The Management in the Technological Institutes in Mexico: A Historical Analysis

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Answers from a set of questions about institutional management are analyzed, they were part of The Reconfiguration of the Academic Profession in Mexico survey, taken in 2007-2008. The study compares the perspective of technological public institutions professors and public state universities, relative to the communication, collegiality and administrative practices. The results show that the academicians of the first institutions perceived, with regard to the academicians of the seconds, the most complicated administrative processes, minor communication and a deficient participation on decisions making are discussed in the light of the federal policies and organizations concepts.

Keywords: academics, school management, leadership styles, leadership, technological institutes, collegiality

CONCEPTUAL FRAMEWORK

The National Development Plan 2007-2012, in its Education Sector Program, mentions six objectives: 1) raise the quality of education, 2) expand educational opportunities, 3) promote the development and use of information and communication technologies in education, (4) offer comprehensive education, 5) offer quality educational services to train people with a high sense of social responsibility and, 6) promote participatory school management that makes educational actors co-responsible and promotes transparency and accountability accounts (SEP, 2007). In the context of this type of aspiration, public policies on higher education have been designed, at least discursively, to contribute to achieving such central objectives and,

at the same time, originally designed for state public universities (Rubio Oca, 2006). Within the framework of these policies, one of the fundamental strategies has been the incorporation of Quality Management Systems (QMS) in Public Higher Education Institutions (IESP), which have promoted the certification of different administrative processes, assuming that This type of action would allow progress towards the improvement of educational quality (Rubio Oca, 2006).

The changes in the country in the field of policies and particularly in the higher education system that led to the previous approach developed from the eighties, when the welfare state that provided financial resources trying to be equitable, without demanding anything in exchange, it gradually became an evaluative State (Ibarra Colado, 2009). This made it currently mandatory for IESPs to obtain additional resources through programs such as the Integral Program for Institutional Strengthening (PIFI), the Program for the Improvement of Faculty (PROMEP) or the Integral Program to Strengthen Postgraduate Studies (PIFOP), the interested institutions show evidence of having, among other aspects, performance evaluation practices for academics, students, and institutions and their educational programs (SEP, 2007).

It is important to highlight within the new policies the incorporation of strategic planning methods in the IESP, in which "supposedly" academics intervene in co-responsibility with the authorities of the institutions to establish general objectives and position the institution, taking into account their environment, determining the actions and resources that allow, in the short and medium term, to be implemented by the educational actors involved. This process of collective planning and collaboration in the institution encourages institutions to participate in calls to obtain additional funds to the federal subsidy based on their performance (SEP, 2011).

With the recent restructuring of the Ministry of Public Education (SEP), the policies and programs generated for public state universities (UPE) were generalized until they reached public technological institutions (IPT). However, its execution has been late. For decades, the system of public technological institutes had its policies, generally consistent with its mission, objectives, and particular characteristics. Regarding the policies applied between 1994-2000 for higher education in general and, in particular, for technological institutes, Didou Aupetit (2002: 55) points out that:

> ... while in the public university sector efforts were made to improve operation, management, and accountability in the federal technological sector, neither the instruments used nor the results obtained were clear, especially at the beginning of the period considered.

The public technological institutes to which reference has been made make up the National System of Technological Institutes (SNIT), founded in 1948, which has established itself as a national reference in the training of engineers. Thus, it is stated that four out of 10 engineers in the country are trained at the SNIT (García Ibarra, 2009). On the other hand, its enrollment is concentrated in 87.2 percent in engineering and technology, and in 12.81 percent in the economic-administrative areas. In 2013, the SNIT has served a school population of 470,359 undergraduate and postgraduate students throughout the national territory, including the Federal District, which represents 14.60 percent of the demand for higher education in the country. (DGEST, 2013).

The SNIT currently has 262 technological institutes distributed in all the states of the republic, 12 of them in the Federal District. Of these, 126 are federal technological institutes, 130 decentralized technological institutes, four Regional Centers for Equipment Optimization and Development (CRODE), an Interdisciplinary Center for Research and Teaching in Technical Education (CIIDET) and a National Center for Research and Technological Development (CENIDET) (DGEST, 2013).

With its 262 institutions, SNIT offers 38 educational programs at the bachelor's level, seven Educational Specialization Programs, 22 Master's Programs, 28 Master of Science Programs and 15 Doctor of Science Programs. Due to its coverage, the SNIT is national in nature (SES-SEP, 2013).

In 2012, the approximate total number of SNIT academics was 26,468. Of these, 67 percent were located in federal technology and 33 percent in decentralized technology. It is estimated that 11,617 are

Full Time Professors (PTC), 1,705 with part-time, 2,051 with three-quarters of time, and 11,095 with subject hours (DGEST, 2012).

The public technological institutes did not start the modernization process at the same time as the state universities. For many years, these institutes were directly coordinated by the Undersecretary of Education and Technological Research (SEIT), which worked differently from the Undersecretary of Higher Education and Scientific Research, to which the state universities belonged (Solana et al., 1981).

