RESEARCH
THE ORGANIZATION OF THE ACADEMIC BODY: THE PREMISES OF DECISION-MAKING, COLLEGIALLY, AND GROUP RESPONSE
An Approach from Self-reference. A Comparative Case Study in Engineering Education
ODETTE LOBATO CALLEROS AND EDUARDO DE LA GARZA

Odette Lobato Calleros is fulltime professor 4 at Universidad Iberoamericana, Mexico City. Prolongación Paseo de la Reforma 880, Lomas de Santa Fe, 01219, Mexico City, DF. EMAIL: odette.lobato@uia.mx
Eduardo De la Garza is fulltime professor C, Universidad Autónoma Metropolitana, Unidad Azcapotzalco, EMAIL: cdelag@correo.azc.uam.mx

Abstract:
At present, the policies of higher education—growth, financing, training, planning, and evaluation—come together in academic bodies, due to the relevance of their response to the demands of knowledge. This study proposes using Luhmann’s perspective of autopoietic systems of decision-making to learn more about the organization of academic bodies and to compare that organization with the ideal state of policies. Putting the perspective to test identifies, in a comparative historical case study of two academic bodies dedicated to engineering: a) a structure of premises of decision-making that tends to remain constant and that differentiates collegiality and the group response; and b) the behavior of each academic body as an autopoietic system of decision-making. The expectations suggested by these findings will need to be tested in other academic bodies.

Keywords: academic personnel, organization, decision-making, teamwork, Mexico.

Introduction
The academic body or academic unit is considered the basic unit of systems of higher education because it contributes in a relevant manner to responding to the system’s own needs for substantive, reactive growth (Clark, 1998) and integration (PROMEP, 2007). 1 Substantive growth refers to development based on knowledge, while reactive growth is expansion based on consumers’ demands.

According to Clark, we define an academic body as the dual cell where an academic pertains to a professional field, discipline, or subject, and to an institution (Clark, 1998). These cells are characterized by their members’ sharing a set of objectives and academic goals that include research, teaching, and publication (PROMEP, 2007). The differentiation of the academic unit and its surroundings occurs through the processes of teaching, research, and dissemination of knowledge of the discipline, as well as through the self-reproduction of these same processes. 2

It is important to point out that the above definition of academic bodies does not emphasize research as the substantive articulating activity, as does the Program of Professor Improvement (PROMEP, 2007), because research is a task that does not coincide with the traditional conformation of academic bodies in Mexico (SEP-PROMEP, 2006). On the other hand, it must be noted that according to Clark (1998), the recognized basic unit of higher education systems is not the individual, but the group.

On the other hand, studies on the situation of academics in institutions of higher education and their behavior in the communities or groups to which they belong, show conflicts between teachers and administrators (Lewis and Altbach, 1996), fragmentation in the development of substantive activities (Gil et al., 1994), lowered morals (Altbach, 2000), little participation in the decision-making of the central administration (Galaz y Viloria, 2004), and the mediating action of self-management regarding the influence of the policies of systems of higher education (De Vries, 1998). Some studies in Mexico prior to 2001 point to the “isolation” and “solitude” where academics worked, and urged “the
construction of organic nuclei as a basic structure of relations” to prevent weakening (Gil et al., 1994; Grediaga, 2000).

During this decade, due to the recognized importance of academic bodies, Mexico’s policies of higher education have been directed to these bodies primarily through: 1) the Program of Professor Improvement (PROMEP) and 2) the Integral Program of Institutional Strengthening (PIFI). These policies recognize the impact of their form of organization on academic results, as is the case of collegiality and teamwork (PROMEP, 2007). Given the current magnitude and complexity of institutions of higher education, increasing the limited knowledge about their organization is becoming ever more important for improved compliance with their mission (Barnett, 2002; Barba y Montaño, 2001; Ibarra, 2001).

In the current stage of the Theory of Organizations, the systematic study of higher education is beginning, enabled by the incipient analysis of the ambiguity of organizations that must respond to social needs more than market needs (Ibarra, 2001). Organizations of higher education are characterized by the ambiguity of objectives, indetermination and the variability of processes, as well as the difficulty of evaluating and especially, determining adequate results. Weick (1976) finds these traits as part of what he considers a loosely coupled system.

In the current stage of the Theory of Organizations, a perspective of study of organizations independent from the market is decision-making, because the analysis of historical development shows not only what the organization is like, but also how it is constituted. At the moment a decision is made to solve a problem that endangers the organization’s survival (March y Olsen, 1989), future conditions are established, as well as a guideline for decisions for subsequent events (Simon, 1978). Thus the complexity and uncertainty of the organization’s future are reduced and the organization’s configuration is established (Torres-Nafarrate, 2004).

