CHAPTER 9

The Long Road toward Excellence in Mexico: The Monterrey Institute of Technology

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Following a trend common in other countries, in its recent history Mexico has aspired to develop some of its higher education institutions to the level of research-oriented peer universities of excellence. From a public sector standpoint, major efforts have been devoted to this pursuit by the National Autonomous University of Mexico1 (Universidad Nacional Autónoma de México, or UNAM), while a private institution—the Technological Institute of Higher Education Studies of Monterrey (Instituto Tecnológico y de Estudios Superiores de Monterrey, or ITESM)2—has embarked on a similar yet distinct path of its own. Because many scholars have studied UNAM,3 whereas ITESM has been less researched, this chapter attempts to contribute to a better understanding of ITESM, with special emphasis on its main campus located in the city of Monterrey.

In recent years, ITESM has developed a respectable reputation, both in Mexico and abroad, as a successful, high-quality institution. ITESM was founded in 1943 in the city of Monterrey, the capital of the northern state of Nuevo León. In recent years, it has expanded nationally through branch campuses established in most states of Mexico and internationally
through remote cities in other countries, although it concentrates most of its research capabilities at its flagship campus in Monterrey. ITESM constitutes a good case for analysis considering its unique history, distinct characteristics, and officially expressed aspiration to become a top research university “a la Mexicana.” Using the model developed by Jamil Salmi (2009)—in which he identifies a number of features as being prevalent among world-class research universities—this chapter analyzes the main characteristics of ITESM to argue that, although ITESM is an institution in which many key operational components are concordant with these features, its overall research development is still small and is comparatively limited in scope. Most important among the features that Salmi identifies are the institution’s ability to attract talent, its access to resources, and its governance model.

Many scholars argue that because of its unique history and evolution, ITESM is somewhat atypical of the structure of higher education in Mexico (Gacel-Ávila 2005; Ortega 1997; Rhoades et al. 2004). ITESM is sometimes criticized for its work, emphasis, and educational model; sometimes admired for its success on many fronts; sometimes associated with a hidden agenda of the Mexican business elite; and sometimes ignored in the development and implementation of educational policies in Mexico. Nevertheless, ITESM is also recognized as an important higher education institution in Latin America and sometimes acclaimed as the best institution in Mexico (Elizondo 2000; Gómez 1997).

Regarding research, it was not until 1996 that ITESM leadership officially declared its intention for ITESM to become a research university. Consequently, ITESM’s race to excellence in research is still relatively new, and it has concentrated mostly on the Monterrey city campus. Certainly, as is analyzed in this chapter, the flagship campus of ITESM has embarked on a path to achieve the status of world-class research university but has yet to reach that goal.

A Brief Historical and Contextual Analysis of the System

In Mexico, public and private higher education subsectors have important differences, which should be analyzed to contextualize the history and role of ITESM. The Mexican higher education system is relatively young despite the fact that the Real y Pontificia Universidad de México, which is regarded as the first predecessor of UNAM, was established in 1553. UNAM adopted its current status as national and autonomous in 1929. Some years later, especially in the 1940s and 1950s, public state universities began to
be established in various states of Mexico. In general, these institutions followed the academic and organizational model of UNAM, which consisted of traditional, professionally oriented academic programs, offered mostly at the undergraduate level and taught mostly by part-time teachers; the election of a rector and deans from among the faculty members; and the recruitment of both full- and part-time faculty members from among recent graduates and local professionals. In general, the governance model adopted by public universities in the country included an assembly-based authority—the University Council—composed of faculty members, students, and deans. The rapid proliferation of public universities was seen by some sectors—especially the influential Roman Catholic Church and the business organizations—as unbalanced or inadequate for the needs of their constituents. These sectors exercised pressure on the government that eventually led to the authorization to establish a few private universities, including ITESM in 1943.

The funding model for public institutions in most states was—and remains to this day—based on public subsidies that cover most of the operational costs. Public institutions, in general, charge very little—sometimes merely symbolic—tuition and fees to students regardless of their economic situation. In contrast, the operations of private universities such as ITESM are funded primarily by tuition and student fees, in addition to sales of services, private tax deductible donations, and even, in some cases, proceeds from the organization of lotteries. Private universities are not generally entitled to public funding, although a few exceptions are made in the case of competitively based financial support for certain specific research or consulting services, or where indirect participation is permitted in funded projects in partnership with public institutions.

During the second half of the 20th century, higher education in Mexico experienced tremendous growth. National enrollment in higher education rose from 30,000 in 1950 to almost 3 million in 2008. The demand was created by rapid population growth (from 25 million in 1950 to 103 million in 2005) and by rapid urbanization during that time. This demand was addressed by massive growth in the offering of academic programs, the expansion of enrollment in public universities, and the establishment of new types of postsecondary institutions. At the same time, especially in the 1990s, many private universities were established because of a relaxed authorization policy from government authorities more concerned with reducing demographic pressures on public higher education than with ensuring the quality of academic programs.
During the 1990s, the main emphasis of public higher education institutions was teaching, with a limited effort made on research. In addition, private universities in general were—and still are—dedicated mainly to the teaching of academic programs, especially low-cost programs requiring limited investment in laboratories and research infrastructure. Quality-assurance mechanisms applicable to both public and private universities were not in place until relatively recently. It was not until the final years of the 20th century and the first decade of the 21st century that a visible process of institutional differentiation emerged.

Today, most large, public flagship universities and a select number of advanced private universities place increased emphasis on research. At the same time—because a national framework for external peer-review-based accreditation of academic programs, applicable to both public and private institutions, has been progressively solidifying and gaining public acceptance (Malo and Fortes 2004)—institutions tend to differentiate themselves by having their programs accredited.

A variety of factors, including more refined government policies, national government decentralization, and institutional diversification, among others, have played a role in this recent developmental process (Brunner et al. 2006), which must be analyzed in the context of the overall evolution of Mexican society (Rubio 2006). The higher education system as a whole also has been influenced by the opening of the Mexican economy and society to the world, which has led to an increased awareness of international practices (Maldonado-Maldonado 2003) and more frequent contact with international research and academic networks.

In summary, the landscape of higher education in Mexico has changed rapidly in recent years in terms of its size, complexity, and diversification. In 2008, the entire national system comprised 2,442 higher education institutions, of which 843 were public and the remaining 1,599 were private. In those institutions, there were 2,814,871 students, of which 65.7 percent were enrolled in public institutions and 34.3 percent were enrolled in private institutions (Tuirán 2008). The growth of the system is impressive, considering that 60 years previously national enrollment in higher education totaled only about 30,000 students in just a few institutions, including ITESM, which had only about 200 students.

The Foundation and History of ITESM

In the analysis of the reasons for the creation and further development of ITESM, it becomes clear why the institution emerged in the state of
Nuevo León. Located in the northeastern part of Mexico, bordering the U.S. state of Texas, the state of Nuevo León is the major hub for trade between Mexico and the United States. Its capital city, Monterrey, is known as the financial capital of Mexico. In general, the most important regional competitiveness indexes consistently rank the state of Nuevo León as the second-most competitive in the country after the federal district (OECD 2009), and the third-largest state economy in Mexico.