The SEIT incorporated the industrial technological and marine technological and agricultural technological and forestry technological institutes in different general directorates such as the General Directorate of Technological Institutes and the General Directorate of Marine Science and Technology, to mention a few. The different types of technological institutes responded to different needs according to the country's regions and their development.

In the trade union sphere, the industrial technology academics were grouped in the Union of Regional Technological Trade Union Delegations (UNDESINTER) since the early 1970s, achieving representation before the National System of Technological Institutes authorities. UNDESINTEC, as it is currently known, achieved direct negotiations with the General Directorate of Technological Institutes, which allowed salary increases, additional benefits, and resolution of payment problems, among other issues (UNDESINTEC, 2012). Perhaps one of the most significant struggles of UNDESINTEC was to stop the decentralization of higher technological education during the 1990s when it was intended that technological institutes be coordinated by the States, as is currently the case with Polytechnic Universities and to some extent measured with the Higher Technological Institutes, called decentralized. However, this did not happen, and work continued directly with the federation.

During September 2013, UNDESINTEC achieved one of its most cherished goals, to become a Section of the SNTE that was exclusively for the workers of the technological institutes. Now, the workers of these institutions belong to the new Section 61 of this union.

One of the strategies of the education sector program in the six years 2000-2006 was to promote the formation of an integrated system of higher education, both national and state. With the creation of the Undersecretary of Higher Education, the first step was taken to achieve this (SEP, 2007). In 2005, the SEP was restructured, the SEIT and the different general directorates of technology disappeared (IT Toluca, 2011). All higher education institutions were coordinated by the Higher Education Undersecretariat (SES), which comprised four general directorates.[1] One of them is the General Directorate of Higher Technological Education (SES.SEP, 2011), where all the technological institutions that previously belonged to the SEIT were integrated.

With the new structure of the SEP, the programs and strategies previously applied exclusively in state universities were extended to all HEIs. But while the former had already been working under new forms of operation for some years, to evaluate educational programs and obtain additional resources, the technological ones began to confront these forms of operation under the guidelines of the new undersecretariat.

Policies for higher education have promoted programs and actions to reduce the gaps between Mexican HEIs, promoting the quality and performance of the different HEIs by obtaining other funds through competition mechanisms (SEP, 2007). Among the programs implemented for such purposes are PROMEP, the Support Program for Professional Strengthening (PAFP), and the Comprehensive Program for the Strengthening of Technological Institutes (PIFIT), where they have recently begun to participate. public technological institutions and their academics (SES.SEP, 2009). For example, PROMEP began its activities in 1996 serving State Public Institutions (IPE). Still, it was not until 2004 that this program began to extend to Public Technological Institutions (IPT), until it was made official in 2008. In 2009 it became the first call to participate in the elaboration of their PIFIT, while the state universities began to formulate programs that strengthen their institutions since 1999. (Chehaibar, Nader, et al., 2007 and DGEST, 2012).

Public policies now have similar purposes for all Mexican HEIs; however, the contexts in which they are applied differ. Flores Crespo (2009) argues that any public policy seeking continuity must be based on findings derived from research and criticism, making an in-depth analysis of its limitations. While the State Public Institutions were more autonomous from their beginnings, the Technological Public Institutions have

always been centralized, given their direct dependence on the SEP. The unions of IPE academics did not reach the level of corporatism as presented in the SNTE, to which the IPT academics belong (Ávila Carrillo, 1990). University unions emerged in the 1970s, practically from the founding of the union of workers and employees of the UNAM (Peláez Ramos, 1990) and as a result of the student movements of 1968 and 1971 (Ibarra Colado, 1983). During these movements, activist teachers began to apply what is considered a joint awareness of the proletarianization of intellectual work (STUNAM, 1979). This fact coincides with the period when the academic market appeared in our country (Gil Antón et al., 1994).

The three main differences between the university unions and the SNTE are their relationship with the State; its political union program in defense of its workers and its relationship with other unions, which gives it more independence and legitimacy; and how they elect their union leaders, assuming the idea that the more democratic the election is, the more independence there will be (STUNAM, 1979).

Another distinctive feature of the IPT is its administrative apparatus and its operation. On the one hand, the IPEs work at the local or regional level under a simpler organization chart than the one applied by the IPTs. In the IPE they have a director and a deputy director for each faculty. In contrast, the IPTs have a director and three deputy directors (Academic, Administrative and Planning), on which the different departments depend according to the areas they serve. While in the IPE the highest authority is the rector, in the IPT the highest authority is not the director of the technological institute, but the General Director of the National System of Technological Institutes (SNIT) whose offices are located in the Federal District. The General Directorate of Higher Technological Education (DGEST) has four Sectoral Coordinators: Academic, Planning, Administrative and Quality. Each one of these Sectorial Coordinations manages the activities corresponding to their area, which are subsequently applied in each technological institute. Decisions are made from the same authority or by those collaborating in the General Directorate of Higher Technological Education. Any administrative procedure for places, payments, budget, among others, must be analyzed, processed and registered with the DGEST (SNEST-DGEST, 2006). Under these conditions, it is natural that the administrative practices within the technological institutes are vertical, that decisions are made only by the directors, without considering other educational actors, and that the information that arrives from the central offices takes time to be known and assimilated by academics.