Outstanding in the study of decision-making is the theory of social systems by Luhmann (1995, 1997, 2008), which postulates that the organization behaves as an autopoietic system of decision-making, a term used by Varela, Maturana y Uribe (1974) to allude to self-reference. In an organization, self-reference does not mean independence from the surroundings. “It means, rather, that the system is recursive, that it is oriented by its values, that it has its own memory, that it oscillates in the framework of its own distinctions and that it therefore produces and develops its own past and its own future” (Torres-Nafarrete 2004:163). This theory does not attempt to distinguish between a closed or open system but instead focuses on “how self-referential closing can produce openness” (Luhmann, 1984:33).

Since the relation between the academic body and its surroundings, through inputs and results, does not seem to be a determining factor for the academic body’s survival—which could be solely apparent due to complexity—we find it pertinent to use a new perspective of study that describes the self-referential quality of academic bodies. This perspective could contribute to understanding how differentiated responses occur with respect to academic results in the presence of policies of higher education and the institution of higher education to which the academic body belongs.

The basic question behind this research is: What are the characteristics of the academic body’s organization that differentiate the academic results? Since the current policies of higher education promote collegiality and teamwork in academic bodies as a basis for obtaining better academic results, special attention will be placed on these forms of organization. As a hypothesis, it is suggested that the academic body as an autopoietic system of decision-making behaves as follows:

• Hypothesis 1. The self-referential organization of the academic body differentiates the academic results.
Hypothesis 2. The academic results, after having been generated by the self-referential organization of the academic body, become part of the body.

This perspective of study, as Luhmann (2008) states, is another observation of the second level that seeks to contribute to the poly-textual description that the modern world requires. As part of the canons of development of knowledge, it makes known the observation and analyses of field researchers in higher education.

The current article contains the following sections: the principal programs of public policies directed to academic bodies, the perspective of study of decision-making, research methodology, results, and conclusions.

Principal Programs of Public Policies Directed to Academic Bodies
In the framework of general public policies—growth, financing, training, planning, and evaluation—during the past decade in Mexico, the principal programs directed to academic bodies are the Program of Professor Improvement in its collective nature, and the Integral Program of Institutional Strengthening with respect to ongoing improvement in academic bodies. These programs are characterized by paying attention to the integration of efforts, of teachers in the first case, and of all members of institutions of higher education in the second case.

Preceding the policies associated with the integration of efforts, two decades ago a policy was implemented to evaluate and stimulate teachers’ individual productivity (National System of Researchers, Institutional System of Scholarships and Incentives, the PROMEP profile). Given its acceptance (Muñoz, 2002), the policy has encouraged new forms of individual work and the implementation of discipline as a referent for teachers (Rondero, 2005).

The individual version of PROMEP was created in 1996 to give continuity to the policy of teacher training and to provide teachers with basic elements after their graduate studies to ensure their continued concentration on substantive activities. In 2000, the collective version was created to encourage the development of consolidated academic bodies, whose condition is the desirable teacher profile. It is a result of the individual version, which serves as a basis for increasing collegiality and teamwork, within and among academic bodies.

PIFI emerged in 2001, to contribute to the articulation of “policies, objectives, strategies, goals, and projects” within institutions of higher education (SEP-PIFI, 2008) by means of a planning process. The vertebral column of the process, pre-established by the Secretariat of Public Education, consists of objectives and indicators that have been identified as associated with the quality of education and that are part of other programs of this organization. Thus PIFI (2008) is an invitation from the Secretariat of Public Education to institutions of higher education to establish how and when they will reach what is expected of them: complying with indicators. This does not mean that all the characteristics of quality in higher education are satisfied, as established by Muñoz C. et al. (1997).

PROMEP and PIFI contribute to the planning of institutions of higher education in the sense stated by Luhmann (1997). Each member of the organization is allowed to take into account the decision-making of other members (for example, the state), as conditions for its own decision-making. This is attained through the linking of evaluation and financing—a link that enables the state’s meta-management (Neave, 2001).

From the perspective of the study of decision-making, PIFI—as a chain of means/ends in organizations characterized by ambiguity—faces the following restrictions (Simon, 1978): a) unclear causalities, b) struggle between higher and intermediate ends, and c) non-neutral means. On the other
hand, what for **PIFI** are objectives, for teachers may be restrictions in fulfilling their objectives (such as obtaining financing).

The evaluation implied in **PROMEP** and **PIFI** has two stages: the first is self-evaluation—following guidelines—and the second is a peer evaluation. The self-evaluation guide for **PROMEP** measures collegiality with a question: “Does the academic body organize events like periodical seminars, congresses, symposia, round tables, etc.? How often?” (**SEP-PROMEP**, 2006:102). This question attempts to evaluate if teachers analyze and discuss in group form the topics they will work on together: “the development of various projects, student theses, and the organization and development of academic events, among other aspects” (**SEP-PROMEP**, 2006:102).