Industrial activity in the state has been transitioning in recent years from a low-value-added manufacturing base toward a more sophisticated high-value-added base. Also, living conditions in Nuevo León exceed average national levels.

Nuevo León has a well-known entrepreneurial culture that spans generations. Its geographic location and the metropolitan character of the population are important factors explaining the economic development of the area, the entrepreneurial attitude of its business community, and the international approach of both the regional economy and the universities in Nuevo León (Mora, Marmolejo, and Pavlakovich 2006). Such factors played a major role in the foundation and further development of ITESM.

The state is served by 43 higher education institutions. The public Autonomous University of Nuevo León is the largest (third in the country with more than 120,000 students), followed by ITESM.

**Founding of ITESM**

The rapid industrialization of Nuevo León, in the early 1940s, required the availability of properly trained professionals and technicians and the consequent expansion of higher education institutions and their academic offerings. In consideration of the incipient development of public higher education institutions, a group of industrialists led by a prominent entrepreneur from the city of Monterrey, Eugenio Garza Sada, decided to establish a university that could respond directly to their needs.

Founded in 1943, ITESM is the fourth-oldest private university in Mexico. The founders of ITESM recognized that there was a shortage in the availability of engineers and middle managers for the region’s companies (Elizondo 2003) and that the model of public universities being established at that time would not be adequate for their needs. A graduate of the Massachusetts Institute of Technology, Sada wanted to establish ITESM as a high-quality, private university in Mexico to prepare within the country “the type of professional required to build a modern Mexican society and economy” (Elizondo 2000). ITESM was officially established
in 1943 as a private, nonprofit educational institution, independent of and unrelated to any political party or religious group.

ITESM began operations with 227 students and 14 faculty members in two undergraduate schools: industrial engineering and accounting (in addition to a high school). Similar private institutions already established in Mexico had emerged for different reasons: the Autonomous University of Guadalajara resulted from the confrontation between two antagonistic political groups in the state of Jalisco, the La Salle University was founded at the request of a Catholic religious group, and the University of the Americas was founded as a U.S.-style college in Mexico City. The only institution established in direct response to demands from the business sector was ITESM, in Monterrey. Although many important milestones exist in the history of ITESM (see annex 9A), some are more significant, especially in relation to ITESM’s research aims, as explained further.

**Establishing the ITESM Lottery, 1947**

ITESM’s initial operations were not without difficulties. Although initial funding was provided by a group of businesses supporting the newly created university, it became clear that to become a long-term sustainable initiative, ITESM would require other sources of support because of its lack of access to public funds. The founders of ITESM took advantage of a legal mechanism allowing nonprofit organizations to conduct lotteries—supervised by the federal government—with the purpose of supporting social causes. The ITESM lottery (currently known as *Sorteo Tec*) eventually became one of the most important sources of funds for the institution’s growth. Currently, ITESM conducts three editions of its national lottery annually, in which it awards prizes totaling US$23 million per year. Each edition of the lottery has 450,000 tickets that, when sold, provide ITESM with gross revenues of US$29 million per edition, or US$97 million per year. Sorteo Tec provides resources for the awarding of scholarships and, more recently, for the establishment of endowed chairs, which have become key to supporting the research activities of the university.

**Granting of U.S. Accreditation, 1950**

In an environment in which laws and regulations for private universities were not clearly defined, the leadership of ITESM decided just a few years after its foundation to pursue accreditation in the U.S. system of higher education as a way to further legitimize its academic offerings. Obtaining accreditation in the United States was intended not only to gain international recognition, but also to mitigate the risk of potential
changes in national regulations, which could jeopardize the institution. Because of geographic proximity, the Southern Association of Colleges and Schools—which accredits educational institutions in 11 U.S. states, including Texas—was approached with this unusual request. The process concluded in 1950, making ITESM the first institution outside the United States to obtain accreditation from any U.S. regional accrediting agency. Accreditation by the U.S. association not only gave ITESM a recognition of quality by a foreign educational entity, but also immersed the institution into a culture of peer-review evaluation and institutional effectiveness, which was uncommon at that time in Mexican higher education. This accreditation played an important role in further developments in the history and accomplishments of ITESM.

**Granting of Special Autonomous Status from the Mexican Government, 1952**

Worries about potential unexpected changes in government regulations dissipated nine years after ITESM’s founding, when its leadership successfully negotiated with the federal government for the granting of a special status of Escuela Libre Universitaria (Free University School), which was formalized through a special presidential decree. This decree allowed ITESM to obtain the equivalent of an autonomous status because it gave the institution the authority to offer academic programs and award degrees under a special treatment from the Ministry of Education. Achieving the status of Free University School—attained by only a few other institutions in Mexico—gave ITESM enough flexibility to modify academic programs and to adapt to new educational and organizational models without the restrictions of other private institutions subject to standard government regulations.

**Expansion to Other Cities, 1967**

A few years after ITESM’s founding, members of the business communities from other regions of Mexico, many of them ITESM graduates, began asking the authorities of the university to open branch campuses outside the city of Monterrey. In 1967, ITESM opened another campus—in the Pacific coastal city of Guaymas, Sonora. This campus was the beginning of a period of massive expansion to other Mexican cities, which was, in all cases, based on the concept of establishing a local board dedicated to obtaining funds for infrastructure and operational expenditures. ITESM assumed responsibility for establishing the campus’s academic model and administering the institution. The model of shared responsibilities—the
local business community responsible for funding and ITESM responsible for academic provision and management—proved a success in the opening of branch campuses, although maintaining the quality of academic programs presented a significant challenge. As of 2010, the ITESM system was composed of a vast network of 33 campuses and 25 sites established across Mexico, serving practically the entire country.

**Offering of Doctoral Degrees, 1968**

Twenty-five years after its founding, ITESM began offering its first doctoral degree: chemistry, with a specialty in organic chemistry. This ability to offer doctoral degrees was the first explicit effort by ITESM in its pursuit to become a research university. It opened up a new domain for ITESM, but also created challenges. This accomplishment was a result of a gradual consolidation of well-prepared faculty members who had begun offering a master’s degree with a specialty in organic chemistry in 1961. The process for establishing a core faculty body under the umbrella of an academic department was later used as a basis for the creation of similar graduate programs at ITESM.

**Formalization of ITESM as a System, 1986**

The progressive and somewhat uncontrolled growth of ITESM branch campuses across the country, beginning in 1967, required ITESM authorities to better organize the institution’s functioning. This organization led to the decision by ITESM’s board to formalize the creation of a system with a rector general and a series of regional vice-presidencies.