On the other hand, the development of technology, science, and innovation require new scenarios. The demands for HEIs are increasing, and various activities, such as the organization in exchange and collaboration networks, depend on different forms of work. The 2007-2012 Education Sector Program also proposed these collaboration strategies.

Vargas Leyva pointed out from the beginning of the last decade:

> Everything indicates that the concept of technological education needs to be reconstructed in the reality of professional training in Mexico. Its mission, characteristics, financing, strategies, relationship with the government, and articulation between institutions of the same subsystem and the university system. This is the challenge. (Vargas Leyva, 2003:55)

The transformations or advances in higher education are already beginning to be glimpsed. The Common Spaces of Higher Technological Education (ECEST) are recently being formed in each of the States of the republic, comprised of the polytechnic universities, technological universities, and technological institutes of each entity. The ECEST will work basically from the collaborative disposition and exchange between the institutions and it would be worth asking if the HEIs and their academics are prepared for it. Ibarra Colado (2009) affirms, "All this requires a more horizontal, decentralized and flexible organization, and more participatory management systems that most institutions lack today."

Changes in higher education face some dilemmas. One of them is the tendency to preserve obsolete decision-making methods that, on the facts, make changes difficult. Another difficulty concerns the organizational and cultural nature of educational institutions (Obregón Barbosa, 2003). In the case of IPTs, the degree of centralization in decision-making can constitute an obstacle in improvement efforts. The central authorities plan the course of change, while the directors and academics of the technological institutes have to operate it. It is the local authorities who manage the activities that promote change. The

question remains in the air: do they have the capacity to do it? Do you know how to manage it? Do they understand what is required to carry it out?

Regarding the organizational nature of the IPT, traditional features are observed in the forms of government and in the lines of authority. Leadership styles and academic organization do not always favor collegiality and become elements that hinder the implementation of new educational policies, such as the greater participation of academics in decision-making, flexibility in some academic tasks, the formation of networks, exchanges or the allocation of resources. The culture and tradition of the IPT, however, cannot be easily modified since it requires *legal-administrative reforms* (DGEST, 2012).

The reports of Mexican higher education have identified that the IPT presented lags in terms of programs recognized for their good quality; although only 47 percent of its enrollment was enrolled in accredited programs, while in the IPE it was 91 percent (Tuirán, 2010). Similarly, the information from the Comparative Study of Mexican Universities (EXECUM) database indicates that in 2011, the IPT had 324 PTC affiliated to the SNI (DGEI, 2013). On the other hand, recent studies have documented that the full-time academic of the IPT is in front of the group "more hours than 16 years ago. He teaches several hours of class per week and attends one to four groups in undergraduate, so he does not they can dedicate 20 hours per week to scientific or technological research, as established by the SNI Regulations to enter this program; therefore, research is left behind or left behind in these HEIs" (Amado Moreno, Sevilla García, Galaz Fontes, and Brito Páez, 2013: 134).

The above considerations suggest that the administrative improvement proposed for all HEIs is questionable as to its feasibility. Will they have to see the management styles that are carried out in them? or is it just lagging? Faced with questions of this nature, it is significant to know the opinion that academics have on issues related to the management that is carried out in their institutions, such as: the appointment of important officials, the selection of new colleagues, the selection, promotion and granting of finality and promotion of the same, the determination of the budget, the approval of academic programs and the teaching performance, which is apparently in the process of modernization.

As part of an organization, reforms can be understood as: technical processes that require efficient management, cultural processes that require understanding, political processes where the power and professional identity of groups and individuals are confronted and confronted (Siskin, 1994, cited by Hargreaves *et al.*, 1998) and, finally, as complex and paradoxical processes due to the nature of educational institutions as regards to its task and functioning (Obregón Barbosa, 2003). It would be necessary to wonder if the management carried out in the Technological Institutes has really begun to transform or if it continues to function traditionally from the perspective of its academics.

The management activities carried out in the IPTs and in the IPEs are different. The organizational environments, the way in which academics participate in decision-making, the administrative styles that predominate in them, and collegiality serve as a framework to compare both types of institutions. Therefore, it is important to specify some terms that are addressed and analyzed in this text, these are: organizational environment, decision-making, administrative style and collegiality.

When we talk about the organizational environment, we refer to the generic perception of situations in a given context and can be defined as: "the individual descriptions of the social or contextual framework of which the person is a part; they are shared perceptions of organizational policies, practices and procedures, both formal and informal" (Reichers Aarnon, 1990). Based on their experiences in an organization, people generate general perceptions about it, about the working conditions and their interaction with the environment, and they serve for the individual to notice the way to adapt their behavior to the demands or practices common in the organization.

Decision-making is a process through which a selection is made among several available alternatives (Münch García, 2006) to solve a problem. The consequences of a bad or good choice can have repercussions, if it is in a work context, in the success or failure of an organization. Decision making is one of the management stages and is considered the most important responsibility of the administrator (Münch García, 2006). Much of the success of any organization depends on the proper selection of solution alternatives.

