for dealing with matters related to higher and professional education. In turn, fraction VIII of such article indicates SEP's powers to: Promote the creation of scientific and technical research institutes and the establishment of laboratories, observatories, planetariums and other centres required by primary, secondary, teachers' training, technical and higher education development; guide, in co-ordination with the relevant instances of the Federal Government and public and private entities, the development of scientific and technologic research [...]

786. Article 1 of the Science and Technology Law (*Ley de Ciencia y Tecnología*), which is the administrative law to fraction V of Article 3 of the Mexican Constitution, indicates that its objective consists in:

- I. Regulating the support the Federal Government must provide to foster, strengthen and develop general scientific and technologic research in the country;
- II. Determine the tools through which the Federal Government will comply with the obligation to support scientific and technologic research;
- III. Establish the action coordinating mechanisms across agencies and entities of the Federal Public Administration and other institutions participating in the definition of policies and programmes regarding scientific and technologic development or directly carrying out such activities;
- IV. Establish co-ordination instances and mechanisms with state governments, and connection and participation schemes with the scientific and academic communities of higher education institutions from the public, social and private sectors to design and formulate promotion, dissemination, development and implementation policies in science and technology as well as to train professionals in the fields of science and technology;
- V. Link scientific and technological research with education;
- VI. Endorse the capability and strengthening of scientific and technological research groups carried out by public higher education institutions, which will materialize their objectives according to the principles, plans, programmes and internal provisions determined by their specific regulations;
- VII. Determine the foundations for the parastatal entities carrying out scientific and technological research activities to be acknowledged as public research centres for the purposes stated in this law, and
- VIII. Regulate the execution of resources generated by public scientific research centres and those contributed by third parties, aimed at creating technological research and development funds.

787. Article 3 indicates that the National Science and Technology System (*Sistema Nacional de Ciencia y Tecnología*) consists, among other elements, of:

[...] V. The National Research Groups and Centres Network (*Red Nacional de Grupos y Centros de Investigación*) and the scientific research activities carried out by universities and higher education institutions according to the applicable regulations.

788. Article 12 establishes that: The principles that will guide the support the Federal Government must provide to foster, develop and strengthen scientific and technological research in general, as well as specific research activities carried out by agencies and entities of the Federal Public Administration, will be the following: [...]

V.- The policies, instruments and criteria through which the Federal Government is to foster and endorse scientific and technological research will strive for the highest beneficial impact of such activities on teaching and learning science and technology, on the quality of education, especially higher education, as well as by motivating the participation and development of new generations of researchers, [...]

789. Article 13 indicates the following: The Federal Government will endorse scientific and technological research by means of the following tools:

IV.- The amount of federal resources granted in the annual federal expenditure budget for public higher education institutions and that, according to their programmes and internal regulations, aim at carrying out scientific or technological research activities; and

VI.- Endorsing the capability and strengthening of scientific and technological research activities carried out by public higher education institutions, which will materialize their objectives according to the principles, plans, programmes and internal provisions determined by their specific regulations; [...]

790. Regarding the relationship between Research and Education, paragraph 2 of Article 42 states that: SEP and CONACyT will establish the required co-ordination and collaboration mechanisms to jointly endorse postgraduate studies, paying special attention to quality improvements; establishing and consolidating academic research groups, basic scientific research in every knowledge field and technological development. These mechanisms will be applied both in higher education institutions and in the National Research Groups and Centres Network.

791. The Administrative Law for Article 5 of the Constitution Regarding Professional Practice in the Federal District (*Ley Reglamentaria del Artículo 5o Constitucional Relativa al Ejercicio de las Profesiones en el Distrito Federal*) and federal territories, establishes in Article 1 that: A professional title is the document issued by State institutions [...] to the person that has concluded the relevant studies [...]; in turn, articles 2, 3 and 4 mention the activities that require a professional title (certificate) to be exercised professionally; it also states that the individual to whom the certificate has been issued has a right to the corresponding professional licence with patent value. This Law dictates the creation of the General Directorate of Professions (*Dirección General de Profesiones*) as an instance dependent of the Federal Government's SEP. The Law defines the General Directorate as an entity linking the State and the professional associations and empowers it with the possibility of registering, once the appropriate requirements are covered, professional titles and issuing a professional licence with patent value and to use as identity card in every professional activity. The Directorate is also responsible for monitoring professional exercise with the contribution of professional associations, among others.

792. The Federal Labour Law (*Ley Federal del Trabajo*) regulates labour relationships in higher education institutions and its provisions belong to the public sphere. Labour relationships in autonomous universities are treated in a special section of such law.

793. Local congresses issue the federal entities' education laws, in accordance with the guidelines established in federal laws. On the other hand, SEP issues agreements contributing to the National Education System's development in the context of its competence and the federal regulatory frameworks. Namely, Agreement N.279 establishes the requirements and procedures related with the official acknowledgement of higher education programmes taught by private institutions. Agreement N.286 states the bases to revalidate autodidactic knowledge, or obtained through labour experience or based upon the certification regime regarding employment training.

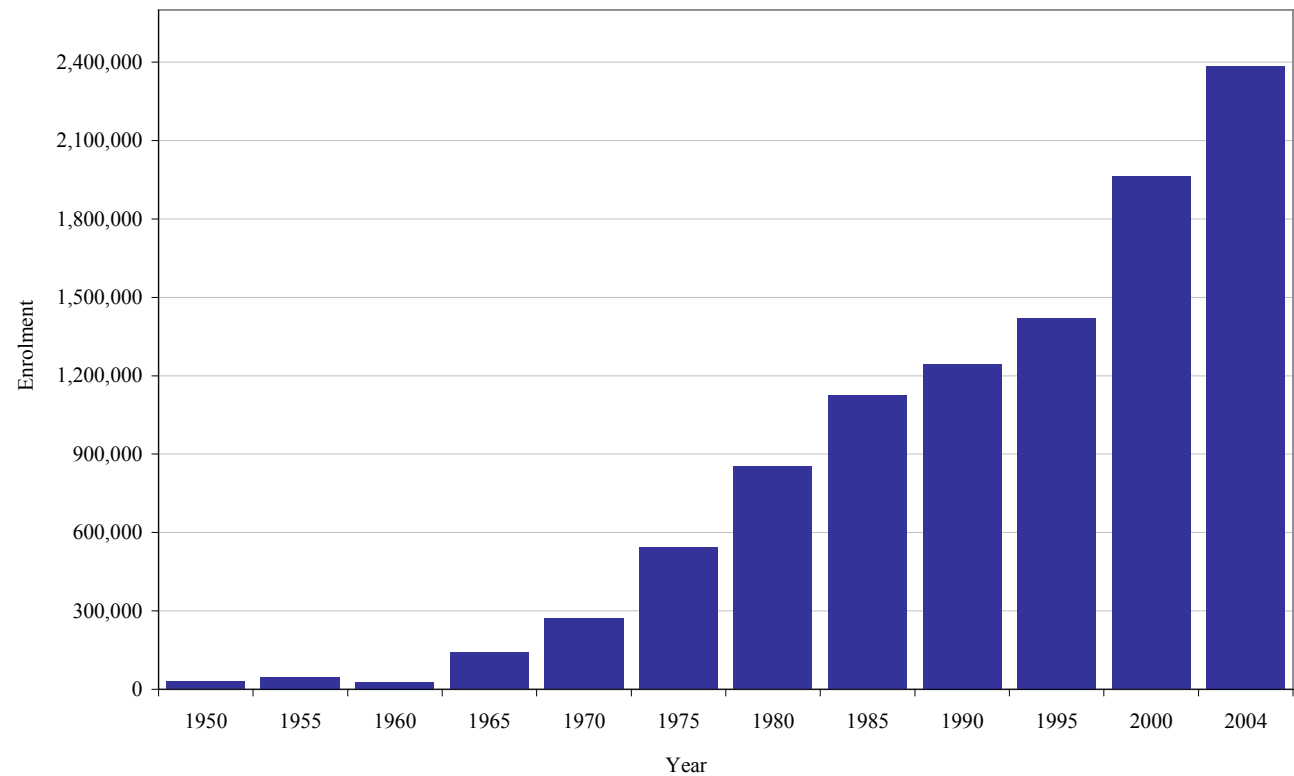
794. The Co-ordination, Operation and Financial Assistance Agreements (*Convenios de Coordinación, Operación y Apoyo Financiero*) established between the federation, the states and the institutions, set the bases for organizing and operating the decentralized entities of the state governments and their financing.

795. In addition to the laws described above, there are regulations, decrees, agreements and administrative manuals that direct higher education institutions in their daily operation.

796. Finally, it is worth keeping in mind that the regulatory framework of higher education does not suffice in terms of the development of an increasingly complex, diversified and decentralized system. In the past four years, different initiatives have been set forth, aimed at reforming or supplementing the current regulatory framework. Nevertheless, it has not been possible to achieve the necessary consensus to turn them into laws.