**Institutional Decision to Include Research as Part of Its Core Mission, 1996**

Although research had been conducted at ITESM since the early years, it was not seen as central to the core functions of the university, especially because the institution had no access to public funding for research. However, the earlier creation of doctoral programs at the ITESM main campus created tensions between the functions of teaching and research that needed to be resolved if the institution wanted to retain well-qualified faculty members and graduate students interested in conducting research. Not until 1996, during the review of its strategic plan, did the institution decide to emphasize research as part of its core activities. This was a necessary step for ITESM to further consolidate its presence and prestige, both in the Mexican higher education landscape and abroad. It was made clear, however, that the major emphasis would be on applied
research relevant to Mexico’s development. This institutional decision would allow ITESM to seek access to research funding from companies and, occasionally, from the government. The decision also led ITESM as a system to begin a process of internal and informal differentiation, because not every ITESM campus would be capable of or interested in formally engaging in the research enterprise. Ten years later, only eight of the 33 campuses have been officially declared research oriented, and the remaining campuses are not expected to engage in research activities (Enriquez 2007).

**Creation of Monterrey Tech Virtual University, 1997**

In the early 1990s, the Southern Association of Colleges and Schools officially challenged the accreditation of ITESM, because of the fact that not all campuses had the same quality standards. Particularly, the association noted that a large number of faculty members lacked appropriate graduate credentials, a problem especially prevalent in ITESM branch campuses. Unable to resolve the problem by simply substituting faculty members, and facing the risk of losing its U.S. accreditation, ITESM authorities decided to massively upgrade the credentials of their faculty members—mostly by offering them distance-education graduate programs. This upgrade required heavily investing in infrastructure to offer distance-education-based graduate programs for faculty members located outside of Monterrey. At the same time, ITESM established partnerships with a variety of institutions, including the University of Texas at Austin and Carnegie Mellon University, both in the United States. These partnerships allowed faculty members from those institutions to teach master’s degree and doctoral courses to ITESM faculty members from their own campuses using satellite videoconferencing. All investment in infrastructure and payment of instructors was covered by ITESM, and ITESM faculty members participating as students had to commit to working for the institution for at least the same amount of time in which they were students. At the same time, ITESM selected a large cadre of faculty members and funded them to study doctoral-degree programs at various universities, primarily in the United States. As a result, in a relatively short period of time ITESM complied with the accreditation requirements established by the Southern Association of Colleges and Schools, at the same time that it developed the expertise to teach distance-education-based programs. The newly acquired know-how was used to create the Virtual University (Cruz Limón 2001), which currently offers professional development and formal degree-seeking courses to more than 80,000
students annually at 1,270 sites in Mexico and 160 sites in 10 countries in Latin America (ITESM 2009c) using cutting-edge technology and standardized pedagogical methods.

Differentiation at ITESM between the Flagship Campus and the System

Located in the city of Monterrey, the flagship campus has the largest academic and research infrastructure of ITESM’s 33-campus nationwide system. It also is the only campus with a School of Medicine. Although not officially recognized as such, the Monterrey campus is the focus of ITESM’s attempts to raise its research profile, as reflected by the disproportionate devotion of resources and institutional efforts relative to the branch campuses.

At the system level, ITESM enrolled 96,649 in the academic year 2009/10, of which 25,705 attended the Monterrey campus, representing 27 percent of the total systemwide enrollment. The Monterrey campus has by far the largest enrollment within the system, followed by the campuses of Mexico City, the state of Mexico, and Guadalajara, respectively. Enrollment at the ITESM-Monterrey campus is distributed as follows: 17 percent in high school, 68 percent in undergraduate programs, and 14 percent in graduate programs. Part of the strategy aimed at strengthening the research capabilities of ITESM, specifically at the Monterrey campus, is evident when one compares the number of graduate students over time: from 2003 to 2009, overall enrollment at that campus grew 5.3 percent (in comparison to only 3.2 percent in the whole ITESM system). However, its high school enrollment decreased 13.8 percent, its undergraduate enrollment increased 4.5 percent, and its graduate enrollment had a spectacular increase of 50.4 percent in the same period (ITESM 2004a, 2010).

A similar pattern can be seen with ITESM’s professoriate; in 2009, a total of 927 full-time faculty members represented a larger proportion of the total 2,102 faculty members at the Monterrey campus (44 percent) in comparison with that of the whole system (33 percent). In parallel, from 2003 to 2009, the number of full-time professors increased by 24 percent at the Monterrey campus, whereas the system as a whole experienced a decline of almost 2 percent. The Monterrey campus employs 32 percent of the total number of full-time faculty members in the ITESM system, whereas it employs only 20 percent of the total number of part-time faculty members (ITESM 2004a, 2010).
As expected, students at the ITESM-Monterrey campus have the greatest range of options in terms of academic programs. Of the 54 different undergraduate degrees offered systemwide, the Monterrey campus offers 43, distributed as follows: mechatronics and information technology (8); processes and manufacturing engineering (5); biotechnology, chemistry, and food sciences (6); architecture and civil engineering (2); biomedicine and health sciences (6); communications, literature, and media (3); international relations and political sciences (2); digital animation and design (2); economics and law (3); business (4); and accounting and finances (2). One important feature of ITESM is that 36 of the 43 undergraduate programs can be studied either in accordance with the traditional style of professionally oriented undergraduate studies prevalent in Mexico or in accordance with an internationally liberal arts-oriented curriculum, more similar to the type of bachelor’s degree offered by U.S. institutions.

At the system level, ITESM offers 26 specialties, 46 master’s degree programs, and 10 doctoral degree programs. Of those, the ITESM-Monterrey campus offers 15 specialties (2 in business, 12 in medicine, and 1 in engineering and architecture); 41 master’s degree programs (2 in architecture, 6 in social sciences and humanities, 2 in communications and journalism, 2 in law, 4 in education, 14 in business administration, 1 in health, and 10 in information technology and electronics); and 7 doctoral degree programs in humanistic studies, public policy, social sciences, educational innovation, engineering sciences, administrative sciences, and information technology and communications.

In addition, in nine of its master’s programs and one of its doctoral programs, the ITESM-Monterrey campus has double-degree agreements in place with a variety of peer institutions, mainly in the United States but also in Australia, Belgium, Canada, and France.

An important factor in strengthening the research profile of ITESM in general has been the financial and time-release support the institution has offered its faculty members to upgrade their academic credentials. In 2008, 11.1 percent of ITESM faculty members at the system level were also enrolled as students in a master’s or doctoral program. The number of faculty members in training is smaller at the ITESM-Monterrey campus (5.6 percent) than the overall numbers at the system level, mainly because the flagship campus has been more successful in attracting faculty members who already have the appropriate credentials, whereas the other campuses must rely more on their own faculty members to achieve similar goals, by supporting the faculty members’ pursuit of graduate education. This support is frequently accomplished by enrolling faculty members in
ITESM’s own programs, either in a traditional classroom setting or through its Virtual University. In both cases, in consideration of the accreditation standards established initially by the Southern Association of Colleges and Schools and more recently by the Mexican accrediting agencies, a great majority of ITESM’s faculty members hold an advanced degree. The proportion of faculty members with advanced degrees at ITESM is much higher than the average in the Mexican higher education system overall. At the ITESM-Monterrey campus in 2008, 95.7 percent of undergraduate courses were taught by faculty members holding a doctorate or master’s degree, and 83.5 percent of graduate courses were taught by faculty members holding a doctorate degree (ITESM 2010).