When talking about participation in decision-making, it must be distinguished that the term participate has ambiguities. In general, it means taking part in something, being involved in some activity together with others, but without the ability to decide or execute. If the term is applied from a sociological perspective, "to participate means to be part of a social group or to carry out an activity from, or on behalf of, that group. From the political perspective, it means to be active in the processes of democratic and identify with a system of government that is conceived as a means to achieve certain common ends" (Latapi, 2005).

Those who run educational institutions present different decision-making styles and ways of solving problems. Robbins (1996) points out that four styles can be distinguished that have to do with the way of thinking (rational to intuitive) of the person who makes the decision and their level of tolerance for ambiguity (high to low tolerance), resulting in the styles managerial, analytical, conceptual and behavioral.

Administrative or leadership styles are important for organizations, since they print the necessary dynamics to human resources to achieve the objectives. Leaders can influence others and possess managerial authority (Robbins, 1996). The administrative or leadership styles that are most recognized today are: a) the autocratic style, where the leader concentrates authority, makes unilateral decisions and limits the participation of his subordinates; b) the democratic style, describes a leader who involves subordinates in decision-making, delegates authority, encourages participation in deciding work methods and goals, and uses feedback as an opportunity to guide his workers and; c) *laissez-faire style*, generally granting the group complete freedom to make their decisions and do the job as they see fit (Robbins, 1996). There is a whole range of positions between these three points. In the first style, decisions are made exclusively by the directors and their closest staff. In contrast, in the second, decision-making is shared with the academic staff of the campus, and in the third style, subordinates are left free to make decisions. their decisions. It is said that participatory styles "favor the participation of teachers in school decision-making processes, both academic and administrative" (Ramos, 2005; Ramos and Ramos, 2005).

Talking about collegiality is talking about community. Educational institutions can encourage individualism or participation. The Dictionary of the Spanish Language (Royal Spanish Academy, 2000) defines the school as "a society or corporation of men of the same dignity or profession," and it is in this space where planning, action, evaluation, training and change can be promoted in a school organization (Santos Guerra, 1994). The advantages of collegiality, according to Santos Guerra (2000), are several: efficiency is multiplied by all influencing the same ideas, the same objectives; It allows prioritizing what is important, it helps to eliminate errors, and unnecessary repetitions, it allows teachers to learn from each other, to help each other, to exchange ideas, experiences, as well as materials. Collegiality favors the development of enriching pedagogical activities such as respect and exchange; it increases the coherence of school activities since students see collaboration between their teachers, as well as group work and solidarity.

More specifically, one speaks of collegiality in an academic environment when referring to a set of assumptions. It is assumed 1) that all academics are hierarchically equal; 2) that the basic mechanism for decision-making is argumentation, without denying the relevance of using voting as a complementary way of reaching agreements; 3) that all academics have access, in relevant quality and quantity, to the information necessary to participate in the corresponding discussions and decision-making; 4) that collegiate participation has to do with decision-making that significantly affects academic work (teaching, study plans, research, etc.), and 5) that "academic merit" and the "common good" are the guiding principles from which decisions are made. Thus, collegiality affects decision-making related to academic work (Kennedy, 1997), and is essential in strategic planning processes (Schuster, et al., 1994), *which* favors the formation of a new culture and organization of academic work, and allows its strengthening.

More open management systems are those promoted by current educational policies. Mexican HEIs are moving towards this organizational change and it is important to know what academics think about the application of these in their institutions. The case of IPT academics becomes more interesting, since it is a sector of higher education where administrative practices have long been more subject to authority. Will the management practices in the IPT become an obstacle to incorporate other forms of work that promote educational policies? How is the organizational change in the IPTs being perceived by your academics?

METHODOLOGY

To implement the survey *The Reconfiguration of the Academic Profession in Mexico (RPAM), the Network of Researchers on Academics (RDISA)* was formed, a collaborative network of specialists interested in the academic profession made up of 35 higher education institutions (HEIs) located in 29 federal entities. The Network translated, adapted, and piloted the international questionnaire to make it relevant to our national context. He helped define the criteria in the context of the International Project The Changing Academic Profession (CAP) recommendations. The sample of the academic plant was obtained and, with the support of the National Association of Universities and Institutions of Higher Education (ANUIES), institutional lists of academics were obtained to proceed with the application of the study questionnaires. The group coordinating the Network was responsible for generating the institutional samples and, once the questionnaires were applied, processing and validating the information contained therein, so that a reliable database could be obtained.

Following the practice used in higher education systems where there are no centralized and detailed lists of academics who work in the respective institutions, a two-stage sampling procedure was used to generate the sample of academics to be surveyed (Abraham, et al., 2002). The information used for this purpose was provided by Format 911 of the 2005-2006 school year[2], complemented with information provided by the National Council of Science and Technology (CONACYT), and adjusted for a small number of institutions whose data was inconsistent with the results. reported in the 911 Format compiled in 2005.