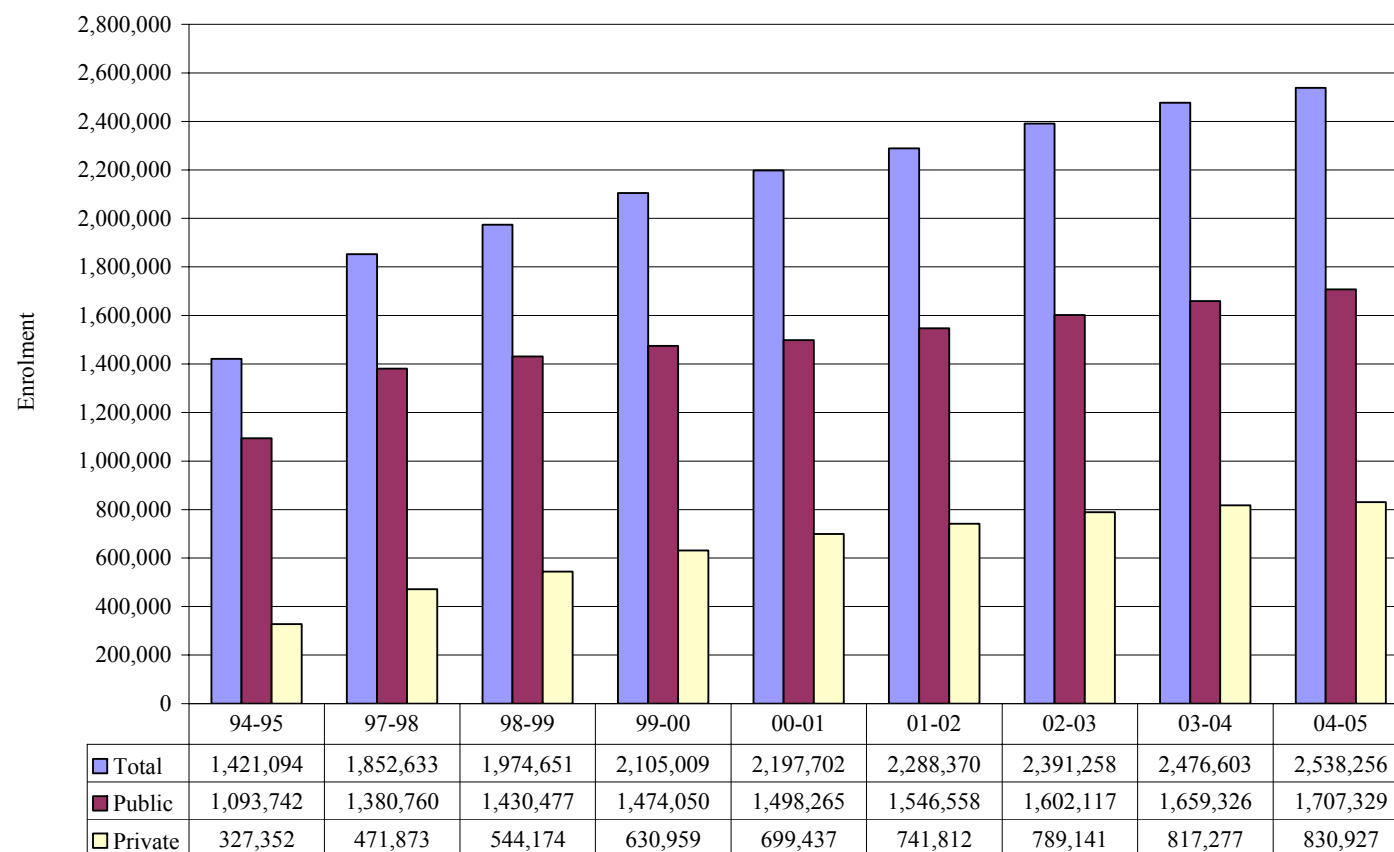
Appendix 2. Statistical annex

Chart A.1 Evolution of schooling enrolment in higher education between 1950-2004



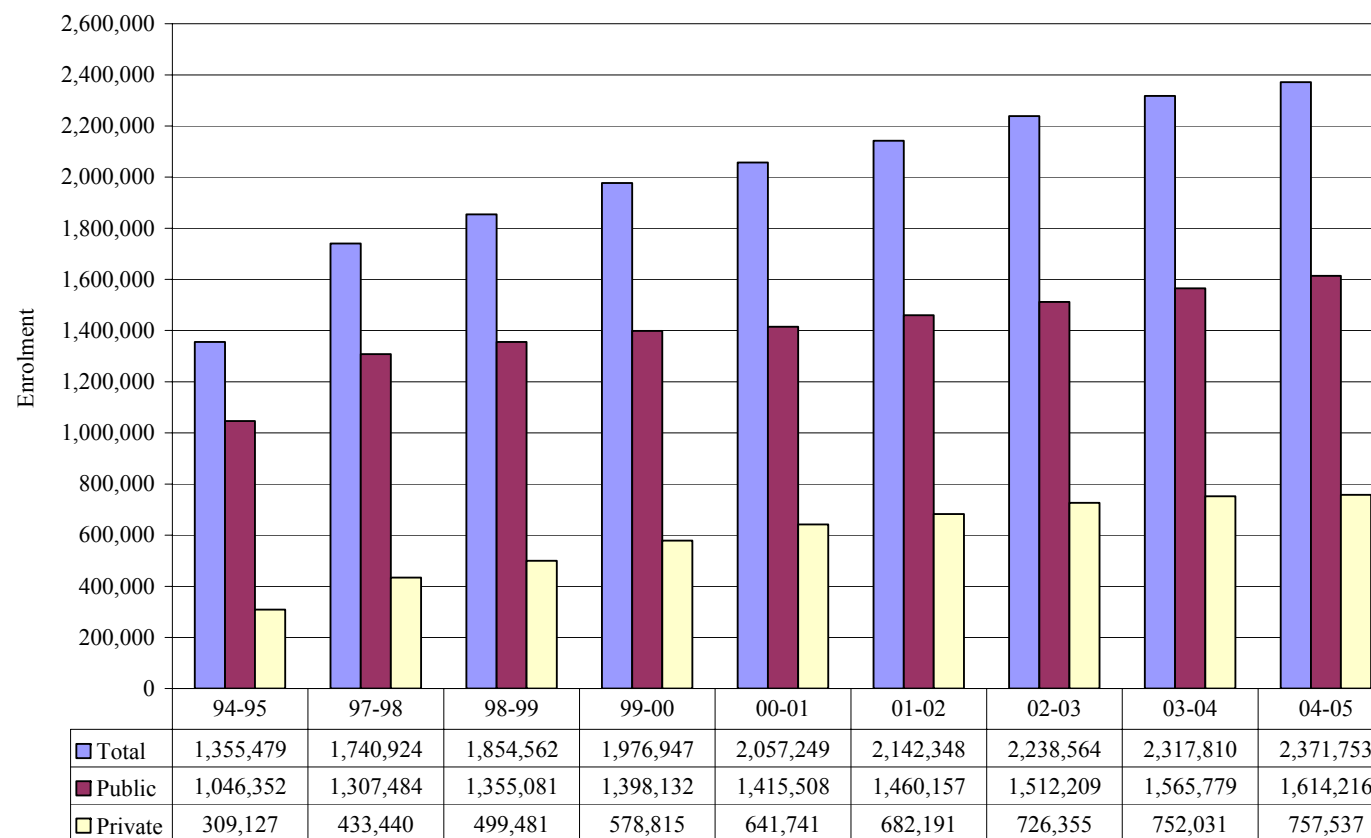
Sources: ANUIES, Anuarios estadísticos 1950-1995; SEP, Formato 911, ciclos escolares 2000-2004.

Chart A.2 Total enrolment* in public and private higher education institutions in academic years 1994-2005



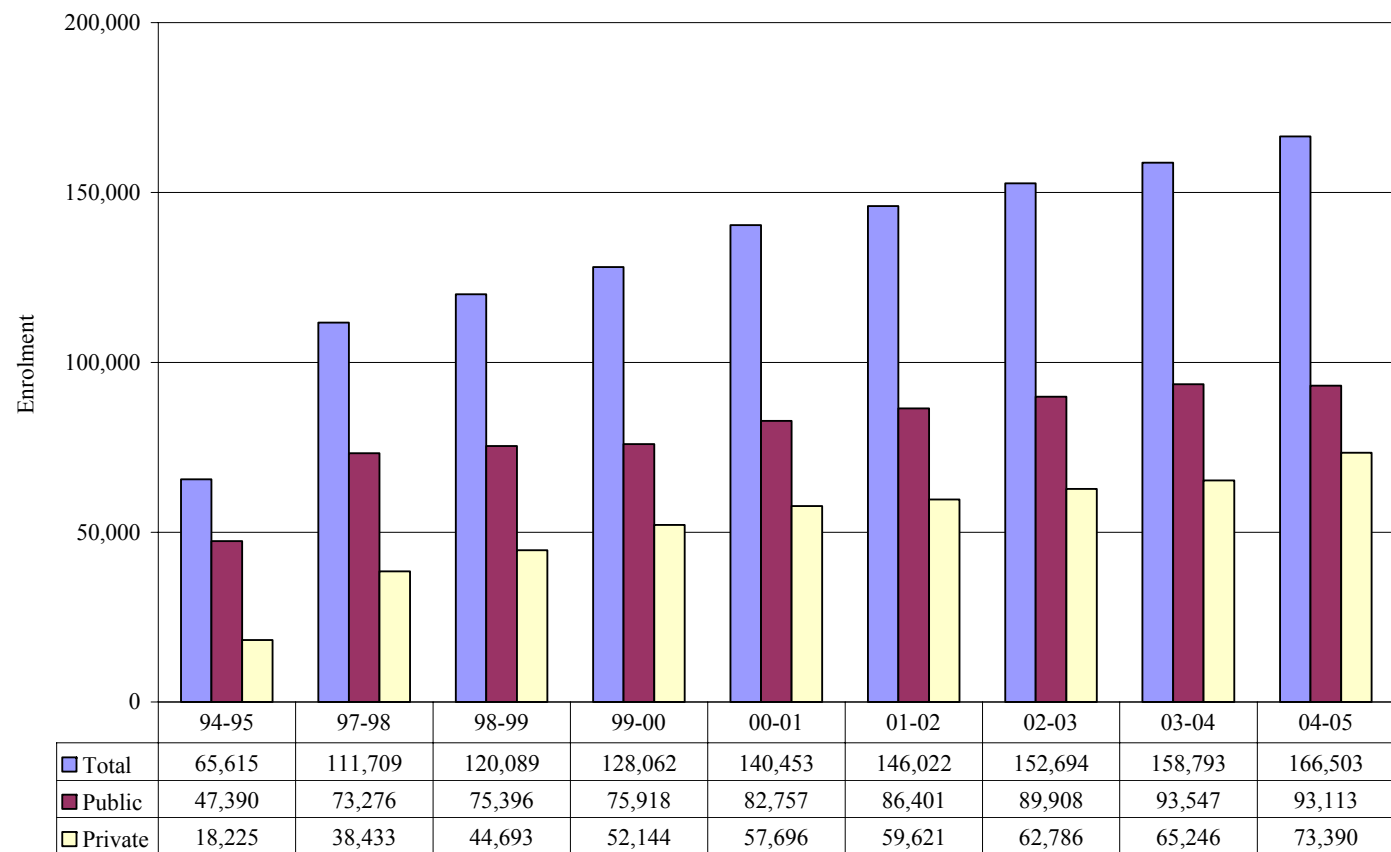
* Schooling and open options. Includes 5B2, 5A4 (*escuelas normales*), 5A4, 5A and 6 level study programmes enrolment
 Sources: ANUIES, *Anuario estadístico 1995*; SEP, *Formato 911, ciclos escolares 1997-2005*.

Chart A.3 Public and private higher education institutions' 5B2, and 5A4 level study programmes enrolment* in academic years 1994-2005



* Schooling and open options. Includes 5A4 (*escuelas normales*) level study programmes.
 Sources: ANUIES, *Anuario estadístico 1995*; SEP, *Formato 911, ciclos escolares 1997-2005*.

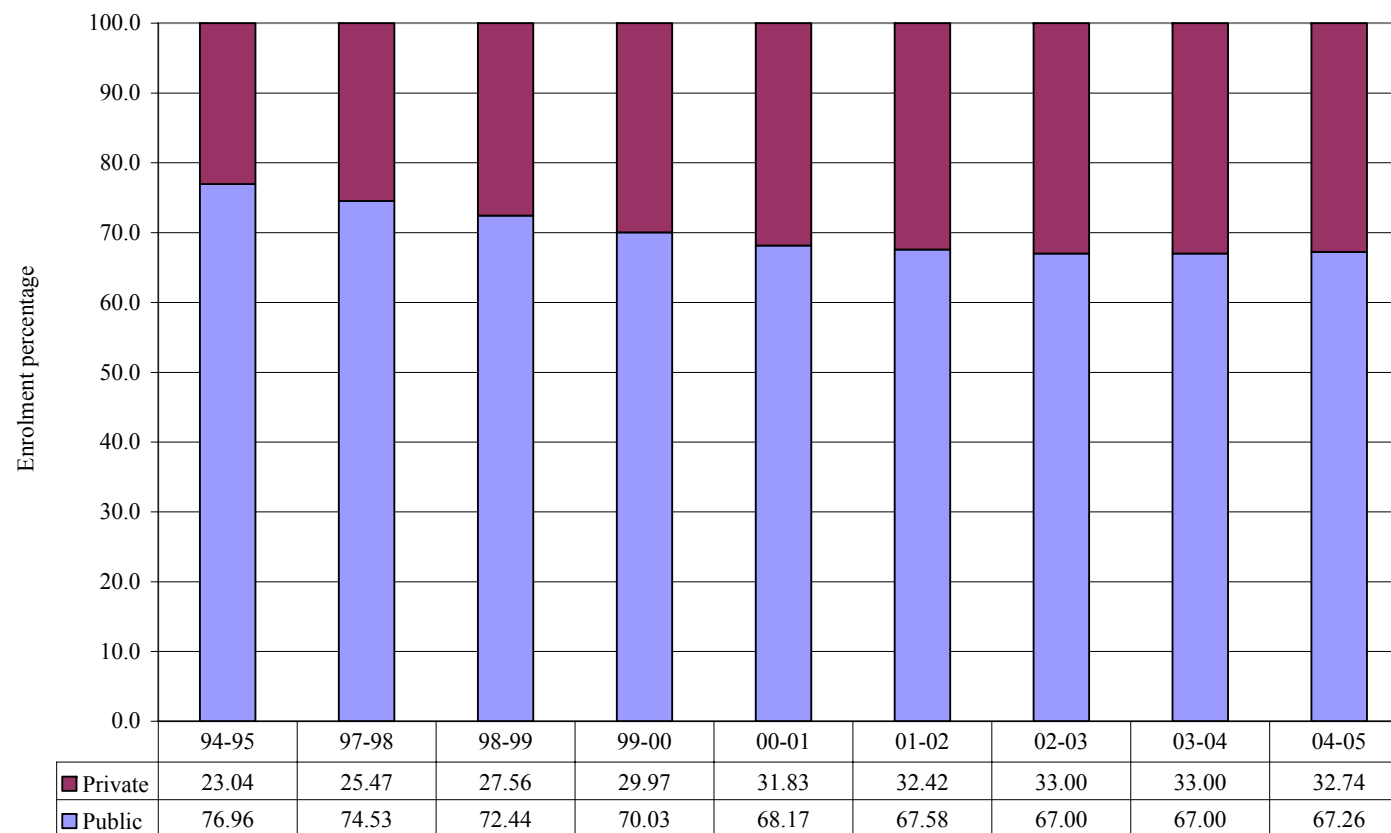
Chart A.4 Public and private higher education institutions' 5A and 6 level study programmes enrolment* in academic years 1994-2005



* Schooling and open options.