In addition, the guideline evaluates teamwork based on publications, theses, and other academic activities on which several teachers collaborate. Publications are analyzed by taking into account their number, as well as the people who participate in their preparation—individuals or groups—whether members of academic bodies, associated students, or members of other bodies. The criteria for analyzing theses refer to the number of theses directed by each teacher and the number of theses in process (**SEP-PROMEP**, 2006). A description is also given of other academic activities in which several teachers collaborate.

Presented below is the perspective from which we shall the study the organization of academic bodies.

**Perspective of Study of Decision-making**

The Theory of Organizations in its current stage (1965-to date) (Ibarra, 2001) studies organizations that are characterized by ambiguity. The perspective of decision-making is developed by the behavioral movement (Simon, 1978), the movement of decision and ambiguity (March y Olsen, 1989), and the theory of social systems by Luhmann (1995, 1997, 2008). It is important to point out that the contributions of the first two movements precede Luhmann’s theory and therefore show continuity in the study of decision-making.

Simon (1978) establishes the bases of this perspective of study, and identifies that behavior in organizations is not predictable based on individuals’ roles, due to the temperament of the decision-maker. In addition, following a functional role would eliminate rationality. On the other hand, if certain decision-making premises are specified in the role, the individual would have to use reason to attain goals.

If organizations determine the importance of “getting things done” (Simon, 1978:3), then action is as relevant as the decision. Therefore, the scientific description of the organization is that it shows “the decisions each person in the organization makes and the influences to which that person is subjected when each decision is made” (Simon, 1978:36-37).

Decisions, in spite of their importance, are made with little adherence to the rational model, in which the **economical man** maximizes his decisions after discovering the complexity of his reality. In organizations, the **administrative man** selects a satisfactory solution, taking into account a few factors that he believes relevant according to his knowledge (Simon, 1978). Decisions made by the **administrative man** have been studied, according to March and Olsen (1989), by taking into account restrictions with respect to available time, knowledge of possible alternatives, availability of organizational attention to address problems, the infeasibility of selecting alternatives that are not customary, and the uncertainty of the decision-maker’s preferences.

Due to the above limitations and power, the organization’s social system, upon perceiving a problem that endangers its survival, has reiterated difficulty in applying a repetitive decision; and given
a problem that is not repetitive, difficulty in developing a contingent decision-making process, whose result will very probably be a repetitive decision (Luhmann, 1997).

In terms of selection, “power is an opportunity to increase the probability of realizing improbable combinations of selections” (Luhmann, 1995:19).

Luhmann’s theory of social systems, which studies organizational systems, establishes that a fundamental problem is “maintaining the difference between the system and its surroundings, instead of maintaining stability” (Luhmann, 2008). That which produces the difference between the two is not a “determinate event” (action) because it views people as conscience and not as a “socially constituted state of things” (Luhmann, 1984:15); in addition, it does not consider sufficiently that “people live and act at the same time, although with temporal horizons of the past and future. Therefore, the social order must be guaranteed in simultaneity and not only as a sequence” (Luhmann, 1984:15).

The key issue of constituting an organization is the “decisions that continue the system’s autopoiesis” (Luhmann, 2008). When these decisions are made, they establish future conditions and a decision-making guideline for coming events (Simon, 1978). Decisions lead to a “choice among various possibilities” (alternatives) (Luhmann, 1997). In this choice, “every operation imposes a coupling of self-reference and hetero-reference” (Luhman, 2008): the first in the sense of the network of a person’s own decisions, and the second in the sense of the motivation behind decisions.

Luhmann studies the communication of decisions because “it is the way the system reacts to irritations [from surroundings] and reflects on itself” (Luhmann, 2008). In such communication, what prevents the organization from losing itself is “the fact that every decision must be accepted as a premise of ulterior decisions, and as such, it contributes to the absorption of uncertainty” (Luhmann, 2008). Therefore the components of communication are disseminating—the act of communicating—and understanding, with an acceptance or rejection of the proposal. “The more a system regulates itself through memory and the premises of decision, the greater the reduced dependence on immediate understanding” (Luhmann, 2008). This idea may explain the mediation of the social system of institutions of higher education, disciplines, and academic bodies regarding public policies, as found by Grediaga (2000), García Salord et al. (2003) and De Vries (1998), respectively.

Although not only communication requires awareness, autopoiesis can occur only through communication, because it permits social resonance (Luhmann, 2008). Communication, which in organizations takes the form of decision-making (Luhmann, 1997), contains topic and function. The topic distinguishes among the objects of communication, which form part of the system’s memory; function refers to the system’s self-references, which enable subsequent communication (Luhmann, 2008). Thus each communication includes content and mechanisms of self-reproduction.

The study of the relation of autopoietic systems to their surroundings modifies the concept of exits/entries due to structural coupling, which refers to the “mutual modifications that interacting units undergo without losing their identity, in the course of interactions” (Maturana y Varela, 1994:101). Coupling can lead to the creation of a new unit in the same domain as the coupled units, or in a different domain.