The analysis of the 911 Format databases, after incorporating the complementary data from CONACYT and other HEIs, identified a total of 2,029 HEIs and 255,274 academics associated with said institutions. Of these, 93,009 were considered full-time (TC) or part-time (MT), that is, they worked in them with a labor contract of at least 20 hours a week. Originally, the HEIs were classified or organized into seven types or strata, but given the purpose of the international project, basic education teacher training schools and institutions that exclusively grant two-year degrees were excluded, so it was reduced. the universe of work to 1,454 HEIs that were organized into five strata: Public Research Centers (CPI), Federal Public Institutions (IPF), State Public Institutions (IPE), Public Technological Institutions (IPT) and Private Institutions (IP), with a total staff of 81,913 academics. Due to methodological considerations, it was decided not to include HEIs with fewer than 20 TC or MT academics in the sample. When applying this last criterion, there was a notable decrease in the number of HEIs, especially private ones, from 1,059 to 142 HEIs. This data implies, in particular, that the set of private institutions represented in this study can be described as elite (Muñoz Izquierdo *et al.*, 2004), while the excluded institutions have been described as Demand Absorption Private HEIs. Residual (Gil Antón, 2008). In this way, the final universities at the institutional and academic level for the study consisted of 379 HEIs and 79,389 CT/MT academics.

Although the RPAM survey was not applied to determine administrative styles and practices, it contains a group of questions addressing these issues. The survey is divided into six segments, section "E" being the one that corresponds to questions about Administration/Management, divided into six sections. The answers to certain questions from five of them were used: "E1" questions about the actors that most influence certain decision-making, "E2", it asks about the influence on the formulation of important academic policies in the institution, as well as "E4", "E5" and "E6" in which the degree of agreement with certain institutional practices is measured. The answers to these questions allow us to have an approach to the opinion of academics on these issues.

To carry out the analysis of the database on these sections, the SPSS program was used.

RESULTS

The application of the same educational policies for public technological institutions and state universities presented different results; despite having purposes of homogenization of the Mexican HEIs. In order to make this statement evident, the results obtained are presented below.

Management Style in Public Technological Institutions

In order to perceive the organizational style of the Technological Public Institutions (IPT) in this new context of higher education, the analysis by type of institution was carried out, of some variables on the management of the RPAM survey (Galaz Fontes, 2008).

When compared with other HEIs such as CPIs, IPFs, IPEs, and IPs, it is observed to what extent the management carried out in Public Technological Institutions emphasizes the mission, communication, vertical administrative style, orientation to performance based on results, the emphasis on the quality of processes; more than the indicators, the collegiality of the decision-making processes and the type of leadership exercised by the highest-ranking officials.

TABLE 1
QUESTIONS ABOUT INSTITUTIONAL MANAGEMENT

In the institution	Public research centers	Federal public institutions	State public institutions	Public technological institutions	Private institutions	Total
There is a strong emphasis on its mission	3.85	3.59	3.70	3.33	4.42	3.73
There is good communication between the administration and academics	3.00	2.96	3.07	2.67	3.32	3.01
There is a vertical administrative style (top down)	3.69	3.28	3.48	3.54	3.76	3.50
There is a strong performance orientation based on results	3.57	3.20	3.19	2.88	3.53	3.21
There is a strong emphasis on the quality of the processes rather than the indicators	2.62	2.70	2.86	2.72	3.10	2.82
The highest-ranking functions exercise competent leadership	3.43	3.23	3.09	2.73	2.94	3.07

Table 1 contains the means obtained on a scale from 1 to 5, where i consisted of strongly disagreeing, 2 disagreeing, 3 regular, 4 agreeing and 5 totally agreeing, for each of the statements considered, concerning to the management environment that occurs in Public Technological Institutions. Regarding the emphasis on the mission, there is a significant difference between the types of institutions considered ($F_{4,1692} = 30.281$, $p < .001$). In particular, the greatest difference occurs between the IPT and the IP (3.33 vs 4.42). That is to say, the academics who work in the IPs maintain that in their institutions, the management places high emphasis on their mission, while the academics of the IPTs recognize a medium level, in this same aspect. For their part, IPE academics had an average of 3.7.

Part of the management responds to the degree of communication between the administration and the academics. In this question, the results indicate differences between the IPT and the PI ($F_{4,1732} = 8.910$,

p<.001), where the mean of the IPT is 2.67, while in the PI it is 3.32. Apparently, in the IPT there is inefficient communication between its administrators and its academics. This is important because it could imply that the educational policies that the government carries out are arriving late or are little known in these institutions. How can they carry out the activities that the national context requires if their academics are unaware of or know little about them?

The different strata coincide in reporting the administration of a vertical type, from top to bottom. However, there is a significant difference between the types of institutions (F4,1698 =5.755, p<.001.), with the vertical administrative style being stronger in the IPs (3.76), followed by the CPIs (3.69) and occupying third place the IPT (3.54). Either way, the level tends to be high, considering the response scale. Hierarchical management prevails in IPTs.