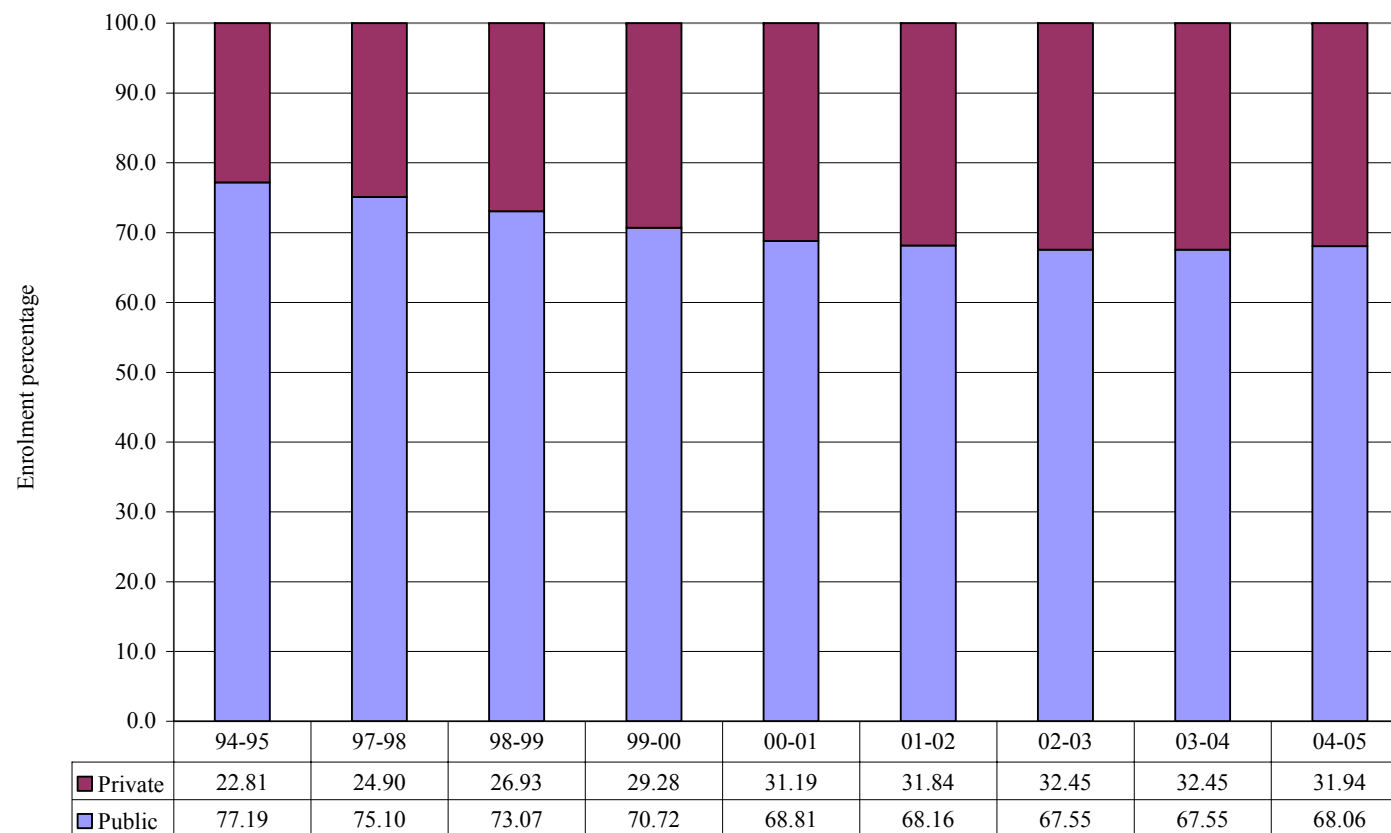
Sources: ANUIES, *Anuario estadístico 1995*; SEP, *Formato 911, ciclos escolares 1997-2005*.

Chart A.5 Public and private share of the total enrolment* in higher education institutions in the academic years 1994-2005



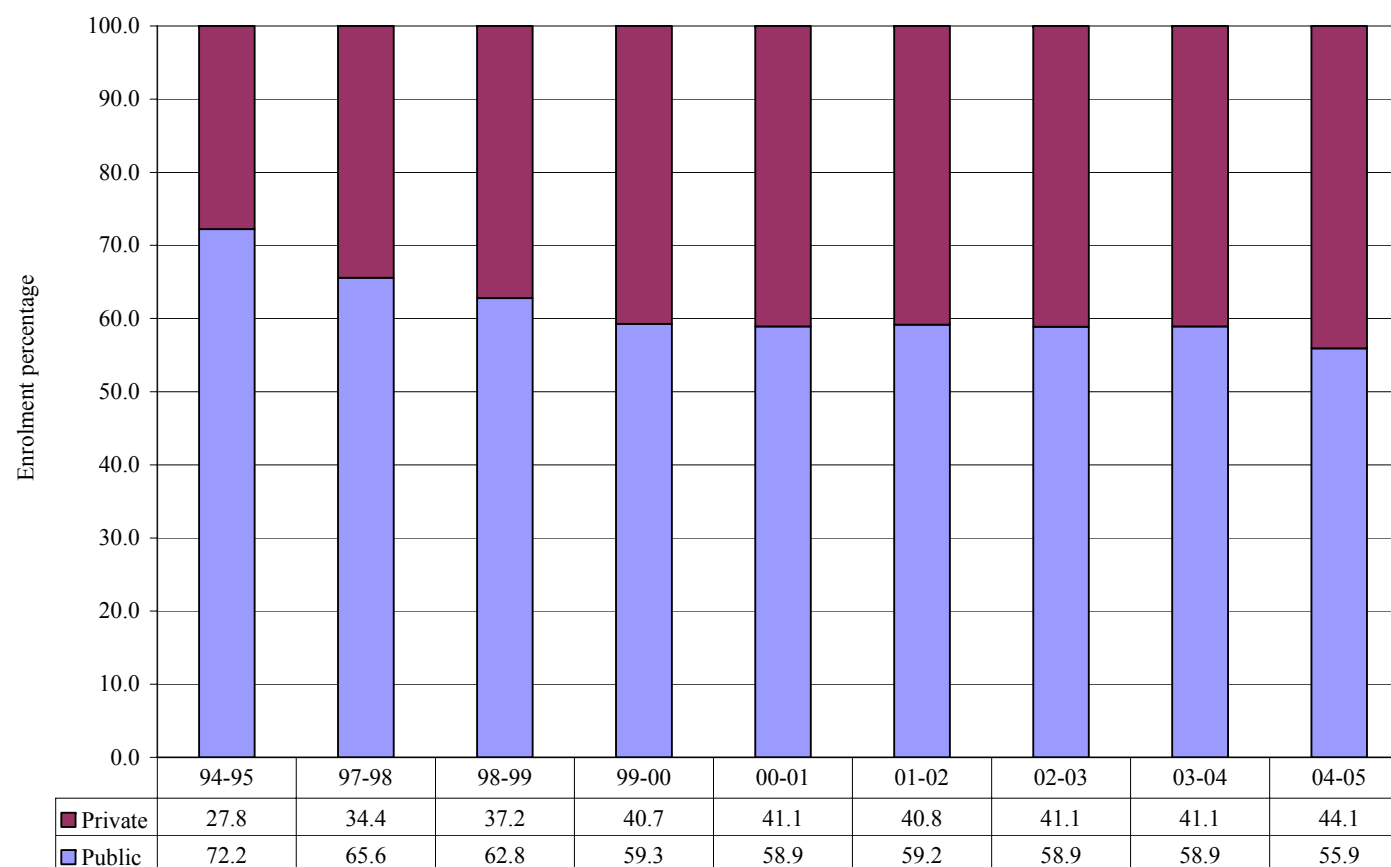
* Schooling and open options. Includes 5B2, 5A4 (*escuelas normales*), 5A4, 5A and 6 level study programmes.
 Sources: ANUIES, *Anuario estadístico 1995*; SEP, *Formato 911, ciclos escolares 1997-2005*.

Chart A.6 Public and private share of higher education institutions' 5B2 and 5A4 enrolment* in academic years 1994-2005



* Schooling and open options. Includes 5A4 (*escuelas normales*) level study programmes.
 Sources: ANUIES, Anuario estadístico 1995; SEP, *Formato 911, ciclos escolares 1997-2005*.

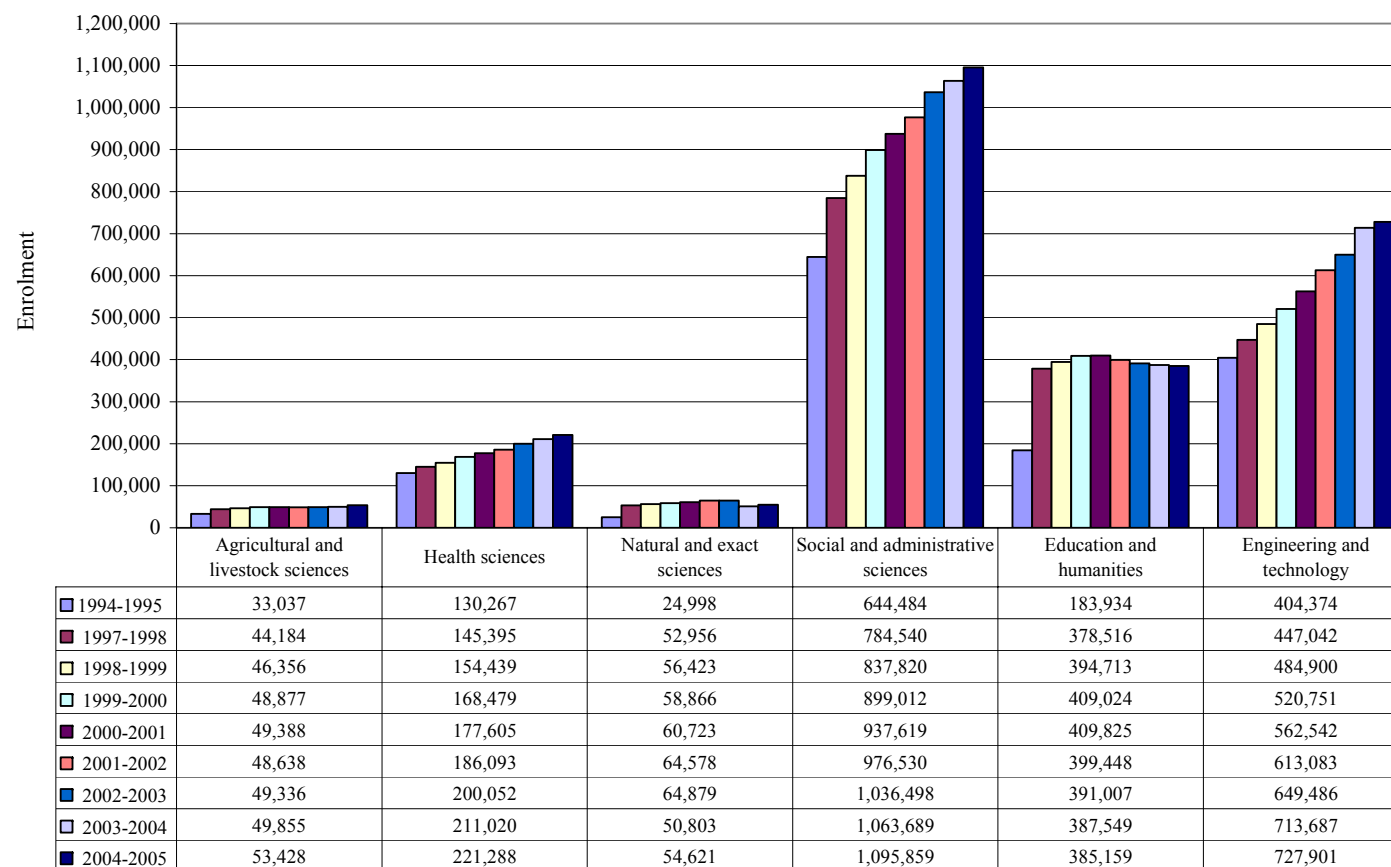
Chart A.7 Public and private share of higher education institutions' especialidad, 5A and 6 level study programmes enrolment* in academic years 1994-2005



* Schooling and open options.

Sources: ANUIES, *Anuario estadístico* 1995; SEP, *Formato 911, ciclos escolares* 1997-2005.

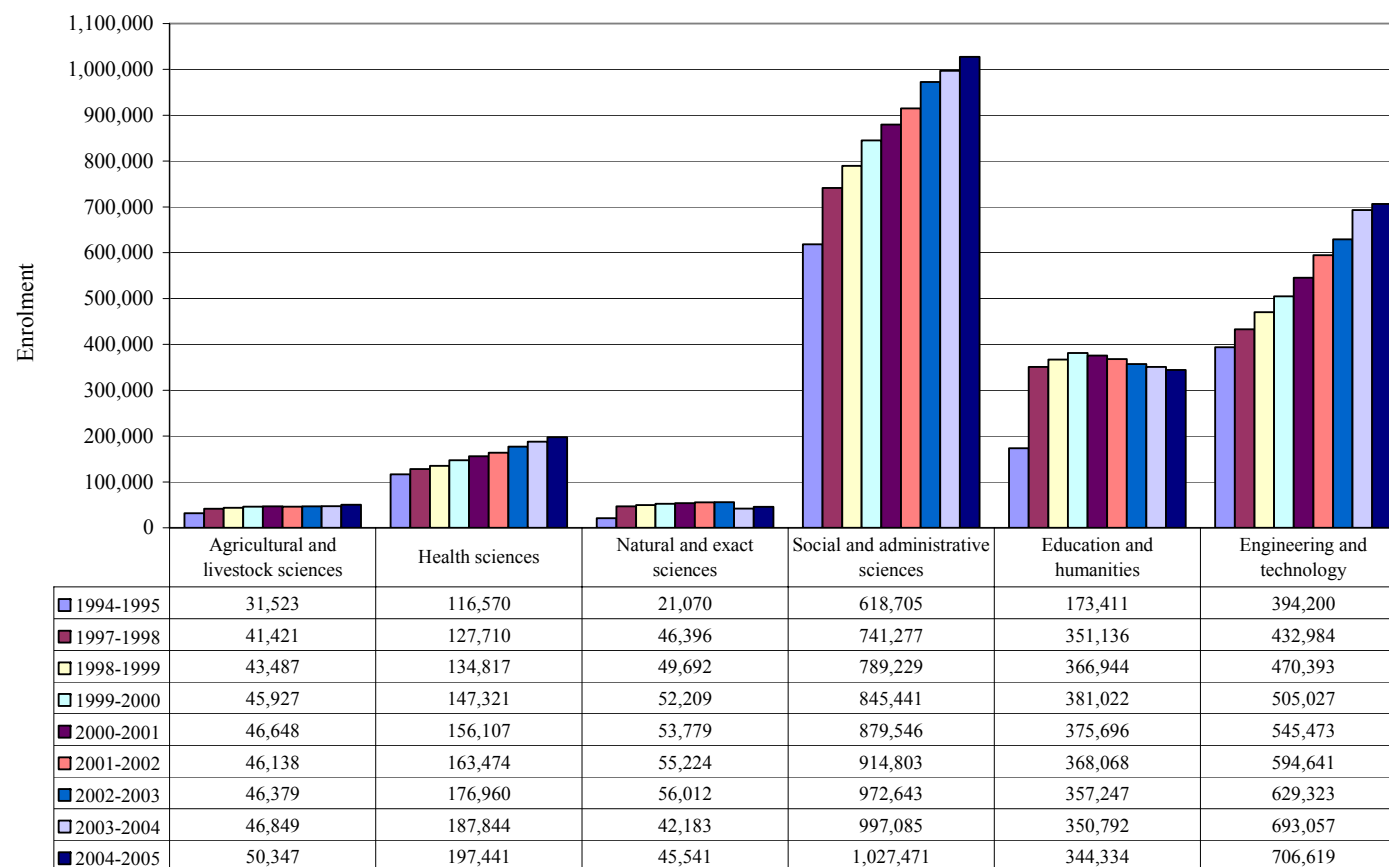
Chart A.8 Higher education institutions' enrolment* by field of knowledge in academic years 1994-2005



* Schooling and open options. Includes 5B2, 5A4, *especialidad*, 5A and 6 level study programmes.