Autopoiesis establishes in the organization a limit of structural variation, which is based on the resources the past grants to the present decision. The future, however, is not determined by the diverse possibilities of using past resources and the organization’s complexity (Luhmann, 2008).

In summary, the statement can be made that in autopoietic systems, being self-referential does not mean that the system is independent from its surroundings; “rather, it means that the system is recursive, that it is oriented by its values... that it has its own memory, that it oscillates in the settings of its own distinctions and that it therefore produces and develops its own past and its own future” (Torres-Nafarrete 2004:163). The system is coupled structurally to its surroundings.
From the perspective of autopoietic systems of decision-making, academic bodies can be viewed as a system that self-reproduces operationally through decisions, which are triggered by perceptions of the surroundings and reflections on the surroundings. These decisions are limited by memory, the anticipations of the system of the academic body, the possible alternatives of decision-making, and power.

Viewing an academic body as an autopoietic system of decision-making, not only changes the observer’s frequent location from the top of the higher education system to the base, but also recognizes the possibility that this base—the academic body—may have its own identity through which it self-reproduces and responds to the irritations that it perceives from policies of higher education, the institution of higher education, and the discipline it develops. In this identity—organization—it is key to know more about the dimensions that current public policies postulate as factors for improving performance in academic bodies: collegiality and teamwork. To make the concept of teamwork more adequate for higher education, we refer to teamwork as the group response. The following sections are dedicated to defining these dimensions.

**Collegiality and the Group Response in Academic Bodies**

Presented below are reflections on decision-making in the academic body, to be related subsequently to collegiality and the group response.

An academic body, faced with the perception of a problem, decides if the decision-making process will be carried out by the individual or group, based on the system’s memory in this respect. The decision may take into account issues that include: if the problem tends to affect others, and if others tend to prefer to participate in solving it. If the decision is made to solve the problem in an individual fashion, this does not indicate a lack of group agreement since the solution may agree with what the group itself has established. On the contrary, if the decision is made collectively, it does not necessarily ensure that the process is democratic, since the decision of an individual or subgroup may prevail.

In the event of a repetitive problem, the decision tends to be individual and repetitive. If the problem is not repetitive and a contingent selection is made by the group, the way the alternative is selected is part of decisions already made. The result will be a more probable type of decision-making process: aggregative, integrative, democratic, and so on. The decision made becomes part of the academic body’s collection of decision-making premises.

After the decision is made, action follows. This action—depending on the decision-making process in terms of agreement on the selected alternative—may be taken by the group or individual. The academic results of actions become part of the organization as information that participates in the linking of its operations. Taking the above into account, presented below is a definition of collegiality and teamwork.

**Collegiality**

In addition to the decision-making perspective and as an aid in elaborating the concept of collegiality, an analysis was made of the descriptive characteristics reported in theoretical and empirical research (Bess, 1998; Massy *et al.*, 1994; Timperley and Robinson 1998). These studies were grouped into various categories (definition, participation, rights, values, type of debate, frequency of interaction, etc.). The various descriptive subsets of collegiality were compared with what March and Olsen (1989) establish as characteristics of aggregative processes and integrative processes.

Through this comparison, we reach two important conclusions. The first is that a guideline that is presented in the concept of collegiality is the search for an academic project in common. The second is that the process through which the academic project in common is established tends to be an
integrative process, which is characterized by the “creation, identification, and application of shared preferences” (March y Olsen, 1989:208). Since the difference between the common good and the private good is recognized as increasingly diffuse, another decision-making process that is considered legitimate is democracy (Torres-Nafarrate, 2004).

An academic project is understood to be the creation and development of objectives, strategies, and goals for the production, transmission, and dissemination of the discipline to which the academic organization is dedicated. This project is elaborated within the organization at hand (academic bodies), taking into account the demands of the surroundings (policies of higher education, institutional framework of the institution of higher education); its scope is determined by the academic processes themselves. It is important to point out that objectives and strategies can be explicit or implicit, decided in a contingent manner, or the result of repetitive decisions.

Collegiality as a decision-making process in the academic body does not depend on whether decisions are made by the group or individual. It includes these two forms of decision-making; it creates and depends on the collection of decision-making premises the teachers in the academic body have in common.

This collection allows teachers to create and develop a common academic project according to the needs and possibilities of the surrounding community that they have decided to serve. Teachers can borrow from this collection in an individual or group manner in making decisions. Thus collegiality is a type of decision-making process in which decision-making premises and the form of establishing them achieve an academic project in common.

To reach this definition, we noticed that an ideal form of decision-making is rarely present in academic bodies. In order to study what really happens in the academic organization, and due to the importance of decisions, the choice was made to analyze decision-making processes in academic bodies as a way of becoming familiar with their organization. Within these processes, different levels of collegiality and group response can occur.

**Group Response**

Teamwork is a characteristic of the form of academic bodies’ organization, as referred to by public policies (PROMEP, 2006). The concept has been taken from business practices and has been the object of little reflection with respect to its development in the educational setting.