Regarding whether there is a strong orientation to performance based on results in the institution, the differences between the strata were also significant (F4,1693 =10.024, p<.001.). The greatest difference occurs between the CPI and the IPT (3.69 vs 2.88). The academics who work in the CPI affirm that in their institutions, they are oriented towards performance based on results, to a greater extent than the academics of the IPT, where they notice a low level in this same aspect. The emphasis on the quality of the processes rather than the indicators shows significant differences between the strata (F4,1593 = 4.446, p<.001.). The greatest difference occurs between the CPI and the IP (2.62 vs 3.10), while the mean of the IPT was 2.72. While the academics who work in the USPs maintain that in their institutions the processes are weighted more than the indicators regularly, the academics of the CPIs and those of the IPTs disagree with the statement.

Regarding whether there is collegiality in the decision-making processes, the results indicate a significant difference between the strata (F4,1681 = 8.959, p<.001.). Particularly, the greatest difference occurs between the CPI and the IPT (3.43 vs. 2.73). The academics who work in the IPTs are the ones who perceive less collegiality in decision-making in their institutions, while the academics of the CPIs maintain that there is greater collegiality in their centers.

The other analyzed question deals with whether the highest-ranking officials exercise competent leadership in their institutions. A significant difference is observed again between the strata (F4,1706 =14.539, p<.001.). Once again, the greatest difference occurs between the IPT and the IP (2.60 vs 3.50). The academics of the PIs distinguish more competent leadership among their high-ranking officials than the academics who work in the IPTs who responded that they disagreed with this statement.

The demands that arise for technological institutes, and for all Mexican HEIs, are related to the organization/administration of the exchange, collaboration, the search for additional funds, maintenance of equipment and laboratories, among other things (Ibarra Colado, 2009).

Table 2 presents the results regarding the influence that certain actors have in decision-making, in the opinion of IPT academics. 31.9% of IPT academics believe that the government or interest groups external to the SNEST and each technology company are the ones who decide which officials will lead them, followed by 28.2% of the opinions that maintain that they are the governing bodies. SNEST government. With this evidence, something already known comes to light, given that the SNEST is a centralized system directed from the SEP, in which decisions of this type are made at the central level. On the other hand, these academics feel that they have the least influence to decide this (6.4%). If compared with other strata, for example, with IPE academics, they believe that government bodies are the ones who have the greatest influence in their institutions with 33.7% the budget managed in the Mexican HEIs is also an issue that is beginning to be restructured. It participates in obtaining additional funds that are normally accessed from very specific strategic projects in which the academic community is involved. When asking about the most influential actors in determining budget priorities, the IPT academics reported that institutional officials are the ones who make these decisions in 53.2%, which leaves no ambiguity about how they observe their reality. They believe that participation as academics is low, the data obtained is 3.7%. In this same question, the IPE academics agreed that their institutional officials have the most influence in this decision, but the percentage obtained was 36.9% (see Table 2).

TABLE 2
OPINION PERCENTAGES OF ACADEMICS

In	government or external interest groups	Governing bodies	institutional officials	Unit officers	Academics
The appointment of important officials	31.9	28.2	28.9	3.7	6.4
Determining budget priorities	9.8	24.4	53.2	8.8	3.7
Approval of new academic programs	10.7	26.1	19.4	8.4	35.4
Teaching evaluation	4.4.	9.5	15.6	21.8	20.4
Selection of new colleagues	3.0	10.4	34.2	22.5	29.9
Promotion and defects of colleagues	2.4	13.2	42.2	13.9	28.4

Regarding participation in the determination of new academic programs and their influence on this decision, 35.4% of the academics reported that they do influence this decision, while those with the least influence are unit officials (8.4%). The unit officials in the technological institutes are the academic heads of each career and the heads of the Departments of Basic Sciences, Economic Administrative Sciences and Academic Development, who are the immediate superior heads of the academics in the IPT, depending on the career in who have the greatest number of hours in front of the group. If we compare these results with those obtained for the IPEs, we find that there is a coincidence in them, they are the most influential actors, except that the academics of the IPEs with 40.5% (see Table 2).

In contrast to the above, the academics maintain in 21.8% that the unit officials are the ones who have the greatest influence in the evaluation of teaching, slightly above the 20.4% who perceive that the academics themselves are the ones who have the greatest influence. There are small differences concerning what happens in the IPE, which report 27.3% collegiality in the evaluation of teaching. As is logical to suppose, both types of institutions believe that the ones with the least influence in this activity are the government or interest groups external to these HEIs (see Table 2). When asked who hires the new academics in the IPTs?, the academics of these institutions believe that the institutional officials select the new colleagues (34.2%). It should be noted that the institutional officials are the director of the institute and the three deputy directors: Academic, Planning and Administrative. 29.9% believe that the academics themselves influence this decision. On the other hand, in the IPE, the highest percentage of academics (34.4%) affirm that they, as academics, are the ones who participate prominently in the selection of new colleagues and 20.2 percent believe that they are their institutional officials (see Table 2).

The institutional officials of the IPT were reported as the actors with the greatest influence in obtaining finality and in the promotion of academics (42.2%), followed by academics with 28.4% and those who have the least influence are, in their opinion, the government or external interest groups (2.4%). The percentages obtained in this area in the opinion of the IPE academics were 31.4% for institutional officials, followed by academics, only with 30.1% (see Table 2).