**Accreditation at ITESM and Support of Its Research**

The accreditation system in Mexico is relatively recent. For many years, private institutions were required only to have official authorization awarded by the Ministry of Education, and subsequently to obtain further specific authorization for the offering of each academic program. As previously indicated, ITESM obtained a special status from the federal government in 1952 that allowed the institution greater flexibility in the development and subsequent authorization of its academic programs. In addition, since 1950 ITESM has pursued and obtained institutional accreditation in the United States from the Southern Association of Colleges and Schools. Such accreditation was reaffirmed for a further 10 years in 2008. ITESM is one of only seven higher education institutions outside the United States with accreditation granted by the association, of which four are in Mexico, although ITESM is the only one outside the United States accredited to offer four or more doctoral degree programs (SACS 2009).

The criteria for eligibility and consequent accreditation by the Southern Association of Colleges and Schools have helped ITESM over the years to develop an organizational culture and practices permeated by the concepts of self-evaluation, quality assurance, and institutional effectiveness. The experience gained during the accreditation process also forced the institution to develop innovative solutions to challenges related to meeting the association’s standards, illustrated most clearly by ITESM’s massive project of upgrading faculty credentials to retain its institutional accreditation.

The experience gained in accreditation not only helped ITESM during its internal process of development, but also had a consequent effect on other higher education institutions in Mexico because it helped engage the Mexican Federation of Private Universities in developing and
implementing a Mexican-style institutional accreditation system in 1996. ITESM was among the first institutions to obtain this federation's accreditation in 1997, and ITESM's accreditation was reaffirmed in 2009 for a further 10 years.

Also, in response to the recent importance assumed by the Mexican Council for the Accreditation of Higher Education—established in 2000 as an umbrella accrediting agency in charge of developing standards and granting authorization to 26 independent, discipline-based accrediting agencies—ITESM has attained or is in the process of attaining accreditation for all eligible academic programs. In addition, some of its academic programs being offered in the Monterrey city campus have been granted accreditation by foreign agencies in a manner similar to the institutional accreditation granted by the Southern Association of Colleges and Schools. Such is the case of accreditations obtained by ITESM from the Association to Advance Collegiate Schools of Business for programs in business, from the Accreditation Board for Engineering and Technology for programs in engineering, and from the Latin American Council for Accreditation of Education in Journalism for programs in journalism.

Finally, at the graduate level, an important indicator of the quality of academic offerings in Mexico is a program’s inclusion by the National Science and Technology Council in the National Program for Quality Graduate Programs, which is attained after an extensive and strict peer-based quality review. This recognition becomes especially important because students enrolled in programs included in this national program are eligible to receive a full, publicly funded scholarship from the National Science and Technology Council covering their tuition and cost of living. As of 2009, ITESM as a system had 40 of its 56 graduate programs included in the national program. Regarding its doctoral offerings, ITESM-Monterrey campus has had four of its seven programs included in this prestigious roster (CONACYT 2009a).

Fostering or Hindering the Research Enterprise?

Traditionally, research in higher education institutions is organized through a central office reporting either to the president of the institution or to the vice president for academic programs. That is not precisely the case at the ITESM-Monterrey campus, where paradoxically such a function does not even exist formally within the organizational structure.

The organizational structure of ITESM has been greatly influenced by the business orientation of its founders (Enriquez 2007). Such an
approach is reflected in having a relatively simple, flat, and flexible hierarchical structure uncommon to a typical higher education institution.

At the system level, the highest executive authority of the institution is the rector general, who is appointed by the Board of Trustees. Internally, the management of the institution is distributed in four regional rectories. The largest of the four regions, in terms of enrollment, is the region in which the flagship campus of Monterrey city is located. On each campus, the highest executive authority is vested in the campus rector (officially known as director general), who reports to the corresponding regional rector. A campus rector usually has four staff offices in charge of academic affairs, business services and outreach, social and student development, and high school programs. In the case of the ITESM-Monterrey campus, the deans of the four schools report to the rector, and each of their sections is organized into academic divisions and graduate schools. Within each of the deanships, a variety of research centers are located.

General research policies and procedures are managed at the system level through the office of the vice rector for academic development and research, to which an Office of Graduate Programs and Research reports. The location of the ITESM system headquarters at the ITESM-Monterrey campus facilitates communication and synergy from the campus to the central office, but at the same time is perceived as a disadvantage at other campuses interested in pursuing research, such as those in Guadalajara and Mexico City.

ITESM’s authorities insist on the importance of having a flexible organizational structure (ITESM 2010). However, such flexibility is reflected in the fact that such structure is frequently changed, according to perceived emerging needs and opportunities. Although it could be argued that flexibility is an important institutional strength, at the same time it could also be seen as a weakness. Because the corresponding higher executive authority appoints all individuals in leadership positions, one can observe entire units at the campus or system level suddenly being transferred, merged, expanded, or shut down. Consequently, academic or administrative executives of the institution are subject to constant changes in roles and location.

**Governance**

Salmi (2009, 28) indicates that one of the three main features of a world-class research university is the existence of a governance model “that
encourages strategic vision, innovation, and flexibility.” In this regard, the governance model at ITESM seems to follow Salmi’s characterization.

Long-term stability in the governing leadership of the institution has been crucial in the development of ITESM. Since its founding more than 60 years ago, ITESM has had only three board presidents and only three rectors. The current outgoing rector, Rafael Rangel-Sostmann, a main architect of ITESM’s rise as a leading institution, has been in place since 1985.

ITESM follows a governance model in which external stakeholders are organized on a Board of Trustees and assume the key authority and appoint the key administrators. In contrast, most public higher education institutions in Mexico have a governance model with limited involvement from outside individuals and with high-level decision-making roles of faculty members and students.

ITESM’s Board of Trustees has the authority to designate the rector general of the institution through its Executive Council and to approve the general budget, the offering of academic programs, and the awarding of degrees. Membership on the board is approved by the voting members. The board is currently composed of 49 individuals, most of them well-known businesspeople and benefactors of the institution.

Within the institution, each regional rector and the three system vice-rectors are appointed by the Executive Council of the board on the basis of a proposal made by the rector general of the ITESM system. The rector general also designates the rector for each of the campuses in consultation with the respective regional rector. Deans of schools are appointed by the respective rector at the campus level.

Regarding faculty governance, in each of the regional rectories there is an Academic Senate comprising the regional rector, who presides; a rector for each of the campuses; and professors serving in the capacity of “senators,” elected by peers according to the rule of one senator for every 30 full- and half-time faculty members. The Academic Senate is responsible for defining academic policies and regulations regarding academic programs, admissions, equivalencies of studies, evaluation of students, sanctioning of students, awarding of degrees, academic requirements for professorships, sabbaticals, and recognitions for outstanding students and faculty members (ITESM 2004b). In addition, each campus has a Faculty Assembly that serves as a forum for consultation and submission of academic initiatives to be considered by the regional Academic Senate.

