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INNOVACION RADICAL DE LA ESTRUCTURA DE UN PROGRAMA DOCTORAL: UNA EXPERIENCIA MEXICANA

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1er CONGRESO DE LA RED INTERNACIONAL DE INVESTIGACION EN COMPETITIVIDAD

UNIVERSIDAD DE GUADALAJARA

Centro Universitario de Ciencias Económico Administrativas
(CUCEA)

6 y 7 de Diciembre de 2007

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Resumen

Este documento da cuenta de los resultados del experimento de una innovación radical efectuada en un programa doctoral que funcionaba con la estructura escolarizada tradicional para transformarlo en un programa de doctorado por investigación. La innovación se realizó utilizando el capital intelectual de los profesores, sin explicitar las teorías contenidas en la literatura existente. Las discusiones, durante tres años al interior de la Sección de Estudios de Posgrado e Investigación, se sustentaban con sus conocimientos, experiencias, los programas doctorales nacionales e internacionales, así como las proposiciones de esquemas, diseños, planes, contenidos curriculares, requisitos y todo lo relativo para formular la primera propuesta ante las autoridades institucionales. Los proceso de discusión, retroalimentación, modificaciones y autorización oficial en mayo de 1995 tomaron cerca de dos años. El primer estudiante, por cierto una dama, fue registrado en Septiembre 2 de 1996, después de realizado un proceso de selección original, diseñado específicamente para el programa nuevo. Los procesos que llevaron a cabo los alumnos para realizar la investigación y actividades doctorales permitieron al Instituto Politécnico Nacional y a la Escuela Superior de Comercio y Administración, concretamente, validar algunos de los supuestos que sustentaban la propuesta del programa doctoral innovado, por ejemplo, a mayor autonomía en el trabajo de la investigación se incrementa la responsabilidad del investigador; mayor confianza en la capacidad autodidacta de los estudiantes, incrementa el nivel académico de sus estudios; El incremento de la responsabilidad y de la confianza en sus capacidades les crea mayor compromiso para resolver sus problemas y con las metas de obtener el grado doctoral. La eficiencia Terminal se incremento drásticamente al reducir su permanencia en la institución de 10 a 4 años, en promedio aritmético; incrementar el número de graduados de 1 por año a 7 por año, con elevado nivel de excelencia académica, el 27% de sus egresados han ingresado al Sistema Nacional de Investigadores. Este experimento empírico ofrece varios cuestionamientos teóricos por investigar.

RADICAL INNOVATION OF THE DOCTORAL PROGRAM FRAMEWORK: MEXICAN EXPERIENCE

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ABSTRACT

This paper show the results obtained after radical innovation, from the doctoral traditional program to the research program. It was worked using professors' intellectual capital, with out explicit theories in books and papers The discussions about the several ideas, and programs from several Mexican and other countries, universities, schedules, designs, programs, plans, arguments and propositions over three years into the same Postgraduate Division and nearly two years with institutional authorities the doctoral research program was attained, and officially authorized. This program was a kind of experimental case that combined experiences, new knowledge, and informal information, around the new proposition that were emerging. So, it was offered in May 1995, and the first student was registered on September 2nd, 1996, after a selection process. The process to carry out the doctoral research and doctoral activities gave the institution the possibility to validate some suppositions, such as the increase of responsibility when the research work is endowed with more autonomy to do it; more stimulation in autodidact capacity gave the students the possibility to attain a better academic level. Following this kind of suppositions the accomplishment of the goal to obtain a doctoral degree, was reduced from a mean of 10 years to a mean 4 years approximately.

In this empirical experiment, perhaps there exist several theoretical questions hidden.

RADICAL INNOVATION OF THE DOCTORAL PROGRAM FRAMEWORK: MEXICAN EXPERIENCE

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Introduction

The management science postgraduate studies in Mexico, starting activities in 1962, by "Instituto Politécnico Nacional" (IPN) in "Escuela Superior de Comercio y Administración" (ESCA), funded on 1845, offering the degrees of Master in Sciences and Doctor in Sciences (M.Scs. Ph.D.), both brought them closer to the top management praxis in organizations. Their study programs had a framework under the traditional way, because the social and economical Mexican necessities so required and the majority of students discussed their doctoral thesis about performance in management problems; and only some of them defended researches on management science problems. Until 1962 management postgraduate programs in Latin America did not exist, including México.