IPT academics perceive that they personally influence the formulation of academic policies within their institution, school and department as shown in Table 3.

TABLE 3
PERCENTAGES OF PERSONAL INFLUENCE THAT ACADEMICS HAVE IN THE FORMULATION OF ACADEMIC POLICIES IN THEIR INSTITUTION

At the level of:	No influence	Little influence	Some influence	A lot of influence
Department, area or similar	31.9	28.2	29.9	3.7
school, college or similar unit	9.8	24.4	53.2	8.8
Institution	10.7	26.1	19.4	8.4

It is interesting to observe that 51.0% reported having some influence in their department and 15.1% believe that they have a lot of influence, so it can be said that 66.1% notice their influence (see Table 3). In the IPT there are Academic Departments where more personal relationships are established between the academic head or career head with the academics. It should also be noted that the academics of these institutions work systematically in their respective Academies, which explains the reported data. With respect to influence in the school or unit, the percentages drop, 33.1 percent claim to have some influence and 3.9% a lot of influence, which adds up to 37.0% while 28.5% claim to have "no influence" and 34.5% He says he has little influence. This information is consistent with what is reported in Table 2 regarding who or who makes the decisions in these institutions. The percentages obtained on the influence in the Institution of Table 3 are consistent with those reported in Table 2 in regard to who or who make the decisions in these institutions. 41.1% believe that they have no influence in the formulation of academic policies at this level, 28.0% mention having little influence, 21.6% affirmed having some influence and only 9.2% said they had a lot of influence. Even adding the percentages of much and some influence, the percentage obtained is lower than those who believe they do not have influence (30.8 vs 41.1%).

Table 4 shows the responses to some common statements and practices in IPTs. Regarding whether there are complicated administrative processes, 49.7% of the academics of these institutions thought that they agree with this statement, almost half of the respondents thought that the administrative processes are complicated, only 26.8 percent affirmed the opposite (see Table 4).

TABLE 4
PERCENTAGES OF RESPONSES ABOUT COMMON PRACTICES IN THE OPINION OF THEIR ACADEMICS

In the institution	In disagreement	Regularly agree	OK
There are administrative processes	26.8	23.5	49.7
There is a supportive attitude of administrative staff towards teaching activities	47.7	25.7	26.7

In the institution	In disagreement	Regularly agree	OK
There is a supportive attitude of administrative staff towards research activities	52.9	25.8	23.3
The administration supports academic freedom	10.7	17.9	71.4
The quality of research is considered in decision-making associated with personnel	53.9	23.1	23.1
The quality of teaching is considered in making decisions associated with personnel	43.8	28.8	27.3

Regarding the attitude of support of the administrative staff towards teaching activities, 47.7% maintain that there is no such support since they disagree with the statement. The attitude of support of the administrative staff towards research activities was also explored, and the results showed that 52.9% of academics believe that they do not agree with this statement, that is, they believe that support does not exist.

Regarding academic freedom, almost three-quarters of those surveyed (71.4%) affirm that it is a more or less common practice in their affiliated institution; only 10.7% did not agree with this statement.

Is the quality of the research considered in decision-making associated with personnel? The academics, with 53.9%, maintain that they do not agree with the statement, in other words, they believe that the quality of the research work is not considered in their institutions to make decisions. However, 23.1% think that it is considered. Table 4 shows how 43.9% of the IPT respondents believe that the quality of teaching is not considered in decision-making, 28.8% say that it is considered on a regular basis and 27.3% affirmed that it is considered.

DISCUSSION

The previous results show the significant differences in management styles found between the IPT and IPE strata, given the perception of the academics who work in the different institutions. The Quality Management Systems that most Mexican HEIs have established start from establishing their institution's mission, vision and values to guide their activities. The total average in this response was 3.73, which means that in the different strata the academics perceive that the emphasis on the mission is of a medium type, with the exception of the IP academics, where the average was higher. While in the IPs the mission is constantly reinforced through advertising abroad, in the IPTs there are no authorized advertising expenses. On the other hand, the mission entrusted to the IPT by the federal government, since the creation of these institutions in 1948, was to train engineers who could support their region's economic development. This mission has been surpassed, since now they are required to be engineers capable of investigating, generating technology and innovating. In the opinion of the academics, the management carried out in the IPTs is not reinforcing the mission of their institutions in particular and that of the SNIT in general.

One problem in HEIs, even in foreign ones, is the communication between the administration and the academics (Tierney, 2010). In this regard, as observed in Table 1, the average obtained for the IPT was the lowest. The administrative style practiced in these institutions, which is traditionally hierarchical, top-down, and centralized, has a significant influence. Communication is always "down" following the hierarchies.

The General Directorate of Higher Technological Education (DGEST) through each Sectoral area (academic, quality, planning or administrative) sends the respective information to the directors of each school, which in turn sends the information to the pertinent sub-directorate (academic, planning and administrative), the deputy director turns it over to the corresponding head, or to all the academic heads, they, in turn, disseminate it in academy meetings and it finally reaches the academics. Even though all this information is published on the DGEST website, it is not considered appropriate until the letter communicating this same information reaches the campus, that is, it is published until it officially arrives and has the stamps of receipt. Information almost always arrives late to academics given the number of intermediaries.