At the student level, ITESM’s Federation of Students serves as a forum for the representation of students. However, it does not formally participate in the governance of the institution.
**Finances**

ITESM’s financial model represents an inspiring case—a private institution that, officially, does not receive direct funding from the government. ITESM’s funding base comes mostly from tuition and fees paid by students, revenues generated by a massive lottery, contract services, and donations from private individuals and companies. Physical infrastructure among the different campuses has been constructed and maintained, mainly as a result of capital campaigns targeting local donors and resources obtained from the national lotteries. The director general at the campus level is responsible for ensuring that the finances of the campus stay sound.

ITESM is an expensive institution that draws from the middle- and upper-level brackets of Mexican society. A highly sophisticated and well-managed financial system allows it to offer need-based scholarships and loans to a large number of its own students.

Although ITESM’s highly publicized financial independence from the government is overemphasized, in practice the institution has managed in a number of ways to gain access to government funds originally designed for public institutions, although these funds are not as significant as the core funding obtained from traditional sources. Unfortunately, limited public information about the institution’s finances prompts speculation about the level of financial stability of ITESM and the real support that it receives from government.

Recognizing that the issue of public funding is highly sensitive, ITESM’s leadership has gradually been able to successfully lobby government agencies to extend some of their programs—originally designed for public institutions—in favor of ITESM. For instance, all students enrolled in graduate academic programs that are positively evaluated by the National Science and Technology Council receive a public scholarship covering living expenses and full tuition and fees, which is directly transferred to the institution. The scholarship program originally was designed for high-quality graduate programs offered in public institutions, but when ITESM subjected its program to the same strict evaluation as performed by the council, the council had no choice but to offer the same benefit to ITESM students. It would be very difficult for ITESM graduate programs approved by the National Science and Technology Council to survive without the indirect public support, because enrollment would be reduced dramatically without it.

Another indirect fiscal benefit to ITESM lies in tax policy. Like other nonprofit institutions and all public universities, ITESM does not pay
revenue taxes, even in the case of the lottery, and is allowed to receive tax-deductible donations from private donors and companies. An additional source of public financing comes from the sale of consulting services to government entities at various levels. For example, ITESM frequently conducts the periodic competitiveness and strategic-planning studies of state and municipal governments.

Finally, ITESM can compete for science and technology innovation funds made available in recent years by government agencies at federal and state levels. It also has indirect access to some small grant programs for international student exchanges.

**Becoming a Research University: Why, Who, and How?**

The research policy and related programs established by ITESM’s leadership and implemented at the campus level have resulted in a more significant presence of the institution in the research arena. The flagship campus in Monterrey has in particular attained a more prominent international stature in research circles related to its fields of expertise.

The ITESM research model constitutes a unique approach to research by concentrating its efforts in a more focused and narrowed scope and by supporting research mostly through private funds. This approach has resulted in a series of intended consequences in terms of external effects, internal allocation of resources, and creation of interdisciplinary research groups, as well as an important increase in scientific production. At the same time, this approach has been associated with some unintended consequences, such as the marginalization of research topics not considered priorities by the institution, a further stratification of campuses within the system, and, in some respects, the reduced freedom for faculty members in their independent pursuit of research topics. The long-term effect of this research approach remains to be seen.

For the first 30 years of its existence, ITESM did not consider research an important component of its activities. This attitude was, in a way, concordant with events happening in public higher education. Finally, in 1970 the Mexican government recognized the need to support research by creating the National Science and Technology Council. However, because only public universities were eligible to use that council’s funds to conduct research, ventures into research by the great majority of private universities, including ITESM, were marginal.
Thereafter, in 1985, while conducting a periodic review of ITESM’s mission, its leadership concurred that the aspirations of becoming an institution of international stature and greater relevance in the national context would require a deeper involvement in research. Accordingly, ITESM’s 1985–95 mission explicitly considered the importance of research (Enriquez 2007). Still, at that time the inclusion of research in the institutional mission was mostly an aspiration. Subsequent reviews of ITESM’s institutional mission in 1996 and 2005 further reaffirmed and clarified the meaning of this institutional commitment to research. In the 2005 review of ITESM’s mission—which established the long-term plan for the institution’s direction until 2015—the rhetoric about the emphasis on research became associated with concrete institutional strategies aimed at supporting it.

This aspiration is not exempt from internal challenges and perceived inequalities, because not every ITESM campus considers the research aspiration viable. Authorities argue that efforts are made to compensate for intra-institutional differences and capabilities (ITESM 2009a), and in fact, the gap between the ITESM-Monterrey campus and the rest of the ITESM system seems to be gradually narrowing. Nevertheless, in practice, substantial differences remain. In such a diverse educational system as that of ITESM, with a few large campuses and many small ones, the pursuit of excellence in research creates intra-institutional stratification. ITESM’s decentralized developmental and financial model, as well as the decision-making process established by the central administration, makes it difficult for small campuses to engage in research, whereas the larger campuses find this aspiration more legitimate, suitable, and achievable. As an example, campuses such as those in the cities of San Luis Potosí and Saltillo each have only one faculty member recognized by the selective National Roster of Researchers (1.5 percent of all full-time faculty members), whereas the Monterrey campus has 122 members in the National Roster of Researchers (13 percent). This intra-institutional differentiation is exacerbated by the fact that the criteria for the institutional support of research consider that the support should be directly linked to officially defined research priorities and that it should show the potential to become self-sufficient or externally funded.

The ITESM research strategy has the following components: (a) making ITESM competitive in attracting researchers; (b) conducting research only in areas identified as institutional priorities; (c) supporting the creation of centers and institutes; (d) financially supporting a series of research-endowed chairs; (e) linking the work of researchers to specific
metrics of success including long-term sustainability, patents, scientific publications, and so forth; and (f) connecting research to the development of new companies and industrial applications. These various elements of the overall strategy are explained later.

**Attracting and Retaining Talented Researchers**

Concordant with Salmi (2009), ITESM has made significant efforts to attract and retain faculty members with adequate credentials. At the Monterrey campus, faculty members with an interest in research will be added to the roster. A good indicator of this goal is provided by the membership of faculty members in the previously mentioned National Roster of Researchers.7

As expected, the ITESM-Monterrey campus has been the most successful at having faculty members who belong to the National Roster of Researchers. At the beginning of the 2009 academic year, 122 faculty members representing 13 percent of the total full-time faculty body were members of the National Roster of Researchers.8 The campus with the next-highest number of members is the Mexico City campus with 36, followed by the state of Mexico campus with 33, and the Guadalajara campus with only 9 (ITESM 2009b). By far, the ITESM system has the highest number of faculty members belonging to the National Roster of Researchers of any private university in Mexico. However, in comparison with public universities, ITESM still lags significantly. For instance, the Autonomous University of Nuevo León, also located in the city of Monterrey, had in the same period 373 researchers who were members of the National Roster of Researchers (UANL 2009), more than three times the number at the ITESM-Monterrey campus.