The doctoral program was performed until 1995 with several modifications during this period. However, in 1992 ESCA's authorities and professors went into a modification process; because the enterprises needed to start changes,

these felt they required more research support, so the postgraduate programs, studies, governmental academic authorities were trying to respond to the new situation. The ESCA's modification process was turned into a radical innovation process that ended up in a new doctoral program in which the idea was to prepare new researchers with capabilities to research in management theory and/or innovations technology management. This process was carried out by the follow intellectual capitals:

a) Group of ESCA's professors selected to changes doctoral project.
b) "Colegio de Profesores" main academic authority in postgraduate department in IPN schools, all professors of postgraduate department.
c) "Colegio de posgrado" main academic authority in postgraduate studies and research IPN division, integrated by postgraduate department Deans of the IPN schools.
d) "Consejo Técnico Consultivo" main academic authority in IPN, integrated by Directors, representative professors and students of the IPN schools.

The process started in the first group until to arrive at the Consejo Técnico Consultivo, after several interactions between collegiate corps previous. Then, the propositions, from partials to total proposition, the new doctoral program, were discussed into of the collegiate units'

interactions until to attain definitive approbation by IPN Consejo Técnico Consultivo. During 3 years took up many hours and efforts their IPN intellectual capital, professors and scholar authorities; it was the utilization naked intellectual capital in action. The process was integrated in three major stages, diagnostic, decisions and design.

Diagnostic.

- The majority of graduates were working in several management activities in private and public organizations; a few of them as researchers in the educational system.
- The research skills and capacities were thought in the blackboard and/or class exercises.
- Much research in sciences like physics, chemistry, biology, psychiatry, and others, is possible to carry out in laboratories, or in vitro; however the research management is not feasible in this ways; in social sciences, it is very rare, enterprises do not take this kind of risks; generally to make in situ or ex-post fact.
- Management studies by scientific method are very young with respect to other sciences; this is one of the reasons to have little success.

- Their research methods are built, fully developed, and validated during research processes, like in other sciences.
- Measurement problems are subjects inherent to management research; parameters and measure scales have been generated jointly with research methods, as in others sciences.
- The terminal efficiency was low, 15% approximately of the students attained a doctoral degree.
- The average was 10 years to accomplish studies and to obtain the degree.

Main decisions.

- Basic and technological researches are one of the main sources of the enterprises and the nation's wealth; the major enterprises and developed countries in the world are the evidence.
- The mission and ends of IPN doctoral programs are: preparing and training researchers.
- The main objectives of doctoral management program are:
  - To increase universal management theory
  - To increase universal management technology
  - To think out management research methods.

  - To think out parameters and measure scales for management phenomena
- A doctoral degree has been a credit for some professionals searching for a position in any research centre; it is the culmination of a formal carrier looking for excellence.
- The research activity requires a high level of knowledge in management theory, competence, skills, practices; then, their teaching require a master sciences degree, and more training in research activities under the guide of research doctors.

New doctoral program conception

The new conception was a 180° rotation in the doctoral program framework, figure 1; the major changes were the following:

- Application process, integrated by four stapes:
  - Resume curriculum vitae.
  - Opinions and suggestions over a management case.
  - Two doctors interviews.
  - Language: English test (TOFEL 600 Points).
  - Research project sanctioned by three doctors (Evaluation Committee)

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Insert here figure 1, approximately

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- Admission act firm.
- Assignations: Tutor, Studies Assessor, Evaluation Committee; that is to say, five doctors supporting each doctoral student; all of them are integrated in a Tutorial Committee. The Tutor could be an internal or external IPN professor; Studies Assessor must be an internal IPN professor; in Evaluation Committee there are two external IPN professors participating.
- Approval of the research doctoral project and of the individual activities program by a College of Professors, that will be, put into effect by the doctoral student, under the guide of his or her Tutor and the Studies Assessor. The individual activities program is integrated by the following:
  - Research work,
  - Teaching activities
  - Publishing of papers
  - Tutorials of bachelor's and master's thesis
  - Participation in meetings, consortiums, workshops with papers
  - Lecturer

- Evaluation Committee: until the attainment of the first thesis manuscript, this is checked and gives feedback semiannually, into the doctoral activities program accomplishment.
- Thesis revision process by the Tutorial Committee.
- Predoctoral exam.
- Doctoral dissertation

Doctoral program characteristics.