The data presented here indicate that communication is the main weakness of the management carried out in the IPTs. According to its academics it is deficient. This remains as a pending issue for its managers.

The vertical administrative method is reported to be stronger among IP academics, ranking third in the perception that IPT academics have. As previously indicated, the Technological Institutes are HEIs that belong to the Ministry of Public Education, are centralized in all aspects and have a strong hierarchical structure that is respected and not questioned by the academics who work in these institutions.

According to the results obtained, one of the interesting differences is the one observed in reference to the orientation of performance based on results. The academics of the IPT notice a low level in this aspect. Obtaining results in these HEIs is not a condition for them to be rehired or terminated. Once you are a government employee and you have finality in the teaching position, in approximately six months, the contract lasts practically until death, considering your retirement from ISSSTE. On the other hand, IPT academics are necessarily part of the SNTE. The union discount is applied to them on their first check and from that very moment they are part of it. The SNTE protects all workers, regardless of the results of their work. The academics of these institutions are accustomed to the fact that their performance results are not considered when granting them positions or managerial positions. These assignments are usually matters of internal policy.

Another clue about the management style is provided by the question about the emphasis of the institutions on the quality of the processes rather than on the indicators. From the certification of some administrative processes in the ISO: 9001 Standard, which was required of all IPTs, the phenomenon of accumulating evidence has occurred, ironically becoming the main activity of the process. The indicator, the evidence, matters, but it doesn't matter how it was carried out, you just have to have it. Academics do not perceive the continuous improvement of processes. Therefore, management is still not consistent with what it should be. However, a considerable number of IPT have certification of their processes.

From the perception of management, it is interesting that IPT academics reported the reference to collegiality. The results indicated, as in the case of communication, a low level. It is worth mentioning that regulations exist parameters to promote collegiality, because it is the space where consensual decisions can be made. However, academics perceive low levels. An example of this is presented in the hiring of new teaching staff. The Internal Regulation of the Technological Institutes (1982) indicates that there must be a Teaching Judging Commission made up of five members. Two representatives of the school management, a representative of the DGEST and two representatives of the teachers. The regulation mentions that they must be academics with prestige and who have distinguished themselves for their professionalism inside and outside the institution. The director, however, names the first three according to his criteria. On the other hand, the election of the two teachers' representatives is carried out in a union assembly. The political group with the union representation generally manipulates the assembly so that teachers related to their group are appointed to integrate part of the Teacher's Determination Commission and have certain power in making these decisions. These practices are common in many of the IPTs, so collegiality, in this sense, is disguised and is only observed in few activities.

Managers in IPTs are not appointed democratically, nor necessarily based on considerations defined in collegiality. The directors, assistant directors and department heads are appointed directly by the Director General or by the director of the campus. The directors of the schools must regularly comply with the condition of being graduates of the same SNIT. In these administrative decisions, the political interests of the groups managed at the General Directorate level permeate. The appointments of deputy directors and

heads of departments are often given as a result of the pressure exerted by the Union Delegation of the schools. The political once again plays a determining role in these appointments. It was precisely the IPT academics who argued that the leadership exercised by their highest-ranking officials in their institutions was not very competent. It seems leaders are not chosen for their skills and competencies, but for other reasons. The way in which officials are appointed in technological institutes does not always allow for appropriate leaders for the positions and circumstances. About the influence that academics perceive of the IPT at the institutional, faculty or department level, it should be explained that the highest percentages occurred at the departmental level, since it is there where more personal relationships are established between the academic head or race with the rest of the colleagues who belong to the Academy, which is the environment in which, it seems, there is collaboration and exchange of ideas. The work in the Academy is usually more collegial and it is also there where the performance of the academics is evaluated.

Thus, where IPT academics say they have the least influence is at the institutional level. It has already been pointed out that the changes come from the DGEST and are taken at another level in which academics do not intervene.

The results shown in this work on some common practices in the IPT show the lack of support of the administrative staff towards teaching and research activities and emerge as a usual practice in the IPT, according to the academics. The management of new academic activities that are beginning to be carried out in the Technological ones seems to be being carried out in isolation, without real coordination, between the different educational actors and between the different instances of the schools. To solve this type of situation, a different administration is required, with greater collaboration, where traditional practices will have to be diluted.

One can also appreciate the perception that there is little support for research and teaching, according to the academics, by the administrative staff of their institutions. They do not perceive support in the activities they carry out as academics, perhaps due to the scarce communication within the schools, nor do they consider that they are taken into account by the administrators in decision-making that has to do with the personnel.

Thus, the management carried out in the IPTs is still perceived as traditional, where the participation of academics is still scarce, where leadership leaves much to be desired, and where communication is the point of greatest weakness. Therefore, another management style is required, one that allows collaboration between academics in a natural way, in which decision-making considers the academic and not the political essential, where there is a greater participation of academics to that the knowledge, innovation, and research that this important education system of the country requires is generated.

ENDNOTES

1. https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0185-27602013000400005#notas
2. https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0185-27602013000400005#notas

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