**Conducting Research in Areas Identified as Institutional Priorities**

The ITESM authorities have decided to orient their research work toward the following areas: biotechnology and food sciences, health, manufacturing and design, mechatronics, nanotechnology, information and communications technology, sustainable development, entrepreneurship, government, social sciences, humanities, regional development, social development, and education. As a focus on those areas, a series of research centers have been created and linked to identified needs and areas of opportunity existing at the local level and based on the research capabilities of ITESM.
At the ITESM-Monterrey campus, 21 research centers are in operation (see table 9.1). The strategy of focusing only on a few selected areas has both positive and negative implications. On the one hand, the strategy helps the institution to focus its resources; on the other hand, the strategy concurrently limits creativity and innovation in other areas.

**Research-Endowed Chairs**
A very effective strategy has been the awarding of financial support for researchers doing work in the institution’s priority areas. From its own funds, ITESM created the endowed chairs (Cátedra) program as a way to foster the creation of research groups supported with seed money. Each Cátedra is approved by a special committee on the basis of a proposal submitted by a group of researchers. Once approved, the Cátedra receives seed funds for a total amount of US$150,000 over five years, during which time additional external funding of equivalent or higher value should be pursued. Each Cátedra is evaluated on an annual basis as a requirement for renewal. Although several Cátedras have been cancelled for not accomplishing expected goals, most have been able to obtain additional funds either from companies or from national or international foundations. It is noticeable that the amount allocated to a Cátedra is significantly lower than the amount usually assigned to a similar type of endowed chair at the

<table>
<thead>
<tr>
<th>Priority area</th>
<th>ITESM-Monterrey campus</th>
<th>Other ITESM campuses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Research centers</td>
<td>Endowed chairs</td>
</tr>
<tr>
<td>Biotechnology and food</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Health</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Manufacturing and design</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Information and communications technology</td>
<td>4</td>
<td>23</td>
</tr>
<tr>
<td>Sustainable development</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Business</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>Government</td>
<td>7</td>
<td>35</td>
</tr>
<tr>
<td>Education</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>TOTAL</td>
<td>21</td>
<td>131</td>
</tr>
</tbody>
</table>

*Source:* ITESM 2009a.

*Includes patents published and awarded from 1998 to 2009.*
international level. For instance, in the United States, US$1 million is considered standard for an endowed chair, and is usually allocated to one individual and for a longer period of time relative to ITESM’s program. In contrast, ITESM’s program has had less financial support, and the funds are allocated to a group of researchers rather than to an individual and are granted for a shorter period of time. Today, ITESM authorities view the Cátedras as the most important stimulator of research productivity, because previous attempts were not as effective. As in other cases, the flagship campus of ITESM has the largest share of Cátedras within the system. At the beginning of academic year 2009, the Monterrey campus had 131 of the 242 Cátedras established in the system.

**Establishing Metrics for Research Productivity**
Concordant with ITESM’s institutional culture and the primary narrowed interest in applied science and technology, a series of specific indicators of research productivity was established and has been constantly monitored. Information by campus, area of research priority, or researcher is available through a public searchable online database. At ITESM, the data show that the overall research productivity of its researchers has significantly increased from 2004 to 2008 at the ITESM-Monterrey campus as well as at the system level (see table 9.2), although numbers remain relatively low in comparison with international standards. For instance, in 2008 faculty members at the ITESM-Monterrey campus published 193 indexed articles equivalent to 0.22 papers per full-time faculty member. However, in some areas the growth has been spectacular, as in the publishing of patents. By 2009, researchers from the ITESM-Monterrey campus had 40 patents published and awarded (see table 9.1). Most of the patents were awarded in the area of manufacturing and design, although more promising and lucrative patents were awarded in the areas of biotechnology and health. A good example of the disparities existing in research infrastructure and productivity among the ITESM campuses is the fact that only one patent has been published and awarded outside of the Monterrey campus. The growth in productivity at the ITESM-Monterrey campus is a direct result of the Cátedras, which included specific metrics of success in terms of patents and long-term financial self-sustainability.

**Connecting Research with the Development of New Companies or Applications**
The overall research strategy of ITESM is complemented by a parallel program aimed at connecting the institution more effectively with the
The Road to Academic Excellence

business sector by fostering a more efficient transfer of knowledge from researchers to companies and vice versa. ITESM’s leadership has devoted significant efforts to establishing a vast network of business incubators (helping the start-up of new high-tech, intermediate technology and of socially oriented microcompanies), business accelerators (supporting small and medium-size companies to help them explore new international markets), and technological parks (hosting companies at specialized facilities). In addition, a Technological Transfer and Intellectual Property Center based at ITESM-Guadalajara provides guidance to researchers from all campuses and companies. Results have been spectacular if one considers that in 2009, the ITESM system had 87 business incubators, 14 business accelerators, and 11 technological parks in operation.

Table 9.2  ITESM: Selected Indicators of Scientific Production, 2004–08

<table>
<thead>
<tr>
<th>Indicator</th>
<th>ITESM system</th>
<th>Monterey campus</th>
<th>Monterey campus versus the ITESM system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articles in indexed journals</td>
<td>239 328</td>
<td>162 193</td>
<td>68 59</td>
</tr>
<tr>
<td>Articles in proceedings</td>
<td>626 516</td>
<td>524 291</td>
<td>84 56</td>
</tr>
<tr>
<td>Books (authoring and coauthoring)</td>
<td>47 109</td>
<td>30 39</td>
<td>64 36</td>
</tr>
<tr>
<td>Chapters in books</td>
<td>86 205</td>
<td>62 104</td>
<td>72 51</td>
</tr>
<tr>
<td>Newspaper editorials</td>
<td>173 412</td>
<td>139 129</td>
<td>80 31</td>
</tr>
<tr>
<td>Peer-reviewed articles</td>
<td>49 92</td>
<td>27 49</td>
<td>55 53</td>
</tr>
<tr>
<td>Dissemination of information</td>
<td>137 117</td>
<td>113 65</td>
<td>82 56</td>
</tr>
<tr>
<td>articles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invited lecturers</td>
<td>530 502</td>
<td>490 215</td>
<td>85 43</td>
</tr>
<tr>
<td>Paper presentations</td>
<td>341 679</td>
<td>246 377</td>
<td>72 56</td>
</tr>
<tr>
<td>Technical reports</td>
<td>212 138</td>
<td>178 89</td>
<td>84 64</td>
</tr>
<tr>
<td>Organizers of conferences</td>
<td>98 151</td>
<td>82 71</td>
<td>84 47</td>
</tr>
<tr>
<td>Members of program committees</td>
<td>59 54</td>
<td>51 29</td>
<td>86 54</td>
</tr>
<tr>
<td>Reviewers of conference/journal</td>
<td>109 200</td>
<td>101 121</td>
<td>93 61</td>
</tr>
<tr>
<td>Participation in editorial committees</td>
<td>47 47</td>
<td>40 22</td>
<td>85 47</td>
</tr>
<tr>
<td>Journal editors</td>
<td>47 47</td>
<td>40 22</td>
<td>85 47</td>
</tr>
<tr>
<td>Theses</td>
<td>331 337</td>
<td>285 173</td>
<td>86 51</td>
</tr>
</tbody>
</table>

Source: Author’s calculations based on ITESM research database, http://www.itesm.edu/wps/portal/WCM_GLOBAL_CONTEXT=/wps/wcm/connect/ITESMv2/Tecnol%C3%B3gico+de+Monterrey/Investigaci%C3%B3n/.
The Academic Model of ITESM: Panacea or Predicament?