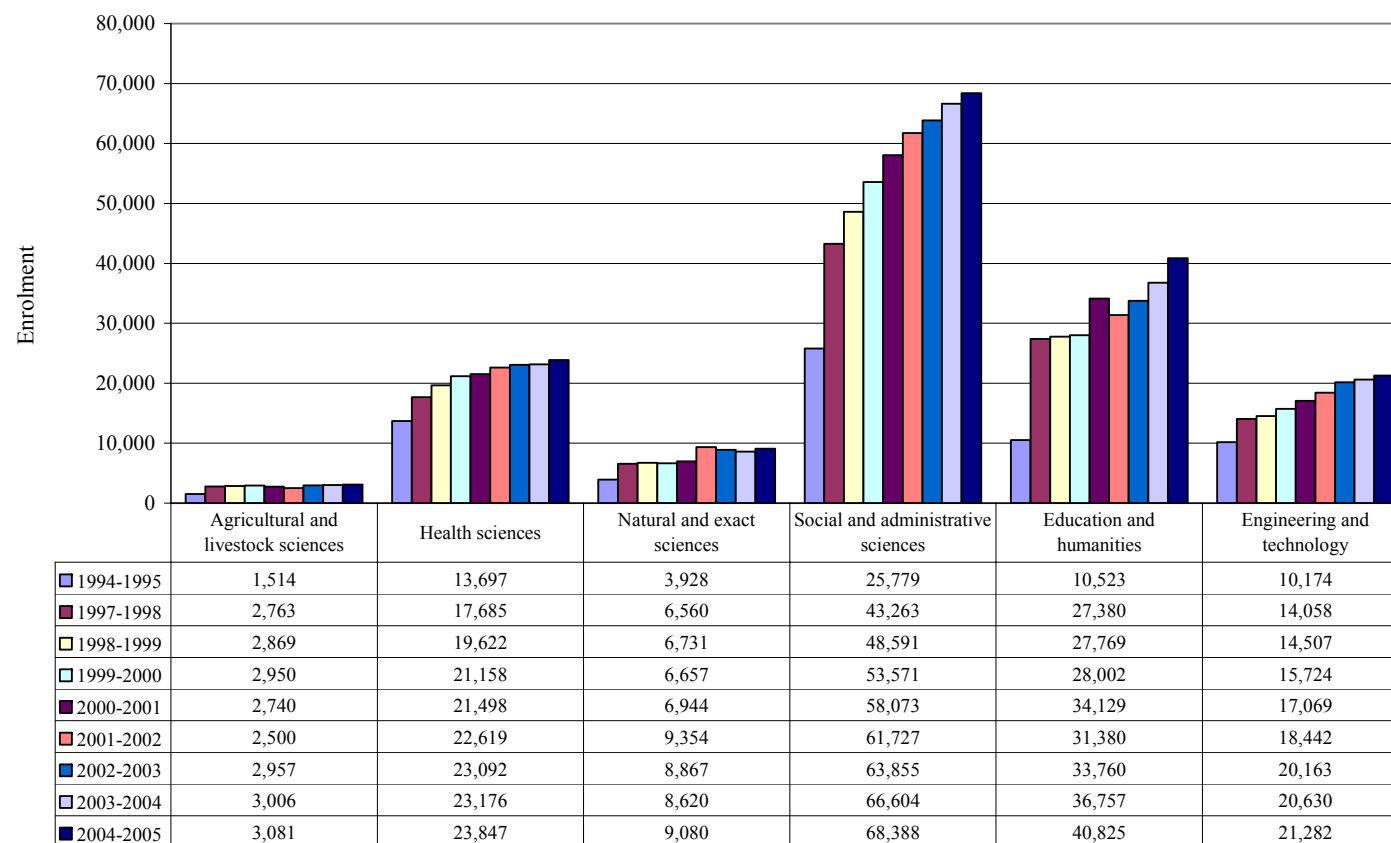
Source: ANUIES, *Anuario estadístico 1995*; SEP, *Formato 911, ciclos escolares 1997-2000*

Chart A.9 Higher education institutions' 5B2 and 5A4 enrolment* by field of knowledge in academic years 1994-2005



* Schooling and open options. Includes 5A4 (*escuelas normales*) level study programmes
 Sources: ANUIES, *Anuario estadístico 1995*; SEP, *Formato 911, ciclos escolares 1997-2005*.

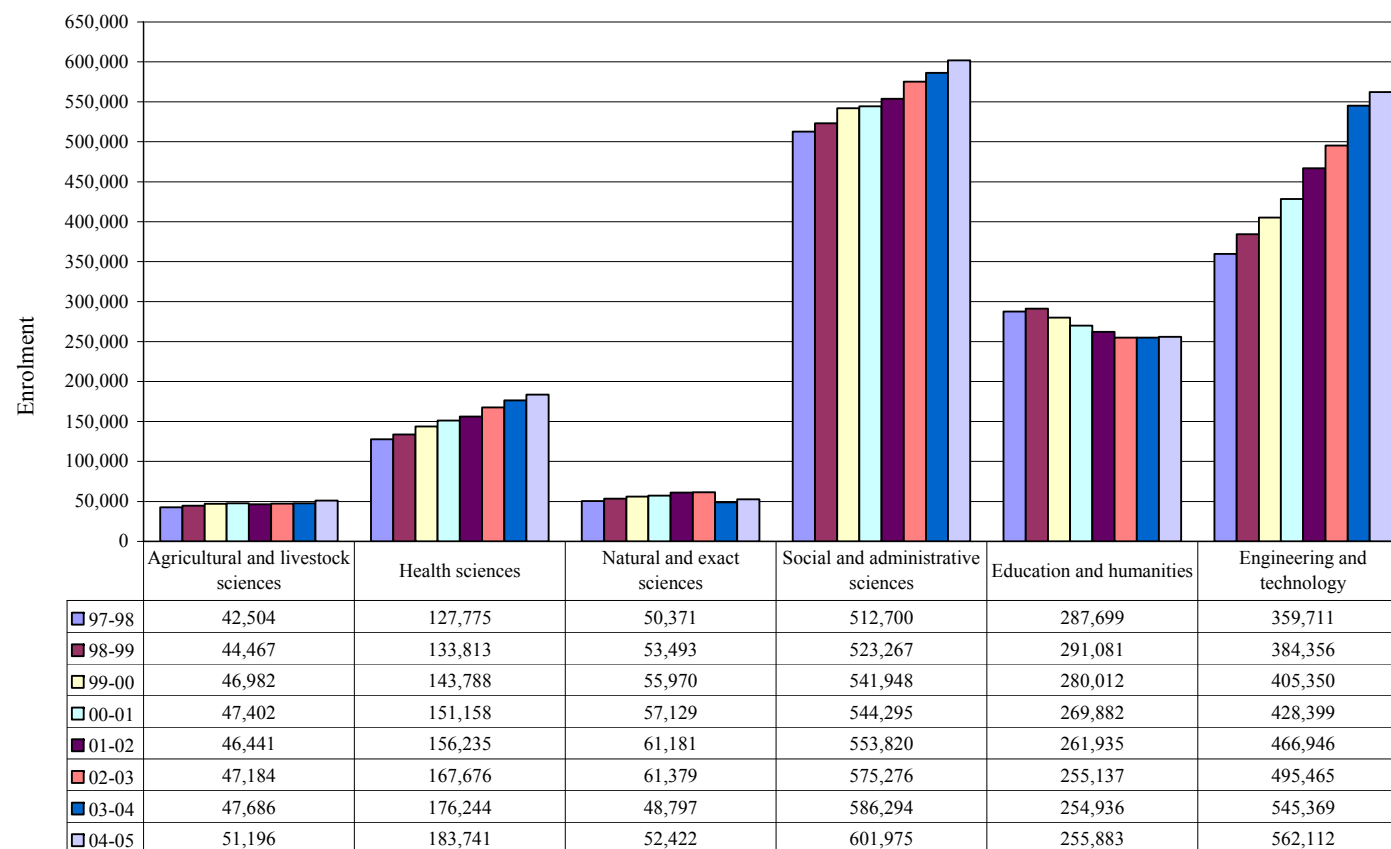
Chart A.10 Higher education institutions' especialidad, 5A and 6 enrolment* by field of knowledge in academic years 1994-2005



* Schooling and open options.

Sources: ANUIES, *Anuario estadístico 1995*; SEP, *Formato 911, ciclos escolares 1997-2005*.

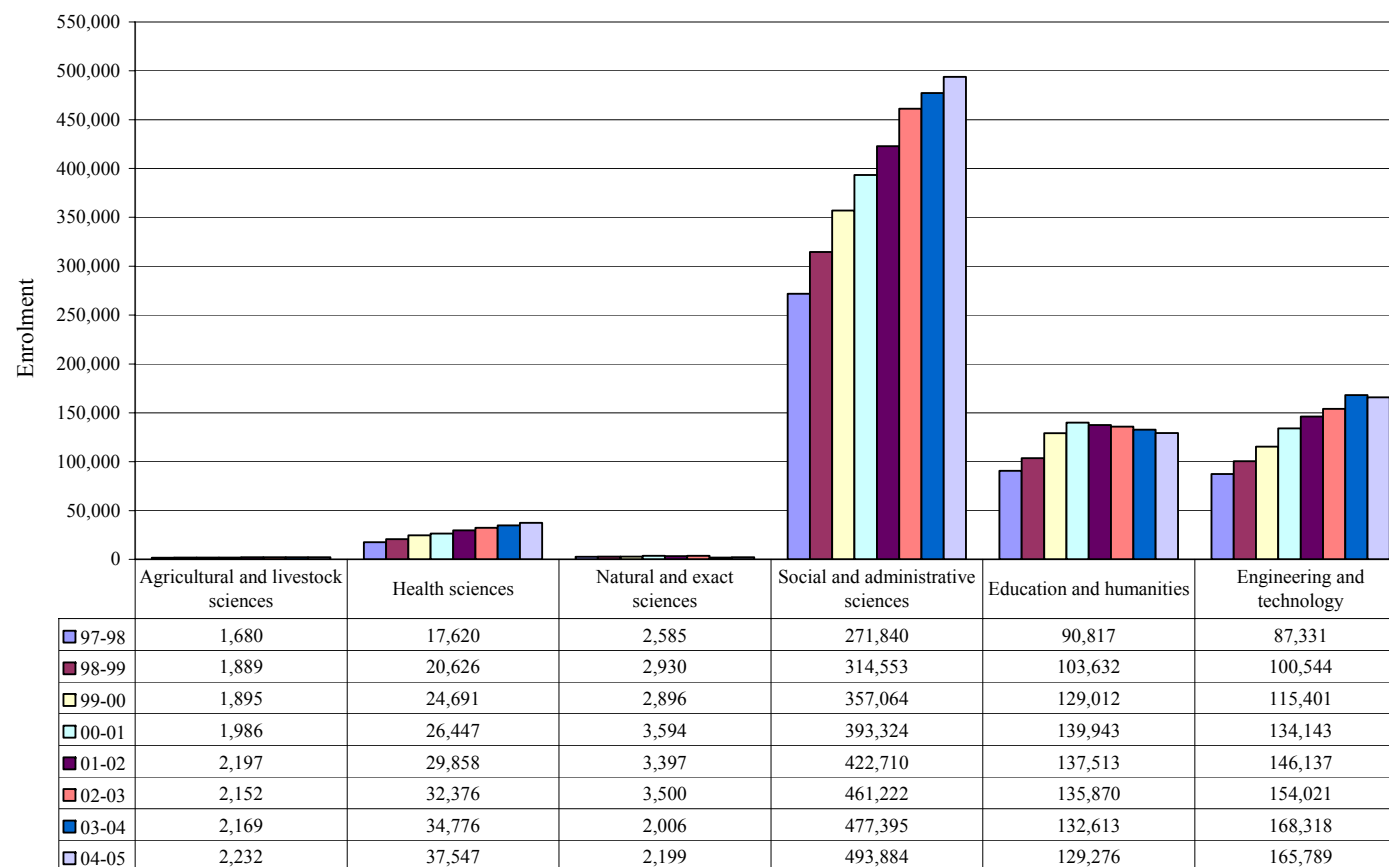
Chart A.11 Enrolment* of public higher education institutions by field of knowledge in academic years 1997-2005



* Schooling and open options. . Includes 5B2, 5A4 (*escuelas normales*), 5A4, *especialidad*, 5A and 6 level study programmes.