Instead of the teamwork concept, the proposal is to use the concept of group response. According to the movement of socio-technical systems, a group response facilitates the elaboration of more effective responses (a goal of systems of higher education). In Europe, the application of group response contributed to the democratization of work (Eijnatten, 1998), a key issue in systems of higher education.

During the development of operating processes in academic bodies, given the perception of a problem, a group response occurs if decisions are supported by a majority of the teachers through their acceptance of the proposal and the realization of joint actions. This definition includes elements of constitution (decisions) and description (actions) in the organization of the academic body.

Based on Luhmann (1997, 2008), collegiality as well as group response would be expected to be a result of the structure of the decisions made—premises of decision-making—and to be a part of the academic body’s self-reproduction. The difference between them seems to be that collegiality contributes to reaching agreements regarding the common academic project—philosophical aspect—and is the basis for the group response to the operating problems that the members of the academic body perceive—the operating aspect. Diverse levels and types of agreement between the personal and group positions would be expected in academic bodies.
Research Methodology

The methodology employed is a comparative historical case study of two academic bodies. The selection ensured: a) a different level of performance according to the System of Scholarships and Incentives for Institutions of Higher Education to which the academic bodies belong; and b) the reduction of the effect of concurrent factors on their organization. For this reason, academic bodies pertaining to the same institution of higher learning and dedicated to the same type of discipline (Becher, 1989) were selected. The two selected bodies were: the Area of Chemical Engineering (AIQ) and the Area of Energy Resources Engineering (AIRE) of a public institution of higher education. A comparative historical case study was carried out to observe, retrospectively, the decisions made and to place special attention on the reconstruction of alternatives, since the selection establishes the academic body’s autopoiesis.

The historical reconstruction of decisions was made through observation of a second order, based on: a) the historical moment—diachronic dimension—that creates the conditions for the context; b) the relational moment—synchronic dimension—that is centered on the interaction between individuals and contexts; and c) the nodes that change the form of the interweaving, making it similar to a spider’s web through its influence on the organization’s future. The first two elements pertain to the academics’ field of study (García Salord et al., 2003) and the third element is identified in this research.

The diachronic dimension was reconstructed on four levels: the policies of the system of higher education, the institution of higher education, the discipline to which each academic body pertains, and the academic bodies themselves.

Due to the nature of the phenomenon, the collection and analysis of data were carried out primarily by using a qualitative methodology (interviews and participant observation), supplemented by quantitative aspects. In the case of AIRE, fifteen of the sixteen fulltime professors were interviewed (93.8% of the population). In AIQ, eighteen of the nineteen professors were interviewed (94.5% of the population). The results are presented below.

Results

One of the most relevant findings is the identification of a basic structure of decision-making premises on certain topics, whose representation and description are shown in Figure 1. In the academic bodies studied, this structure acts as a background for a large part of the individual decisions of the leader and professors; such decisions serve as the basis of group decisions. The variations within the types of premises have led to the construction of different forms of organization and results in AIQ and AIRE.

FIGURE 1
Basic Structure of Types of Decision-making Premises of the Academic Bodies Studied
Premises of the Vision of the Academic Body

In the case of AIQ, ever since its founding the members have had a shared basic premise, which is “to be a strong research group in chemical engineering, which teaches through research”.

In AIRE, rather than a single basic premise, several are observed. They are sustained and supported in different manners by some of the members. The premise they all share is “to train generalists in energy”.

In the construction of the vision, the other decision-making premises of the structure and academic results converge.
The lack of agreement on the vision of AIRE is due in large part to the differences in their disciplinary traditions, values, and personal interests; thus disagreements are generated in the process of group decision-making.

The fact that AIQ has a vision shared by most of the academics with regard to research and teaching permits a higher level of collegiality and group response, and allows the academic body to exert influence on its external surroundings.

Premises of Decision-making Contained in the Disciplinary Tradition

The observation was made that professors appropriate these premises principally through the socialization implied by their doctoral studies and their professional experience.

The AIQ professors share the same undergraduate training, work experience, and graduate studies as the so-called “major leagues”, whose decision-making premises are:

1) To promote the transmission of disciplinary tradition and the development of technology through the teacher/pupil relationship associated with graduate studies;
2) To disseminate the results of research in recognized journals, to participate as judges, and to create its own journal;
3) To form links with private- and public-sector industry through research projects;
4) To maintain collaborating relationships with teachers and professionals, including alumni from graduate programs;
5) To obtain financing for research, both within and outside of the institution of higher education;
6) To teach through research at the graduate level;
7) To influence the decisions of the institution of higher education and of the policy programs of the system of higher education;
8) To support the scientific efforts of the discipline (new academic bodies, scientific associations).

The principal contribution of the above premises is that since they are accepted by the professors of greatest weight in the academic body and by the majority (79%), they generally permit more rapid and effective decision-making by both individuals and groups in AIQ, than in AIRE.