- It has a unique objective: To train capable researchers so as to generate scientific knowledge and/or technological developments, as a consequence of the study of the management phenomenon.
- It is a personalized program.
- It is an interdisciplinary program.
- It is an interinstitutional program.
- It is a tutorial program.
- The least number of subject possible, and the most obligatory autodidactic learning.
- The program does not prepare persons for top management, CEO's, advisers, or entrepreneurs. This does not give more or less importance to any doctoral program, simply, congruence with the objective.
- In the whole researcher training, the necessity of daily research activities and practice are privileged,

autodidactic studies are very important, and classroom studies are considered necessary to review and study some specific knowledge, the same as in other intellectual activities, as in poetry, painting, philosophy, under the guide of a senior researcher or Tutor and Studies Assessor who are responsible to train him or her in research skills.

- The last step reduces:
  - Apprenticeship time
  - Research costs
  - Deviations
  - Errors
- Tutor orientations and joint work increase:
  - Responsibility and rigor sense.
  - Economy, effectiveness and efficient work notion
  - Skills, abilities, and expertness
  - Aptitudes to analyze, synthesize, and concluded
  - Capabilities and stimulus of creativity and innovation
  - Honesty, veracity, and prudence values of the new researchers generations
  - The daily practice of scientific work, qualities, such as, objectivity; differentiation; characterization; hierarchically and methodical

arrangement; this practice is able to produce enrichment.

Perhaps, this kind of attributes are genetic and distributed capriciously in each individual; however, this attributes could be trained into certain reasoning and specific development for some activities. In this processes it should be laudable, not to try to standardize persons and to pay attention to preserve individuality. This is more profitable in scientific work.

Doctoral program's Framework.

In this experiment, the major responsibility is supported by five senior researchers, follow the figure 1:

- Dean of the Doctoral Department. Coordination follow functions:
  - Promotion of doctoral program in the country
  - Students selection processes
  - Management processes for students following their accomplishments in their individual activities in the doctoral program, periodical evaluations, administrative matters, and students' personal problems.
  - Coordination of the doctoral exams.
  - Coordination of the doctoral dissertation.

- Thesis Director (major tutor). He or she is the main researcher who has the responsibility to training in research work the assigned student.
- Study Assessor. He or she is the researcher who guides the autodidactic studies to place their pupils near the knowledge frontier.
- Evaluation Committee: This is integrated by three researchers who review, evaluate, and offer feed back to advance reports over activities performed each semester, compared against the activities programmed in the individual doctoral activities program.

In this way, the whole tutorial is accomplished by a Tutorial Committee. The researchers coming from diverse disciplines, institutions and States; it could also be convenient to consider that some professors received their Ph.D. from Universities in other countries; Then, the students are attaining an amplified vision of the research work and methods, and receiving cultural research enrichment.

All these changes in the studies of the doctoral program have been accomplished in a very personalized way, each student and his o her research project are singular cases.

Results.

Figure 4 shows information arising from students dates processed; comparing the results of two periods.

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Insert here figure 2, approximately.