Source: SEP, *Formato 911, ciclos escolares 1997-2005*

Chart A.12 Enrolment* of private higher education institutions by field of knowledge in academic years 1997-2005



* Schooling and open options. Includes 5B2, 5A4 (*escuelas normales*), 5A4, *especialidad*, 5A and 6 level study programmes.
Source: SEP, *Formato 911, ciclos escolares 1997-2005*.

Table A.1 Enrolment* of higher education institutions by field of knowledge and ISCED level in academic years 1997-2005

Academic year 1997-1998

ISCED level	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology	Total
5B2	343	2,034	584	6,832	3,490	8,525	21,808
5A4 (escuelas normales)					206,292		206,292
5A4	41,078	125,676	45,812	734,445	141,354	424,459	1,512,824
Subtotal	41,421	127,710	46,396	741,277	351,136	432,984	1,740,924
Especialidad	372	13,571	170	6,493	2,159	1,157	23,922
5A	1,851	3,361	4,185	35,236	23,712	11,897	80,242
6	540	753	2,205	1,534	1,509	1,004	7,545
Subtotal	2,763	17,685	6,560	43,263	27,380	14,058	111,709
Total	44,184	145,395	52,956	784,540	378,516	447,042	1,852,633
Percentage	2.38%	7.85%	2.86%	42.35%	20.43%	24.13%	

Academic year 1998-1999

ISCED level	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology	Total
5B2	582	2,817	485	11,407	4,365	14,992	34,648
5A4 (escuelas normales)					210,544		210,544
5A4	42,905	132,000	49,207	777,822	152,035	455,401	1,609,370
Subtotal	43,487	134,817	49,692	789,229	366,944	470,393	1,854,562
Especialidad	327	15,453	247	7,828	1,745	1,284	26,884
5A	1,986	3,386	4,008	39,213	24,507	12,120	85,220
6	556	783	2,476	1,550	1,517	1,103	7,985
Subtotal	2,869	19,622	6,731	48,591	27,769	14,507	120,089
Total	46,356	154,439	56,423	837,820	394,713	484,900	1,974,651
Percentage	2.35%	7.82%	2.86%	42.43%	19.99%	24.56%	

Academic year 1999-2000

ISCED level	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology	Total
5B2	1,130	3,361	57	15,447	3,345	21,927	45,267
5A4 (escuelas normales)					215,506		215,506
5A4	44,797	143,960	52,152	829,994	162,171	483,100	1,716,174
Subtotal	45,927	147,321	52,209	845,441	381,022	505,027	1,976,947
Especialidad	403	16,387	237	8,202	1,776	1,259	28,264
5A	1,998	3,774	3,818	43,752	24,574	13,228	91,144
6	549	997	2,602	1,617	1,652	1,237	8,654
Subtotal	2,950	21,158	6,657	53,571	28,002	15,724	128,062
Total	48,877	168,479	58,866	899,012	409,024	520,751	2,105,009
Percentage	2.32%	8.00%	2.80%	42.71%	19.43%	24.74%	

Academic year 2000-2001

ISCED level	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology	Total
5B2	1,144	3,511	106	18,715	4,911	27,061	55,448
5A4 (escuelas normales)					200,931		200,931
5A4	45,504	152,596	53,673	860,831	169,854	518,412	1,800,870
Subtotal	46,648	156,107	53,779	879,546	375,696	545,473	2,057,249
Especialidad	228	16,601	222	8,127	2,073	1,880	29,131
5A	1,959	3,834	3,935	47,909	30,374	13,772	101,783
6	553	1,063	2,787	2,037	1,682	1,417	9,539
Subtotal	2,740	21,498	6,944	58,073	34,129	17,069	140,453
Total	49,388	177,605	60,723	937,619	409,825	562,542	2,197,702
Percentage	2.25%	8.08%	2.76%	42.66%	18.65%	25.60%	

* Schooling and open options.

Source: SEP, *Formato 911, ciclos escolares 1997-2005*.

Table A.1 continuation ...

Academic year 2001-2002

ISCED level	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology	Total
5B2	849	3,589	62	21,396	4,855	32,799	63,550
5A4 (escuelas normales)					184,100		184,100
5A4	45,289	159,885	55,162	893,407	179,113	561,842	1,894,698
Subtotal	46,138	163,474	55,224	914,803	368,068	594,641	2,142,348
<i>Especialidad</i>	352	16,599	300	9,218	2,339	2,028	30,836
5A	1,635	4,999	6,415	50,161	26,874	14,703	104,787
6	513	1,021	2,639	2,348	2,167	1,711	10,399
Subtotal	2,500	22,619	9,354	61,727	31,380	18,442	146,022
Total	48,638	186,093	64,578	976,530	399,448	613,083	2,288,370
Percentage	2.13%	8.13%	2.82%	42.67%	17.46%	26.79%	

Academic year 2002-2003

ISCED level	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology	Total
5B2	1,018	3,828	9	23,102	1,016	40,051	69,024
5A4 (escuelas normales)					166,873		166,873
5A4	45,361	173,132	56,003	949,541	189,358	589,272	2,002,667
Subtotal	46,379	176,960	56,012	972,643	357,247	629,323	2,238,564
<i>Especialidad</i>	492	16,803	275	9,903	1,947	1,811	31,231
5A	1,872	5,157	6,000	51,232	29,190	16,705	110,156
6	593	1,132	2,592	2,720	2,623	1,647	11,307
Subtotal	2,957	23,092	8,867	63,855	33,760	20,163	152,694
Total	49,336	200,052	64,879	1,036,498	391,007	649,486	2,391,258
Percentage	2.06%	8.37%	2.71%	43.35%	16.35%	27.16%	

Academic year 2003-2004

ISCED level	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology	Total
5B2	937	3,507	1	26,943	741	43,936	76,065
5A4 (escuelas normales)					155,548		155,548
5A4	45,912	184,337	42,182	970,142	194,503	649,121	2,086,197
Subtotal	46,849	187,844	42,183	997,085	350,792	693,057	2,317,810
<i>Especialidad</i>	351	16,526	173	9,619	2,390	1,849	30,908
5A	2,019	5,259	5,609	53,875	31,533	16,798	115,093
6	636	1,391	2,838	3,110	2,834	1,983	12,792
Subtotal	3,006	23,176	8,620	66,604	36,757	20,630	158,793
Total	49,855	211,020	50,803	1,063,689	387,549	713,687	2,476,603
Percentage	2.01%	8.52%	2.05%	42.95%	15.65%	28.82%	

Academic year 2004-2005

ISCED level	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology	Total
5B2	1,162	5,750	17	31,204	1,030	44,331	83,494
5A4 (escuelas normales)					146,308		146,308
5A4	49,185	191,691	45,524	996,267	196,996	662,288	2,141,951
Subtotal	50,347	197,441	45,541	1,027,471	344,334	706,619	2,371,753
<i>Especialidad</i>	258	17,827	218	10,082	2,395	1,982	32,762
5A	2,137	4,812	6,021	54,480	35,001	16,925	119,376
6	686	1,208	2,841	3,826	3,429	2,375	14,365
Subtotal	3,081	23,847	9,080	68,388	40,825	21,282	166,503
Total	53,428	221,288	54,621	1,095,859	385,159	727,901	2,538,256
Percentage	2.10%	8.72%	2.15%	43.17%	15.17%	28.68%	

* Schooling and open options.

Source: SEP, *Formato 911, ciclos escolares 1997-2005*.

Table A.2 Public and private higher education institutions' enrolment* by field of knowledge and ISCED level in academic years 1997-2005

Academic year 1997-1998	ISCED level	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology	Total
Private	5B2	26	528		1,201	126	505	2,386
	5A4 (escuelas normales)					63,242		63,242
	5A4	1,569	15,009	2,346	249,596	15,427	83,865	367,812
	Subtotal	1,595	15,537	2,346	250,797	78,795	84,370	433,440
	Especialidad	0	1,267	31	3,238	466	219	5,221
	5A	85	779	183	17,600	10,648	2,694	31,989
	6	0	37	25	205	908	48	1,223
	Subtotal	85	2,083	239	21,043	12,022	2,961	38,433
Subtotal private		1,680	17,620	2,585	271,840	90,817	87,331	471,873
Public	5B2	317	1,506	584	5,631	3,364	8,020	19,422
	5A4 (escuelas normales)					143,050		143,050
	5A4	39,509	110,667	43,466	484,849	125,927	340,594	1,145,012
	Subtotal	39,826	112,173	44,050	490,480	272,341	348,614	1,307,484
	Especialidad	372	12,304	139	3,255	1,693	938	18,701
	5A	1,766	2,582	4,002	17,636	13,064	9,203	48,253
	6	540	716	2,180	1,329	601	956	6,322
	Subtotal	2,678	15,602	6,321	22,220	15,358	11,097	73,276
Subtotal public		42,504	127,775	50,371	512,700	287,699	359,711	1,380,760
Total		44,184	145,395	52,956	784,540	378,516	447,042	1,852,633

Academic year 1998-1999	Level	Agricultural sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Technology and engineering	Total
Private	5B2	44	467	0	1,251	208	870	2,840
	5A4 (escuelas normales)					69,875		69,875
	5A4	1,770	17,604	2,703	288,285	20,293	96,111	426,766
	Subtotal	1,814	18,071	2,703	289,536	90,376	96,981	499,481
	Especialidad	33	1,501	36	4,223	599	263	6,655
	5A	42	1,054	160	20,594	11,797	3,219	36,866
	6	0	0	31	200	860	81	1,172
	Subtotal	75	2,555	227	25,017	13,256	3,563	44,693
Subtotal private		1,889	20,626	2,930	314,553	103,632	100,544	544,174
Public	5B2	538	2,350	485	10,156	4,157	14,122	31,808
	5A4 (escuelas normales)					140,669		140,669
	5A4	41,135	114,396	46,504	489,537	131,742	359,290	1,182,604
	Subtotal	41,673	116,746	46,989	499,693	276,568	373,412	1,355,081
	Especialidad	294	13,952	211	3,605	1,146	1,021	20,229
	5A	1,944	2,332	3,848	18,619	12,710	8,901	48,354
	6	556	783	2,445	1,350	657	1,022	6,813
	Subtotal	2,794	17,067	6,504	23,574	14,513	10,944	75,396
Subtotal public		44,467	133,813	53,493	523,267	291,081	384,356	1,430,477
Total		46,356	154,439	56,423	837,820	394,713	484,900	1,974,651

* Schooling and open options.

Source: SEP, *Formato 911, ciclos escolares 1997-2005*.

Table A.2 continuation ...

Academic year 1999-2000	ISCED level	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology	Total
Private	5B2	46	466	0	1,232	130	573	2,447
	5A4 (escuelas normales)					79,630		79,630
	5A4	1,772	20,852	2,736	325,590	34,431	111,357	496,738
	Subtotal	1,818	21,318	2,736	326,822	114,191	111,930	578,815
	Especialidad	23	2,206	15	4,669	758	150	7,821
	5A	54	1,157	141	25,336	13,226	3,200	43,114
	6	0	10	4	237	837	121	1,209
	Subtotal	77	3,373	160	30,242	14,821	3,471	52,144
Subtotal private		1,895	24,691	2,896	357,064	129,012	115,401	630,959
Public	5B2	1,084	2,895	57	14,215	3,215	21,354	42,820
	5A4 (escuelas normales)					135,876		135,876
	5A4	43,025	123,108	49,416	504,404	127,740	371,743	1,219,436
	Subtotal	44,109	126,003	49,473	518,619	266,831	393,097	1,398,132
	Especialidad	380	14,181	222	3,533	1,018	1,109	20,443
	5A	1,944	2,617	3,677	18,416	11,348	10,028	48,030
	6	549	987	2,598	1,380	815	1,116	7,445
	Subtotal	2,873	17,785	6,497	23,329	13,181	12,253	75,918
Subtotal public		46,982	143,788	55,970	541,948	280,012	405,350	1,474,050
Total		48,877	168,479	58,866	899,012	409,024	520,751	2,105,009

Academic year 2000-2001	ISCED level	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology	Total
Private	5B2	46	411	28	1,254	147	665	2,551
	5A4 (escuelas normales)					80,358		80,358
	5A4	1,914	22,927	3,336	359,821	42,334	128,500	558,832
	Subtotal	1,960	23,338	3,364	361,075	122,839	129,165	641,741
	Especialidad	15	2,068	0	4,585	936	782	8,386
	5A	11	1,032	187	27,335	15,400	4,100	48,065
	6	0	9	43	329	768	96	1,245
	Subtotal	26	3,109	230	32,249	17,104	4,978	57,696
Subtotal private		1,986	26,447	3,594	393,324	139,943	134,143	699,437
Public	5B2	1,098	3,100	78	17,461	4,764	26,396	52,897
	5A4 (escuelas normales)					120,573		120,573
	5A4	43,590	129,669	50,337	501,010	127,520	389,912	1,242,038
	Subtotal	44,688	132,769	50,415	518,471	252,857	416,308	1,415,508
	Especialidad	213	14,533	222	3,542	1,137	1,098	20,745
	5A	1,948	2,802	3,748	20,574	14,974	9,672	53,718
	6	553	1,054	2,744	1,708	914	1,321	8,294
	Subtotal	2,714	18,389	6,714	25,824	17,025	12,091	82,757
Subtotal public		47,402	151,158	57,129	544,295	269,882	428,399	1,498,265
Total		49,388	177,605	60,723	937,619	409,825	562,542	2,197,702

* Schooling and open options.