In AIQ, it is possible to dissent without conflict with respect to the premises of the “major leagues” if a professor of weight supports the dissent. Such professors are generally founders.

Most professors of AIRE, in spite of their professional experience, do not share the premises of the discipline’s tradition because they have different undergraduate degrees (physics, various engineering degrees) and graduate degrees with objectives of various types. This variation generates differences in the conception of higher education, its processes, and its position with regard to its external surroundings: issues that represent relevant complications in obtaining agreement through a majority vote, with consequences in actions. The result is an internally weakened academic body with unfavorable repercussions regarding its surroundings. The differences create two conflicting subgroups. The organization of the subgroup that emphasizes the application of technology is characterized by a majority of undergraduate students who are completing their thesis or social service; there are few graduate students and almost no professors from other academic bodies. Only two professors lead projects, which attempt to solve business problems that do not require research. The results are published as technical reports.

The organization of the subgroup that emphasizes pure and applied research is characterized by each professor’s receiving collaboration from undergraduate students who are interested in completing graduate studies, as well as some graduate students. This subgroup encourages good fundamentals in
the basic sciences in the undergraduate program. The professors in this subgroup seek collaboration from their colleagues within and outside of the institution of higher education; they also hold seminars, and elaborate proposals for joint projects that they present to industry, government organizations, or foundations. Their results are published in juried journals.

At the present time, in AIRE only five of the sixteen academics pertain to the first level of SNI; therefore only these individuals do research in an intensive manner, according to the decision-making premises accepted by this system.

The networks of professor coauthors show structural differences. In AIRE, fewer results and five unconnected subgroups are observed. In AIQ, all professors are interconnected, with the exception of one. According to the qualitative study, this connectedness is a reflection of the level of agreement in the discipline’s decision-making premises, the interconnection of research topics, and the ability to solve conflicts regarding the distribution of resources, among other aspects.

**Premises of Values that Motivate Professors’ Interest in Knowing and Responding to External Surroundings**

The premise that is manifested with greatest force is the commitment to others’ well-being, especially the least privileged, in addition to one’s own well-being. Based on this attitude, the following decision-making premises are generated: conceiving of universities as places for intellectuals, supporting the nation’s technological needs, and ensuring the survival of professors and the academic body, as described below.

1) **Conceiving of universities as places for intellectuals** has its roots, in the case of AIQ, in the University Movement of 1968, whose premises are shared by the most senior and powerful professors. As one of them expressed: “Having been part of the 1968 Generation makes us different.” This does not occur in the same manner in AIRE because its founders—contemporary to the Movement—departed from the area. Some of its members manifest their affiliation with such premises, however.

The professors in AIQ conceive of the university “as a place where the nation’s intellectuals congregate”, where one learns and questions, as shown by some of their publications that critically analyze the development of technology in Mexico.

In AIQ, philosophy plays a preponderant role, and is therefore part of the academic body’s graduate programs. Both undergraduate and graduate students are taught to be critical, to generate their own ideas, and to express and defend those ideas. This is taught in student/teacher interaction.

The undergraduate students in AIRE express that they are taught primarily to be followers and not independent thinkers.

2) **Supporting the nation’s technological needs.** Such support is sought by AIQ for developing the chemical industry, and by AIRE with respect to demands for energy. In addition, both academic bodies establish the purpose of contributing to the reduction of pollution. AIQ has more links with organizations that make decisions about the nation’s technological development (vg.: CONACYT).

3) **Ensuring the survival of professors and the academic body.** Both groups show the professors’ interest in complying with an academic career, although in different manners.

In AIRE, most members do not show a tendency to know and respond to the policies of the system of higher education, as proven by less development of research (a priority activity in such policies). Therefore, their participation is limited on outside commissions that make rulings.

The professors at AIQ have greater interest in knowing and responding to policies of higher education; as proof, fifteen of the nineteen professors belong to SNI. In addition, the founding leader and professors attempt to influence decisions in the policy programs of the system of higher education.

*Strategic Premises of the Academic Project*
These premises are related to the creation and development of strategies for attaining the academic project of one or several professors. Feedback and/or the ability to complement the academic body’s vision attempt to ensure the strategies’ success.

The existence of such premises means that each professor must have the opportunity to reflect on internal and external perturbations of the academic body. External perturbations include those generated by the institution of higher education where the professor works, and the policies of the higher education system. Internal conflicts that endanger professors’ primary interests must be solvable and not surpass their capacity of attention.

The development of joint strategies occurs as long as such strategies are necessary for attaining the professors’ interest, in first place in relation to the institution of higher education, and then with respect to the policies of the system of higher education. The first is a requirement for accessing the benefits of the second. When the decision-making process is democratic, at least among the professors of greatest weight, the creation of internal obstacles tends to be reduced.