ITESM has focused most of its work not only on its renewed interest in research, but also on the further development of a standardized teaching-learning model (the ITESM educational model) that has gradually been implemented at all campuses and in all academic programs and their respective courses. By the end of the 2008/09 academic cycle, 74 percent of the courses at the ITESM-Monterrey campus were being taught in accordance with this educational model (ITESM 2009a).

Briefly, the ITESM educational model is based on the assumptions that graduates must be competitive on the global stage, must be strongly formed in terms of ethical values, must be highly committed to social responsibility, must be able to work in a multicultural environment, and must have an entrepreneurial spirit. It also assumes that students must be prepared to become leaders in their communities. The model considers professors as facilitators and guides of the more active and self-managed learning style of these students. It relies heavily on the use of information technology and tends to be highly standardized across all ITESM campuses.

The strategy of ITESM’s educational model’s strategy is based on three pillars: (a) standardization of the syllabus across the system, which helps the institution develop at a faster rate and use common pedagogical materials to support all courses of similar content—taking advantage of the combined expertise of faculty members and of economies of scale; (b) standardization of a technological platform developed in-house and used systemwide to support the teaching-learning process; and (c) a mandatory massive awareness and training program for all faculty members in the use of the technological platform for the development of materials, teaching of content, and learning assessment. Such an extensive standardization of ways and means of teaching has allowed ITESM to make rapid advances in implementing its educational model.

ITESM as an Elitist Institution

In terms of tuition, ITESM is an expensive institution that only a small proportion of Mexican families can afford. ITESM is among the top three most-expensive institutions in Mexico. Although no public information is available regarding the socioeconomic status of the families of ITESM students, it is widely accepted in Mexico that the majority of ITESM students belong to families with higher socioeconomic status.
and arrive, in most cases, from costly private high schools. This situation poses an important challenge to an institution that, according to its academic model, intends to prepare students with both a world-class sense of competitiveness and a local consciousness and awareness of social responsibility.

ITESM has made important efforts to become more affordable to students with limited financial resources. In fact, 35 percent of undergraduate students and 53 percent of graduate students at ITESM have some type of scholarship or loan provided to them from its own funds (ITESM 2009a). Nevertheless, a generalized public perception remains that ITESM is elitist and tends to distance graduates from the problems faced by the majority of the population. Efforts to reduce this negative perception seem to be in place, but it may take a number of years to change these long-standing perceptions.

At the same time, ITESM has taken advantage of certain legal education regulations in Mexico, adapting them to support the goals of its academic model in matters related to fostering more social awareness in its students. Such is the case of the mandatory performance of 480 hours of social service, which, under federal law, is a requirement for all undergraduate students in Mexico. A distortion of this regulation, typical in Mexican higher education, has been either to confound this program with an opportunity for professional training or to have participating students serve as cheap labor for office work. Recognizing that one public perception about ITESM students and graduates is their detachment from real problems being faced by the community, the ITESM academic model insists on the need to make students socially responsible and to cultivate in them a sense of solidarity with underserved sectors of the population. This set of factors led ITESM leadership to establish an internal regulation to ensure that all students from all academic programs dedicate at least 50 percent of these mandatory social-service hours to activities expressly designed to contribute to social causes and to gain awareness of social issues. However, there is still substantial room for improvement in this area.

**International Dimensions at ITESM**

ITESM has gained a solid reputation as an internationally oriented institution. Many of the strategies envisioned by experts in the field of international education are already present at ITESM. These strategies include the acquisition of complete fluency in at least a second language
for all students, the inclusion of an international dimension in the curriculum of all academic programs, the attraction of international students and scholars, the sending of a large number of students and scholars abroad, the offering of dual-degree options for students, the development of international teams for research, and the performance of research with an international dimension. In all these areas, ITESM has made important advances.

As expected, the flagship Monterrey campus is the campus most involved in the internationalization strategy of the institution. For instance, in the case of international student mobility, 11 percent of the ITESM-Monterrey campus students were studying abroad in 2008, while the campus hosted international students equivalent to a significant 8 percent of its total enrollment. At the graduate level, 6 percent of the ITESM-Monterrey campus students went abroad in 2008, and 15 percent of its graduate enrollment was composed of international students. Regarding faculty mobility, during the same period 24 percent of the ITESM-Monterrey campus faculty members went abroad while the campus hosted international faculty members equivalent to 12 percent of its total faculty roster (ITESM 2009a).

In addition, ITESM has developed a variety of dual-degree and mutual credit-recognition programs with international peer institutions. It also has more than 400 international memoranda of understanding in place and maintains formal international offices in numerous countries. In summary, ITESM has a relatively comprehensive approach in its international strategy, which has helped substantially to raise its international reputation.

**Conclusion**

As shown in this examination of ITESM, the university has taken a number of steps toward becoming a world-class research university, at least on its Monterrey campus. Overall, the greatest challenge for ITESM is how to reconcile the desire to become a world-class research university, which is evident in the flagship campus, with the distant realities faced by the small campuses.

In general, ITESM partially exhibits the features outlined by Salmi (2009) in his description of a world-class university. These include the capacity to attract a high concentration of talented faculty members and students, the availability of abundant resources, and the presence of a visionary governance model.
Much of ITESM’s progress has been due to the uniqueness and agility of its academic and organizational model, which has permitted the institution to advance at a much more rapid pace than would be possible at other, more traditional universities. Undoubtedly, such an academic and organizational model has resulted historically from its unique governance approach. At the same time, such uniqueness has caused ITESM to become somewhat isolated from the rest of the Mexican higher education system.

Regarding the availability of financial resources, the case of ITESM is significantly different from the one found in many countries, where the desire to have world-class research universities is supported by a strong commitment from the government. In contrast, ITESM’s growth has been financed mostly by charging high tuition to students, relying on contributions from donors, and maintaining a lucrative lottery. Such an approach, although successful in sustaining the development of the institution, may not be enough to support higher levels of investment in the research infrastructure necessary to sustain the status of a world-class research university. Attempts by the ITESM leadership to obtain additional resources from the government are always limited by the fact that ITESM is not a public institution and by the general perception prevalent in Mexico that ITESM is an elitist institution serving primarily the better-off sector of society.