Source: SEP, *Formato 911, ciclos escolares 1997-2005*.

Table A.2 continuation ...

Academic year 2001-2002	ISCED level	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology	Total
Private	5B2	15	448	18	1,057	262	573	2,373
	5A4 (<i>escuelas normales</i>)					73,724		73,724
	5A4	2,158	25,697	2,980	387,466		140,625	606,094
	Subtotal	2,173	26,145	2,998	388,523	121,154	141,198	682,191
	<i>Especialidad</i>	15	1,869	46	4,979	1,129	704	8,742
	5A	9	1,844	304	28,737	14,129	4,139	49,162
	6	0	0	49	471	1,101	96	1,717
	Subtotal	24	3,713	399	34,187	16,359	4,939	59,621
Subtotal private		2,197	29,858	3,397	422,710	137,513	146,137	741,812
Public	5B2	834	3,141	44	20,339	4,593	32,226	61,177
	5A4 (<i>escuelas normales</i>)					110,376		110,376
	5A4	43,131	134,188	52,182	505,941	131,945	421,217	1,288,604
	Subtotal	43,965	137,329	52,226	526,280	246,914	453,443	1,460,157
	<i>Especialidad</i>	337	14,730	254	4,239	1,210	1,324	22,094
	5A	1,626	3,155	6,111	21,424	12,745	10,564	55,625
	6	513	1,021	2,590	1,877	1,066	1,615	8,682
	Subtotal	2,476	18,906	8,955	27,540	15,021	13,503	86,401
Subtotal public		46,441	156,235	61,181	553,820	261,935	466,946	1,546,558
Total		48,638	186,093	64,578	976,530	399,448	613,083	2,288,370

Academic year 2002-2003	ISCED level	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology	Total
Private	5B2	11	510	4	1,328	245	708	2,806
	5A4 (<i>escuelas normales</i>)					65,895		65,895
	5A4	2,125	28,415	3,247	424,437	51,676	147,754	657,654
	Subtotal	2,136	28,925	3,251	425,765	117,816	148,462	726,355
	<i>Especialidad</i>	15	1,995	0	5,685	1,076	677	9,448
	5A	1	1,432	243	29,266	15,641	4,731	51,314
	6	0	24	6	506	1,337	151	2,024
	Subtotal	16	3,451	249	35,457	18,054	5,559	62,786
Subtotal private		2,152	32,376	3,500	461,222	135,870	154,021	789,141
Public	5B2	1,007	3,318	5	21,774	771	39,343	66,218
	5A4 (<i>escuelas normales</i>)					100,978		100,978
	5A4	43,236	144,717	52,756	525,104	137,682	441,518	1,345,013
	Subtotal	44,243	148,035	52,761	546,878	239,431	480,861	1,512,209
	<i>Especialidad</i>	477	14,808	275	4,218	871	1,134	21,783
	5A	1,871	3,725	5,757	21,966	13,549	11,974	58,842
	6	593	1,108	2,586	2,214	1,286	1,496	9,283
	Subtotal	2,941	19,641	8,618	28,398	15,706	14,604	89,908
Subtotal public		47,184	167,676	61,379	575,276	255,137	495,465	1,602,117
Total		49,336	200,052	64,879	1,036,498	391,007	649,486	2,391,258

* Schooling and open options.

Source: SEP, *Formato 911, ciclos escolares 1997-2005*.

Table A.2 continuation

Academic year 2003-2004	ISCED level	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology	Total
Private	5B2	20	555	1	1,169	265	695	2,705
	5A4 (escuelas normales)					59,858		59,858
	5A4	2,107	30,617	1,860	439,963	52,757	162,164	689,468
	Subtotal	2,127	31,172	1,861	441,132	112,880	162,859	752,031
	Especialidad	15	1,941	0	6,027	1,050	853	9,886
	5A	13	1,621	140	29,468	17,203	4,504	52,949
	6	14	42	5	768	1,480	102	2,411
	Subtotal	42	3,604	145	36,263	19,733	5,459	65,246
Subtotal private		2,169	34,776	2,006	477,395	132,613	168,318	817,277
Public	5B2	917	2,952	0	25,774	476	43,241	73,360
	5A4 (escuelas normales)					95,690		95,690
	5A4	43,805	153,720	40,322	530,179	141,746	486,957	1,396,729
	Subtotal	44,722	156,672	40,322	555,953	237,912	530,198	1,565,779
	Especialidad	336	14,585	173	3,592	1,340	996	21,022
	5A	2,006	3,638	5,469	24,407	14,330	12,294	62,144
	6	622	1,349	2,833	2,342	1,354	1,881	10,381
	Subtotal	2,964	19,572	8,475	30,341	17,024	15,171	93,547
Subtotal public		47,686	176,244	48,797	586,294	254,936	545,369	1,659,326
Total		49,855	211,020	50,803	1,063,689	387,549	713,687	2,476,603

Academic year 2004-2005	ISCED level	Agricultural and livestock sciences	Health sciences	Natural and exact sciences	Social and administrative sciences	Education and humanities	Engineering and technology	Total
Private	5B2	24	579	1	1,616	199	740	3,159
	5A4 (escuelas normales)					54,267		54,267
	5A4	2,123	33,406	2,053	452,353	51,229	158,947	700,111
	Subtotal	2,147	33,985	2,054	453,969	105,695	159,687	757,537
	Especialidad	52	2,369	25	6,473	1,046	1,134	11,099
	5A	25	1,176	118	32,212	20,844	4,819	59,194
	6	8	17	2	1,230	1,691	149	3,097
	Subtotal	85	3,562	145	39,915	23,581	6,102	73,390
Subtotal private		2,232	37,547	2,199	493,884	129,276	165,789	830,927
Public	5B2	1,138	5,171	16	29,588	831	43,591	80,335
	5A4 (escuelas normales)					92,041		92,041
	5A4	47,062	158,285	43,471	543,914	145,767	503,341	1,441,840
	Subtotal	48,200	163,456	43,487	573,502	238,639	546,932	1,614,216
	Especialidad	206	15,458	193	3,609	1,349	848	21,663
	5A	2,112	3,636	5,903	22,268	14,157	12,106	60,182
	6	678	1,191	2,839	2,596	1,738	2,226	11,268
	Subtotal	2,996	20,285	8,935	28,473	17,244	15,180	93,113
Subtotal public		51,196	183,741	52,422	601,975	255,883	562,112	1,707,329
Total		53,428	221,288	54,621	1,095,859	385,159	727,901	2,538,256

* Schooling and open options.

Source: SEP, *Formato 911, ciclos escolares 1997-2005*.

Table A.3 Ten most populated 5A4 level study programmes in academic years 1994-1995, 2000-2001 and 2004-2005

Academic year 1994	
Programme	Total
Public accountant	162,348
Law	134,576
Administration	118,679
Midicine	58,122
Industrial engineering	54,937
Architecture	47,434
Computer sciences	40,364
Electronic engineering	36,166
Civil engineering	33,314
Psychology	28,805
Academic year 2000-2001	
Programme	Total
Law	179,641
Administration	138,549
Public accountant	124,226
Industrial engineering	55,039
Computer sciences	53,587
Computer system engineering	51,264
Psychology	47,809
Education plan 94	44,171
Surgeon	39,754
Civil engineering	31,367
Academic year 2004-2005	
Programme	Total
Law	209,031
Administration	169,307
Public accountant	111,987
Psychology	77,914
Industrial engineering	74,603
Computer system engineering	70,184
Computer sciences	54,913
Surgeon	46,256
Education	37,200
Communication sciences	35,472

Sources: ANUIES, Anuario Estadístico 1995; *Formato 911, ciclos escolares 2000-2001 y 2004-2005*

Table A.4 Public and private higher education institutions' graduates by federal entities in academic years 1994-1995, 2000-2001 and 2004-2005

Institutions	State	Academic year 1994-1995		Total	Academic year 2000-2001		Total	Academic year 2004-2005		Total
		5B2 and 5A4	Especialidad , 5A and 6		5B2 and 5A4	Especialidad , 5A and 6		5B2 and 5A4	Especialidad , 5A and 6	
Public	Aguascalientes	1,073	131	1,204	2,378	344	2,722	2,819	379	3,198
	Baja California	3,125	392	3,517	4,200	669	4,869	4,180	448	4,628
	Baja California Sur	311	41	352	727	107	834	629	122	751
	Campeche	972	96	1,068	1,751	301	2,052	1,910	441	2,351
	Chiapas	1,302	7	1,309	3,757	236	3,993	5,229	652	5,881
	Chihuahua	3,251	103	3,354	5,849	722	6,571	7,184	1,089	8,273
	Coahuila	4,281	291	4,572	6,294	488	6,782	8,046	661	8,707
	Colima	900	126	1,026	1,889	266	2,155	2,643	282	2,925
	Distrito Federal	27,287	2,943	30,230	39,219	2,846	42,065	35,829	8,694	44,523
	Durango	980	108	1,088	1,914	177	2,091	3,005	502	3,507
	Estado de México	11,310	938	12,248	13,530	1,645	15,175	15,683	2,159	17,842
	Guanajuato	1,737	496	2,233	3,280	807	4,087	5,192	1,150	6,342
	Guerrero	2,471	167	2,638	6,204	32	6,236	6,091	311	6,402
	Hidalgo	1,042	57	1,099	3,120	710	3,830	4,628	160	4,788
	Jalisco	3,378	380	3,758	7,289	1,502	8,791	14,230	2,162	16,392
	Michoacán	3,692	106	3,798	5,365	482	5,847	6,838	929	7,767
	Morelos	957	259	1,216	2,036	589	2,625	3,017	583	3,600
	Nayarit	1,069	112	1,181	1,815	51	1,866	2,676	296	2,972
	Nuevo León	6,859	731	7,590	8,350	1,005	9,355	9,775	1,323	11,098
	Oaxaca	2,461	101	2,562	5,121	104	5,225	6,372	135	6,507
	Puebla	6,775	203	6,978	8,862	141	9,003	9,208	606	9,814
	Querétaro	1,113	148	1,261	2,869	385	3,254	3,913	580	4,493
	Quintana Roo	268	0	268	919	2	921	1,189	41	1,230
	San Luis Potosí	1,943	204	2,147	3,927	405	4,332	3,896	481	4,377
	Sinaloa	4,877	203	5,080	8,559	369	8,928	9,731	697	10,428
	Sonora	3,107	148	3,255	6,361	196	6,557	7,196	499	7,695
	Tabasco	1,831	66	1,897	4,653	304	4,957	5,413	220	5,633
	Tamaulipas	4,221	21	4,242	4,554	517	5,071	7,861	1,140	9,001
	Tlaxcala	1,003	108	1,111	2,202	285	2,487	2,543	203	2,746
	Veracruz	3,857	413	4,270	12,678	1,366	14,044	11,581	1,270	12,851
	Yucatán	1,843	345	2,188	2,352	444	2,796	2,998	589	3,587
	Zacatecas	1,299	106	1,405	1,975	401	2,376	2,579	626	3,205
Total public		110,595	9,550	120,145	183,999	17,898	201,897	214,084	29,430	243,514

Sources: ANUIES, *Anuario Estadístico 1995*; SEP, *Formato 911, ciclos escolares 2000-2001 y 2004-2005*.

Table A.4 continuation ...

Institutions	State	Academic year 1994-1995			Academic year 2000-2001			Academic year 2004-2005		
		5B2 and 5A4	Especialidad , 5A and 6	Total	5B2 and 5A4	Especialidad , 5A and 6	Total	5B2 and 5A4	Especialidad , 5A and 6	Total
Private	Aguascalientes	74	0	74	295	6	301	604	223	827
	Baja California	367	96	463	1,318	295	1,613	1,790	192	1,982
	Baja California Sur	0	0	0	0	0	0	449	53	502
	Campeche	0	0	0	83	0	83	165	211	376
	Chiapas	943	0	943	1,768	232	2,000	4,756	1,291	6,047
	Chihuahua	365	17	382	1,174	146	1,320	1,642	182	1,824
	Coahuila	1,185	96	1,281	1,846	505	2,351	2,173	326	2,499
	Colima	31	0	31	106	0	106	72	0	72
	Distrito Federal	10,835	1,715	12,550	18,204	5,829	24,033	21,953	4,962	26,915
	Durango	102	0	102	372	194	566	514	203	717
	Estado de México	4,113	497	4,610	4,770	901	5,671	10,818	2,727	13,545
	Guanajuato	1,884	464	2,348	2,493	579	3,072	5,771	1,622	7,393
	Guerrero	0	0	0	307	285	592	751	446	1,197
	Hidalgo	73	0	73	512	50	562	1,400	484	1,884
	Jalisco	3,566	226	3,792	6,630	882	7,512	10,508	1,628	12,136
	Michoacán	415	24	439	875	7	882	1,516	126	1,642
	Morelos	342	19	361	1,020	64	1,084	2,325	213	2,538
	Nayarit	0	25	25	220	9	229	612	11	623
	Nuevo León	4,821	402	5,223	5,814	719	6,533	8,232	1,193	9,425
	Oaxaca	185	43	228	525	81	606	1,061	449	1,510
	Puebla	2,291	184	2,475	3,612	1,210	4,822	5,959	2,021	7,980
	Querétaro	474	13	487	652	71	723	1,346	246	1,592
	Quintana Roo	0	0	0	121	125	246	259	29	288
	San Luis Potosí	129	0	129	521	132	653	1,058	287	1,345
	Sinaloa	328	0	328	443	70	513	1,438	383	1,821
	Sonora	429	27	456	548	49	597	1,083	294	1,377
	Tabasco	7	0	7	154	103	257	525	289	814
	Tamaulipas	1,666	178	1,844	2,937	1,494	4,431	5,320	1,060	6,380
	Tlaxcala	58	0	58	145	0	145	323	7	330
	Veracruz	599	30	629	3,608	585	4,193	7,615	1,222	8,837
	Yucatán	455	0	455	1,143	125	1,268	2,385	290	2,675
	Zacatecas	88	26	114	93	100	193	315	158	473
Total private		35,825	4,082	39,907	62,309	14,848	77,157	104,738	22,828	127,566

Sources: ANUIES, *Anuario Estadístico* 1995; SEP, *Formato 911, ciclos escolares 2000-2001 y 2004-2005*.