During the origins of \textit{AIQ}, the existence of a leader who promoted friendship among professors permitted the creation of shared strategies at social gatherings. Subsequently, due to conflicts involving resources at a time of economic crisis, this relationship became solely professional. Respect during interaction has prevailed because of the balance of forces among prestigious professors, as well as shared histories of mutual help.

This type of premises was present more in \textit{AIQ} than in \textit{AIRE}. They refer to substantive activities, to hiring academics, and obtaining and distributing resources.

\textit{Premises of the Personal Interests of the Leader and Professors}

The most relevant personal interests identified in association with academic work are economic income and prestige. The retirement system is a concern. The premises of decision-making described above—vision, disciplinary tradition, values, and strategies of the academic project and personal interests—join together in the premises of the group’s founding leader and the professors.

\textit{Premises Related to the Founding Leader of the Academic Body}

In the case of \textit{AIQ}, the founding leader, based on this type of premises, proposed the vision of an area with feedback from professors. In addition, he contributed in an important manner to sustaining and working toward the objective for almost fifteen years. This did not occur in \textit{AIRE} due to the absence of leadership. It is clear that leaders and their traits influence the possibility of a group response.

\textit{Professors’ Premises of Decision-making}

Important individual decisions for professors include: \textit{a}) the substantive activity to which they dedicate their time as a priority (teaching, research, or publication); \textit{b}) the type of graduate studies completed and where; \textit{c}) participation in administrative positions; \textit{d}) line of research; \textit{e}) researchers inside or outside of the academic body who collaborate with them; \textit{f}) external links with companies, universities, and organizations that apply the policy programs of the system of higher education, and participation on publishing commissions; \textit{g}) the graduate students whose theses are under their direction; and \textit{h}) a search for resources for research.

As shown in the description of the types of premises of decision-making in the basic structure of academic bodies, important disagreement exists in \textit{AIRE} among professors since its origin. As a result, the conflict has become a recurrent topic of communication that hinders the attainment of personal interests. The self-reproduction of the organization’s system prevents collegiality and favors responses by individuals and subgroups.
In AIQ, individual decisions have also generated conflicts among professors. The difference with respect to AIRE is that these conflicts have not survived as a topic because agreements, and especially a vision, were established when the academic body was created. The observation was made that discussions about making internal decisions result in a type of self-reproduction of the academic group that has a collection of shared premises of decision-making—collegiality—that facilitates the group response and the attainment of important interests for each professor.

As supplementary information, it is important to mention that PROMEP (2001) evaluated the two academic bodies under study as having the same level of consolidation “in formation”.

Conclusions
The basic question behind this research is: What are the organizational characteristics of an academic body that make a difference in its academic results? In an attempt to answer the question, a comparative historical case study was carried out of two academic bodies dedicated to engineering education. Observation of a second order reconstructed three decades of the bodies' social system and analyzed them from the perspective of autopoietic systems of decision-making (Luhmann, 1995, 1997, 2008). In conclusion, the statement can be made that since their founding, both groups’ organizations have been historically influenced by a basic structure of types of decision-making premises.

The constitution of the organization of the academic bodies under study is based on types of decision-making premises—topics—and the interaction among these types of decision-making premises—function. Such premises act as a background for most of the professors’ individual decisions, which are the basis for group decisions. This fact corroborates the postulates by Luhmann (2008) that affirm that the topic distinguishes among the objects of communication, and that the function establishes the system’s self-references.

The basic structure as identified contains the following types of premises: a) the vision of the academic body; b) the disciplinary tradition; c) the values that stimulate professors’ interest in knowing and responding to the surroundings outside of the academic body; d) the strategies of the academic project; and e) the personal interests of the professors and leader.

It is important to indicate that the decision-making premises that arose when the academic bodies were founded, have tended to remain in decisions, thus establishing the self-references of each system. One academic body’s system strengthens compliance with the professors’ personal interests, while the other body’s system is a hindrance for those interests.

In relation with Hypothesis 1—“The self-referential organization of the academic body differentiates the academic results”—the observation was made that discrepancies in the contents of types of decision-making premises generate different forms of organization of academic bodies and diverse levels of academic results. Based on the above, Hypothesis 1 is not rejected.

Regarding the feedback of the academic body’s organizational system as stated in Hypothesis 2—“The academic results, after having been generated by the self-referential organization of the academic body, become part of the body”—the observation was made that professors compare and adjust the vision and strategies of the academic project according to information on the obtained results. Based on the above, Hypothesis 2 is not rejected.

With respect to the academic bodies’ organizational traits, which the policies of the higher education system refer to as factors of performance, collegiality, and teamwork (and which we call the perspective of decision-making as a group response), the observation was made that the academic body with the better academic results according to the System of Scholarships and Incentives of the institution of higher education to which it pertains, is characterized by the self-referential system that enables a higher level of collegiality and group response.
In the academic bodies studied, the observation was made that collegiality and group response contribute to and depend on the decision-making premises that the professors have in common, as well as the agreements reached. These forms of organization facilitate decision-making, hetero-referential coupling—motivation—and self-referential coupling—the network of one’s own decisions (Luhmann, 2008). Collegiality, whose proposed definition emphasizes the philosophical aspect, was found to be associated with motivation, since it includes the value-related premises of decision-making that make professors interested in knowing and responding to certain needs in their surroundings (the nation’s technological reality, policies of the higher education system, survival of professors and the academic body) and the premises of the professors’ personal interests.