If one considers the limited availability of resources devoted to supporting the research ambitions of ITESM, its research model—which focuses on a relatively restricted number of areas of specialization and mostly on areas of applied research—has initially yielded some promising results. However, this limited set of priorities could become the principal liability to the further progress of the institution toward its long-term goal of research excellence by limiting the institution’s flexibility.

As expected, ITESM has shown a strong capacity to attract talented faculty members and students to its flagship campus, whereas the results have been more mixed systemwide. This trend is reflected in both the membership of faculty in the National Roster of Researchers and ITESM’s level of internationalization. The institution’s Monterrey campus will continue to benefit from its geographic position, especially if it can further build working partnerships with other institutions of higher education in the region, especially the public Autonomous University of Nuevo León. Nevertheless, there is no question that ITESM plays, and will continue to play, a very prominent role in higher education in Mexico. ITESM’s flagship campus also will likely continue to strive toward international
recognition as a competent research university. The path for development adopted over the years by ITESM makes a unique case that must continue to be studied—to draw significant lessons that could be useful in other regional contexts. The solution “a la Mexicana” adopted by ITESM constitutes a relevant subject for further analysis.
### Annex 9A  ITESM: A Brief History

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1943</td>
<td>ITESM is founded in the city of Monterrey.</td>
</tr>
<tr>
<td>1947</td>
<td>The Monterrey campus is inaugurated. Eight graduates receive the first degrees in chemical engineering. The ITESM lottery is begun.</td>
</tr>
<tr>
<td>1950</td>
<td>ITESM is accredited in the United States by the Southern Association of Colleges and Schools.</td>
</tr>
<tr>
<td>1952</td>
<td>ITESM is granted special status at Escuela Libre Universitaria by the Presidential Decree published on July 24, 1952.</td>
</tr>
<tr>
<td>1963</td>
<td>The first graduate degree is awarded, with the specialty in chemical sciences. ITESM begins using computers and television-based instructional programs.</td>
</tr>
<tr>
<td>1967</td>
<td>The first campus outside of Monterrey is inaugurated in the city of Guaymas, Sonora.</td>
</tr>
<tr>
<td>1968</td>
<td>ITESM begins offering its first doctoral degree, in chemistry with specialty in organic chemistry.</td>
</tr>
<tr>
<td>1978</td>
<td>ITESM inaugurates its School of Medicine in the city of Monterrey.</td>
</tr>
<tr>
<td>1986</td>
<td>The mission statement is defined as preparing professionals with the highest levels of excellence in their respective areas of specialty. New general bylaws are adopted allowing for the official creation of the ITESM system as a multicampus system with a new organizational structure.</td>
</tr>
<tr>
<td>1986</td>
<td>ITESM is connected to BITNET, the international communications network among universities. The telecommunications satellite network is inaugurated.</td>
</tr>
<tr>
<td>1996</td>
<td>ITESM defines its 2005 mission: to prepare professionals committed to the development of their communities while internationally competitive in their respective fields of study. ITESM also defines in its mission the goal of conducting research and extension relevant to the development of the country.</td>
</tr>
<tr>
<td>1997</td>
<td>The Virtual University is established. ITESM begins offering distance-education-based programs in Mexico and Latin America. A redesign of its teaching-learning model is established.</td>
</tr>
<tr>
<td>1998</td>
<td>The social service of students in all academic programs becomes mandatory to benefit the community.</td>
</tr>
<tr>
<td>2004</td>
<td>The Mexican Council of Accreditation of Higher Education recognizes ITESM as the institution of higher education with the most academic programs either accredited or recognized as being quality programs by accrediting agencies in Mexico.</td>
</tr>
<tr>
<td>2005</td>
<td>A new ITESM vision is defined for the 2005–15 period, as well as the corresponding mission and strategies.</td>
</tr>
</tbody>
</table>

**Source:** Adapted from ITESM website, http://www.itesm.edu/wps/portal?WCM_GLOBAL_CONTEXT=/ITESMv2/Tecnol%C3%B3gico+de+Monterrey/Con%C3%B3cenos/Qu%C3%A9+es+el+Tecnol%C3%B3gico+de+Monterrey/Historia.

**Notes**

1. Undoubtedly, the best-known case of a Mexican research-oriented university of excellence is that of UNAM, which is self-defined as the highest house of studies of Mexico. UNAM, because of its history, scope, and size, is the largest university in the country—by all relevant indicators—and arguably the most...
important one. Its prominence is reflected by its inclusion among the top universities in the world in widely known rankings such as those of Shanghai Jiao Tong University’s Academic Ranking of World Universities and the Times Higher Education.

2. Although its official name is Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM), it is most widely known in Spanish as Tecnológico de Monterrey and in English as Monterrey Institute of Technology or just Monterrey Tech. For the purposes of this chapter, it will be referred as ITESM.

3. The case of UNAM has been analyzed by several authors who have reviewed different aspects of its role in shaping life, politics, and society in contemporary Mexico (Camp 1984); the limitations and constraints of its academic model (Malo 2007); its unique governance and structure (Ordorika 2003); and the challenges faced by this mega-university of 280,000 students. In contrast, ITESM’s history and characteristics have been studied only on a limited basis.

4. The Technology Achievement Index of the state was measured by the United Nations as 0.476, still below that registered by the United States (0.733) but also higher than average for Mexico (0.389). This composite index focuses on how well the country or a region as a whole is participating in the creation and use of technology (Desai et al. 2002).

5. A good example is that state income per capita (US$15,437 in 2008) exceeds the national average by 87 percent and that life expectancy (75 years for men and 79 for women) also exceeds average national levels. In fact, the state has the second-lowest level of poverty in Mexico, one of the least-marginalized populations in the country, and a better income distribution than most of Mexico, as measured by the Gini coefficient (OECD 2009).

6. For a detailed description of the National Roster of Researchers, see footnote 7.

7. This program was created in 1984 by the Mexican government originally with the goal of compensating for the low salaries at public universities as a way to retain qualified researchers. Over the years, membership in the National Roster of Researchers has come to symbolize the quality and prestige of the scientific contributions of the researcher. A member receives not only prestige and recognition by peers, but also additional tax-free income given by the government directly to the researcher (CONACYT 2009b). However, this program funds only researchers working in public institutions, a fact that puts ITESM at a disadvantage when it attempts to attract or retain talented researchers. This situation has led ITESM’s authorities to establish a policy under which its researchers can apply to the National Roster of Researchers for membership; but once the recognition is awarded, the monetary compensation owed to the researcher is paid by ITESM from its own funds.
8. Members of the National Roster of Researchers at the ITESM-Monterrey campus were distributed as follows: 27 candidates; 72 national researchers at level 1; 18 at level 2; and 5 at level 3 (the most prestigious level for active researchers).

References


The Long Road toward Excellence in Mexico: The Monterrey Institute of Technology