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In the first period that was operating with the traditional framework, 55 graduated Ph.D.; 2 of them were accepted by the Research National System (RNS) during 32 years. About the 55 Ph.D. from the first period it was not possible to obtain dates to estimate the terminal efficiency. With respect to 18 students, rescued and graduated in the 2nd period; the mean terminal efficiency were 10 years and 4 months; in this 32 years 1.4 persons obtained the Ph. D. degree. Monastersky (2007) observed that for many of today's graduate students, the future could not look much bleaker. However, they, students and IPN, saw long periods of training, a shortage of academic jobs, and intense competition for research grants looming ahead of them. In the second period operating with the new framework, this is, by research, during 10 years, there graduated 70 Ph.D.; rescuing 18 of them from the old program, and graduating 52 from the new program. 1 from 18 graduated was accepted by RNS; and 14 from 52 graduated were accepted by RNS; the mean terminal efficiency was 4 years and 2 months, obtaining the Ph.D. degree seven persons per year. In other

words, the time to attain the Ph.D. degree was reduced to 6 year and increased in 5.6 persons per year the graduate number. This means that there is a 60% reduction pear year to study, and 400% of increasing the number of persons obtaining Ph.D. degrees in the Mexican Republic. Recently had proposed studies to examine organizational and personal factors that contribute to the number of graduate students leaving their program of study prior to receiving the terminal degree; the organizational factors included:

- student selection process
- program structure
- ineffective advisers or mentors
- lack of program flexibility
- lack of community (Smith, Maroney, Nelson, Abel, and Abel, 2006).

The framework doctoral program's radical innovation had direct effect on student selection process and program flexibility; and indirect effect on ineffectively of advisors and mentors; and the community of the program.

The personal factors affecting indirectly performance students suggested:

- Relationship with significant others
- Family responsibilities

- Support systems
- Employment responsibilities
- Financial strains
- Time constraints
- Overload (Smith, Maroney, Nelson, Abel, and Abel, 2006).

On the other hand, the tacit knowledge from intellectual capital

Conclusions

The radical innovation achieved on doctoral framework tested its efficacy and effectiveness; both institution and students

The experiment results have demonstrated that at this level the autodidactic studies, under guide from Study Assessor, jointly with the praxis of the skills, competences, capacities and values in their research work, the postgraduate programs are more effective and efficient, a researcher cannot perform significant research without first understanding the literature in the field (Boote & Beile, 2005), learning to work with the literature, "to canvass and interpret the field and to construct her version of its terrain," is also a form of "identity work" in which the scholar positions herself and her own work in relation to the field (Kamler & Thomson, 2006; in Golde,

2007).; in addition, the researchers' formative processes are integrative.

The investments in time and financing, for the students and the IPN, were reduced drastically.

PH.D. degree studies are considered the last step for persons. At this level, they are already masters; they have the highest qualifications; then, it is convenient to be careful in their approach; and how to complete the formative processes, to polish their philosophy, values, capacities, and skills, to improve their Ph.D. performance. This is a way professional should act; that should tend toward excellence; the new doctor's generations have the responsibility to conserve the reasonability, respect, and dignity that by centuries the research activities have preserved.

It seems pertinent, in the new formative processes, that the new young researchers are the continuity of the new revolutions, without loosing control. They are trained to carry out and manage high complexity, and the intricacies capriciously interwoven of traditions, changes, opposites, entropy, negative entropy, chaos, harmonies, control, and leaderships.

Empirical findings show that the low general cultural level in the country is influencing the low demand in management postgraduate studies. More research of joint work research between enterprises, universities, and research centers,

could be stimulated an increase our participation in the international markets and their competitiveness, and increase the cultural level.

The new Doctoral research program could stimulate more persons who are looking for the scientist life. What research type, scientific or technological, and what management areas are privileged by students and universities; which has been the kind and level of impact and what effect this reproduction of researchers has done to their communities and institutions; what was before and is at present the social, economic and cultural status of the students who graduated in the new doctoral research program; there should also be a study of the gender effects in this doctoral program.