Table A.4 continuation

<i>Institutos</i>	<i>Academic year 1994-1995</i>		Total	<i>Academic year 2000-2001</i>		Total	<i>Academic year 2004-2005</i>		Total
	5B2 and 5A4	<i>Especialidad</i> , 5A and 6		5B2 and 5A4	<i>Especialidad</i> , 5A and 6		5B2 and 5A4	<i>Especialidad</i> , 5A and 6	
Subtotal public	110,595	9,550	120,145	183,999	17,898	201,897	214,084	29,430	243,514
Subtotal private	35,825	4,082	39,907	62,309	14,848	77,157	104,738	22,828	127,566
Total	146,420	13,632	160,052	246,308	32,746	279,054	318,822	52,258	371,080

Sources: ANUIES, *Anuario Estadístico 1995*; SEP, *Formato 911, ciclos escolares 2000-2001 y 2004-2005*.

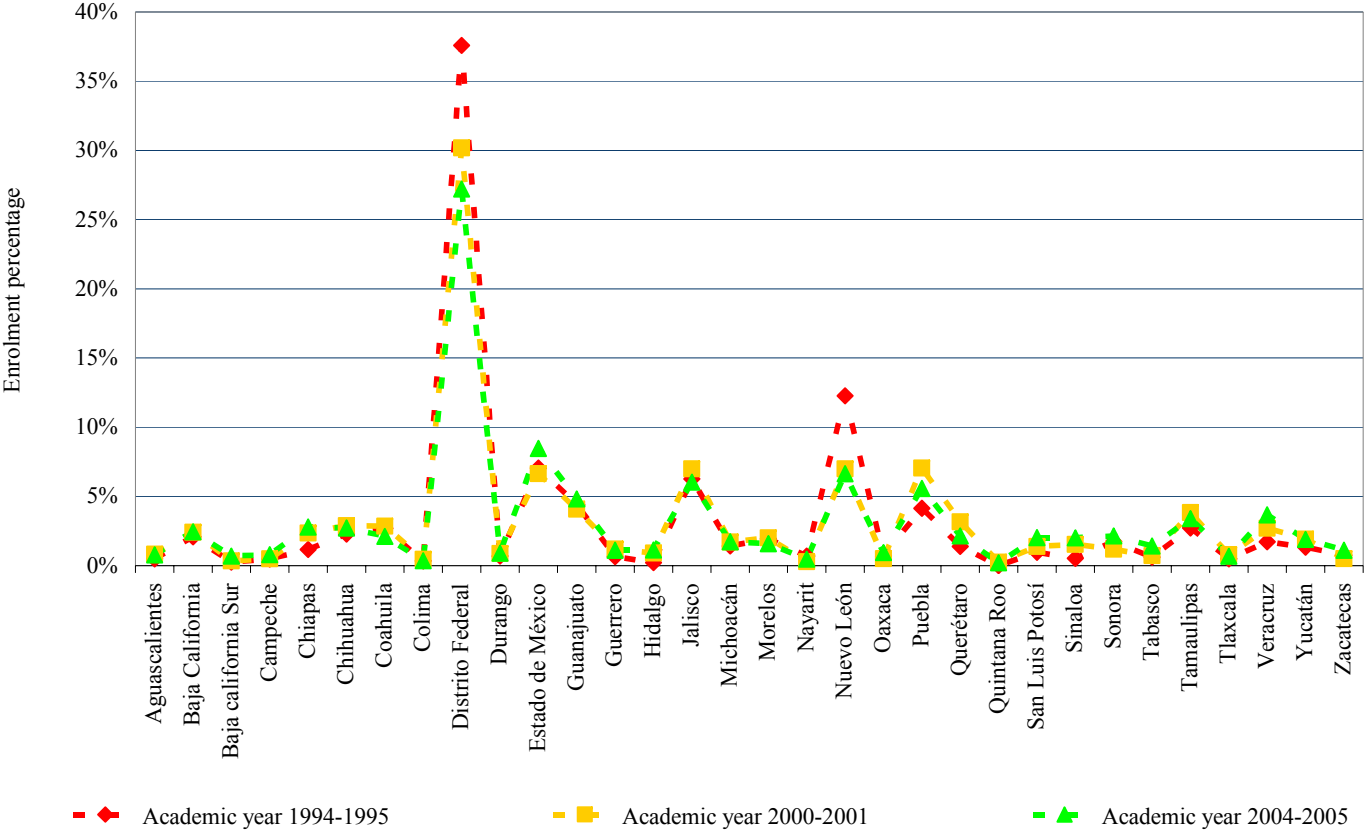
Table A.5 Enrolment* in especialidad, 5A, and 6 level study programmes by federal entities in academic years 1994-1995, 2000-2001 and 2004-2005

State	Academic year 1994-1995					Academic year 2000-2001					Academic year 2004-2005				
	Especialidad	5A	6	Total	%	Especialidad	5A	6	Total	%	Especialidad	5A	6	Total	%
Aguascalientes	225	78	21	324	0.49%	217	879	61	1,157	0.82%	78	1,205	24	1,307	0.78%
Baja California	279	913	170	1,362	2.08%	344	2,642	420	3,406	2.43%	425	3,014	651	4,090	2.46%
Baja California Sur	32	133	0	165	0.25%	1	376	97	474	0.34%	8	980	159	1,147	0.69%
Campeche	165	141	0	306	0.47%	258	421		679	0.48%	232	1,077	24	1,333	0.80%
Chiapas	240	512	15	767	1.17%	306	2,992	1	3,299	2.35%	521	4,079	33	4,633	2.78%
Chihuahua	204	1,277	16	1,497	2.28%	339	3,641	74	4,054	2.89%	257	4,122	144	4,523	2.72%
Coahuila	180	1,547	40	1,767	2.69%	428	3,447	130	4,005	2.85%	490	2,787	239	3,516	2.11%
Colima	24	175	20	219	0.33%	68	500	63	631	0.45%	106	390	83	579	0.35%
Distrito Federal	9,191	12,167	3,306	24,664	37.59%	15,610	21,719	5,053	42,382	30.18%	16,406	22,441	6,441	45,288	27.20%
Durango	98	359	0	457	0.70%	166	951	115	1,232	0.88%	228	1,188	74	1,490	0.89%
Estado de México	1,436	3,035	150	4,621	7.04%	1,630	7,031	676	9,337	6.65%	3,140	9,963	1,006	14,109	8.47%
Guanajuato	915	1,824	152	2,891	4.41%	762	4,403	546	5,711	4.07%	1,045	6,225	758	8,028	4.82%
Guerrero	54	367	4	425	0.65%	25	1,602	59	1,686	1.20%	8	1,813	40	1,861	1.12%
Hidalgo	52	96	0	148	0.23%	786	500	1	1,287	0.92%	970	810	96	1,876	1.13%
Jalisco	1,966	1,994	149	4,109	6.26%	1,900	7,565	365	9,830	7.00%	2,021	7,526	489	10,036	6.03%
Michoacán	116	811	8	935	1.42%	178	2,117	93	2,388	1.70%	183	2,478	210	2,871	1.72%
Morelos	45	1,177	52	1,274	1.94%	446	1,902	477	2,825	2.01%	245	1,770	632	2,647	1.59%
Nayarit	72	386	0	458	0.70%	68	309	15	392	0.28%	156	623	20	799	0.48%
Nuevo León	503	7,350	193	8,046	12.26%	484	9,081	254	9,819	6.99%	929	9,617	523	11,069	6.65%
Oaxaca	136	314	5	455	0.69%	177	496	43	716	0.51%	141	1,375	56	1,572	0.94%
Puebla	492	2,132	93	2,717	4.14%	888	8,663	337	9,888	7.04%	814	7,922	548	9,284	5.58%
Querétaro	246	651	10	907	1.38%	469	3,900	68	4,437	3.16%	789	2,568	211	3,568	2.14%
Quintana Roo				0	0.00%	29	327		356	0.25%	15	321	13	349	0.21%
San Luis Potosí	345	257	27	629	0.96%	381	1,511	62	1,954	1.39%	443	2,777	154	3,374	2.03%
Sinaloa	136	208	0	344	0.52%	565	1,550	46	2,161	1.54%	632	1,984	733	3,349	2.01%
Sonora	22	1,113	5	1,140	1.74%	215	1,420	19	1,654	1.18%	138	3,334	94	3,566	2.14%
Tabasco	287	112	0	399	0.61%	185	833		1,018	0.72%	178	2,148	26	2,352	1.41%
Tamaulipas	306	1,452	27	1,785	2.72%	338	4,880	172	5,390	3.84%	329	5,130	191	5,650	3.39%
Tlaxcala	52	259	7	318	0.48%	112	958	45	1,115	0.79%	109	936	79	1,124	0.68%
Veracruz	378	725	27	1,130	1.72%	1,033	2,630	125	3,788	2.70%	1,061	4,758	277	6,096	3.66%
Yucatán	473	384	16	873	1.33%	534	2,044	95	2,673	1.90%	417	2,583	152	3,152	1.89%
Zacatecas	90	393	0	483	0.74%	189	493	27	709	0.50%	248	1,432	185	1,865	1.12%
Total	18,760	42,342	4,513	65,615	100%	29,131	101,783	9,539	140,453	100%	32,762	119,376	14,365	166,503	100%

* Schooling and open options.

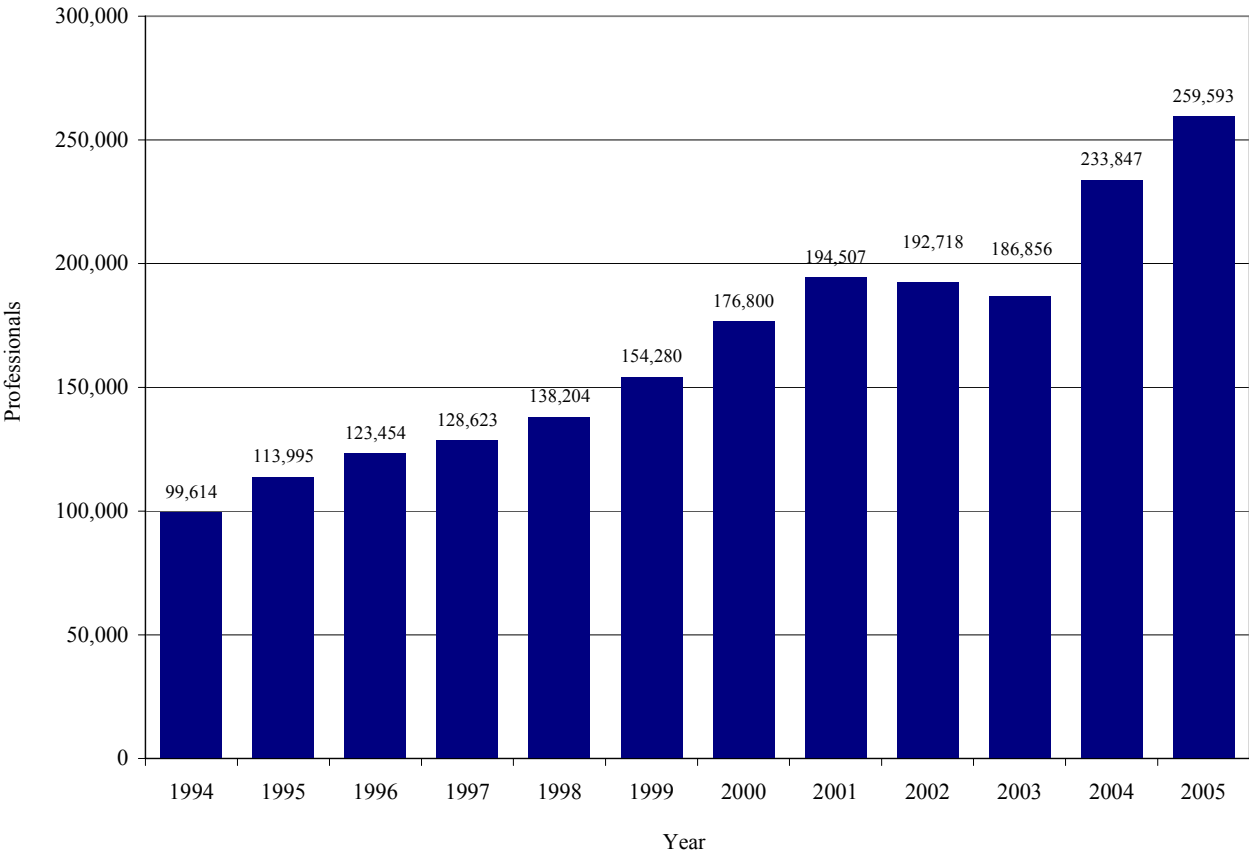
Sources: ANUIES, *Anuario Estadístico 1995*; SEP, *Formato 911, ciclos escolares 2000-2001 y 2004-2005*.