The group response is associated more with the decisions of the system’s operation, as we postulated in the definition. The difference with respect to our statement at the beginning of the study is that we now know with greater precision which types of decision-making premises act in a system’s operation. In future studies, both empirical and theoretical, it will be useful to continue developing the definition of these forms of organization.

Public Policies Regarding Academic Bodies

The Program of Professor Improvement and the Integral Program of Institutional Strengthening could be more effective if more knowledge is available about the way the organization of academic bodies is constituted. Thus the recommendation is made to repeat this study in academic bodies dedicated to other types of disciplines.

PROMEP, in moving from individual to group evaluation, is based principally on the disciplinary tradition—training—and on a fragmented analysis of the academic body’s organization. According to the study carried out, it will be useful to discover not only if the academic body knows what to do—disciplinary tradition—but also why—values that lead to knowing and responding to the external surroundings; and if the academic body knows clearly where it wants to go—vision—and how it wants to get there—strategies of the academic project. It will be required to establish the above, as well as the participation of the premises of academics’ personal interests, and the presence of a leader.

The planning that PIFI suggests may seem similar to the findings related to the academic bodies under study. The difference is that PIFI uses the perspective of the economic man who maximizes decisions for attaining interests through a chain of ends and means, while the results of the historical study we presented show the preponderance of the self-referential system of the academic body, beyond the professors’ personal interests.

In future research, the following questions may be used to learn more about the decision-making premises of academic bodies:

1) What: Do what degree does disciplinary tradition provide clarity for the way substantive activities are carried out?
2) Values: How interested is the academic body in responding to its external surroundings? What is the critical level of society’s manifest needs with respect to the academic body’s discipline and the way it contributes to resolving the nation’s needs? How does the academic body participate in implementing programs of public policies? How does it participate in decision-making at the institution of higher education? In general, what is its ability to respond to the policies of the system of higher education?
3) Vision: How do substantive activities tend to converge in a single vision, to distinguish the academic body from others?
4) **Strategies of the academic project:** What are the strategies of the academic project and how were they established? How many professors contribute to implementing the strategies of the academic project? How does each professor contribute to the academic body? How does the academic body contribute to each professor?

5) **Leader(s):** How are the professors in the academic body distinguished? What are the characteristics of the academic leader?

6) **Personal interests:** What are the professors’ personal concerns?

To discover the level of collegiality, focusing on the organization of events as proposed by *SEP-PROMEP* (2006) is not recommended. Rather, the decision-making premises based on values and professors’ personal interests should be determined, and the identity established of the beneficiaries of the academic body’s results.

In terms of group response, it would be useful for *SEP-PROMEP* (2006) not only to focus on results (publications, theses), but also to analyze the way decision-making premises are linked to the strategies of the academic project, and to determine which professors collaborate in its development. Regarding publications, use should be made of research on social networks, in order to define networks of co-authors.

*PIFI* and *PROMEP* suggest the type of planning and expected profiles, while academic bodies respond from the autopoiesis of their decisions. This study seeks to contribute to closing that gap by increasing knowledge of academic bodies in elaborating public policies.

**Acknowledgements**

We appreciate the financial support of **CONACYT** for carrying out this research, and the important recommendations of Dr. Antonio Barba and Dr. Carlos Muñoz Izquierdo.

**Notes**

1. The concept of “academic body” is a neologism introduced by the Program of Professor Improvement (*PROMEP*) as part of the policies promoted by the Under Secretariat of Higher Education in 2001. The term is defined as the “group of fulltime professors who share one or various lines of the innovative generation or application of knowledge (*LGAC*), (research or study) in disciplinary or multidisciplinary topics, and a set of objectives and academic goals. In addition, its members follow Educational Programs at various levels for full compliance with institutional functions.” Clark refers to “academic unit” in his writings. In this article, we identify academic body as the academic unit used by Clark.

2. *PROMEP* also introduces the idea of professors with a “desirable profile”; in other words, professors who have balanced activities in teaching, research, tutoring, and administration.

**References**


Gil, Manuel (coord.); Grediaga, Rocío; Pérez Franco, Lilia; Rondero, Norma; Casillas, Miguel Ángel; De Garay Adrián (1994). Los rasgos de la diversidad, México: Universidad Autónoma Metropolitana-Unidad Azcapotzalco.


**Article Received:** July 29, 2008  
**Ruling:** November 14, 2008  
**Second Version:** December 1, 2008  
**Accepted:** December 2, 2008