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Figure 1
Doctoral program framework

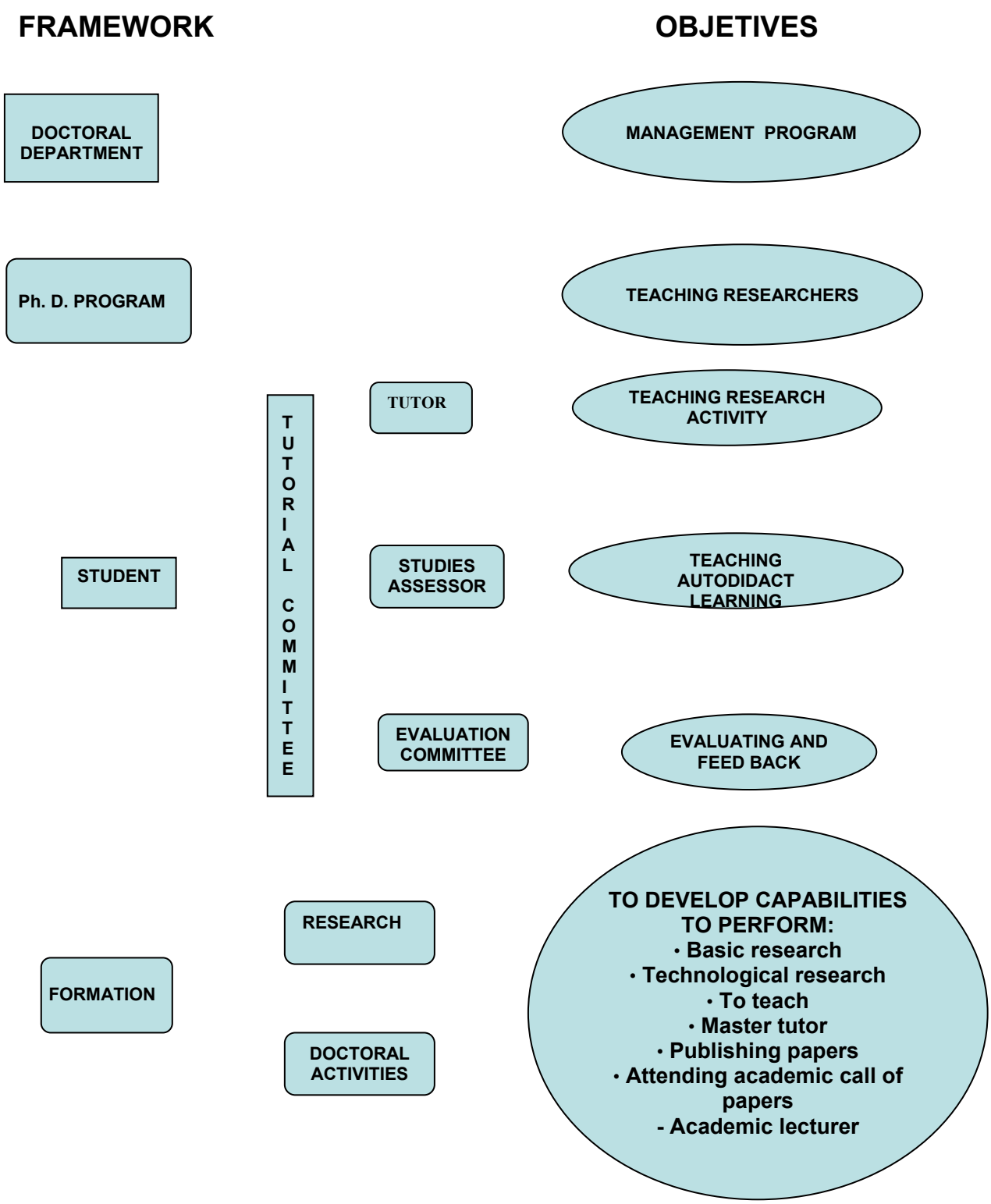

Figure 2

Results of two periods and comparison between them

Period	Framework	Achieved Ph.D.		Subtotal		Total		Duration Mean	
								Years, months	Graduates per year
1st. 1962-1994 **32 years**	Traditional	53	42.4%						
		RNS* 2	1.6%	55	44%	**55**	44%	- - -	- - -
2nd. 1995-2006 **11 years**	Traditional	17	13.6%						
		RNS 1	0.8%	18	14.4%			10,4	1.4
	By research	38	30.4%						
		RNS 14	11.2%	52**	41.6%	**70**	56%	4,2	7
Total		**108**							
		RNS 17				**125**	100%		

* Researchers National System
** 14/52 = 26.9%