Chart A.13 Enrolment* share in especialidad, 5A and 6 level study programmes by federal entities in academic years 1994-1995, 2000-2001 and 2004-2005



* Schooling and open options.
Sources: ANUIES, *Anuario Estadístico 1995*; SEP, *Formato 911, ciclos escolares 2000-2001 y 2004-2005*.

Chart A.14 Professional licences issued by SEP’s General Directorate of Professions during the 1994-2005 period



Source: SEP, 1994-2005.

Chart A.15 Professional licences issued by SEP's General Directorate of Professions during the 1994-2005 period

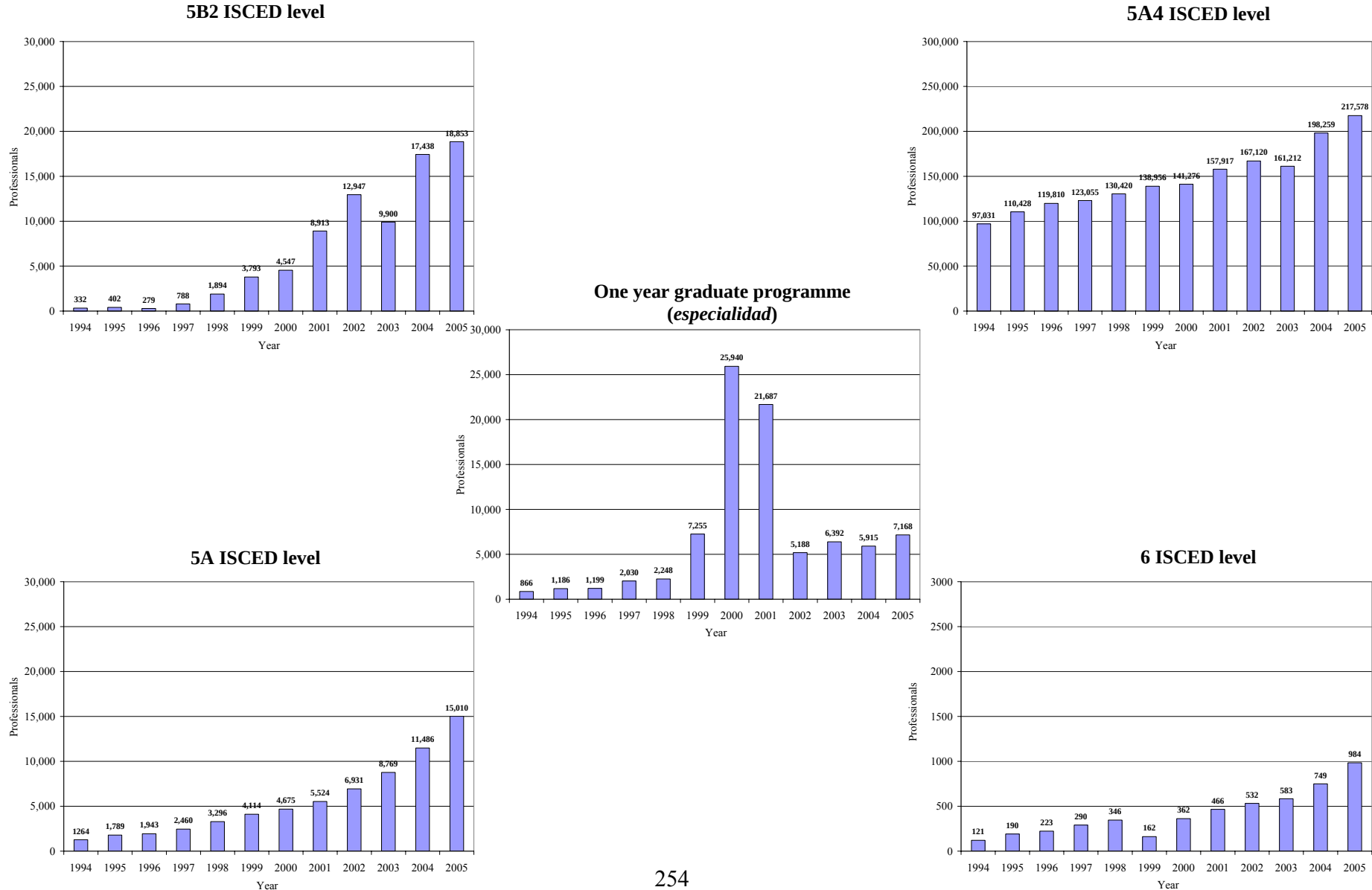
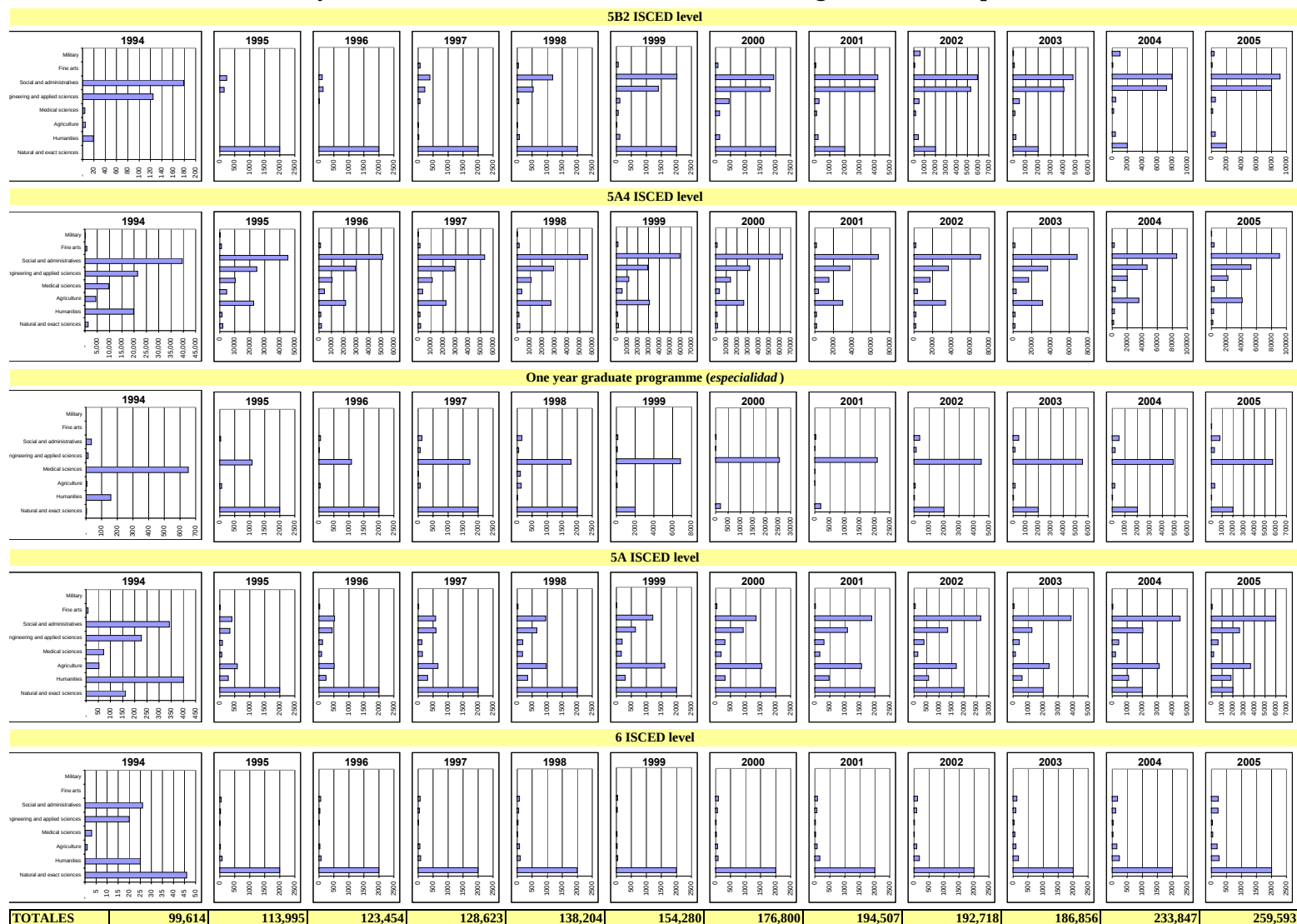


Table A.6 Professional licences issued by SEP's General Directorate of Professions during the 1994-2005 period

5B2 ISCED level												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Natural and exact sciences	-	-	-	26	70	118	136	221	408	231	425	506
Humanities	19	6	7	11	12	17	1	3	9	9	16	15
Agriculture	5	7	5	6	5	63	131	130	164	148	201	180
Medical sciences	4	5	19	66	54	117	449	287	471	506	461	520
Engineering and applied sciences	125	149	139	221	532	1,399	1,811	3,991	5,305	4,067	7,255	8,015
Social and administratives	179	235	109	391	1,181	2,016	1,940	4,204	5,939	4,798	7,957	9,146
Fine arts	-	-	-	67	39	63	78	77	71	106	82	101
Military	-	-	-	-	1	-	1	-	580	35	1,041	370
5A4 ISCED level												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Natural and exact sciences	1,317	1,488	1,555	1,508	1,460	1,147	1,507	1,782	2,158	2,211	2,866	2,906
Humanities	19,811	22,536	21,348	22,378	26,935	30,849	26,301	29,872	33,687	31,596	35,644	41,169
Agriculture	4,375	4,640	4,473	3,630	3,723	5,380	3,584	3,999	3,678	3,464	4,052	3,765
Medical sciences	9,671	10,249	10,583	11,307	11,161	11,508	13,951	15,070	17,109	16,529	20,028	22,106
Engineering and applied sciences	21,370	24,690	29,295	29,119	29,118	29,268	31,848	37,482	36,969	36,895	46,648	52,750
Social and administratives	39,592	45,440	51,121	53,301	56,325	59,235	62,497	67,836	71,240	68,373	86,073	90,836
Fine arts	767	1,211	1,247	1,478	1,481	1,436	1,497	1,783	2,073	2,015	2,808	3,604
Military	128	174	188	334	217	133	91	93	206	129	140	442
One year graduate programme (especialidad)												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Natural and exact sciences	3	-	1	4	10	10	17	24	43	35	22	29
Humanities	158	61	42	73	135	85	60	103	100	160	209	309
Agriculture	5	6	2	15	105	55	21	158	9	13	15	8
Medical sciences	653	1,080	1,085	1,729	1,794	6,835	25,569	20,890	4,495	5,554	4,885	5,715
Engineering and applied sciences	13	7	17	76	48	107	96	138	154	168	225	276
Social and administratives	34	32	52	132	155	160	176	372	385	456	551	801
Fine arts	-	-	-	1	1	3	1	2	2	6	8	30
Military	-	-	-	-	-	-	-	-	-	-	-	-
5A ISCED level												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Natural and exact sciences	162	286	237	320	344	290	318	478	589	605	1,090	1,822
Humanities	400	586	506	662	967	1,611	1,539	1,560	1,700	2,402	3,136	3,661
Agriculture	53	68	92	144	174	162	188	171	161	163	225	213
Medical sciences	72	92	121	133	184	192	312	308	398	412	431	616
Engineering and applied sciences	227	338	441	596	651	636	922	1,090	1,352	1,264	2,040	2,622
Social and administratives	342	405	518	583	948	1,214	1,353	1,895	2,674	3,863	4,520	6,002
Fine arts	8	14	28	22	28	8	43	22	57	60	44	74
Military	-	-	-	-	-	1	-	-	-	-	-	-
6 ISCED level												
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Natural and exact sciences	46	81	73	87	103	42	86	172	183	180	239	260
Humanities	25	21	34	60	74	28	70	77	95	97	155	190
Agriculture	1	2	3	7	16	20	29	29	18	57	29	41
Medical sciences	3	9	17	18	28	4	18	20	22	32	30	39
Engineering and applied sciences	20	28	34	48	48	31	65	76	92	89	118	223
Social and administratives	26	49	60	68	76	36	94	88	120	128	173	226
Fine arts	-	-	2	2	1	1	-	4	2	-	5	5
Military	-	-	-	-	-	-	-	-	-	-	-	-
Total	99,614	113,995	123,454	128,623	138,204	154,280	176,800	194,507	192,718	186,856	233,847	259,593

Source: SEP, 1994-2005.

Chart A.16 Professional licenses issued by SEP's General Directorate of Professions during the 1994-2005 period



Source: SEP, 1994-2005.